

CANADA
DEPARTMENT OF MINES
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GEOLOGICAL SURVEY OF CANADA

WATER SUPPLY PAPER No. 1

PRELIMINARY REPORT
GROUND WATER RESOURCES
OF THE
RURAL MUNICIPALITY OF ENNISKILLEN
NO. 3
SASKATCHEWAN

By
B. R. MacKay and H. N. Hainstock



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1936

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BUREAU OF ECONOMIC GEOLOGY
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Publication of Results

The essential information pertaining to the ground water conditions is being published in reports, one being issued for each municipality. Copies of these reports are being sent to the secretary treasurers of the municipalities and to certain Provincial and Federal Departments, where they can be consulted by residents of the municipalities or by other persons, or they may be obtained by writing direct to the Director, Bureau of Economic Geology, Department of Mines, Ottawa. Should anyone require more detailed information than that contained in the reports such additional information as the Geological Survey possesses can be obtained on application to the director. In making such request the applicant should indicate the exact location of the area by giving the quarter section, township, range, and meridian concerning which further information is desired.

The reports are written principally for farm residents, municipal bodies, and well drillers who are either planning to sink new wells or to deepen existing wells. Technical terms used in the reports are defined in the glossary,

How to Use the Report

Anyone desiring information about ground water in any particular locality should read first the part dealing with the municipality as a whole in order to understand more fully the part of the report that deals with the place in which he is interested. At the same time he should study the two figures accompanying the report. Figure 1 shows the surface and bedrock geology as related to the ground water supply, and Figure 2 shows the relief and the location and type of water wells. Relief is shown by lines of equal elevation called "contours". The elevation above sea-level

is given on some or all of the contour lines on the figure.

If one intends to sink a well and wishes to find the approximate depth to a water-bearing horizon, he must learn: (1) the elevation of the site, and (2) the probable elevation of the water-bearing bed. The elevation of the well site is obtained by marking its position on the map, Figure 2, and estimating its elevation with respect to the two contour lines between which it lies and whose elevations are given on the figure. Where contour lines are not shown on the figure, the elevations of adjacent wells as indicated in the Table of Well Records accompanying each report can be used. The approximate elevation of the water-bearing horizon at the well-site can be obtained from the Table of Well Records by noting the elevation of the water-bearing horizon in surrounding wells and by estimating from these known elevations its elevation at the well-site.¹ If the water-bearing horizon is in bedrock the depth to water can be estimated fairly accurately in this way. If the water-bearing horizon is in unconsolidated deposits such as gravel, sand, clay, or glacial debris, however, the estimated elevation is less reliable, because the water-bearing horizon may be inclined, or may be in lenses or in sand beds which may lie at various horizons and may be of small lateral extent. In calculating the depth to water, care should be taken that the water-bearing horizons selected from the Table of Well Records be all in the same geological horizon either in the glacial drift or in the bedrock. From the data in the Table

¹ If the well-site is near the edge of the municipality, the map and report dealing with the adjoining municipality should be consulted in order to obtain the needed information about nearby wells.

of Well Records it is also possible to form some idea of the quality and quantity of the water likely to be found in the proposed well.

GLOSSARY OF TERMS USED

Alkaline. The term "alkaline" has been applied rather loosely to some ground-waters. In the Prairie Provinces, a water is usually described as "alkaline" when it contains a large amount of salts, chiefly sodium sulphate and magnesium sulphate in solution. Water that tastes strongly of common salt is described as "salty". Many "alkaline" waters may be used for stock. Most of the so-called "alkaline" waters are more correctly termed "sulphate waters".

Alluvium. Deposits of earth, clay, silt, sand, gravel, and other material on the flood-plains of modern streams and in lake beds.

Aquifer or Water-bearing Horizon. A water-bearing bed, lens, or pocket in unconsolidated deposits or in bedrock.

Buried pre-Glacial Stream Channels. A channel carved into the bedrock by a stream before the advance of the continental ice-sheet, and subsequently either partly or wholly filled in by sands, gravels, and boulder clay deposited by the ice-sheet or later agencies.

Bedrock. Bedrock, as here used, refers to partly or wholly consolidated deposits of gravel, sand, silt, clay, and marl that are older than the glacial drift.

Coal Seam. The same as a coal bed. A deposit of carbonaceous material formed from the remains of plants by partial decomposition and burial.

Contour. A line on a map joining points that have the same elevation above sea-level.

Continental Ice-sheet. The great ice-sheet that covered most of the surface of Canada many thousands of years ago.

Escarpment. A cliff or a relatively steep slope separating level or gently sloping areas.

Flood-plain. A flat part in a river valley ordinarily above water but covered by water when the river is in flood.

Glacial Drift. The loose, unconsolidated surface deposits of sand, gravel, and clay, or a mixture of these, that were deposited by the continental ice-sheet. Clay containing boulders forms part of the drift and is referred to as glacial till or boulder clay. The glacial drift occurs in several forms:

(1) Ground Moraine. A boulder clay or till plain (includes areas where the glacial drift is very thin and the surface uneven).

(2) Terminal Moraine or Moraine. A hilly tract of country formed by glacial drift that was laid down at the margin of the continental ice-sheet during its retreat. The surface is characterized by irregular hills and undrained basins.

(3) Glacial Outwash. Sand and gravel plains or deltas formed by streams that issued from the continental ice-sheet.

(4) Glacial Lake Deposits. Sand and clay plains formed in glacial lakes during the retreat of the ice-sheet.

Ground Water. Sub-surface water, or water that occurs below the surface of the land.

Hydrostatic Pressure. The pressure that causes water in a well to rise above the point at which it is struck.

Impervious or Impermeable. Beds, such as fine clays or shale, are considered to be impervious or impermeable when they do not permit of the perceptible passage or movement of the ground water.

Pervious or Permeable. Beds are pervious when they permit of the perceptible passage or movement of ground water, as for example porous sands, gravel, and sandstone.

Pre-Glacial Land Surface. The surface of the land before it was covered by the continental ice-sheet.

Recent Deposits. Deposits that have been laid down by the agencies of water and wind since the disappearance of the continental ice-sheet.

Unconsolidated Deposits. The mantle or covering of alluvium and glacial drift consisting of loose sand, gravel, clay, and boulders that overlies the bedrock.

Water Table. The upper limit of the part of the ground wholly saturated with water. This may be very near the surface or many feet below it.

Wells. Holes sunk into the earth so as to reach a supply of water. When no water is obtained they are referred to as dry holes. Wells in which water is encountered are of three classes.

(1) Wells in which the water is under sufficient pressure to flow above the surface of the ground. These are called Flowing Artesian Wells.

(2) Wells in which the water is under pressure but does not rise to the surface. These wells are called Non-Flowing Artesian Wells.

(3) Wells in which the water does not rise above the water table. These wells are called Non-Artesian Wells.

NAMES AND DESCRIPTIONS OF GEOLOGICAL FORMATIONS, REFERRED
TO IN THESE REPORTS

Wood Mountain Formation. The name given to a series of gravel and sand beds which have a maximum thickness of 50 feet, and which occur as isolated patches on the higher parts of Wood Mountain. This is the youngest bedrock formation and, where present, overlies the Ravenscrag formation.

Cypress Hills Formation. The name given to a series of conglomerates and sand beds which occur in the southwest corner of Saskatchewan, and rests upon the Ravenscrag or older formations. The formation is 30 to 125 feet thick.

Ravenscrag Formation. The name given to a thick series of light-coloured sandstones and shales containing one or more thick lignite coal seams. This formation is 500 to 1,000 feet thick, and covers a large part of southern Saskatchewan. The principal coal deposits of the province occur in this formation.

Whitemud Formation. The name given to a series of white, grey, and buff coloured clays and sands. The formation is 10 to 75 feet thick. At its base this formation grades in places into coarse, limy sand beds having a maximum thickness of 40 feet.

Eastend Formation. The name given to a series of fine-grained sands and silts. It has been recognized at various localities over the southern part of the province, from the Alberta boundary east to the escarpment of Missouri coteau. The thickness of the formation seldom exceeds 40 feet.

Bearpaw Formation. The Bearpaw consists mostly of incoherent dark grey to dark brownish grey, partly bentonitic shales, weathering light grey, or, in places where much iron

is present, buff. Beds of sand occur in places in the lower part of the formation. It forms the uppermost bedrock formation over much of western and southwestern Saskatchewan and has a maximum thickness of 700 feet or somewhat more.

Belly River Formation. The Belly River consists mostly of non-marine sand, shale, and coal, and underlies the Bearpaw in the western part of the area. It passes eastward and northeastward into marine shale. The principal area of transition is in the western half of the area where the Belly River is mostly thinner than it is to the west and includes marine zones. In the southwestern corner of the area it has a thickness of several hundred feet.

Marine Shale Series. This series of beds consists of dark grey to dark brownish grey, plastic shales, and underlies the central and northeastern parts of Saskatchewan. It includes beds equivalent to the Bearpaw, Belly River, and older formations that underlie the western part of the area.

WATER-BEARING HORIZONS OF THE MUNICIPALITY

The rural municipality of Enniskillen covers an area of 324 square miles in the southeastern corner of the province. It comprises nine townships described as townships 1, 2, and 3, ranges 1, 2 and 3, west of the second meridian. The area is covered by a mantle of unconsolidated drift that was deposited by the continental ice-sheet and by the waters that resulted from its melting. This mantle of glacial drift varies somewhat in thickness. In the southern part of the municipality it is from 45 feet to 150 feet in thickness, the minimum deposition being in the vicinity of Northgate. It increases in thickness to the north and attains its maximum thickness of from 200 to 250 feet in the northeastern and northwestern corners of the municipality.

Water-bearing Horizons in the Unconsolidated Deposits.

Souris river has cut a deep valley in this glacial drift and for a distance of a mile or less on each side of the valley the original drift has been modified by the action of the runoff water, the finer materials having been washed away leaving the coarser materials exposed on the surface. During recent times the flood-waters of the river have deposited several thin layers of silt, sand, and gravel on its flood-plain. In township 2, range 1, there is a large area of recent sand which marks the site of a former lake basin.

Throughout the municipality the upper 10 to 30-foot zone of the glacial drift is composed essentially of a yellow clay. Pockets of sand and gravel are scattered throughout this clay over most of the municipality. In certain areas, however, fairly extensive deposits of glacial gravels are found. These areas are shown on the accompanying map. A fine, blue-grey clay underlies the yellow clay and extends down to the bedrock. In a few localities a deposit of fine sand is found between the blue clay and the bedrock and pockets of sand will probably occur within the blue clay itself.

The sand and gravel deposits in the upper 30-foot zone of the glacial drift, occur either as recent deposits on the flood-plains of the river and creeks, as recent lake sands, as glacial gravels, or as lenses within the yellow clay. These form the uppermost water-bearing horizon. All of the shallow wells in the municipality derive their water from this horizon and in years of normal rainfall they produce a supply of hard, "alkaline", and "non-alkaline" water, that in most cases is sufficient for local needs. In drought periods, however, they yield only a small supply of water. Where this horizon is lacking dugouts can be excavated in the impervious clays and a supply of water for stock requirements can be retained during the summer months.

Where present, the sand deposits that lie between the blue clay and the bedrock constitute another water-bearing horizon in the glacial drift. This horizon has been encountered by only three wells, and thus its areal distribution is not known, but it is thought to occur only in a small depression in the preglacial land surface. Only a moderate supply of hard water is obtained from it.

Throughout the municipality the glacial drift is underlain by the Ravenscrag formation. This formation is composed of a series of soft shale, sandstone and sandy shale beds, and two or more lignite coal seams. The total thickness of the formation is not known, but it is at least 200 to 300 feet thick. The coal seams and the various sand layers act as water-bearing horizons, and the depths at which water can be obtained from them depends upon the thickness of the glacial drift.

Water-bearing Horizons in the Bedrock

From the data obtained, three definite water-bearing horizons are known to occur in the Ravenscrag formation. In the southern part of the municipality where there is a minimum covering of glacial drift, a pervious zone of sandy shale and a lignite coal seam, encountered at depths of 45 to 200 feet or at an elevation of from 1,650 to 1,700 feet.

constitute the uppermost of these three water-bearing horizons. The water from this horizon is soft in quality, abundant in quantity, and rises to within 30 to 90 feet of the surface. The second water-bearing horizon also consists of a sandy phase of the formation and a second lignite coal seam. It has been encountered throughout the Municipality at a depth of from 275 to 325 feet, or at an elevation of 1,525 to 1,575 feet. The majority of the wells that tap this horizon are producing an abundant supply of medium hard water which contains some organic matter derived from the coal, and an appreciable amount of iron, which settles out as a red precipitate of iron oxide. A number of wells, however, yield soft water. The hydrostatic pressure is sufficient to cause the water to rise to within 75 to 150 feet of the surface in wells drilled on the uplands, and to rise to the surface or flow a few inches above it, in wells drilled in Souris River valley. The third water-bearing horizon is encountered at a depth of 400 to 460 feet or at an elevation of from 1,400 to 1,450 feet. This also is formed by sandy beds which both overlie and underlie a small lignite coal seam. The water from this horizon is soft and does not contain any noticeable amount of iron, but in township 2, range 1, the water is salty in character. The hydrostatic pressure is not as great in this horizon as in the others and where tapped, the water rises to within 150 to 200 feet of the surface. An inflammable gas often accompanies the water from each of the horizons. The water is used for stock and unless the salt (sodium chloride) or the iron content is very high, it can also be used for domestic purposes.

