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PRELIMINARY REPORT

GROUND-WATER RESOURCES OF THE RURAL MUNICIPALITY OF MILDEN NO. 286 SASKATCHEWAN

By
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GROUND WATER RESOURCES OF THE RURAL MUNICIPALITY OF MILDEN, NO.286 SASKATCHEWAN

INTRODUCTION

Lack of rainfall during the years 1930 to 1934 over a large part of the Prairie Provinces brought about an acute shortage both in the larger supplies of surface water used for irrigation and the smaller supplies of ground water required for domestic purposes and for stock. In an effort to relieve the serious situation the Geological Survey began an extensive study of the problem from the standpoint of domestic uses and stock raising. During the field season of 1935 an area of 80,000 square miles, comprising all that part of Saskatchewan south of the north boundary of township 32, was systematically examined, records of approximately 60,000 wells were obtained, and 720 samples of water were collected for analyses. The facts obtained have been classified and the information pertaining to any well is readily accessible. The examination of so large an area and the interpretation of the data collected were possible because the bedrock geology and the Pleistocene deposits had been studied previously by McLearn, Warren, Rose, Stansfield, Wickenden, Russell, and others of the Geological Survey. The Department of Natural Resources of Saskatchewan and local well drillers assisted considerably in supplying several hundred well records. The base maps used were supplied by the Topographical Surveys Branch of the Department of the Interior.

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

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[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 age.

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 overlie 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 Milden, No. 286, is an area of 288 square miles in western Saskatchewan. It consists of eight full townships, described as tps. 27, 28, 29, and 30, ranges 11 and 12, W. 3rd mer. The centre of the area lies approximately 84 miles by highway southwest of Saskatoon. The Outlook section of the Canadian Pacific railway enters sec. 25, tp. 29, range 11, and leaves the municipality in sec. 30, tp. 29, range 12, and on it is situated, in section 17, the village of Milden. A second line branches from this line just west of Milden and runs in a southwesterly direction, leaving the area in sec. 30, tp. 28, range 12. The Eatonia section of the Canadian National railways runs in an east-west direction across townships 27, ranges 11 and 12, and on it are located the villages of Dinsmore and Wiseton. The municipality is also served by Provincial Highways Nos. 15, 42, and 44.

The municipality is drained by Macdonald and Stonyridge creeks. Stonyridge creek flows in a northerly direction through township 30, range 11, and Macdonald creek flows in a northeasterly direction through the central part of the municipality. Barber lake and a large marshy depression in township 28, range 12, are the headwaters of Macdonald creek. Milden lake, a long, narrow body of water, occurs in the eastern part of township 28, range 11. The elevation increases from approximately 1,800 feet above sea-level along Macdonald creek, to 2,175 feet in the southeastern corner; to somewhat more than 1,900 feet in the southwestern corner, and to more than 1,950 feet above sea-level in the northwestern corner of the township. The villages of Milden, Dinsmore, and Wiseton lie at elevations of 1,875, 2,007, and 1,881 feet above sea-level, respectively. In a narrow area surrounding Barber lake deposits of glacial

outwash sand and gravel occur. A small area in parts of secs. 34 and 35, tp. 30, range 12, is covered by glacial lake sands. Narrow areas along Stonyridge and Macdonald creeks, Milden lake, and an area in the southeastern part of township 27, range 11, are mantled by boulder clay. Throughout the remainder of the township glacial lake clay overlies the boulder clay.

Water-bearing Horizons in the Unconsolidated Deposits

The glacial outwash sands and gravels that occur in the vicinity of Barber lake contain water at depths of less than 20 feet. Wells sunk in this area should obtain water, but it is always advisable to locate the water-bearing deposits by means of a test auger before going to the expense of digging a well. The supply from wells sunk in this area is generally adequate for local needs and the water from most of the wells is used for domestic purposes as well as for stock.

One well sunk in the glacial lake sands obtains water within 20 feet of the surface. The supply is small and inadequate for local needs. Little trouble should be experienced in obtaining water from the lake sands, but they do not cover an extensive area in this municipality. The water is usable for all farm needs. Water should also be obtained from the underlying boulder clay or glacial till.

The glacial lake clay that covers most of the surface of this municipality is not thought to contain any large amounts of water. In these areas water is obtained chiefly from scattered deposits of sand and gravel that occur near the contact of the lake clay and boulder clay, or within the boulder clay at depths greater than 35 feet. The deposits that occur at shallow depth do not appear to be continuous even within narrow limits, and they are not of numerous occurrence. The possibilities of obtaining water from wells dug in depressions and ravines are

good, but wells sunk in these localities derive their supply by seepage from impounded surface water. The supply from the shallow wells varies considerably, depending on the areal extent of the aquifer and also on the amount of annual precipitation, but there should always be sufficient water for domestic needs and for a few head of stock. Some of the wells yield over-sufficient supplies for farm needs. The water varies considerably in quality, but it is not as hard and highly mineralized as that obtained from deeper wells. The water from some of the wells is not used for drinking, but in no instance was it recorded as unfit for stock.

The sand and gravel deposits that occur in the unweathered zone of the boulder clay supply most of the wells in this municipality. These wells vary in depth from 35 to 150 feet, but a few have been sunk to depths greater than 150 feet. It has been possible to outline two areas in the municipality in which the deposits appear to be numerous and fairly continuous. The "A" boundary line on Figure 1 of the accompanying map outlines an area in which a number of wells tap water-bearing deposits at depths of 40 to 114 feet, or at elevations of 1,940 to 1,970 feet above sea-level. With the exception of a well in sec. 14, tp. 27, range 11, these wells yield an abundant supply of water that is usable for domestic needs and stock. The above-mentioned well, however, cannot be used for domestic purposes. The "B" boundary line outlines an area in which wells derive water at depths of 40 to 150 feet, or at elevations ranging from 1,770 to 1,820 feet above sea-level. Over most of this area the deposits appear fairly numerous, but in the southwestern corner of township 30, range 11, it was found necessary to drill to greater depths before water was obtained. The water-bearing horizon, or the water-bearing deposits, appear to lie closer to the surface towards the western part of the area, and wells outside the

outlined area may tap the same horizon. The supply from the wells included in this group is generally adequate for local needs, but at least five wells do not yield sufficient water for farm needs. The water is very hard and highly mineralized, and that from a number of wells is not used for domestic purposes.