GROUND WATER CONDITIONS BY TOWNSHIPS

Township 1, Range 1

One water-bearing horizon occurs in the glacial drift in this township. It is formed by the sand and gravel deposits that lie within the upper 20 feet of the drift mantle. These deposits are

either in the form of old river sands and gravels along the ravines, as low, narrow ridges that possibly mark old lake beaches, or as lenses within the clay. Shallow wells that tap this aquifer yield a supply of hard, potable water that is sufficient for local needs. Those that are dug into the yellow or blue clays are usually intermittent in character and their supply is dependant upon the amount of rainfall, the wells going completely dry in drought periods.

To the writer's knowledge no water-bearing sands have been encountered in the blue clay.

Two water-bearing horizons occur in the Ravenscrag formation. A coal seam and its enclosing sandy shale beds form the upper aquifer at a depth of 165 feet or at an elevation of approximately 1,700 feet. This horizon has been tapped by three wells in the southwestern corner of the township and an abundant supply of soft, usable water is being derived from it. The hydrostatic pressure is sufficient to cause the water to rise to within 30 to 60 feet of the surface. The second water-bearing horizon is composed of sandy shale beds and a second coal seam. This horizon is encountered at a depth of 265 to 350 feet or at an elevation of 1,560 to 1,450 feet. Those wells that are deriving their supply from the sandy beds that overlies the coal, are usually from 260 to 300 feet in depth, whereas those that derive their supply from the coal seam and the underlying sandy strata vary from 300 to 360 feet in depth. The water rises to within 30 to 140 feet of the surface and it is soft in character and abundant in quantity. When considerable water is derived from the coal, it has a brown tinge and contains a noticeable amount of iron. Should other deep wells be drilled throughout the township, an abundant supply of water can be obtained from these two water-bearing horizons.

Township 1, Range 2.

Two water-bearing horizons occur in the glacial deposits in this township. The upper horizon is composed of the sand and gravel deposits that lie within 30 feet of the surface at an elevation of

1835 to 1860 feet. All of the shallow wells in the township having a permanent supply, derive their water from this horizon. The sand and gravel deposits are quite extensive in the southeastern and northwestern corners of the township and in these localities little trouble is experienced in locating an adequate supply of water that is suitable for domestic and stock use. In the central part, however, the sand and gravel deposits are scarce and it is difficult to obtain a good supply of water from shallow wells. Sufficient water for domestic purposes can usually be obtained from seepage from the clay, but the water is in many cases quite "alkaline" in character.

A second water-bearing horizon which lies below the blue clay and above the Ravenscrag formation is encountered in the SE $\frac{1}{4}$, section 36, at a depth of 100 feet or at an elevation of 1,790 feet. At this depth there is a 10-foot thick bed of quicksand which contains some water. This horizon may occur elsewhere in the township, but if so it will probably yield at best only a moderate supply of water.

At least three water-bearing horizons occur in the Ravenscrag bedrock formation. The uppermost horizon is a coal seam and its enclosing sandy shale beds, which are encountered at a depth of from 35 to 100 feet. In the SW $\frac{1}{4}$, section 5, a shaft was sunk to this coal seam, but only a few tons of coal were removed before a sudden flow of water filled the workings. At the present time the water, which is soft and sulphur bearing, is flowing to a height of one foot above the surface level. This is the only location, however, where a large quantity of water is derived from the horizon. The second water-bearing horizon is composed of sandy beds and occurs at a depth of 110 to 140 feet or at an elevation of 1,700 to 1,740 feet. The water is soft in character, abundant in quantity, and rises to within 70 feet of the surface. A coal seam and its associated sandy shale beds, which occur at a depth of 300 to 325 feet or at an elevation of 1,550 feet, form the third horizon. The water rises to within 80 feet of the surface, is abundant in quantity, and soft in character.

Should these horizons be tapped by further drilling throughout the township, an abundant supply of potable water is to be expected.

Township 1, Range 3

The glacial deposits in this township contain one known water-bearing horizon. This horizon is composed of the sand and gravel deposits that occur in the upper 30 feet of the drift. These deposits are fairly extensive to the south of Souris river, and little trouble is experienced in getting a sufficient supply of water from shallow wells tapping this horizon in the area. As a rule the water from the deeper of the shallow wells is slightly "alkaline" in character.

Sandy shale beds of the Ravenscrag formation form a water-bearing horizon at a depth of 160 to 200 feet or at an elevation of 1,650 to 1,720 feet. Only two wells have tapped this horizon in the township and both yield an abundant supply of soft, potable water. The hydrostatic pressure is sufficient to cause the water to rise to within 50 feet of the surface. As the Ravenscrag formation underlies the glacial drift throughout the township this horizon, or others that may occur below it, will provide an adequate supply of water should they be tapped by other deep wells.

Township 2, Range 1

The sand and gravel deposits that lie above the impervious blue clay at an elevation of from 1,800 to 1,830 feet, form the only known water-bearing horizon in the glacial drift of this township. The sands and gravels are either lake deposits or glacial gravels and are extensive over practically the entire township. Shallow wells tapping this horizon yield an abundant and permanent supply of hard, potable water. With the exception of the following quarter section. NE. section 6, NW. section 8, SW. section 10,

and the SW. section 11, where shallow wells failed to obtain a suitable supply of water, no trouble should be experienced in obtaining an adequate supply of water from this horizon.

The Ravenscrag formation underlies the glacial drift throughout the township and contains two water-bearing horizons. The upper horizon is composed of sandy shale beds and is encountered at a depth of from 220 to 300 feet or at an elevation of 1,532 to 1,625 feet. Three wells have tapped this horizon in the southwestern part of the township and the water obtained is soft, with a high "soda" content and rises to within 40 feet of the surface. In the SW. $\frac{1}{4}$, section 5, the water from a well tapping this horizon becomes quite roily before a storm. This is due to a change in atmospheric pressure. The second horizon is made up of sandy beds which occur below a coal seam at depths of 400 to 468 feet, or at an elevation of 1,450 to 1,375 feet. The water from this horizon is soft and "alkaline" in character, and abundant in quantity. The hydrostatic pressure is not as great as in the upper horizon and the water only rises to within 125 to 160 feet of the surface. An abundant supply of water should be obtained from these horizons throughout the municipality.

Township 2, Range 2

Underground water from the glacial drift is obtained from two water-bearing horizons. The upper horizon is made up of the river gravels along the flood-plain of Souris river, and by the lenses and ridges of sand and gravel that occur above the blue clay. A fairly well defined gravel and sand ridge trending in a north-south direction occurs 1 to 2 miles west of the eastern border of the township. Wells dug into these deposits yield a fairly abundant supply of hard, potable water. On the flat sections, however, wells dug into the gravel lenses or into the clay are dependant upon the amount of rainfall for their water supply. Wells dug into the river

gravels yield an abundant supply as long as the water level in the river is high.

A second water-bearing horizon was encountered in the SW. $\frac{1}{4}$, section 26, at a depth of 209 feet. A sand bed lying at the base of the blue clay forms this horizon and it yields an abundant supply of hard water. The water rises to within 50 feet of the surface. The areal extent of this horizon is not known.

The Ravenscrag formation contains at least two water-bearing horizons. The upper aquifer is a coal seam and its enclosing, sandy, shale beds and it is encountered at a depth of 240 to 260 feet or at an elevation of 1,630 feet. The water rises to within 60 feet of the surface, is abundant in quantity, soft in character, and often contains a considerable amount of iron and organic matter which has been derived from the coal as the water passes through it. The second water-bearing horizon is composed of sandy shale beds and a small lignite coal seam which occur at a depth of from 375 to 440 feet or at an elevation of from 1,490 to 1,455 feet. The water is soft and contains a considerable amount of "soda." The hydrostatic pressure is sufficient to cause the water to rise to within 170 to 200 feet of the surface. Throughout the township an abundant supply of water can be obtained from these horizons.

Township 2, Range 3

The glacial drift of this township contains one water-bearing horizon. It is formed by the sand and gravel deposits that occur as strips along the ravines, and as lenses within the upper 20 feet of the drift. The supply of water from this horizon is not abundant and many of the wells do not give a sufficient supply for local needs. The best locations for shallow wells that would produce a permanent supply of water are in the ravines that lead into Souris river. On the uplands, the sand and gravel occur as lenses or as thin strips within the clay and wells dug into these lenses and strips

of sand are usually intermittent in character, going dry in drought periods and the late winter months. Several dry holes are usually dug before one of these lenses is encountered and often two or more wells have to be used in order to obtain a sufficient supply for stock use.

Only one well, located in the NE. $\frac{1}{4}$, section 30, has been drilled into the Ravenscrag formation. It encountered a water-bearing sandy shale at a depth of 347 feet or at an elevation of 1,513 feet. The water is hard and rises to within 100 feet of the surface. Should other wells be drilled into the Ravenscrag formation throughout the township, an abundant supply of water can be obtained at depths of 300 to 450 feet.

Township 3, Range 1

Very little water is obtained from the glacial drift in this township as it contains only a few deposits of sand and gravel. The few shallow wells that do occur derive their water from small lenses of sand within the yellow clay or from the flood-plain deposits in Souris River valley.

Thirty-two wells have been drilled into the Ravenscrag formation and all are deriving an abundant supply of water from two water-bearing horizons. The uppermost horizon is formed by a coal seam and a sand deposit that underlies it, and it is encountered at a depth of 300 to 350 feet in the southern part of the township and at a depth of 200 to 300 feet in the northern part. The water is usually hard and high in iron, but in a few wells it is medium soft in character. It rises to within 80 to 120 feet of the surface and is usable for both men and animals. The second horizon is composed of sandy shale and sandstone and it is encountered at a depth of from 400 to 438 feet or at an elevation of from 1,410 to 1,450 feet. The water is hard to medium soft in character, fairly abundant in quantity, and rises to 100 to 135 feet of the surface. An

abundant supply of potable water can, therefore, be obtained from the Ravenscrag formation throughout the township.

Township 3, Range 2

Underground water in the glacial drift is derived from two water-bearing horizons. The sands and gravels that occur as flood-plain deposits in the valleys, as glacial gravels along Moose Mountain creek, and as lenses and strips within the upper 30 feet of the drift, form the uppermost horizon. A number of springs occur along Souris valley and they give an adequate supply of hard, potable water, but the wells that are dug into the flood-plain deposits as a rule yield only a moderate supply. Shallow wells, however, obtain an adequate supply of water from the glacial gravels. The lenses of gravel and sand yield only small supplies of water, sufficient for domestic use and a few head of stock. It is often necessary to dig several dry holes before a sand lens is located. A few dugouts are used and this is a practical method of retaining a supply of water for stock use during the summer months. Wells that derive their water by seepage from the yellow and blue clays in many cases yield only a small supply of strongly "alkaline" water.

A second water-bearing horizon was encountered at a depth of 130 feet by a well drilled in the town of Oxbow. No information was obtained on this well, however, and the character and extent of the aquifer could not be determined.

Two water-bearing horizons occur in the Ravenscrag formation. The upper horizon is a coal seam and its associated sandy beds. It is encountered at a depth of 300 feet on the uplands, and at 170 feet in the river valleys. The water is hard and contains a considerable amount of iron. On the higher lands the water rises to within 60 to 120 feet of the surface, and in the valleys it rises to within a few feet of the surface or flows less than a foot above the surface. The

second water-bearing horizon is a sand bed which is encountered at a depth of 425 to 450 feet on the uplands and at approximately 300 feet in the valleys. The water is medium hard to soft in character, and in many cases contains a considerable amount of iron. The hydrostatic pressure is sufficient to cause the water to rise to within 40 to 90 feet of the surface on the uplands, and to the surface or a short distance above it in the valleys. In some of the wells there is a strong flow of gas. Throughout the township these horizons will yield an abundant supply of water should they be tapped by other wells.

Township 3, Range 3

The sand and gravel deposits, which occur either as glacial gravels or as pockets within the upper 30 feet of the drift, form the only productive water-bearing horizon in the thick deposit of glacial material that mantles this township. The elevation of the top of this aquifer varies from 1,850 feet in the southeast corner to 1,900 feet in the northwest corner of the township. This horizon is the source of water for all of the shallow wells, but the supply is not large. The best supply is obtained from glacial gravels that occur along a ravine to the southeast of Frobisher. Elsewhere throughout the township, the wells are dug into small, scattered lenses and small strips of sand and gravel, and the supply of water depends upon the size of the sand body encountered and upon the amount of local precipitation. As a rule the supply from an individual well is sufficient for household purposes and for 10 to 20 head of stock. Wells that are dug into the clay, or very small seams of gravel, usually yield "alkaline" water. Dugouts are used by some farmers for storing water for stock use during the summer months. This method of retaining the runoff waters can be used to advantage throughout the township.

Underground water from the Ravenscrag formation is, and

can be obtained, from two horizons. A coal seam and an underlying sand bed form the uppermost horizon at a depth of 300 to 350 feet, or at an elevation of 1,550 to 1,590 feet. The water is medium soft to hard in character and contains iron, which precipitates as the red oxide, upon exposure to air. The water is abundant in quantity and is usable for both humans and stock. The hydrostatic pressure is sufficient to cause the water to rise to within 60 to 100 feet of the surface. The second water-bearing horizon is a sand bed which is encountered at a depth of 400 to 465 feet or at an elevation of 1,400 to 1,450 feet. The water rises to within 100 to 200 feet of the surface and is soft to medium hard in character, and abundant in quantity. Should other wells be drilled into the Ravenscrag formation an adequate supply of water will be obtained from these horizons.

Statistical Summary of Well Information in Rural Municipality of Emmiskillen, No. 3, Saskatchewan

| | Township | Range | 1 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 3 | Total No. in Municipality |
|--------------------------------------|----------|-------|----|----|----|----|----|----|----|----|-----|---------------------------------|
| | | | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | |
| West of 2nd mer. | | | | | | | | | | | | |
| Total No. of Wells in Township | | | 46 | 41 | 12 | 54 | 28 | 59 | 58 | 42 | 109 | 449 |
| No. of wells in bedrock | | | 11 | 13 | 2 | 6 | 8 | 1 | 33 | 11 | 7 | 92 |
| No. of wells in glacial drift | | | 35 | 28 | 10 | 48 | 19 | 58 | 22 | 31 | 102 | 353 |
| No. of wells in alluvium | | | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 4 |
| Permanency of Water Supply | | | | | | | | | | | | |
| No. with permanent supply | | | 25 | 23 | 12 | 37 | 21 | 25 | 39 | 30 | 55 | 267 |
| No. with intermittent supply | | | 7 | 4 | 0 | 3 | 3 | 16 | 4 | 8 | 10 | 55 |
| No. dry holes | | | 14 | 14 | 0 | 14 | 4 | 18 | 15 | 4 | 44 | 127 |
| Types of Wells | | | | | | | | | | | | |
| No. of flowing artesian wells | | | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 3 |
| No. of non-flowing artesian wells | | | 13 | 11 | 2 | 8 | 8 | 1 | 33 | 9 | 7 | 92 |
| No. of non-artesian wells | | | 19 | 15 | 10 | 32 | 16 | 40 | 10 | 27 | 58 | 227 |
| Quality of Water | | | | | | | | | | | | |
| No. with hard water | | | 20 | 18 | 8 | 34 | 17 | 41 | 34 | 35 | 61 | 268 |
| No. with soft water | | | 12 | 9 | 4 | 6 | 7 | 0 | 9 | 3 | 4 | 54 |
| No. with salty water | | | 1 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 4 |
| No. with "alkaline" water | | | 7 | 3 | 1 | 7 | 4 | 5 | 2 | 1 | 9 | 39 |
| Depths of Wells | | | | | | | | | | | | |
| No. from 0 to 50 feet deep | | | 35 | 29 | 9 | 46 | 20 | 58 | 25 | 31 | 102 | 355 |
| No. from 51 to 100 feet deep | | | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 3 |
| No. from 101 to 150 feet deep | | | 0 | 6 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 9 |
| No. from 151 to 200 feet deep | | | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 6 |
| No. from 201 to 500 feet deep | | | 8 | 3 | 0 | 7 | 8 | 1 | 33 | 9 | 6 | 75 |
| No. from 501 to 1000 feet deep | | | | | | | | | | 1 | | 1 |
| No. over 1,000 feet deep | | | | | | | | | | | | |
| How the Water is used | | | | | | | | | | | | |
| No. usable for domestic purposes | | | 27 | 24 | 11 | 34 | 22 | 37 | 40 | 36 | 60 | 291 |
| No. not usable for domestic purposes | | | 5 | 3 | 1 | 6 | 2 | 4 | 3 | 2 | 2 | 31 |
| No. usable for stock | | | 30 | 27 | 12 | 40 | 23 | 38 | 43 | 38 | 65 | 316 |
| No. not usable for stock | | | 2 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 6 |
| Sufficiency of Water Supply | | | | | | | | | | | | |
| No. sufficient for domestic needs | | | 30 | 27 | 12 | 40 | 24 | 40 | 43 | 38 | 65 | 319 |
| No. insufficient for domestic needs | | | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 3 |
| No. sufficient for stock needs | | | 27 | 23 | 11 | 35 | 21 | 23 | 35 | 28 | 52 | 255 |
| No. insufficient for stock needs | | | 5 | 4 | 1 | 5 | 3 | 18 | 8 | 10 | 13 | 67 |

ANALYSES AND QUALITY OF WATER

General Statement

Samples of water from representative wells in surface deposits and bedrock were taken for analyses. Except as otherwise stated in the table of analyses the samples were analysed in the laboratory of the Borings Division of the Geological Survey by the usual standard methods. The quantities of the following constituents were determined; total dissolved mineral solids, calcium oxide, magnesium oxide, sodium oxide by difference, sulphate, chloride, and alkalinity. The alkalinity referred to here is the calcium carbonate equivalent of all acid used in neutralizing the carbonates of sodium, calcium, and magnesium. The results of the analyses are given in parts per million--that is, parts by weight of the constituents in 1,000,000 parts of water; for example, 1 ounce of material dissolved in 10 gallons of water is equal to 625 parts per million. The samples were not examined for bacteria, and thus a water that may be termed suitable for use on the basis of its mineral salt content might be condemned on account of its bacteria content. Waters that are high in bacteria content have usually been polluted by surface waters.

Total Dissolved Mineral Solids

The term "total dissolved mineral solids" as here used refers to the residue remaining when a sample of water is evaporated to dryness. It is generally considered that waters that have less than 1,000 parts per million of dissolved solids are suitable for ordinary uses, but in the Prairie Provinces this figure is often exceeded. Nearly all waters that contain more than 1,000 parts per million of total solids have a taste due to the dissolved mineral matter. Residents

accustomed to the waters may use those that have much more than 1,000 parts per million of dissolved solids without any marked inconvenience, although most persons not used to highly mineralized water would find such waters highly objectionable.

Mineral Substances Present

Calcium and Magnesium

The calcium (Ca) and magnesium (Mg) content of water is dissolved from rocks and soils, but mostly from limestone, dolomite, and gypsum. The calcium and magnesium salts impart hardness to water. The magnesium salts are laxative, especially magnesium sulphate (Epsom salts, MgSO_4), and they are more detrimental to health than the lime or calcium salts. The calcium salts have no laxative or other deleterious effects. The scale found on the inside of steam boilers and tea-kettles is formed from these mineral salts.

Sodium

The salts of sodium are next in importance to those of calcium and magnesium. Of these, sodium sulphate (Glauber's salt, Na_2SO_4) is usually in excess of sodium chloride (common salt, NaCl). These sodium salts are dissolved from rocks and soils. When there is a large amount of sodium sulphate present the water is laxative and unfit for domestic use. Sodium carbonate (Na_2CO_3) "black alkali", sodium sulphate "white alkali", and sodium chloride are injurious to vegetation.

Sulphates

Sulphates (SO_4) are one of the common constituents of natural water. The sulphate salts most commonly found are sodium sulphate, magnesium sulphate, and calcium sulphate (CaSO_4). When the water contains large quantities of the sulphate of sodium it is injurious to vegetation.

Chlorides

Chlorides are common constituents of all natural water and are dissolved in small quantities from rocks. They usually occur as sodium chloride and if the quantity of salt is much over 400 parts per million the water has a brackish taste.

Iron

Iron (Fe) is dissolved from many rocks and the surface deposits derived from them, and also from well casings, water pipes, and other fixtures. More than 0.1 part per million of iron in solution will settle as a red precipitate upon exposure to the air. A water that contains a considerable amount of iron will stain porcelain, enamelled ware, and clothing that is washed in it, and when used for drinking purposes has a tendency to cause constipation, but the iron can be almost completely removed by aeration and filtration of the water.

Hardness

Calcium and magnesium salts impart hardness to water. Hardness of water is commonly recognized by its soap-destroying powers as shown by the difficulty of obtaining lather with soap. The total hardness of a water is the hardness of the water in its original state. Total hardness is divided into "permanent hardness" and "temporary hardness". Permanent hardness is the hardness of the water remaining after the sample has been boiled and it represents the amount of mineral salts that cannot be removed by boiling. Temporary hardness is the difference between the total hardness and the permanent hardness and represents the amount of mineral salts that can be removed by boiling. Temporary hardness is due mainly to the bicarbonates of calcium and magnesium and iron, and permanent hardness to the sulphates and chlorides of calcium and magnesium. The permanent hardness

can be partly eliminated by adding simple chemical softeners such as ammonia or sodium carbonate, or many prepared softeners. Water that contains a large amount of sodium carbonate and small amounts of calcium and magnesium salts is soft, but if the calcium and magnesium salts are present in large amounts the water is hard. Water that has a total hardness of 300 parts per million or more is usually classed as excessively hard. Many of the Saskatchewan water samples have a total hardness greatly in excess of 300 parts per million; when the total hardness exceeded 3,000 parts per million no exact hardness determination was made. Also no determination for temporary hardness was made on waters having a total hardness less than 50 parts per million. As the determinations of the soap hardness in some cases were made after the samples had been stored for some time, the temporary hardness of some of the waters as they come from the wells probably is higher than that given in the table of analyses.

Analyses of Water Samples from the Municipality of Enniskillen, NO. 3, Saskatchewan

| LOCATION | | | | Depth of Well, Ft. | Total dis'vd Solids | Cl. | HARDNESS | | | CONSTITUENTS AS ANALYSED | | | | CONSTITUENTS AS CALCULATED IN ASSUMED COMBINATIONS | | | | | | | | Source of Water | | |
|----------|------|------|-----|--------------------|---------------------|-----|----------|------|-------|--------------------------|-------|-----------------|-----|--|-----------------|-------------------|--------|-------------------|-------------------|-------------------|-------------------|-----------------|---------------------------------|---------------------------------|
| No. | Qtr. | Sec. | Tr. | | | | Rge. | Mer. | Total | Perm | Temp. | Alka- linity | CaO | MgO | SO ₄ | Na ₂ O | Solids | CaCO ₃ | CaSO ₄ | MgCO ₃ | MgSO ₄ | | Na ₂ CO ₃ | Na ₂ SO ₄ |
| 1. | SE. | 33 | 1 | 2 | 2 | 20 | 1,460 | 27 | 550 | | 490 | 190 | 79 | 660 | 420 | 1,476 | 340 | | 125 | 57 | | 909 | 45 | 1 |
| 2. | NW. | 1 | 1 | 1 | 2 | 265 | 2,200 | 936 | 25 | not det. | 630 | 20 | 11 | | 1169 | 2,204 | 36 | | 23 | | 601 | | 1,544 | 2 |
| 3. | NW. | 16 | 2 | 1 | 2 | 468 | 2,840 | | | | | | | | | | | | | (2) | | | (1) | 2 |
| 4. | SE. | 2 | 2 | 2 | 2 | 308 | 1,520 | 336 | 15 | not det. | 885 | 20 | | | 837 | 1,524 | 36 | | | | 868 | | 620 | 2 |
| 5. | NW. | 10 | 3 | 1 | 2 | 410 | 1,880 | 338 | 20 | not det. | 1,105 | 20 | 7 | 4 | 904 | 1,809 | 36 | | 15 | | 1,113 | | 475 | 2 |
| 6. | SW. | 16 | 3 | 1 | 2 | 312 | 980 | 56 | 420 | 80 | 340 | 150 | 76 | 144 | 224 | 873 | 269 | | 159 | | 140 | 213 | 92 | 2 |
| 7 | NW. | 33 | 3 | 1 | 2 | 220 | 1,508 | | | | | | | | | | (2) | | (4) | | (1) | (5) | (3) | 2 |
| 8. | NW. | 12 | 3 | 2 | 2 | 320 | 1,845 | | | | | | | | | | (1) | (3) | (2) | (4) | | | (5) | 2 |
| 9. | NE. | 29 | 3 | 3 | 2 | 465 | 1,940 | 180 | 35 | not det. | 820 | 40 | 14 | 336 | 816 | 1,651 | 72 | | 29 | | 756 | 497 | 297 | 2 |

Water samples indicated thus, 1, are from glacial drift.
 Water samples indicated thus, 2, are from bedrock, Ravenscrag formation.
 Analyses are reported in parts per million; where numbers (1), (2), (3), (4), and (5) are used instead of parts per million, they represent the relative amounts in which the five main constituents are present in the water.
 Analyses Nos. 3, 7, and 8, by Provincial Analyst, Regina.
 For interpretation of this table read the section on Analyses and Quality of Water.

Water from the Unconsolidated Deposits

One sample of water from the glacial drift was analysed. It has a total dissolved solid content of 1,460 parts per million and is excessively hard, the total hardness being 550 parts per million. It contains 909 parts per million of sodium sulphate (Glauber's Salt) and may have a laxative effect upon those not accustomed to its use. Some of the water from the drift may contain so much mineral salt in solution, however, that it will be unfit for drinking. In general, the waters from the glacial drift in this municipality are suitable for stock and may be used for irrigation, although they are not as beneficial as rain water.

Water from the Bedrock

Four samples of water from the Ravenscrag formation were analysed in the laboratory of the Boring's Division, Geological Survey, and the results are listed in the accompanying table. The results of three analysis that were determined by the provincial analyst are also given, but the exact amount of the mineral salts in these samples is not known and they are listed in the order of their comparative quantity.

The waters from the Ravenscrag formation in this municipality have an average total dissolved solid content of 1,800 parts per million. The water is soft to medium hard, the total hardness commonly being from 15 to 100 parts per million, and rarely exceeding 400 parts per million. As a rule the water from the upper part of the Ravenscrag formation has a higher degree of hardness than that from the lower part.

Unlike the water from the glacial drift, which has a high calcium and magnesium salt content, the water from the Ravenscrag formation is high in sodium salts. Sodium carbonate (black alkali) as a rule is the predominant salt present, with sodium chloride (common salt) being next in abundance. In the samples analysed the sodium carbonate content averages 800

parts per million, and the sodium chloride, 700 parts per million. The water is salty and has a definite "soda " taste. The water is not harmful for drinking, but it is unpalatable and does not quench thirst. It is suitable for stock but cannot be used for irrigation.