Little difficulty should be experienced in deriving water from the lower part of the drift throughout the municipality. The water will be usable for stock, but may not be suitable for domestic use. Springs occur along the creeks and ravines and can be used for watering stock. A few dams have been constructed to impound surface water and their further use is recommended.

Water-bearing Horizons in the Bedrock

The Bearpaw formation immediately underlies the glacial drift in the area south of the approximate geological boundary shown on Figure 1 of the accompanying map; the Belly River formation underlies the drift to the north of the line, and also underlies the Bearpaw formation. No outcrops of either formation occur in this municipality, and it is not definitely known at what depth the bedrock occurs. Since the surface of the bedrock is not thought to be level, the elevation at which it is encountered will vary in different localities of the municipality, but from information at hand it appears that bedrock occurs at an elevation somewhat above 1,700 feet above sea-level. Bedrock was reported to occur at an elevation of 1,820 feet above sea-level in the well in sec. 18, tp. 28, range 11, but this is thought to be considerably higher than the elevation at which bedrock generally occurs in this part of Saskatchewan. The Bearpaw formation is not thought to be of great thickness in this area and it is doubtful if any of the wells are drawing

their supply from this formation, but some of the wells in townships 27, ranges 11 and 12, may be obtaining part of their supply from the lower part of the Bearpaw formation.

Most of the wells in this municipality that obtain water from aquifers in the bedrock tap the Belly River formation. The sand aquifers in this formation are thought to be lenticular in shape and they do not appear to form continuous water-bearing horizons. The possibilities of obtaining water from the bedrock appear to be much better in the northern part of the municipality. The wells that derive water from the bedrock tap aquifers at depths of 180 to 600 feet, or at elevations of 1,690 to 1,330 feet above sea-level. The water from the deep wells is soft, but that from the shallower wells is hard. The supply from the wells is adequate for local needs and the water is under hydrostatic pressure. The water is often used for drinking although it contains a considerable amount of iron, or has a salty taste.

GROUND WATER CONDITIONS BY TOWNSHIPS

Township 27, Range 11

The elevation in this township decreases from 2,150 feet above sea-level at the southeastern corner to less than 1,950 feet above sea-level at the northwestern corner. The northern and central parts of the township are fairly level, but a number of low, rolling hills occur in the southern part. Two ravines occur trending in a northwesterly direction from section 14, and in a westerly direction from section 9. The southeastern half of the township is mantled by boulder clay or glacial till, but in the northwestern half the glacial till is covered by glacial lake clay. The top soil in section 36 is very stony.

The upper part or weathered zone of the drift does not contain many water-bearing deposits. In the area where glacial till outcrops at the surface a few shallow wells obtain small amounts of water within 20 feet of the surface, but the supply is almost directly derived by seepage from surface water in sloughs or ravines. Such localities are the most favourable sites for shallow wells in this township. Shallow wells dug beside water impounded in dams and dugouts yield sufficient water for domestic needs. It seems improbable that abundant supplies of water will be obtained at shallow depth in the drift. Any water-bearing deposits of sand and gravel that do exist are widely scattered and many holes will probably be dug before a producing deposit is tapped. The supply from the existing shallow wells varies almost directly with the amount of annual precipitation, and the supply is only slightly more than sufficient for domestic needs. The water, however, is moderately hard and not highly mineralized. It is recorded as satisfactory for domestic purposes.

The glacial lake clay probably is not more than 20 to 30 feet thick in this township and it yields little or no water. Water-bearing deposits at the contact of the lake clay and the boulder clay are not numerous, and most of the wells in this township obtain water from sand and gravel deposits that occur in the boulder clay at depths ranging from 40 to 160 feet. In the area outlined by the "A" boundary line (Figure 1) the deposits appear to be numerous at elevations ranging from 1,940 to 1,970 feet above sea-level, and no great difficulty should be experienced in locating water in this area. Elsewhere in the township, in smaller areas, usually only a little more than a section in extent, the possibilities of obtaining water from similar deposits are also fairly good. With few exceptions the wells that tap water-bearing deposits in the lower part of the drift yield a sufficient amount of water for farm needs, and the supply is usually more than adequate. The water is very hard, and that from some wells is recorded as "alkaline", but with two exceptions it is used for domestic purposes as well as stock.

A well located in the SE.$\frac{1}{4}$, section 12, is drawing water from a sand aquifer at a depth of 234 feet, or at an elevation of 1,906 feet above sea-level. One hundred feet of sand was drilled through before water was encountered. It seems improbable that this well encountered bedrock, but it is possible that part of the supply is being derived from the Bearpaw formation. The areal extent of this aquifer is unknown, but in section 11 it was found necessary to drill to a depth of 400 feet before tapping an aquifer. The supply from the well is recorded as insufficient, although the water rises 110 feet above the aquifer. It is possible that the fine sand of the aquifer partly clogs the casing and shuts off the supply of water. The water is very hard, contains a considerable amount of mineral

salts in solution, and is recorded as salty, but it is used for drinking as well as for stock.

Two wells, located in sections 11 and 31, have been drilled into the underlying bedrock formations. They are 400 and 600 feet deep, respectively, and tap aquifers at elevations of 1,675 and 1,333 feet above sea-level. The aquifers of both wells are probably located within the Belly River formation, although it is possible that part of the water obtained in the well in section 11 may be from the lower part of the Bearpaw formation. The areal extent of the aquifers feeding the wells is not known, and it is impossible to state at what depth water may be encountered in the Belly River formation. The two producing wells yield abundant supplies of water. The hydrostatic pressure is sufficient to raise the water 320 feet above the aquifer in the well in section 11 and 560 feet above the aquifer in the well in section 31. The water from the well in section 11 is hard, highly mineralized, and not used for drinking, whereas that from the well in section 31 is soft and is usable for domestic purposes.

Township 27, Range 12

The surface of this township is fairly level except where an intermittent stream has eroded a deep ravine that trends from the southeastern corner towards Barber lake. The elevation varies from 1,850 to 1,900 feet above sea-level throughout most of the area, but a small area in the southeastern corner rises above 1,950 feet, and the southern part of Barber lake, which crosses the northern boundary of this township, lies below 1,830 feet above sea-level. Boulder clay or glacial till is exposed only in parts of sections 19, 30, and 31, being concealed by glacial outwash sand and gravel to the south of

Barber lake, and by glacial lake clay throughout the remainder of the township. The glacial outwash sands and gravels have not been tested extensively, but two wells located in the NW.$\frac{1}{4}$, section 32, and the SW.$\frac{1}{4}$, section 33, may be obtaining water from these deposits. The wells are less than 20 feet deep and the supply is sufficient for local needs. The water is quite satisfactory for drinking.