WELL RECORDS—Rural Municipality of

B 4-4
1860-10,000

| WELL No. | LOCATION | | | | | TYPE OF WELL | DEPTH OF WELL | ALTITUDE WELL (above sea level) | HEIGHT TO WHICH WATER WILL RISE | | PRINCIPAL WATER-BEARING BED | | | CHARACTER OF WATER | TEMP. OF WATER (in°F.) | USE TO WHICH WATER IS PUT | YIELD AND REMARKS |
|----------|----------|------|-----|------|------|--------------|---------------|---------------------------------|-----------------------------------|-------|-----------------------------|-------|-------------------------|--------------------|------------------------|---------------------------|---|
| | ¼ | Sec. | Tp. | Rge. | Mer. | | | | Above (+) Below (-) Surface | Elev. | Depth | Elev. | Geological Horizon | | | | |
| 1 | NW | 1 | 1 | 1 | 2 | Drilled | 265 | 1820 | - 60 | 1760 | 265 | 1555 | Ravenscrag, sandy shale | Soft, milky | 44 | S. | Many dry holes to 40', abundant supply. # |
| 2 | NW | 2 | " | " | " | Dug | 15 | 1850 | - 10 | 1840 | 15 | 1835 | Glacial, gravel | Hard, clear | 42 | D. S. | Sufficient supply. |
| 3 | SW | 4 | " | " | " | Drilled | 165 | 1860 | - 60 | 1800 | 165 | 1695 | Ravenscrag, coal seam | Soft, brown colour | — | D. S. | " |
| 4 | NW | 5 | " | " | " | Dug | 9 | 1830 | - 3 | 1827 | 3 | 1827 | Glacial, gravel | Hard, muddy | | S. | Also sub- artesian water at 130'. |
| 5 | NE | 6 | " | " | " | Drilled | 165 | 1850 | - 30 | 1820 | 165 | 1685 | Ravenscrag, coal seam | " , clear | 44 | D. S. | Sufficient supply. |
| 6 | NW | 6 | " | " | " | " | 158 | 1860 | - 50 | 1810 | 158 | 1702 | Ravenscrag, sandy shale | Soft, clear | 43 | D. S. I. | " |
| 7 | SW | 12 | " | " | " | " | 336 | 1810 | - 60 | 1750 | 336 | 1474 | Ravenscrag, sandy shale | " , " | 45 | S. | Abundant supply, gas with water. |
| 8 | SW | 12 | " | " | " | Dug | 28 | 1810 | - 16 | 1794 | | | Glacial, clay | Hard, " | 45 | S. D. | Sufficient supply, soft water at 135'. |
| 9 | NW | 12 | " | " | " | " | 18 | 1815 | ? | ? | 18 | 1797 | Brn , sand | " , " | 45 | D. S. | " , " " " 135'. |
| 10 | SE | 13 | " | " | " | " | 20 | 1805 | - 15 | 1790 | 15 | 1790 | " , clay | " , alkaline | 45 | D. S. | Insufficient supply, soft water at 305'. |
| 11 | NE | 13 | " | " | " | " | 12 | 1725 | 0 | 1725 | 12 | 1713 | " , sand | " , clear | 45 | D. S. I. | Sufficient supply. |
| 12 | SE | 16 | " | " | " | " | 19 | 1865 | - 10 | 1855 | 19 | 1844 | " , " " | " , " | 41 | D. S. I. | " , soft water at 350'. |
| 13 | NW | 20 | " | " | " | " | 22 | 1850 | - 15 | 1835 | 15 | 1835 | " , " " | " , " | 40 | D.S.I. | Sufficient in years of normal rainfall. |
| 14 | NE | 20 | " | " | " | Drilled | 300 | 1820 | - 50 | 1770 | 300 | 1520 | Ravenscrag, coal seam ? | Soft, " | 46 | D. S. I. | Sufficient for local needs. |
| 15 | NW | 21 | " | " | " | " | 260 | 1850 | - 50 | 1800 | 260 | 1590 | Ravenscrag, shale | " " | | D. S. I. | Sufficient supply. |
| 16 | SE | 22 | " | " | " | Dug | 22 | 1825 | - 12 | 1813 | ? | ? | Glacial, clay | Hard, " | | D. S. I. | " , soft water at 300'. |
| 17 | SE | 22 | " | " | " | " | 22 | 1825 | - 18 | 1807 | 18 | 1807 | vsig , gravel | " , alkaline | | S. | " |
| 18 | NE | 22 | " | " | " | " | 24 | 1820 | - 21 | 1799 | 21 | 1799 | " , sand | " , clear | 44 | D. S. | " , " |
| 19 | SW | 24 | " | " | " | Drilled | 271 | 1800 | - 70 | 1730 | 271 | 1529 | Ravenscrag, sandy shale | Soft, " | 45 | D. S. | " |
| 20 | SW | 24 | " | " | " | Dug | 22 | 1800 | - 2 | 1898 | ? | ? | Glacial, gravel | Hard, " | 51 | D. S. I. | " |
| 21 | NE | 26 | " | " | " | Drilled | 360 | 1810 | - 60 | 1750 | 360 | 1450 | Ravenscrag, coal seam | Soft, cloudy | | D. S. | No shallow wells. |
| 22 | NW | 27 | " | " | " | Dug | 16 | 1805 | - 9 | 1796 | 7 | 1796 | Glacial, gravel | Hard, clear | 42 | D. S. | Sufficient supply. |
| 23 | SW | 27 | " | " | " | " | 20 | 1815 | - 10 | 1805 | 10 | 1805 | " , sand | " , alkaline | 44 | D. S. | Poor supply |

NOTE—All depths, altitudes, heights and elevations given above are in feet.

(D) Domestic; (S) Stock; (I) Irrigation; (M) Municipality; (N) Not used.
(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of

B 4-4
1880—10,000

| WELL No. | LOCATION | | | | | TYPE OF WELL | DEPTH OF WELL | ALTITUDE WELL (above sea level) | HEIGHT TO WHICH WATER WILL RISE | | PRINCIPAL WATER-BEARING BED | | | CHARACTER OF WATER | TEMP. OF WATER (in°F.) | USE TO WHICH WATER IS PUT | YIELD AND REMARKS |
|----------|----------|------|-----|------|------|--------------|---------------|---------------------------------|-----------------------------------|-------|-----------------------------|-------|-------------------------|--------------------|------------------------|---------------------------|---|
| | ¼ | Sec. | Tp. | Rge. | Mer. | | | | Above (+) Below (-) Surface | Elev. | Depth | Elev. | Geological Horizon | | | | |
| 24 | SW | 28 | 1 | 1 | 2 | Dug | 12 | 1835 | - 8 | 1827 | 8 | 1827 | Glacial, gravel | Hard, alkaline | 42 | D. S. I. | Sufficient supply of soft water at 335'. |
| 25 | SW | 30 | " | " | " | " | 15 | 1855 | -11 | 1844 | 11 | 1844 | " , sand | " , clear | 39 | D. S. | Abundant supply. |
| 26 | NW | 30 | " | " | " | " | 25 | 1850 | - 2 | 1848 | ? | ? | " , blue clay | " , alkaline | 48 | S. | Poor supply. |
| 27 | SW | 32 | " | " | " | " | 28 | 1865 | -20 | 1845 | 20 | 1845 | Glacial | " , milky | | D. S. I. | Sufficient supply. |
| 28 | SE | 32 | " | " | " | " | 20 | 1860 | - 6 | 1854 | ? | ? | " , sand | Soft, clear | | S. | Well in slough |
| 29 | SE | 34 | " | " | " | " | 8 | 1810 | - 5 | 1805 | 5 | 1805 | " , " | Hard, " | 41 | D. S. | Sufficient supply, soft water at 300'. |
| 30 | SE | 35 | " | " | " | " | 13 | 1850 | - 7 | 1843 | 7 | 1843 | " , " | Hard, " | 42 | D. S. | " " , " " " 305'. |
| 31 | NE | 35 | " | " | " | " | 7 | 1820 | - 3 | 1817 | ? | ? | " , clay | " , alkaline | | D. S. I. | Insufficient supply, soft water at 310'. |
| 32 | SW | 36 | " | " | " | Drilled | 300 | 1810 | -30 | 1780 | 300 | 1510 | Ravenscrag, sandy shale | Soft, cloudy | 44 | S. | Abundant supply, sufficient gas for domestic heating. |
| 33 | NW | 36 | " | " | " | " | 298 | 1850 | -140 | 1710 | 258 | 1592 | Ravenscrag, sandy shale | " , saline | | N. | Struck gas at 295', 14 lbs. pressure. |
| 1 | NE | 2 | 1 | 2 | 2 | Dug | 9 | 1840 | - 5 | 1835 | 5 | 1935 | Glacial, gravel | Hard, clear | 49 | D. S. I. | Sufficient supply. |
| 2 | SW | 5 | " | " | " | " | 45 | 1800 | + 1 | 1801 | 35 | 1765 | Ravenscrag, coal seam | Soft, sulphur | 49 | S. | Abundant " . |
| 3 | NW | 8 | " | " | " | Drilled | 130 | 1850 | -70 | 1780 | 130 | 1720 | Ravenscrag, sandy shale | " , clear | 44 | D. S. | " " . |
| 4 | NE | 8 | " | " | " | " | 140 | 1840 | -80 | 1760 | 140 | 1700 | Ravenscrag, sandy shale | " , " | | D. S. | Sufficient " . |
| 5 | SE | 8 | " | " | " | " | 140 | 1840 | -80 | 1760 | 140 | 1700 | Ravenscrag, sandy shale | soda Soft, clear | | D. S. | Abundant " . |
| 6 | SW | 9 | " | " | " | Dug | 14 | 1850 | -11 | 1839 | 11 | 1839 | Glacial, sand | Hard " alkaline | 48 | D. S. | Poor " . |
| 7 | SW | 11 | " | " | " | " | 40 | 1840 | -10 | 1830 | 32 | 1808 | " , " | Milky | 46 | S. | Constant supply . |
| 8 | SW | 12 | " | " | " | " | 9 | 1850 | - 5 | 1845 | 5 | 1845 | " , " | Hard " | 49 | D. S. I. | Abundant " . |
| 9 | NE | 12 | " | " | " | " | 12 | 1850 | - 8 | 1842 | 8 | 1842 | " , " | Hard, " | 50 | D. S. | Sufficient " . |
| 10 | SW | 16 | " | " | " | Drilled | 140 | 1855 | -40 | 1815 | 140 | 1715 | Ravenscrag, sandy shale | Soft, " | 44 | D. S. I. | " " . |
| 11 | SE | 16 | " | " | " | " | 140 | 1855 | -70 | 1785 | 140 | 1715 | Ravenscrag, shale | " , " , soda | 44 | D. S. I. | " " . |
| 12 | SE | 18 | " | " | " | Dug | 15 | 1840 | -12 | 1828 | 12 | 1828 | Glacial clay | Hard, " | 49 | D. S. I. | " " . |
| 13 | NW | 17 | " | " | " | Drilled | 199 | 1860 | -100 | 1760 | 199 | 1661 | Ravenscrag, sandy shale | Soft, " | 44 | D. S. | Abundant " , kills plants. |
| 14 | NW | 13 | " | " | " | " | 110 | 1850 | | | 110 | 1740 | Ravenscrag, sandy shale | " , " | 44 | D. S. | " " , " " . |
| 15 | SE | 19 | " | " | " | Dug | 21 | 1850 | -15 | 1835 | 15 | 1835 | Glacial, sand | Hard, alkaline | | S. | Poor supply. |

NOTE—All depths, altitudes, heights and elevations given above are in feet.

(D) Domestic; (S) Stock; (I) Irrigation; (M) Municipality; (N) Not used.
(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of ~~WINNIPEG~~ NO. 3.