The glacial lake clay is not thought to contain water in sufficient quantities for farm needs, but the boulder clay that underlies the glacial lake clay is known to contain deposits of water-bearing sand and gravel. The thickness of the lake clay is estimated to be between 15 and 30 feet. Most of the water-bearing sands and gravel from which the shallow wells in this township obtain water are located at or near the contact of the lake clay and underlying boulder clay. The wells included in this group are not usually more than 30 feet deep. A few of the shallow wells are dug near sloughs or depressions or in small ravines, and obtain most of their water by direct seepage from the impounded surface water. These wells may not tap water-bearing sand or gravel. Wells that encounter deposits of sand or gravel are not so readily affected by drought conditions. The deposits do not form continuous aquifers and should be located by means of a test auger before wells are dug. The supply from the shallow wells in this township varies considerably, but that from most of the wells is more than adequate for domestic needs, and in all but a few it is sufficient for stock needs. The water is not very highly mineralized and as a rule is usable for drinking as well as for stock.

About twenty wells in this township obtain water from deposits of sand and gravel that occur in the blue boulder clay at depths ranging from 35 to 119 feet. It has been found impossible to outline an area in which a continuous water-bearing

horizon exists, but in a few localities of small areal extent some wells appear to tap a common aquifer, and other wells sunk in the vicinity of the producing wells would probably tap the same water-bearing deposits. The supply of water from this group of wells is not abundant, but is sufficient for local requirements. The water is very hard and that from most wells is very highly mineralized and has a laxative effect on those not accustomed to its use. Some of the water is used only for stock.

Two wells located in sections 17 and 20 obtain water from aquifers at depths of 180 and 190 feet, or at elevations of 1,690 and 1,665 feet above sea-level, respectively. It is doubtful if the same aquifer is common to both wells, as there is a difference of more than 100 feet in the height to which the water rises in the wells. The aquifers, however, are probably located in the lower part of the Bearpaw or the upper part of the Belly River formation. In a well located in section 24 a sand aquifer was encountered at a depth of 200 feet, or at an elevation of 1,700 feet above sea-level, which might possibly be a continuation of one of the aquifers tapped by the wells in sections 17 and 20, but lack of information over the intervening area makes it impossible to forecast a continuous horizon at this elevation. The supply from the wells is abundant and the water from the well in section 17 was recorded as usable for drinking by the Provincial Analyst. The water from the other wells is also used for drinking as well as stock.

Two wells located in the NW.$\frac{1}{4}$, section 3, and the NE.$\frac{1}{4}$, section 26, are thought to obtain water from aquifers in the Belly River formation. They are drilled to depths of 280 and 350 feet, and the aquifers are tapped at elevations of 1,610 and 1,565 feet above sea-level, respectively. It is assumed that the wells tap individual aquifers rather than a continuous horizon.

Wells sunk to similar depths in the immediate vicinity of the producing well in section 26 may tap a water-bearing horizon, but the areal extent of the aquifer in section 3 is not thought to be large. The supply from the well in section 3 is insufficient for local needs, but that from the other well is abundant. The water from both wells is hard and highly mineralized, but it is used for domestic purposes.

Two wells in the SW.$\frac{1}{4}$, section 2, and the SE.$\frac{1}{4}$, section 3, are probably obtaining water from a common aquifer located in the Belly River formation. The wells are over 400 feet deep and the aquifer is encountered at an approximate elevation of 1,480 feet above sea-level. The areal extent of the aquifer is unknown, but it does not extend as far north as section 24, although it may extend for some distance from the location of the producing wells. Both wells yield large supplies of soft, highly mineralized water which is used for drinking as well as for stock.

The deepest well in the township, 739 feet, is located in section 24. The aquifer is in the lower part of the Belly River formation at an elevation of 1,161 feet above sea-level. It is possible that this well may be obtaining part of its supply from an older formation than the Belly River, but the water is similar in quality to that obtained from the lower part of the Belly River in other parts of the municipality. The areal extent of this aquifer is unknown, but it may extend over a considerable area. The supply from the well is abundant, and the water rises 50 feet above the aquifer. The water is soft and has a soda taste, but it is used for domestic purposes as well as for stock.

Township 28, Range 11

The maximum elevation of more than 2,000 feet above sea-level occurs in the southeastern corner of the township. Boulder clay or glacial till is exposed in an area surrounding Milden lake, but elsewhere in the township it is concealed by glacial lake clay. With the exception of the valley containing Milden lake, the ground surface is fairly level. Milden lake, at an elevation of 1,881 feet above sea-level, extends from section 1 to section 27 and is a permanent body of water.

The glacial lake clay in this area is not thought to be very thick and yields little or no water. The boulder clay that underlies the lake deposits contains water-bearing deposits. The upper part of the glacial drift in this township does not contain many water-bearing deposits, and only a few wells obtain water within 50 feet of the surface. No continuous aquifers are present, but water-bearing deposits appear to be fairly numerous in the vicinity of the lake and marshy lowland. Shallow wells dug beside undrained depressions should yield sufficient water for domestic needs and a few head of stock. These shallow wells are readily affected by drought conditions. The supply from the shallow wells that tap pockets of sand and gravel is usually sufficient for local needs, and the water is used for drinking and for stock. A number of springs occurring in the vicinity of Milden lake are used for watering stock, but the water is not suitable for domestic purposes. An abundant supply of water is not to be expected from the upper part of the glacial drift in this township.

Most of the wells in this township derive water from scattered deposits of sand and gravel that occur in the unweathered, blue boulder clay, at depths of 50 to 160 feet, but commonly at depths of 50 to 85 feet. Over small areas the deposits

appear to show some evidence of continuity, but no area can be outlined in which they form a horizon of large areal extent. With the exception of four or five wells, the supply from this part of the glacial drift is sufficient for local needs. The water is usually very hard and highly mineralized, in many cases being "alkaline", and that from a few wells is only used for stock. One well, located in section 34, yielded water that caused scour in stock, and it was filled in. There should be no difficulty in obtaining water from the lower part of the drift in this township.

A 260-foot well in the NW.$\frac{1}{4}$, section 18, is thought to tap an aquifer in the Belly River formation at an elevation of 1,660 feet above sea-level. The areal extent of the aquifer is unknown, but it is not thought to be very extensive. The supply from the well is more than sufficient for local needs and the hydrostatic pressure is sufficient to raise the water 180 feet above the aquifer. The water is hard and contains a considerable amount of mineral salts in solution, but it is being used for drinking without any apparent ill effects.

Township 28, Range 12

Barber lake and a large marshy depression extend from the southwestern corner of the township to the north-central part. The lake lies at an elevation of 1,829 feet. Throughout the remainder of the area the surface is level and the elevation increases to approximately 1,925 feet above sea-level in the eastern part of the township. A narrow area surrounding Barber lake is covered by glacial outwash sands and gravels, and the remainder of the township is mantled by glacial lake clay. The outwash deposits and glacial lake clay are not thought to be more than 25 to 30 feet thick, and they are underlain by boulder clay or glacial till.

Shallow wells are common in the vicinity of Barber lake where the outwash sands and gravels come to the surface, and in the north-central part of the township where gravel is encountered within 15 feet of the surface. The deposits appear to be continuous in both areas and no great difficulty should be experienced in obtaining water at shallow depth in them. Within short distances of these shallow wells, however, it was found necessary to sink wells to a considerable depth before water was obtained. The supply from the shallow wells in the northern part of the area is abundant, and the water is suitable for domestic use as well as for stock. The supply from some of the wells in the vicinity of Barber lake is inadequate, and some of the water is too highly mineralized for drinking, but it can all be used for stock.

The lower part of the drift has been extensively prospected, especially in the eastern half of the township. The water-bearing deposits appear to be of considerable areal extent, and in many places two or more wells tap a common water-bearing horizon. This fact is noted in sections 2, 3, 4, 9, 10, and 12, where wells from 65 to 112 feet deep tap a water-bearing horizon located at elevations ranging from 1,810 to 1,840 feet above sea-level. Three wells located in sections 13, 24, and 25, sunk to depths of 70 feet, tap an aquifer at an elevation of 1,830 to 1,850 feet above sea-level. Wells in sections 35 and 36 are sunk to depths of 65 to 80 feet, and tap what appears to be a common aquifer at elevations of 1,780 to 1,800 feet above sea-level. A number of wells in sections 14 and 15 also tap a common aquifer at depths of 120 to 140 feet, or at elevations of 1,760 to 1,785 feet above sea-level. A few wells tap isolated pockets of sand and gravel, but little difficulty should be experienced in locating water in the lower part of the drift in

this township, although a dry hole was sunk to a depth of 160 feet in section 22, and wells in the NW.¼, section 24, and the NW.¼, section 26, yield small quantities of water. With few exceptions, however, the supply from the deep wells is sufficient, or even more than sufficient, for farm requirements. The water is in many cases very hard, and that from some wells is too highly mineralized for domestic use. The water in a number of the wells is under considerable hydrostatic pressure.

Four wells, located in sections 19, 29, 31, and 32, are thought to be obtaining water from aquifers in the underlying bedrock at depths ranging from 242 to 300 feet, or at elevations of 1,615 to 1,708 feet above sea-level. The water in these wells is under similar hydrostatic pressure, and one aquifer may be common to the four wells. In section 30, however, it was necessary to drill to an elevation of 1,515 feet above sea-level before an aquifer was encountered, and a dry hole was also sunk to a depth of 245 feet in the same section; hence an aquifer of considerable areal extent may not exist. An abundant supply of water is obtained from the wells, and although it is hard, highly mineralized, and in two instances recorded as "alkaline", it is, with one exception, being used for domestic purposes as well as for stock.

The areal extent of the aquifer tapped by a 400-foot well in section 30 is unknown. The aquifer is located in the Belly River formation at an elevation of 1,515 feet above sea-level, and it may be of considerable areal extent. The well was drilled by the Canadian Pacific Railway Company, but the water could not be used in their locomotives. The supply, however, is said to have been abundant.

Township 29, Range 11

Macdonald creek flows in a northeasterly direction across the township, and its valley is fairly wide but shallow. With the exception of this valley, which lies at an elevation of approximately 1,800 feet above sea-level, the township is level to slightly undulating. Milden, in section 17, is at an elevation of 1,875 feet above sea-level, and the elevation throughout the township varies from 1,850 to 1,925 feet above sea-level. A narrow area along Macdonald creek and a strip along the western boundary of the township are mantled by boulder clay or glacial till. Throughout the remainder of the area the glacial till is concealed by at least 30 feet of glacial lake clay.

In the areas covered by glacial lake clay the possibilities of obtaining water at shallow depth are not good, but a few wells tap small water-bearing deposits in the boulder clay along Macdonald creek. Test augers should be used to locate the deposits before a well is dug. Shallow wells sunk beside sloughs will probably yield water when the sloughs contain water, but a large supply is not to be expected. The existing shallow wells yield adequate water for farm needs, but that from the well in section 9 is only being used for stock. The lake clay does not yield water.

The lower part of the drift has been tested rather extensively in some parts of this township, and wells have tapped water-bearing deposits of sand and gravel at depths ranging from 40 to 160 feet. In the area outlined by the "B" boundary line the deposits appear to be fairly numerous at depths of from 40 to 120 feet, or at elevations of 1,780 to 1,820 feet above sea-level. In other smaller areas there also appears to be some continuity in the occurrence of the deposits

that form aquifers for producing wells. This is especially true in sections 12, 13, and 24, where four wells have tapped deposits at depths of 40 to 45 feet, or at elevations of 1,870 to 1,880 feet above sea-level. Two wells in section 2 appear to tap a common aquifer, as do two wells in the western part of section 3, and the eastern part of section 4. By carefully studying the well records in conjunction with the maps, it should be possible to select a well site where the possibilities of obtaining water are good. A few wells that tap the water-bearing deposits in the lower part of the drift yield inadequate supplies for local needs, but a large number of stock are raised in this part of the municipality. The water is hard and highly mineralized, and in some instances its use is limited to stock. Dams have been constructed on Macdonald creek and the impounded water is used to supplement the supply from wells. Suitable locations exist along Macdonald creek for the construction of other dams. Dugouts can also be used to conserve surface water.