B 4-4
1880—10,000

| WELL No. | LOCATION | | | | | TYPE OF WELL | DEPTH OF WELL | ALTITUDE WELL (above sea level) | HEIGHT TO WHICH WATER WILL RISE | | PRINCIPAL WATER-BEARING BED | | | CHARACTER OF WATER | TEMP. OF WATER (in°F.) | USE TO WHICH WATER IS PUT | YIELD AND REMARKS |
|----------|----------|------|-----|------|------|--------------|---------------|---------------------------------|-----------------------------------|-------|-----------------------------|-------|--------------------------------|----------------------|------------------------|---------------------------|--|
| | ¼ | Sec. | Tp. | Rge. | Mer. | | | | Above (+) Below (-) Surface | Elev. | Depth | Elev. | Geological Horizon | | | | |
| 16 | SE | 20 | 1 | 2 | 2 | Dug | 16 | 1805 | -14 | 1791 | 16 | 1789 | Glacial, sand | Hard, clear | 44 | D. S. | Poor supply. |
| 17 | NE | 20 | " | " | " | Drilled | 166 | 1855 | -90 | 1765 | 160 | 1695 | Ravenscrag, sandy shale | Soft, " | 47 | D. S. | Abundant supply. |
| 18 | SE | 24 | " | " | " | Dug | 9 | 1865 | -6 | 1859 | 6 | 1859 | Glacial, clay | Hard, " | 50 | D. S. I. | Sufficient supply. |
| 19 | NW | 24 | " | " | " | Drilled | 96 | 1865 | -70 | 1795 | 96 | 1769 | Bedrock ? | " , " | 44 | D. S. | " , kills plants. |
| 20 | SW | 25 | " | " | " | " | 325 | 1860 | -70 | 1790 | 325 | 1535 | Ravenscrag, coal seam | Soft, " | 44 | D. S. | Abundant " , " " . |
| 21 | SW | 29 | " | " | " | Dug | 10 | 1855 | -8 | 1847 | 8 | 1847 | Glacial, gravel | Hard, " | 49 | D. S. | Poor supply. |
| 22 | SE | 30 | " | " | " | " | 13 | 1850 | -4 | 1846 | 13 | 1837 | " , " | " , " | 42 | D. S. I. | Water level changes every few days. |
| 23 | NW | 30 | " | " | " | " | 13 | 1855 | -4 | 1851 | 10 | 1845 | " , " | " , " | 45 | I. S. I. | Sufficient supply. |
| 24 | NW | 32 | " | " | " | " | 12 | 1860 | -6 | 1854 | 6 | 1854 | " , " | alkaline Hard, clear | | D. S. I. | " " . |
| 25 | SE | 33 | " | " | " | " | 20 | 1860 | -12 | 1848 | 12 | 1818 | " , clay | " , " | 43 | D. I. | " " , #. |
| 26 | SW | 33 | " | " | " | Drilled | 300 | 1860 | -80 | 1780 | 300 | 1560 | Ravenscrag, sandy shale | " , " | 45 | S | " " . |
| 27 | SW | 36 | " | " | " | " | 325 | 1890 | -90 | 1800 | 322 | 1568 | Ravenscrag, sandy shale | Soft, " | 42 | D. S. | Some water at 100', abundant supply at 322'. |
| 1 | NW | 2 | 1 | 3 | 2 | Drilled | 200 | 1850 | -50 | 1800 | 200 | 1650 | Ravenscrag, sandy shale | " " | 44 | S. | Sufficient supply. |
| 2 | NW | 3 | " | " | " | Dug | 22 | 1870 | -17 | 1853 | 17 | 1853 | Glacial, gravel | Hard, " | 48 | D. S. | " " . |
| 3 | SW | 5 | " | " | " | Drilled | 160 | 1880 | ? | ? | 160 | 1720 | Ravenscrag, sandy shale | Soft, " | 43 | S. | " " . |
| 4 | SE | 5 | " | " | " | Dug | 28 | 1920 | -16 | 1904 | 16 | 1904 | Glacial, gravel | Hard, " | 44 | D. S. I. | " " . |
| 5 | NW | 6 | " | " | " | " | 12 | 1890 | -8 | 1882 | 8 | 1882 | " , " | " , " | 40 | D. S. | " " . |
| 6 | NW | 8 | " | " | " | " | 56 | 1850 | -54 | 1796 | 54 | 1796 | " , sand | " , alkaline | 44 | S. | " " , laxative to human beings. |
| 7 | NW | 8 | " | " | " | " | 20 | 1850 | -14 | 1836 | 16 | 1834 | " , " | Soft, clear | 48 | D. S. | " " . |
| 8 | SE | 10 | " | " | " | " | 32 | 1860 | -22 | 1838 | 32 | 1828 | " , " | Hard, " | 42 | D. S. | Insufficient supply. |
| 9 | NW | 11 | " | " | " | " | 10 | 1850 | -2 | 1848 | 10 | 1840 | " , " | " , " | 46 | D. S. M. | Abundant supply. |
| 10 | SE | 12 | " | " | " | " | 14 | 1850 | -5 | 1845 | 11 | 1839 | " , " | " , " | 41 | D. S. | Insufficient supply. |
| 11 | NE | 29 | " | " | " | " | 12 | 1750 | -5 | 1745 | 5 | 1745 | " , gravel | Soft, black colour | | D. S. | Sufficient " . |
| 12 | NE | 35 | " | " | " | " | 10 | 1850 | -4 | 1846 | 7 | 1843 | " , sand | Hard, clear | | D. S. I. | " " . |
| 1 | NW | 2 | 2 | 1 | 2 | Drilled | 325 | 1810 | -150 | 1660 | 325 | 1455 | Ravenscrag, coal seam | Soft, salty, clear | 44 | D. S. I. | Abundant supply, gas at 280'. |
| 2 | SE | 4 | " | " | " | " | 265 | 1835 | -20 | 1815 | 265 | 1570 | Sand at the base of blue clay? | Soda, soft, clear | 43 | D. S. | Sufficient supply |

NOTE—All depths, altitudes, heights and elevations given above are in feet.

(D) Domestic; (S) Stock; (I) Irrigation; (M) Municipality; (N) Not used.
(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of

WINNIPEG NO. 3.

B 4-4
1880—10,000

| WELL No. | LOCATION | | | | | TYPE OF WELL | DEPTH OF WELL | ALTITUDE WELL (above sea level) | HEIGHT TO WHICH WATER WILL RISE | | PRINCIPAL WATER-BEARING BED | | | CHARACTER OF WATER | TEMP. OF WATER (in°F.) | USE TO WHICH WATER IS PUT | YIELD AND REMARKS |
|----------|----------|------|-----|------|------|--------------|---------------|---------------------------------|-----------------------------------|-------|-----------------------------|-------|-------------------------------|---------------------|------------------------|---------------------------|---|
| | ¼ | Sec. | Tp. | Rge. | Mer. | | | | Above (+) Below (-) Surface | Elev. | Depth | Elev. | Geological Horizon | | | | |
| 3 | SW | 4 | 2 | 1 | 2 | Drilled | 212 | 1840 | - 70 | 1770 | 212 | 1628 | Sand at the base of blue clay | Hard, iron, sulphur | | D. S. | Sufficient supply. |
| 4 | SE | 5 | " | " | " | Dug | 9 | 1850 | - 5 | 1845 | 5 | 1845 | Glacial, sand, | Hard, clear | 49 | D. S. I. | Poor supply. |
| 5 | SW | 5 | " | " | " | Drilled | 305 | 1840 | - 40 | 1800 | 305 | 1535 | Ravenscrag, sandy shale | Soft, soda, clear | 42 | D. S. | Abundant supply. |
| 6 | NW | 5 | " | " | " | Dug | 20 | 1850 | - 16 | 1834 | 16 | 1834 | Glacial, sand | Hard, clear | 44 | D. S. | Sufficient supply. |
| 7 | SW | 6 | " | " | " | " | 14 | 1850 | - 11 | 1839 | 10 | 1840 | " , " | " , " | 44 | D. S. | " " |
| 8 | NW | 6 | " | " | " | " | 25 | 1850 | - 12 | 1838 | 12 | 1838 | " , " | Very hard, clear | 42 | D. S. | " " , 35 dry holes on Q. S. |
| 9 | SW | 7 | " | " | " | " | 25 | 1830 | - 8 | 1822 | 8 | 1822 | " , gravel | Hard, alkaline | | S. | Poor supply, laxative. |
| 10 | NE | 8 | " | " | " | Drilled | 428 | 1860 | -160 | 1700 | 428 | 1432 | Ravenscrag, sandy shale | " , clear, salty | | S. | Sufficient supply, alkaline water from yellow clay. |
| 11 | NW | 8 | " | " | " | Dug | 40 | 1850 | | | | | Glacial clay | | | N. | Dry holes. |
| 12 | NE | 9 | " | " | " | " | 14 | 1840 | - 12 | 1828 | 6 | 1834 | " gravel | Hard, " | 43 | D. S. I. | Sufficient supply. |
| 13 | SE | 10 | " | " | " | " | 11 | 1840 | - 7 | 1833 | 6 | 1834 | " " | " , " | 47 | D. S. I. | " " . |
| 14 | SW | 10 | " | " | " | " | 12 | 1840 | | | | | " clay | " , " | | D. S. | " " . |
| 15 | SW | 11 | " | " | " | " | 25 | 1830 | | | | | " " | | | N. | Dry holes. |
| 16 | SE | 11 | " | " | " | " | 10 | 1810 | - 9 | 1801 | 9 | 1801 | " gravel | " , " | 48 | D. S. I. | Sufficient supply . |
| 17 | SE | 12 | " | " | " | " | 8 | 1815 | - 4 | 1811 | 6 | 1809 | " | " , " | 50 | D. S. I. | " " . |
| 18 | SW | 12 | " | " | " | " | 12 | 1800 | - 6 | 1794 | 6 | 1794 | " " | " , " | 50 | D. S. I. | " " . |
| 19 | SE | 14 | " | " | " | " | 10 | 1800 | - 8 | 1792 | 9 | 1791 | " , sand | " , " | 55 | D. S. I. | " " . |
| 20 | NE | 14 | " | " | " | " | 12 | 1810 | - 8 | 1802 | 8 | 1802 | " , " | " , " | 50 | D. S. I. | " " . |
| 21 | NW | 16 | " | " | " | Drilled | 468 | 1840 | -140 | 1700 | 460 | 1380 | Ravenscrag, sandy shale | " , cloudy, salty | 44 | S. | " " , laxative, #. |
| 22 | SW | 17 | " | " | " | Dug | 10 | 1860 | - 3 | 1857 | 8 | 1852 | Glacial, sand | Hard, alkaline | 45 | D. S. | " " . |
| 23 | NW | 18 | " | " | " | " | 25 | 1840 | - 13 | 1827 | 13 | 1827 | " , gravel, | " , " | 40 | D. S. I. | " " . |
| 24 | SW | 19 | " | " | " | Drilled | 400 | 1850 | -125 | 1725 | 400 | 1450 | Ravenscrag, sandy shale | Soft, clear, soda | 43 | D. S. | " " , contains gas. |
| 25 | SW | 21 | " | " | " | Dug | 10 | 1830 | - 8 | 1822 | 8 | 1822 | Glacial, sand, | Hard, clear | 48 | D. S. I. | " " . |
| 26 | NW | 21 | " | " | " | " | 15 | 1820 | - 9 | 1811 | 9 | 1811 | " , " | " , " | 50 | D. S. I. | " " . |
| 27 | SE | 22 | " | " | " | " | 15 | 1800 | - 12 | 1788 | 12 | 1788 | " , " | " , " | 44 | D. S. | " " . |
| 28 | SW | 22 | " | " | " | " | 10 | 1820 | - 4 | 1816 | 10 | 1810 | " , " | " , " | 50 | D. S. | " " . |
| 29 | SW | 24 | " | " | " | " | 20 | 1820 | - 10 | 1810 | 10 | 1810 | " , gravel | " , " | 44 | D. S. | " " . |

NOTE—All depths, altitudes, heights and elevations given above are in feet.

(D) Domestic; (S) Stock; (I) Irrigation; (M) Municipality; (N) Not used.
(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of

MANUSCRIPT NO. 3.