A 490-foot well in the NE.$\frac{1}{4}$, section 32, taps an aquifer in the Belly River formation at an elevation of 1,420 feet above sea-level. Due to the irregular occurrence of the water-bearing sands in the Belly River formation, the areal extent of the producing aquifer is not known. It, or similar aquifers, may be encountered in other parts of the area, but the expense involved may not warrant the drilling of deep wells. The supply from the deep well is abundant and the hydrostatic pressure is sufficient to raise the water 390 feet above the aquifer. The water is soft, contains a considerable amount of mineral salts in solution, and is being used for all farm purposes.

Township 29, Range 12

The surface of this township is cut by many small, intermittent tributaries of Stonyridge and Macdonald creeks.

A large area in the eastern half of the township is mantled by boulder clay or glacial till, but throughout the remainder of the area it is concealed by approximately 30 feet of glacial lake clay.

The lake clay yields little or no water, but water-bearing deposits exist in the upper part of the glacial till or boulder clay. The deposits are very scattered and only a few shallow wells obtain water. Except along the ravines and in the vicinity of undrained depressions, it will probably be necessary to sink wells to depths of at least 45 feet before water is obtained. An 18-foot well in section 3 yields an abundant supply of water, but the supply from the other shallow wells is not large. The water from the wells, however, is not highly mineralized and is used for drinking as well as for stock.

Difficulty is also experienced in obtaining water from the lower part of the drift, that is, from the unweathered, blue boulder clay. In the area outlined by the "B" boundary line a few wells derive water from aquifers at depths ranging from 95 to 120 feet, or at elevations of 1,780 to 1,810 feet above sea-level. In the remainder of the area wells obtain water from scattered deposits of sand and gravel at depths of 40 to 120 feet, and the deposits do not form a continuous aquifer. The supply from the wells tapping deposits in the lower part of the drift, with two exceptions, is adequate for farm needs. The water is very hard and although highly mineralized it is nearly always used for domestic purposes. Water obtained from shallow wells sunk near the water impounded by dams and dugouts should be far superior in quality to that from the deep wells.

Two wells located in sections 23 and 30 tap aquifers at depths of 200 and 300 feet, or at elevations of 1,705 and

1,610 feet above sea-level, respectively. These wells are thought to derive at least part of their supply from the bedrock Belly River formation, but the aquifers are not thought to be correlated, and each water-bearing deposit is probably of local areal extent. The water in the well in section 23 rises 70 feet above the aquifer, and the supply is abundant. In the well in section 30, however, the water rises 200 feet above the aquifer, but the supply is recorded as being sufficient only for local requirements. The water from both wells is very hard and highly mineralized; that from the well in section 30 is used for domestic needs, although it acts as a laxative.

Three wells located in the SE.$\frac{1}{4}$, section 4, the NE.$\frac{1}{4}$, section 16, and the SW.$\frac{1}{4}$, section 32, also obtain water from aquifers in the Belly River formation at depths of 485, 420, and 509 feet, respectively, or at elevations of 1,365, 1,480, and 1,423 feet above sea-level. These wells are not thought to tap a common aquifer, and the water-bearing deposits are probably of local areal extent. The sand deposits in the Belly River formation in this area appear to be lenticular in shape, but no dry holes have been drilled into the bedrock in this township. The supply from two of the producing wells is abundant, but that from the well in section 16 is inadequate for local needs. The cylinder of the pump in this well may not be far enough down the well, or the supply of water may be partly shut off by sand plugging the well casing. The water from the well in section 32 is soft and has a soda taste, whereas that from the other wells is hard, but all are used for drinking as well as for stock.

Township 30, Range 11

With the exception of narrow areas along Stonyridge and Macdonald creeks, the boulder clay or glacial till that

mantles this township is covered by glacial lake clay. The lake clay is not thought to exceed more than 30 feet in thickness. The surface of this township is level except where cut by the creeks. The valley of Stonyridge creek is quite shallow. A few wells in this township obtain small supplies of water at shallow depth, usually within 25 feet of the surface. These wells are in most places dug near undrained depressions or ravines and their water is derived by seepage from the impounded surface water rather than from a gravel or sand aquifer. The supply from these wells is sufficient for domestic needs, but is seldom adequate for all stock requirements, and it is easily affected by drought conditions. The lower part of the drift has been fairly extensively prospected, since little water is obtained from its upper part. In the area outlined by the "B" boundary line a number of wells obtain water from aquifers located at depths ranging from 90 to 145 feet, or at elevations of 1,770 to 1,810 feet above sea-level. With the exception of the few shallow seepage wells, the shallowest wells that obtain water from aquifers in the drift are approximately 100 feet deep. Water-bearing deposits appear to be fairly numerous within this outlined area. The supply from these wells is frequently more than sufficient for local requirements. The water is very hard and highly mineralized, but with few exceptions it is being used for domestic needs as well as for stock. That from a few wells acts as a laxative.

A well located in section 21 taps an aquifer at a depth of 185 feet, or at an elevation of 1,730 feet above sea-level. This aquifer may be in the bedrock or at the contact of the drift and bedrock. Its areal extent has not been defined, but it is not thought to be large. The supply from this well is sufficient for stock needs, but the water contains a large amount of mineral salts in solution and is not used for drinking.

Wells located in sections 2, 4, 7, 8, 30, and 35 have tapped aquifers in the Belly River formation at depths ranging from 225 to 350 feet, or at elevations of 1,560 to 1,695 feet above sea-level. With the exception of the wells in section 35 the other wells may be tapping a common aquifer, and the water in the wells in the southern part of the area rises to within 25 feet of the surface. The sand deposits in the Belly River formation, however, in many places are lenticular in shape, and it is possible that each well taps a localized pocket. Four wells drilled to depths of 250 to 350 feet, in section 35, all encountered water. The supply from the wells tapping the Belly River formation is abundant, and the water is used for domestic purposes and for stock although that from one well is recorded as being laxative. The well in section 30 is not used at present.

A well located in section 6, drilled to a depth of 500 feet, taps an aquifer in the Belly River formation at an elevation of 1,410 feet above sea-level. The areal extent of this horizon is unknown, but it might be encountered by other wells drilled to similar depths in this locality. The supply from this well is abundant, and the water is soft and is being used for drinking as well as for stock.

Township 30, Range 12

The difference in topographic relief in this township amounts to approximately 50 feet, and the surface is fairly level. Stonyridge creek, a small intermittent stream, has eroded a shallow valley, not more than 25 feet deep, in the southeastern corner of the township. Boulder clay or glacial till is exposed in a narrow area along the creek, but elsewhere in the township it is covered by glacial lake deposits. Glacial lake sands occur in parts of sections 34 and 35, and glacial lake clay occurs in the remainder of the area.

A few shallow wells obtain small supplies of water from sand and gravel deposits in the glacial drift. Most of the wells are located along the northern boundary of the township. The upper part of the glacial drift in this township has not proved particularly productive, and on most farms it has been necessary to sink wells into the lower part of the drift. The supply from the shallow wells is generally sufficient for domestic purposes and a few head of stock, but it is dependant to a large degree on the amount of annual precipitation. It is unusual for shallow wells in this township to yield sufficient water for local needs. The water is moderately soft to hard, and that from most wells is used for domestic purposes.

Most of the wells in this township obtain their supply from scattered sand and gravel deposits that occur in the lower part of the glacial drift. In the area outlined by the "B" boundary line the deposits appear to be more numerous than elsewhere, and a number of wells in this area derive water at depths of 105 to 150 feet, or at elevations of 1,790 to 1,820 feet above sea-level. Over the remainder of the township the deposits are tapped at depths varying from 48 to 150 feet, but with the exception of the two wells located in sections 20 and 22, the deposits are not thought to form a continuous aquifer. A few of the wells yield supplies that are inadequate for local needs, and only two yield an oversufficient supply. The water is hard and very highly mineralized, and that from a number of wells is unfit for domestic use.

Four wells, located in sections 5, 6, 16, and 17, tap aquifers in the Belly River formation at depths of 360, 300, 330, and 248 feet, or at elevations of 1,560, 1,630, 1,610, and 1,697 feet above sea-level, respectively. The wells appear to tap individual water-bearing deposits. It should be possible,

however, to obtain water at similar depths in other parts of the township. The supply from the four wells is abundant, and the hydrostatic pressure is sufficient to raise the water at least 125 feet above the aquifer. The water is hard and highly mineralized, and that from two wells acts as a laxative. It is being used for drinking, however, as well as for stock.

STATISTICAL SUMMARY OF WELL INFORMATION IN RURAL MUNICIPALITY OF MILDEN, NO. 286, SASKATCHEWAN

Township	27	27	28	28	29	29	30	30	Total No. in Municipality
West of 3rd mer. Range	11	12	11	12	11	12	11	12	
Total No. of Wells in Township	51	46	43	48	32	23	34	26	303
No. of wells in bedrock	2	7	1	6	1	5	11	4	37
No. of wells in glacial drift	49	39	42	42	31	18	23	22	266
No. of wells in alluvium	0	0	0	0	0	0	0	0	0
Permanency of Water Supply									
No. with permanent supply	45	43	42	45	32	23	32	22	284
No. with intermittent supply	6	2	1	1	0	0	1	4	15
No. dry holes	0	1	0	2	0	0	1	0	4
Types of Wells									
No. of flowing artesian wells	2	0	0	0	0	0	0	0	2
No. of non-flowing artesian wells	37	18	15	17	19	15	23	16	160
No. of non-artesian wells	12	27	28	29	13	8	10	10	137
Quality of Water									
No. with hard water	47	40	43	38	31	20	32	23	274
No. with soft water	4	5	0	8	1	3	1	3	25
No. with salty water	1	4	0	0	0	0	0	1	6
No. with "alkaline" water	24	18	13	16	18	10	12	16	127
Depths of Wells									
No. from 0 to 50 feet deep	12	21	15	16	13	5	6	8	96
No. from 51 to 100 feet deep	28	15	22	19	11	8	5	3	111
No. from 101 to 150 feet deep	7	2	4	6	6	5	10	11	51
No. from 151 to 200 feet deep	1	3	1	1	1	1	2	0	10
No. from 201 to 500 feet deep	2	4	1	6	1	3	11	4	32
No. from 501 to 1,000 feet deep	1	1	0	0	0	1	0	0	3
No. over 1,000 feet deep	0	0	0	0	0	0	0	0	0
How the Water is Used									
No. usable for domestic purposes	44	36	34	37	20	21	29	20	241
No. not usable for domestic purposes	7	9	9	9	12	2	4	6	58
No. usable for stock	51	42	41	45	32	23	32	26	292
No. not usable for stock	0	3	2	1	0	0	1	0	7
Sufficiency of Water Supply									
No. sufficient for domestic needs	45	42	40	44	29	23	32	21	276
No. insufficient for domestic needs	6	3	3	2	3	0	1	5	23
No. sufficient for stock needs	44	35	39	43	27	19	29	18	254
No. insufficient for stock needs	7	10	4	3	5	4	4	8	45

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 boilders 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 Milden, No. 28o, Saskatchewan.

LOCATION						Depth of Well, Ft.	Total dis'vd solids	HARDNESS			CONSTITUENTS AS ANALYSED						CONSTITUENTS AS CALCULATED IN ASSUMED COMBINATIONS								Source of Water
No.	Qtr.	Sec.	Tp.	Rge.	Mer.			Total	Perm.	Temp.	Cl.	Alka-linity	CaO	MgO	SO_4	Na_2O	Solids	$CaCO_3$	$CaSO_4$	$MgCO_3$	$MgSO_4$	Na_2CO_3	Na_2SO_4	NaCl	$CaCl_2$	
1	SE.	4	27	11	3	78	3,500												(1)		(3)		(4)	(2)		x1
2	NW.	o	27	11	3	Spring	1,118											53	557	245			242	21		x1
3	NE.	18	27	11	3	95	1,770											(4)	(1)		(2)		(3)		(5)	x1
4	SW.	26	27	11	3	65	1,037												(1)		(3)	(2)		(4)		x1
5	NW.	31	27	11	3	600	2,040												(4)		(5)	(2)	(1)	(3)		x2
6	NE.	34	27	11	3	100	2,425											(4)	(1)		(2)		(3)		(5)	x1
7	SW.	2	27	12	3	407	2,440	35			1,250	290	30	7	25	1,232	2,400	54		15		232	37	2,o52		x2
8	SE.	3	27	12	3	420	2,520	40			1,300	340	30	11	16	1,309	2,521	54		23		275	24	2,145		x2
9	NE.	17	27	12	3	180	2,223											(3)	(1)		(2)				(4)	x3?
10	S½	22	27	12	3	Reser-voir	1,088												314	140	343		263	27		x1
11	SE.	4	28	11	3	85													(2)		(3)	(4)	(1)	(5)		x1
12	NW.	34	28	12	3	10												100				54	8	1o		x1
13	NW.	17	29	11	3	84												27	1,105	392			4o2	oo		x1
14	NW.	18	29	11	3	Creek											2,758		1,000	240	691		727	100		x1