B 4-4
1880—10,000

| WELL No. | LOCATION | | | | | TYPE OF WELL | DEPTH OF WELL | ALTITUDE WELL (above sea level) | HEIGHT TO WHICH WATER WILL RISE | | PRINCIPAL WATER-BEARING BED | | | CHARACTER OF WATER | TEMP. OF WATER (in° F.) | USE TO WHICH WATER IS PUT | YIELD AND REMARKS |
|----------|----------|------|-----|------|------|--------------|---------------|---------------------------------|-----------------------------------|-------|-----------------------------|-------|-------------------------|---------------------------|-------------------------|---------------------------|--|
| | ¼ | Sec. | Tp. | Rge. | Mer. | | | | Above (+) Below (-) Surface | Elev. | Depth | Elev. | Geological Horizon | | | | |
| 30 | NE | 26 | 2 | 1 | 2 | Dug | 6 | 1800 | - 2 | 1798 | 4 | 1796 | Glacial, sand | Hard, clear | 52 | D. S. | Sufficient supply. |
| 31 | SW | 27 | " | " | " | " | 12 | 1830 | -10 | 1820 | 20 | 1820 | " " | " " | 43 | D. S. | Abundant supply. |
| 32 | NE | 31 | " | " | " | " | 22 | 1847 | -20 | 1827 | 20 | 1827 | " gravel | " " | 44 | D. S. | Waters 12 head of stock. |
| 33 | NE | 32 | " | " | " | " | 4 | 1753 | - 2 | 1751 | 2 | 1751 | " sand | Soft, " | 53 | D. S. | " 10 " " " |
| 1 | SE | 2 | 2 | 2 | 2 | Drilled | 308 | 1900 | -50 | 1850 | 308 | 1592 | Ravenscrag, coal seam | Soft, clear | | D. S. | Abundant supply, #. |
| 2 | SW | 2 | " | " | " | " | 240 | 1870 | -60 | 1810 | 240 | 1630 | Ravenscrag, coal seam | " , brown colour | 45 | D. S. | " " |
| 3 | NE | 2 | " | " | " | Dug | 15 | 1910 | - 2 | 1908 | 5 | 1905 | Glacial, gravel | Hard, alkaline | 48 | D. S. | Poor supply. |
| 4 | NW | 3 | " | " | " | Drilled | 365 | 1855 | -180 | 1675 | 365 | 1490 | Ravenscrag, sandy shale | Soft, soda clear | 44 | D. S. | Sufficient supply. |
| 5 | SE | 4 | " | " | " | " | | 1850 | | | | | Ravenscrag, sandy shale | Soft, soda, yellow colour | | D. S. | " " |
| 6 | NW | 4 | " | " | " | Dug | 14 | 1840 | - 7 | 1833 | 10 | 1830 | Glacial | Hard clear | 42 | D. S. | " " |
| 7 | SW | 6 | " | " | " | " | 10 | 1690 | | | 10 | 1680 | " , clay | " , alkaline | | D. S. | Dry at present. |
| 8 | NW | 10 | " | " | " | Drilled | 260 | 1870 | -80 | 1790 | 250 | 1620 | " | Hard, iron, clear | 45 | D. S. I. | Sufficient supply. |
| 9 | NW | 11 | " | " | " | Dug | 30 | 1885 | | | | | " gravel | | | N. | Went dry in 1907. |
| 10 | NE | 12 | " | " | " | " | 11 | 1880 | - 9 | 1871 | 10 | 1870 | " , sand | Soft, clear | | D. S. | Sufficient supply. |
| 11 | NW | 12 | " | " | " | " | 28 | 1890 | -24 | 1866 | 25 | 1865 | " , gravel | Hard, alkaline | 43 | D. | Sub-artesian water at 290' & 420'. |
| 12 | SW | 13 | " | " | " | Bored | 23 | 1910 | -20 | 1890 | 20 | 1890 | " , sand | Soft, clear | 45 | D. I. | Use 11' well for stock. |
| 13 | SW | 13 | " | " | " | Drilled | 437 | 1910 | -200 | 1710 | 437 | 1473 | Ravenscrag, coal seam | " , " | 46 | N. | Sub-artesian water at 310' & 425'. |
| 14 | NE | 14 | " | " | " | " | 446 | 1900 | -170 | 1730 | 446 | 1454 | Ravenscrag, sandy shale | " , " | 46 | D. S. | Sufficient supply. |
| 15 | SE | 16 | " | " | " | " | 258 | 1855 | -70 | 1785 | 258 | 1597 | Ravenscrag, sandy shale | " , " | | D. S. | " " |
| 16 | NW | 16 | " | " | " | Dug | 25 | 1850 | - 9 | 1841 | 20 | 1830 | Glacial | Hard, " | 45 | D. S. | " " |
| 17 | SW | 26 | " | " | " | Drilled | 209 | 1895 | -50 | 1845 | 209 | 1686 | Sand below blue clay | " , " | 44 | D. S. | " " |
| 18 | NE | 26 | " | " | " | Dug | 33 | 1895 | -29 | 1866 | 30 | 1865 | Glacial, sand | " , " | 46 | D. S. I. | " " |
| 19 | NE | 32 | " | " | " | " | 17 | 1695 | - 5 | 1690 | 7 | 1688 | " , gravel | " , " | 53 | D. S. | " " |
| 20 | SW | 33 | " | " | " | " | 12 | 1850 | - 3 | 1847 | 4 | 1846 | " , " | " , " | | D. S. | " , sub-artesian water at 290' & 425'. |
| 21 | NW | 34 | " | " | " | " | 12 | 1894 | - 9 | 1886 | 10 | 1885 | " , sand | " , " | 46 | D. S. | " , sub-artesian water at 335' & 470'. |
| 22 | NW | 35 | " | " | " | " | 19 | 1910 | -13 | 1897 | 15 | 1895 | " , clay | " , " | 46 | D. S. | Moderate supply. |

NOTE—All depths, altitudes, heights and elevations given above are in feet.

(D) Domestic; (S) Stock; (I) Irrigation; (M) Municipality; (N) Not used.
(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of ~~WISSEMAN~~ NO. 3.B 4-4
1880—10,000

| WELL No. | LOCATION | | | | | TYPE OF WELL | DEPTH OF WELL | ALTITUDE WELL (above sea level) | HEIGHT TO WHICH WATER WILL RISE | | PRINCIPAL WATER-BEARING BED | | | CHARACTER OF WATER | TEMP. OF WATER (in°F.) | USE TO WHICH WATER IS PUT | YIELD AND REMARKS |
|----------|----------|------|-----|------|------|--------------|---------------|---------------------------------|-----------------------------------|-------|-----------------------------|-------|------------------------|--------------------|------------------------|---------------------------|---|
| | ¼ | Sec. | Tp. | Rge. | Mer. | | | | Above (+) Below (-) Surface | Elev. | Depth | Elev. | Geological Horizon | | | | |
| 1 | NE | 4 | 2 | 3 | 2 | Dug | 12 | 1870 | -5 | 1865 | 9 | 1861 | Glacial, sand | Hard, clear | 45 | D. | Poor supply, numerous dry holes dug. |
| 2 | SW | 4 | " | " | " | " | 10 | 1828 | -9 | 1819 | 9 | 1819 | " , " | " , " iron | 47 | D. S. | Two similar wells yield sufficient supply. |
| 3 | NE | 5 | " | " | " | " | 9 | 1854 | -4 | 1850 | 2 | 1852 | " " " | " " | 46 | D. S. | Poor supply. |
| 4 | NE | 8 | " | " | " | " | 12 | 1875 | -10 | 1865 | 10 | 1865 | " " | " " | 48 | D. S. | Waters 20 head of stock. |
| 5 | SE | 9 | " | " | " | " | 14 | 1874 | -6 | 1868 | 7 | 1867 | " " | " " | 46 | D. S. | Sufficient for local needs. |
| 6 | SW | 10 | " | " | " | " | 27 | 1870 | -15 | 1855 | 23 | 1847 | " " | " " | 49 | D. S. | Insufficient supply. |
| 7 | NW | 10 | " | " | " | " | 10 | 1864 | -6 | 1858 | 9 | 1855 | " , gravel | " " | 48 | D. S. | " " |
| 8 | NE | 12 | " | " | " | " | 18 | 1849 | -14 | 1835 | 12 | 1837 | " , sand | " " | 42 | D. S. | Abundant supply. |
| 9 | NE | 13 | " | " | " | " | 10 | 1850 | -4 | 1846 | 8 | 1842 | " " | " " | 48 | D. S. | Sufficient supply. |
| 10 | SE | 16 | " | " | " | " | 10 | 1865 | -7 | 1858 | 7 | 1858 | " " | " " | 46 | D. S. | Waters 25 head of stock. |
| 11 | SE | 18 | " | " | " | " | 15 | 1892 | -5 | 1887 | 5 | 1887 | " " | " " | 48 | S. | Abundant supply. |
| 12 | SW | 19 | " | " | " | " | 10 | 1855 | -5 | 1850 | 5 | 1850 | " " | " " | 44 | D. S. | Sufficient supply. |
| 13 | NW | 20 | " | " | " | " | 10 | 1888 | -3 | 1885 | 5 | 1883 | " " | " " | 44 | D. S. | Abundant supply. |
| 14 | SE | 20 | " | " | " | " | 10 | 1880 | -4 | 1876 | 4 | 1876 | " " | " " | 48 | D. S. | Sufficient supply with use of similar well. |
| 15 | NE | 21 | " | " | " | " | 14 | 1884 | -9 | 1875 | 12 | 1872 | " " | " " | 45 | D. S. | " " " |
| 16 | NW | 22 | " | " | " | " | 40 | 1890 | | | | | " clay | " " | | N. | Thirty dry holes. |
| 17 | NW | 24 | " | " | " | " | 14 | 1860 | -10 | 1850 | 12 | 1848 | " sand | " " | 43 | D. S. | Insufficient supply |
| 18 | SE | 24 | " | " | " | " | 8 | 1831 | -2 | 1829 | 2 | 1829 | " gravel | " " | 50 | D. S. I. | Waters 20 head of stock. |
| 19 | NW | 26 | " | " | " | " | 12 | 1859 | -9 | 1850 | 8 | 1851 | " sand | " " | 48 | D. S. | Insufficient supply |
| 20 | SE | 27 | " | " | " | " | 25 | 1860 | -15 | 1845 | 13 | 1842 | " " | " " | 43 | D. S. | Sufficient with 2 other similar wells. |
| 21 | SW | 27 | " | " | " | " | 12 | 1860 | -9 | 1851 | 9 | 1851 | " " | " " | 46 | D. S. | " " 1 " " well. |
| 22 | SE | 28 | " | " | " | " | 12 | 1852 | -8 | 1844 | 8 | 1844 | " " | " yellow colour | 44 | D. S. | Waters 50 head of stock. |
| 23 | NE | 28 | " | " | " | " | 9 | 1850 | -5 | 1845 | 5 | 1845 | " " | Hard, clear | 48 | D. S. | Insufficient supply. |
| 24 | SW | 28 | " | " | " | " | 9 | 1855 | -5 | 1850 | 5 | 1850 | " sandy, clay | " " | 45 | D. S. | " " " |
| 25 | NE | 30 | " | " | " | Drilled | 347 | 1860 | -100 | 1760 | 345 | 1515 | Ravenscrag, sandy beds | " " | 44 | D. S. | Abundant supply. |
| 26 | NE | 31 | " | " | " | Dug | 25 | 1846 | -8 | 1838 | | | Glacial blue clay | " " | 44 | D. S. | Insufficient supply. |
| 27 | NE | 32 | " | " | " | " | 17 | 1884 | -5 | 1879 | 15 | 1869 | " sand | " " | 42 | S. | Moderate supply. |

alkaline

NOTE—All depths, altitudes, heights and elevations given above are in feet.

(D) Domestic; (S) Stock; (I) Irrigation; (M) Municipality; (N) Not used.
(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of ENNISKILLEN NO. 3.

B 4-4
1880—10,000

| WELL No. | LOCATION | | | | | TYPE OF WELL | DEPTH OF WELL | ALTITUDE WELL (above sea level) | HEIGHT TO WHICH WATER WILL RISE | | PRINCIPAL WATER-BEARING BED | | | CHARACTER OF WATER | TEMP. OF WATER (in° F.) | USE TO WHICH WATER IS PUT | YIELD AND REMARKS |
|----------|----------|------|-----|------|------|--------------|---------------|---------------------------------|-----------------------------------|-------|-----------------------------|-------|-------------------------|-------------------------|-------------------------|---------------------------|--|
| | ¼ | Sec. | Tp. | Rge. | Mer. | | | | Above (+) Below (-) Surface | Elev. | Depth | Elev. | Geological Horizon | | | | |
| 28 | NW | 33 | 2 | 3 | 2 | Dug | 11 | 1855 | - 8 | 1847 | 8 | 1847 | Glacial, sand | Hard clear | 54 | D. S. | Insufficient supply. |
| 29 | SE | 33 | " | " | " | " | 14 | 1854 | -10 | 1844 | 10 | 1844 | " " | " " | 48 | D. S. | Sufficient with 2 other similar wells. |
| 30 | NE | 34 | " | " | " | " | 19 | 1855 | - 7 | 1848 | 10 | 1845 | " gravel | " " | 43 | D. S. | Insufficient supply. |
| 31 | SE | 35 | " | " | " | " | 15 | 1858 | - 9 | 1849 | 9 | 1849 | " sand | " " | 45 | D. S. | Waters 40 head of stock. |
| 1 | NE | 4 | 3 | 1 | 2 | Dug | 4 | 1750 | - 2 | 1748 | 2 | 1748 | Recent alluvium | Hard, clear | | D. S. | Waters 15 head of stock. |
| 2 | SE | 5 | " | " | " | " | 18 | 1830 | -14 | 1816 | 16 | 1814 | Glacial, sand | " " | | S. | Insufficient supply. |
| 3 | SE | 6 | " | " | " | Drilled | 412 | 1862 | -100 | 1762 | 412 | 1450 | Ravenscrag, sandy shale | alkaline Hard, clear | 46 | D. S. | Abundant supply. |
| 4 | NW | 6 | " | " | " | " | 412 | 1860 | -135 | 1725 | 410 | 1450 | Ravenscrag, sandy shale | Soft, clear | | D. S. | " " |
| 5 | SW | 7 | " | " | " | " | 350 | 1871 | | | 350 | 1521 | Ravenscrag, sandy shale | Hard, " | 44 | D. S. | " " |
| 6 | NE | 7 | " | " | " | " | 373 | 1860 | - 75 | 1785 | 330 | 1530 | Ravenscrag, sandy shale | " , cloudy | 44 | D. S. | " " |
| 7 | NE | 8 | " | " | " | Dug | 16 | 1855 | - 7 | 1848 | | | Glacial yellow clay | " , clear | 52 | D. | Small seepage from dugout. |
| 8 | NW | 8 | " | " | " | Drilled | 320 | 1855 | -120 | 1735 | 320 | 1535 | Ravenscrag, coal seam | " " | | D. S. | Abundant supply, waters 150 horses. |
| 9 | NW | 10 | " | " | " | " | 410 | 1800 | - 90 | 1710 | 400 | 1400 | Ravenscrag, sandstone | Soft amber colour | | D. S. I. | " " , #. |
| 10 | NE | 12 | " | " | " | " | 325 | 1824 | - 80 | 1744 | 324 | 1500 | Ravenscrag, sandy shale | Hard, clear | 44 | D. S. | " " |
| 11 | SW | 13 | " | " | " | " | 360 | 1824 | -100 | 1724 | 360 | 1464 | Ravenscrag, sandy shale | " " | 44 | M. D | Town of Glen Ewen. |
| 12 | SW | 14 | " | " | " | " | 320 | 1850 | - 80 | 1770 | 320 | 1530 | Ravenscrag, sandy shale | Soft, " | 44 | D. S. | Abundant supply. |
| 13 | SE | 14 | " | " | " | " | 332 | 1810 | - 100 | 1710 | 332 | 1478 | Ravenscrag, sandy shale | soda Hard, " | | D. S. | Waters 100 head of stock. |
| 14 | NE | 16 | " | " | " | " | 280 | 1849 | - 50 | 1789 | 280 | 1569 | Ravenscrag, sandy shale | Hard iron precipitate | | D. S. | " 100 " " " , |
| 15 | SW | 16 | " | " | " | " | 312 | 1850 | -100 | 1750 | 312 | 1538 | Ravenscrag, sandy shale | Hard, yellow tinge | 44 | D. S. I. | " 75 " " " , #. |
| 16 | SE | 17 | " | " | " | " | 300 | 1855 | -120 | 1735 | 300 | 1555 | Ravenscrag, sand | Hard, iron, precipitate | | D. S. | " 30 " " " . |
| 17 | NW | 18 | " | " | " | Dug | 12 | 1874 | - 10 | 1864 | 10 | 1864 | Glacial, sand | Hard, clear | 50 | D. | Sufficient supply. |
| 18 | NW | 19 | " | " | " | Drilled | 300 | 1849 | -200 | 1649 | 290 | 1559 | Ravenscrag, gravel | " red | 44 | S. | Abundant supply, but laxative on human beings, |
| 19 | NE | 20 | " | " | " | " | 225 | 1860 | -100 | 1760 | 225 | 1635 | " , sandy shale | tinge Soft, clear gas | 44 | D. S. | " " |
| 20 | NW | 20 | " | " | " | " | 295 | 1860 | - 70 | 1790 | 295 | 1565 | Ravenscrag, sandy beds | Soft, clear | | D. S. | " " " " " . |
| 21 | NE | 21 | " | " | " | " | 296 | 1850 | -140 | 1710 | 296 | 1554 | Ravenscrag, " | Hard, iron precipitate | | D. S. | Waters 20 head of stock. |
| 22 | NW | 22 | " | " | " | " | 260 | 1845 | -150 | 1695 | 260 | 1585 | Ravenscrag, beds | Hard, iron precipitate | 44 | D. S. | Abundant supply. |

NOTE—All depths, altitudes, heights and elevations given above are in feet.