Water samples indicated thus, x1, are from glacial drift.
Water samples indicated thus, x2, are from bedrock, Belly River formation.
Water samples indicated thus, x3, are from bedrock, Bearpaw 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.
Hardness is the soap hardness expressed as calcium carbonate ($CaCO_3$).
Analyses Nos. 3, 4, 5, 6, 9, and 11, by Provincial Analyst, Regina; Analysis No. 1 by University of Saskatchewan; Analyses Nos. 2, 10, 12, 13, and 14 by Canadian Pacific Railway.
For interpretation of this table read the section on Analyses and Quality of Water.

Water from the Unconsolidated Deposits

No samples of water from wells in the unconsolidated deposits were taken for chemical analysis by the field party in 1935, but a number of samples of water from these deposits have been analysed by the Provincial Analyst, the chemical departments of the Canadian Pacific Railway Company, and the University of Saskatchewan, and the results are given in the table accompanying this report. None of these samples was taken from wells sunk in the glacial outwash sands and gravels in the vicinity of Barber lake, or in the glacial lake sands along the northern boundary of the municipality. The water from these types of deposits is usually moderately soft, not highly mineralized, and in many cases suitable for domestic purposes. No samples of water were obtained from shallow wells in the boulder clay, but from information collected on water from this source in surrounding municipalities, the water should be found quite satisfactory for domestic use. The water from shallow wells in the lake clay will probably be somewhat similar in quality, as the water is thought to be obtained from sand and gravel deposits that occur at or near the contact of the lake clay and the underlying boulder clay. Sample No. 12 is from a 10-foot well, and this water should be satisfactory for all farm needs. Sample No. 2 is from a spring, and this water can be used for drinking as well as for stock.

Samples 1, 3, 4, 6, 11, and 13 are from wells that tap water-bearing deposits in the lower part of the glacial drift. The total dissolved solid content of these samples varies from 1,037 to 3,500 parts per million. The water is quite hard and calcium sulphate ($CaSO_4$) is the most abundant mineral salt present. Magnesium sulphate (Epsom salts) and sodium sulphate (Glauber's salt) are next in order of abundance. Samples 1, 11,

and 13, may act as a slight laxative on those not accustomed to highly mineralized water. Small amounts of calcium carbonate and sodium chloride are also present. The waters analysed may be fairly representative of the water from the lower part of the glacial drift in the municipality of Milden. The water is suitable for stock and in many cases can be used for drinking. In some instances, however, it cannot be used for drinking as it acts as a laxative.

Water from the Bedrock

Two samples of water from the bedrock, Nos. 7 and 8, were collected by the field party in 1935, and the results of the chemical analysis are shown on the accompanying table. One sample, No. 9, was analysed by the Provincial Analyst. This water is thought to be partly derived from the Bearpaw formation, but the results appear to indicate that the water is from the glacial drift. It is hard and highly mineralized, but may be usable for domestic purposes. Three samples of water from the Belly River formation were analysed. The total dissolved solid content varies from 2,040 to 2,520 parts per million. Samples 7 and 8 are quite soft, containing only 35 and 40 parts per million of total hardness. The salts of sodium are abundant and in order of abundance, as a rule, are sodium chloride, sodium carbonate, and sodium sulphate. Some of the waters, however, are hard and contain a large amount of calcium and magnesium salts. The water may have a salty or soda taste, but is usable for drinking and for stock. The presence of sodium carbonate (black alkali) renders the water unfit for irrigation.

WELL RECORDS—Rural Municipality of MILDEN, NO. 286, SASKATCHE AN.