(D) Domestic; (S) Stock; (I) Irrigation; (M) Municipality; (N) Not used.
(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of

ENNISKILLEN NO. 3.

B 4-4
1860—10,000

| WELL No. | LOCATION | | | | | TYPE OF WELL | DEPTH OF WELL | ALTITUDE WELL (above sea level) | HEIGHT TO WHICH WATER WILL RISE | | PRINCIPAL WATER-BEARING BED | | | CHARACTER OF WATER | TEMP. OF WATER (in°F.) | USE TO WHICH WATER IS PUT | YIELD AND REMARKS |
|----------|----------|------|-----|------|------|--------------|---------------|---------------------------------|-----------------------------------|-------|-----------------------------|-------|------------------------|-----------------------|------------------------|---------------------------|--|
| | ¼ | Sec. | Tp. | Rge. | Mer. | | | | Above (+) Below (-) Surface | Elev. | Depth | Elev. | Geological Horizon | | | | |
| 23 | NW | 23 | 3 | 1 | 2 | Drilled | 265 | 1845 | - 90 | 1755 | 265 | 1580 | Ravenscrag, sandy beds | Hard, red precipitate | 44 | D. S. | Abundant supply. |
| 24 | SE | 24 | " | " | " | " | 403 | 1820 | -120 | 1700 | 403 | 1417 | Ravenscrag, gravel bed | Hard, clear | 45 | D. S. | " " . |
| 25 | NE | 24 | " | " | " | " | 323 | 1830 | - 60 | 1770 | 323 | 1507 | Ravenscrag, sand | " , red precipitate | 46 | S. | " " . |
| 26 | SW | 26 | " | " | " | Dug | 17 | 1820 | | | | | Glacial, drift clay | | | N. | Dry hole. |
| 27 | SW | 28 | " | " | " | Drilled | 275 | 1850 | - 80 | 1770 | 275 | 1575 | Ravenscrag, sand | Soft brown tinge | | D. S. | Abundant supply, kills house plants. |
| 28 | SE | 28 | " | " | " | " | 280 | 1840 | -100 | 1740 | 280 | 1560 | Ravenscrag, sand | Hard, red precipitate | | D. S. | Waters 100 head of stock. |
| 29 | NE | 28 | " | " | " | " | 480 | 1848 | - 80 | 1768 | 480 | 1368 | " , gravel | Soft, clear salty | 42 | D. S. | Abundant supply. |
| 30 | SW | 30 | " | " | " | " | 325 | 1847 | -150 | 1697 | 320 | 1527 | " , sand | Soft, clear | 44 | D. S. | " " . |
| 31 | SW | 30 | " | " | " | Dug | 11 | 1847 | - 6 | 1841 | 11 | 1836 | Glacial, sand | Hard, " | 48 | D. S. | Waters 90 head of stock. |
| 32 | NE | 31 | " | " | " | Drilled | 275 | 1850 | - 90 | 1760 | 275 | 1575 | Ravenscrag, gravel | " , red precipitate | 44 | D. S. | Abundant supply. |
| 33 | NW | 32 | " | " | " | " | 236 | 1847 | -100 | 1747 | 228 | 1619 | " , sand | Hard, red precipitate | 44 | S. | " " , strong gas pressure. |
| 34 | SW | 32 | " | " | " | " | 238 | 1830 | - 85 | 1745 | 238 | 1592 | " " | Hard, red sediment | 44 | S. | " " . |
| 35 | SW | 33 | " | " | " | " | 195 | 1835 | - 80 | 1755 | 195 | 1640 | Ravenscrag ? | Hard, red precipitate | 44 | D. S. | " " . |
| 36 | SW | 33 | " | " | " | " | 210 | 1820 | -110 | 1710 | 210 | 1610 | " , gravel | Hard, yellow sediment | 44 | D. S. | Waters 80 head of stock. |
| 37 | NW | 33 | " | " | " | Dug | 14 | 1835 | - 10 | 1825 | 12 | 1823 | Glacial, sand | Hard, clear | | D. | Sufficient for domestic use only. |
| 38 | NW | 33 | " | " | " | Drilled | 220 | 1835 | - 80 | 1755 | 220 | 1615 | Ravenscrag | Hard, red sediment | | D. S. | Only waters 12 head of stock, contains considerable organic matter, #. |
| 39 | NW | 34 | " | " | " | Dug | 12 | 1840 | - 2 | 1838 | ? | ? | Glacial, clay | Hard, clear | | S. | Good supply in wet years. |
| 40 | SW | 34 | " | " | " | Drilled | 260 | 1840 | -100 | 1740 | 260 | 1580 | Ravenscrag, coal seam | Soft, white sediment | | D. S. | Waters 100 head of stock, harmful to vegetables. |
| 41 | SE | 36 | " | " | " | Dug | 5 | 1835 | - 4 | 1831 | 5 | 1830 | Recent sand | Soft, clear | | D. S. | Sufficient supply. |
| 1 | SW | 1 | 3 | 2 | 2 | Dug | 7 | 1700 | - 3 | 1697 | 3 | 1697 | Glacial, gravel | Hard, " | | D. | House use only. |
| 2 | SW | 2 | " | " | " | " | 19 | 1905 | -17 | 1888 | 17 | 1888 | " " | " " | 49 | D. S. I | Sufficient supply. |
| 3 | NW | 3 | " | " | " | " | 23 | 1915 | | | | | " " | " " | 48 | D. S. | Waters 30 head of stock. |
| 4 | NW | 4 | " | " | " | Drilled | 168 | 1700 | +? | 1700+ | 168 | 1532 | Ravenscrag, coal seam? | " " | 45 | D. S. I | Abundant supply. |
| 5 | SW | 6 | " | " | " | Dug | 32 | 1850 | -12 | 1838 | 18 | 1832 | Glacial, sandy, clay | " " alkaline | | S. | Very poor supply, |
| 6 | SW | 7 | " | " | " | " | 12 | 1855 | - 9 | 1846 | 9 | 1846 | Glacial, gravelly clay | Hard, clear | 46 | D. S. | Waters 10 head of stock. |
| 7 | SE | 7 | " | " | " | " | 20 | 1850 | -17 | 1833 | 17 | 1833 | Glacial, clay | Soft, " | 48 | S. | " 20 " " " . |
| 8 | SW | 9 | " | " | " | Spring | ? | 1715 | + 1 | 1716 | | | | Hard, " | 44 | D. S. I | Never goes dry. |

NOTE—All depths, altitudes, heights and elevations given above are in feet.

(D) Domestic; (S) Stock; (I) Irrigation; (M) Municipality; (N) Not used.
(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of ENNISKILLEN NO. 3.

B 4-4
1880—10,000

| WELL No. | LOCATION | | | | | TYPE OF WELL | DEPTH OF WELL | ALTITUDE WELL (above sea level) | HEIGHT TO WHICH WATER WILL RISE | | PRINCIPAL WATER-BEARING BED | | | CHARACTER OF WATER | TEMP. OF WATER (in°F.) | USE TO WHICH WATER IS PUT | YIELD AND REMARKS |
|----------|----------|------|-----|------|------|--------------|---------------|---------------------------------|-----------------------------------|-------|-----------------------------|-------|------------------------|----------------------------|------------------------|---------------------------|---|
| | ¼ | Sec. | Tp. | Rge. | Mer. | | | | Above (+) Below (-) Surface | Elev. | Depth | Elev. | Geological Horizon | | | | |
| 9 | NW | 10 | 3 | 2 | 2 | Dug | 28 | 1895 | - 21 | 1874 | 23 | 1872 | Glacial, sand | Hard, C O ₂ gas | 48 | D. S. I. | Waters 75 head of stock. |
| 10 | NW | 12 | " | " | " | Drilled | 320 | 1730 | 0 | 1730 | 300 | 1430 | Ravenscrag, sandy beds | Hard, red sediment | | D. S. | " 100 " " " , # |
| 11 | SE | 14 | " | " | " | Spring | | 1737 | | 1737 | | | | Soft, clear | 64 | D. S. | Abundant supply. |
| 12 | NE | 15 | " | " | " | " | | 1745 | | 1745 | | | | Hard, " | 50 | D. S. I. | " " . |
| 13 | SW | 18 | " | " | " | Dug | 30 | 1860 | - 24 | 1836 | 24 | 1836 | Glacial, sand | " " | 46 | D. S. | Domestic " only. |
| 14 | NW | 18 | " | " | " | " | 20 | 1860 | - 16 | 1844 | 15 | 1845 | " " | " " | 46 | D. S. I. | Only waters 10 head of stock. |
| 15 | SE | 19 | " | " | " | " | 17 | 1855 | - 13 | 1842 | 13 | 1842 | " " | Soft, " | 48 | D. S. I. | Waters 50 head of stock. |
| 16 | NE | 19 | " | " | " | " | 24 | 1860 | - 19 | 1841 | 20 | 1840 | " , sandy clay | Hard, " alkaline | 48 | D. | Small steady supply, laxative. |
| 17 | NW | 20 | " | " | " | " | 40 | 1855 | | | | | Glacial | Hard, clear | | D. S. | Limited supply. |
| 18 | SW | 22 | " | " | " | " | 7 | 1850 | 0 | 1850 | ? | ? | " sand | " " | 46 | D. S. M. | Abundant supply. |
| 19 | SW | 22 | " | " | " | " | 22 | 1810 | - 18 | 1792 | 18 | 1792 | " " | "brown, tinge | 44 | D. S. I. | Waters 45 head of stock. |
| 20 | SW | 23 | " | " | " | Drilled | 138 | 1730 | - 10 | 1720 | 138 | 1592 | Ravenscrag, coal seam | Soft, soda, brown colour | 45 | D. S. I. | Abundant supply, used to flow until 1930. |
| 21 | NE | 23 | " | " | " | " | 280 | 1900 | -120 | 1780 | 280 | 1620 | Ravenscrag | Hard, red precipitate | 46 | Creamery | Sufficient supply. |
| 22 | NE | 23 | " | " | " | " | 360 | 1903 | ? | ? | 360 | 1543 | " | Hard, yellow tinge | | D. S. M. | Supplies town of Oxbow. |
| 23 | NE | 23 | " | " | " | " | 130 | 1903 | ? | ? | 130 | 1773 | Glacial | Good | | M. | Oxbow M. Well. |
| 24 | NE | 24 | " | " | " | Dug | 16 | 1890 | - 13 | 1877 | 13 | 1877 | " , blue clay | Hard, clear | | D. | Only lasted 1 year. |
| 25 | NE | 25 | " | " | " | " | 12 | 1890 | - 9 | 1881 | 10 | 1880 | " , sand | " " | | D. | Only sufficient for house use. |
| 26 | NE | 26 | " | " | " | Drilled | 300 | 1910 | -100 | 1810 | 300 | 1610 | Ravenscrag | " , red precipitate | | D. S. | Waters 50 head of stock. |
| 27 | SW | 30 | " | " | " | " | 437 | 1870 | - 80 | 1790 | 437 | 1433 | " , sandy beds | Soft, clear | | S. I. | Abundant supply. |
| 28 | SW | 30 | " | " | " | Dug | 34 | 1870 | - 9 | 1861 | 18 | 1852 | Glacial, gravel | Hard, " | 45 | D. S. | Sufficient supply. |
| 29 | NW | 31 | " | " | " | Drilled | 425 | 1897 | - 90 | 1807 | 425 | 1472 | Ravenscrag, sand | " , red sediment | | D. S. | Abundant supply, water at 315', 40 lb. gas pressure at first. |
| 30 | NE | 31 | " | " | " | " | 450 | 1890 | -110 | 1780 | 445 | 1445 | " | Soft, soda | 44 | D. S. | Abundant supply. |
| 31 | NE | 32 | " | " | " | Dug | 10 | 1860 | - 5 | 1855 | 5 | 1855 | Glacial | Hard, clear | 52 | D. S. I. | Waters 20 head of stock. |
| 32 | SW | 34 | " | " | " | " | 15 | 1900 | - 7 | 1893 | 12 | 1888 | " , sand | " " | 48 | D. S. | " 25 " " " . |
| 33 | SW | 34 | " | " | " | " | 22 | 1900 | - 19 | 1881 | 20 | 1880 | " " | " " | 45 | D. S. | " 7 " " " . |
| 34 | SW | 35 | " | " | " | " | 20 | 1905 | -118 | 1887 | 18 | 1887 | " " | " " | | D. S. | Sufficient for house use only. |
| 35 | NE | 36 | " | " | " | Drilled | 320 | 1890 | - 60 | 1830 | 320 | 1570 | Ravenscrag, sandy beds | " " | 44 | D. S. | Abundant supply |

NOTE—All depths, altitudes, heights and elevations given above are in feet.

(D) Domestic; (S) Stock; (I) Irrigation; (M) Municipality; (N) Not used.
(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of WINNIKILLER NO. 3.B 4-4
1860—10,000

| WELL No. | LOCATION | | | | | TYPE OF WELL | DEPTH OF WELL | ALTITUDE WELL (above sea level) | HEIGHT TO WHICH WATER WILL RISE | | PRINCIPAL WATER-BEARING BED | | | CHARACTER OF WATER | TEMP. OF WATER (in°F.) | USE TO WHICH WATER IS PUT | YIELD AND REMARKS |
|----------|----------|------|-----|------|------|--------------|---------------|---------------------------------|-----------------------------------|-------|-----------------------------|-------|------------------------|--------------------------|------------------------|---------------------------|--|
| | ¼ | Sec. | Tp. | Rge. | Mer. | | | | Above (+) Below (-) Surface | Elev. | Depth | Elev. | Geological Horizon | | | | |
| 1 | NE | 2 | 3 | 3 | 2 | Dug | 15 | 1860 | - 9 | 1851 | 13 | 1847 | Glacial, sand | Soft, clear | 50 | D. S. | Waters 4 head of stock. |
| 2 | NW | 1 | " | " | " | " | 21 | 1865 | - 17 | 1848 | 17 | 1848 | " , gravel | Hard, " | 44 | D. S. | " 8 " " " |
| 3 | NW | 2 | " | " | " | " | 18 | 1863 | - 10 | 1853 | 10 | 1853 | " " | " " | 45 | D. S. | Abundant supply. |
| 4 | NW | 3 | " | " | " | " | 12 | 1860 | - 8 | 1852 | 9 | 1851 | " " | " " | 46 | D. S. | Waters 20 head of stock. |
| 5 | NE | 5 | " | " | " | " | 22 | 1870 | - 20 | 1850 | 21 | 1849 | and sand Glacial, " | " " | 46 | D. S. | Sufficient supply in years of normal rainfall. |
| 6 | SE | 6 | " | " | " | " | 15 | 1875 | - 13 | 1862 | 13 | 1862 | " clay | " " | | N. | Very poor supply. |
| 7 | SW | 7 | " | " | " | " | 35 | 1880 | - 33 | 1847 | 33 | 1847 | " " | alkaline Hard, clear | | S. | Sufficient for 4 head of stock. |
| 8 | NW | 7 | " | " | " | " | 20 | 1885 | - 10 | 1875 | 10 | 1875 | " gravel | Soft, clear | | D. S. | Waters 100 head of stock. |
| 9 | SE | 7 | " | " | " | " | 14 | 1880 | - 11 | 1869 | 11 | 1869 | " " | Hard, " | 45 | D. S. I. | " 15 " " " , also 1 similar well. |
| 10 | NW | 8 | " | " | " | " | 8 | 1880 | - 2 | 1878 | 8 | 1872 | " sand | " " | 56 | D. S. | " 50 " " " |
| 11 | SW | 9 | " | " | " | " | 10 | 1880 | - 2 | 1878 | 4 | 1876 | " gravel | " " | 44 | D. S. | " 50 " " " |
| 12 | SE | 9 | " | " | " | " | 13 | 1885 | - 4 | 1881 | 6 | 1879 | " sand | " " | 46 | D. S. I. | " 80 " " " |
| 13 | NE | 9 | " | " | " | " | 23 | 1895 | - 13 | 1882 | 17 | 1878 | " " | " " | 42 | D. S. | " 30 " " " |
| 14 | NE | 10 | " | " | " | " | 12 | 1890 | | | | | " clay | | | N. | Dry except when filled with rain water. |
| 15 | NW | 11 | " | " | " | Drilled | 360 | 1880 | -100 | 1780 | 360 | 1520 | Ravenscrag ? | " iron precipitate | 43 | D. S. | Abundant supply. |
| 16 | NE | 11 | " | " | " | Dug | 20 | 1865 | | | | | Glacial clay | | | N. | Dry holes. |
| 17 | NW | 12 | " | " | " | " | 18 | 1880 | - 6 | 1874 | 18 | 1862 | " sand | Hard, clear | 50 | D. S. | Mod. supply. |
| 18 | NE | 12 | " | " | " | " | 31 | 1870 | - 26 | 1844 | 26 | 1844 | " " | " " | 43 | D. S. | Sufficient for 8 head of stock in 1935. |
| 19 | NW | 13 | " | " | " | " | 22 | 1881 | - 18 | 1863 | 22 | 1859 | " " | alkaline Hard, clear, | 46 | D. S. | Only sufficient for house use, & six horses |
| 20 | NE | 16 | " | " | " | " | 20 | 1885 | | | | | " blue clay | alkaline | | N. | Dry holes. |
| 21 | SE | 16 | " | " | " | Drilled | 440 | 1880 | -200 | 1680 | 440 | 1440 | Ravenscrag ? | Hard, red colour | | D. S. | Waters 40 head of stock. |
| 22 | SW | 16 | " | " | " | Dug | 35 | 1880 | - 28 | 1852 | 33 | 1847 | Glacial, gravel | Hard, clear | 42 | D. | Sufficient for house use, also 17' well for stock. |
| 23 | NE | 17 | " | " | " | " | 18 | 1875 | - 7 | 1868 | 16 | 1859 | " sand | " " | 43 | D. S. | Waters 100 head of stock. |
| 24 | NE | 18 | " | " | " | " | 20 | 1880 | - 18 | 1862 | 18 | 1862 | " clay | " " | | S. | Insufficient supply. |
| 25 | SW | 18 | " | " | " | " | 20 | 1890 | - 17 | 1873 | 17 | 1873 | " gravel | alkaline Hard, clear | | D. S. | Sufficient for 15 head of stock. |
| 26 | NW | 20 | " | " | " | " | 20 | 1910 | - 19 | 1891 | 19 | 1891 | " clay | " " | | D. S. | Very poor supply. |
| 27 | SE | 20 | " | " | " | " | 18 | 1890 | - 11 | 1879 | 18 | 1872 | " sand | " " | | D. S. | Only sufficient for house use. |
| 28 | SE | 21 | " | " | " | " | 35 | 1890 | - 30 | 1860 | 30 | 1860 | " clay | " " | | D. S. | Very poor supply. |

NOTE—All depths, altitudes, heights and elevations given above are in feet.

(D) Domestic; (S) Stock; (I) Irrigation; (M) Municipality; (N) Not used.
(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of EMMISTILLEN NO. 3.B 4-4
1860—10,000

| WELL No. | LOCATION | | | | | TYPE OF WELL | DEPTH OF WELL | ALTITUDE WELL (above sea level) | HEIGHT TO WHICH WATER WILL RISE | | PRINCIPAL WATER-BEARING BED | | | CHARACTER OF WATER | TEMP. OF WATER (in°F.) | USE TO WHICH WATER IS PUT | YIELD AND REMARKS |
|----------|----------|------|-----|------|------|--------------|---------------|---------------------------------|-----------------------------------|-------|-----------------------------|-------|---------------------------|--------------------------|------------------------|---------------------------|--|
| | ¼ | Sec. | Tp. | Rge. | Mer. | | | | Above (+) Below (-) Surface | Elev. | Depth | Elev. | Geological Horizon | | | | |
| 29 | SW | 22 | 3 | 3 | 2 | Dug | 20 | 1890 | - 10 | 1880 | 12 | 1878 | Glacial, gravel | Hard, clear | 46 | D. S. | Only sufficient for 10 head of stock. |
| 30 | NW | 23 | " | " | " | " | 20 | 1890 | - 18 | 1872 | 18 | 1872 | " sand | " " | 44 | D. S. | Sufficient for house use, & 3 head of stock. |
| 31 | SE | 23 | " | " | " | " | 24 | 1887 | - 14 | 1873 | 14 | 1873 | " " | alkaline Hard, clear, | 43 | D. S. | " " " " , & 15 " " " |
| 32 | NE | 24 | " | " | " | " | 13 | 1880 | - 10 | 1870 | 10 | 1870 | " gravel | alkaline Hard, clear | 44 | D. S. | Sufficient for local needs. |
| 33 | SE | 24 | " | " | " | Drilled | 500 | 1878 | -160 | 1718 | 500 | 1378 | Ravenscrag, sand | " , iron sediment | 44 | S. I. | Waters 70 head of stock, #. |
| 34 | NE | 25 | " | " | " | Dug | 20 | 1890 | - 18 | 1872 | 18 | 1872 | Glacial, sand | Hard, clear | | D. | Domestic supply only. |
| 35 | NW | 25 | " | " | " | " | 14 | 1890 | - 5 | 1885 | 12 | 1878 | " " | " " | | D. S. I. | Waters 20 head of stock. |
| 36 | SE | 27 | " | " | " | " | 12 | 1885 | - 4 | 1881 | 4 | 1881 | " " | " " | 44 | D. S. | " 60 " " " . |
| 37 | SE | 28 | " | " | " | Drilled | 415 | 1903 | -100 | 1803 | 415 | 1488 | Ravenscrag, sandy beds | Soft, " | | D. S. | " 100 " " " . |
| 38 | SE | 28 | " | " | " | Dug | 12 | 1900 | - 7 | 1893 | 8 | 1892 | Glacial, sand | Hard, " | | D. S. I. | " 25 " " " . |
| 39 | NE | 28 | " | " | " | " | 12 | 1890 | - 7 | 1883 | 8 | 1882 | " " | " " | 46 | D. S. | " 50 " " " . |
| 40 | NE | 29 | " | " | " | " | 14 | 1910 | - 8 | 1902 | 13 | 1897 | " " | " " | | D. S. | " 25 " " " , #. |
| 41 | NE | 29 | " | " | " | Drilled | 465 | 1910 | -100 | 1810 | 465 | 1445 | Ravenscrag, sandy beds | Soft, clear | 46 | D. S. | Over-sufficient supply. |
| 42 | SE | 30 | " | " | " | Dug | 8 | 1900 | - 5 | 1895 | 6 | 1894 | Glacial, sand | Hard, " | | D. S. I. | Sufficient supply with a similar well. |
| 43 | NE | 30 | " | " | " | Drilled | 309 | 1900 | - 60 | 1840 | 309 | 1591 | Ravenscrag, sandy beds | Soft, " | 44 | D. S. | Over-sufficient supply, also water at 285'. |
| 44 | SW | 31 | " | " | " | Dug | 25 | 1920 | - 19 | 1901 | 19 | 1901 | Glacial, sand | Hard, " | 43 | D. S. | Used for house and 6 head of stock. |
| 45 | SW | 31 | " | " | " | " | 21 | 1905 | - 19 | 1886 | 18 | 1887 | " , " | alkaline Hard, clear | 44 | D. S. | Waters 10 head of stock. |
| 46 | NW | 31 | " | " | " | " | 25 | 1915 | - 7 | 1908 | 9 | 1906 | " , gravel | " " | | D. S. | " 6 " " " , also use dugout. |
| 47 | NW | 32 | " | " | " | " | 17 | 1915 | - 6 | 1909 | 6 | 1909 | " , clay | alkaline Hard, clear | | D. S. | Seepage from dugout. |
| 48 | NW | 33 | " | " | " | " | 15 | 1900 | - 5 | 1895 | 5 | 1895 | " , " | " " | 46 | D. S. | Insufficient supply. |
| 49 | SW | 33 | " | " | " | " | 15 | 1905 | - 8 | 1897 | 9 | 1896 | " , gravel | " , " | 44 | D. S. | Waters 40 head of stock. |
| 50 | NE | 35 | " | " | " | Drilled | 350 | 1900 | -60 | 1840 | 350 | 1550 | Ravenscrag, sandy beds | " , iron precipitate | | S. | " 80 " " " . |
| 51 | NW | 36 | " | " | " | Dug | 18 | 1895 | -11 | 1884 | 11 | 1884 | Glacial, gravel | Hard, clear | 46 | D. S. I. | " 25 " " " , also 2 similar wells. |
| 52 | NE | 36 | " | " | " | " | 15 | 1897 | - 5 | 1892 | 15 | 1882 | " , clay | " , " | 48 | D. | Only sufficient supply for house use. |
| 53 | NE | 36 | " | " | " | " | 14 | 1897 | - 8 | 1889 | 14 | 1883 | " , sand | " " | | D. S. | Seepage from dugout waters 10 head of stock. |

NOTE—All depths, altitudes, heights and elevations
given above are in feet.(D) Domestic; (S) Stock; (I) Irrigation; (M) Municipality; (N) Not used.
(#) Sample taken for analysis.