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	SE.	1	27	11	3	Bored	102	2,100	- 09	2,091	102	2,058	Glacial sand	Hard, iron	41	D, S	Ample for 40 head stock.
2	NE.	1	"	"	"	Dug	12	2,150	- 0	2,150			Glacial gravel	Soft	42	D, S	Intermittent; usually sufficient for 25 head stock.
3	SW.	2	"	"	"	Bored & Drilled	160	2,155	-132	2,023	160	1,995	Glacial fine sand	Moderately hard, iron		D, S, I	Ample; yields 28 barrels daily.
4	NE.	2	"	"	"	Bored	150	2,135	- 85	2,050	150	1,985	Glacial sand	Hard, iron	41	D, S	Ample; waters 4 head stock.
5	SE.	2	"	"	"	Dug	12	2,155	- 0	2,155			Glacial drift	Hard, iron	44	D, S	Intermittent supply.
6	SE.	4	"	"	"	Dug	78	2,090	- 70	2,020	70	2,020	Glacial gravel	Very hard, "alkaline"	42	D, S	Yields 10 barrels a day; laxative for man; #.
7	NE.	4	"	"	"	Bored	114	2,055	- 94	1,961	114	1,941	Glacial gravel	Hard, iron, red sediment	41	D, S	Yields 20 barrels a day.
8	NE.	5	"	"	"	Bored	58	2,000	- 33	1,967	58	1,942	Glacial gravel	Hard, iron, "alkaline"	42	D, S	Waters 40 to 50 head stock.
9	NE.	6	"	"	"	Dug	15	1,950	- 11	1,939	11	1,939	Glacial sand	Hard, "alkaline"	43	D, S	Sufficient for 10 head stock.
10	NW.	6	"	"	"	Spring		1,925					Glacial drift				#.
11	SE.	8	"	"	"	Bored	40	1,990	- 15	1,975	40	1,950	Glacial drift	Hard	42	D, S	Sufficient for 75 head stock.
12	NW.	8	"	"	"	Springs		?					Glacial drift	Hard		S	Along ravine; each good for 100 head stock.
13	NW.	9	"	"	"	Bored	40	1,990	- 25	1,965	40	1,950	Glacial drift	Hard, iron, slightly "alkaline"	41	D, S	Ample for 8 head stock.
14	NW.	10	"	"	"	Bored	65	2,025	- 57	1,968	57	1,968	Glacial sand	Hard, iron	42	D, S	Waters 100 head stock.
15	NE.	10	"	"	"	Bored	84	2,055	- 71	1,984	84	1,971	Glacial sand	Very hard, iron, grey sediment		D, S	Ample for 100 head stock.
16	NW.	11	"	"	"	Drilled	400	2,075	- 80	1,995	400	1,675	Belly River(?)	Hard, iron, "alkaline"		S	Oversufficient; waters 100 head stock.
17	SE.	12	"	"	"	Drilled	234	2,140	-124	2,016	234	1,906	Glacial drift(?)	Hard, iron, cloudy, salt	42	D, S	Insufficient; yields 3 barrels a day.
18	SW.	12	"	"	"	Dug	16	2,140	- 0	2,140			Glacial sand	Soft	42	D, S	Intermittent supply.
19	NW.	12	"	"	"	Bored	120	2,100	- 80	2,020	120	1,980	Glacial sand	Hard, iron	41	D, S	Sufficient for 20 head stock.
20	NW.	13	"	"	"	Bored	117	2,075	- 92	1,983	117	1,958	Glacial fine sand	Hard, iron, "alkaline", odorous	42	S	Yields 15 barrels a day; hauls drinking water.
21	NE.	13	"	"	"	Dug	16	2,095	- 0	2,095			Glacial drift	Soft	45	D, S	Intermittent supply.
22	NE.	14	"	"	"	Bored	85	2,070	- 75	1,995			Glacial sand	Hard, iron, "alkaline"	42	S	Intermittent, insufficient; usually waters 4 head stock; unfit for human consumption.
23	SE.	16	"	"	"	Bored	40	2,000	- 20	1,980	40	1,960	Glacial drift	Hard, iron, "alkaline"	42	D, S	Sufficient for 10 head stock.
24	SE.	17	"	"	"	Bored	50	1,970	- 20	1,950	50	1,920	Glacial drift	Hard, iron, "alkaline"	41	D, S	
25	NE.	18	"	"	"	Bored	95	1,955	- 60	1,895	95	1,860	Glacial drift	Hard, iron, "alkaline", cloudy	41	D, S	Sufficient for 20 head 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.

WELL RECORDS—Rural Municipality of MILDEN, NO.286, SASKATCHEWAN.

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				
26	NW.	19	27	11	3	Bored	100	1,925	- 85	1,840			Glacial drift	Hard, iron, "alkaline"	41	S	Intermittent; usually waters 10 head stock; unfit for humans.
27	SW.	20	"	"	"	Bored	65	1,950	- 40	1,910	65	1,885	Glacial sand	Hard, iron, red sediment	41	D, S	Sufficient for 25 head stock.
28	SE.	20	"	"	"	Bored	50	1,970	- 30	1,940	50	1,920	Glacial fine sand	Hard, iron, "alkaline"	42	D, S	Abundant supply; has only 8 head stock.
29	NW.	22	"	"	"	Dug	60	1,990	- 42	1,948	60	1,930	Glacial sand	Hard, iron, "alkaline"		D, S	Yields 50 to 70 barrels a day.
30	NW.	23	"	"	"	Drilled	52	2,025	- 45	1,980	52	1,973	Glacial gravel	Hard, iron	41	D, S	Sufficient; waters 14 head stock.
31	NE.	23	"	"	"	Bored	75	2,035	- 50	1,985	75	1,960	Glacial sand	Hard, iron, slightly "alkaline"	41	D, S	Sufficient for 30 head stock.
32	SW.	24	"	"	"	Bored	110	2,055	- 90	1,965	110	1,945	Glacial fine sand	Hard, iron, "alkaline"	41	D, S	Yields 10 barrels a day.
33	NE.	24	"	"	"	Bored	110	2,060	- 95	1,965	110	1,950	Glacial sand	Hard, "alkaline"	42	D, S	Sufficient; waters 10 head stock.
34	NW.	24	"	"	"	Bored	86	2,050	- 50	2,000	86	1,964	Glacial fine sand	Hard, cloudy, "alkaline"	42	D, S	Sufficient for 30 head stock.
35	SW.	25	"	"	"	Bored	65	2,025	- 45	1,980	65	1,960	Glacial sand	Hard	42	D, S	Sufficient; waters 15 head stock.
36	SW.	26	"	"	"	Bored	65	2,005	- 35	1,970	65	1,940	Glacial gravel	Hard, slight sediment		D, S, M	Ample supply; #; owned by town of Dinsmore; second town well for drinking.
37	SW.	27	"	"	"	Bored	90	2,000	- 10	1,990	90	1,910	Glacial drift	Hard, iron, "alkaline"	42	S	Sufficient; waters 40 to 50 head stock; laxative; hauls drinking water.
38	SE.	27	"	"	"	Bored	65	2,010	- 20	1,990	65	1,945	Glacial sand	Hard, iron	42	D, S	Oversufficient for 15 head stock.
39	NW.	28	"	"	"	Bored	75	1,960	- 55	1,905	75	1,885	Glacial drift	Hard, iron, "alkaline"	42	D, S	Sufficient; waters 40 head stock.
40	SW.	30	"	"	"	Dug	70	1,925	- 65	1,860			Glacial drift	Hard, "alkaline"	42	D, S	Intermittent supply.
41	NE.	30	"	"	"	Bored	100	1,945	- 80	1,865	100	1,845	Glacial drift	Hard, iron, "alkaline"	42	D, S	Sufficient; yields 20 barrels a day.
42	NW.	31	"	"	"	Drilled	600	1,933	- 40	1,893	600	1,333	Belly River	Soft	40	D, S	Oversufficient; waters 20 head stock; #.
43	NE.	33	"	"	"	Bored	75	1,965	- 55	1,910	75	1,890	Glacial black sand	Very hard, iron	42	D, S	Waters 18 head stock.
44	NE.	34	"	"	"	Bored	100	1,990	- 30	1,960	100	1,890	Glacial sand	Hard	41	D, S	Second similar well; #.
45	NW.	34	"	"	"	Dug	90	1,970	- 60	1,910	90	1,880	Glacial drift	Hard, iron	42	D, S	Sufficient for 100 head stock.
46	SW.	36	"	"	"	Bored	95	2,010	- 55	1,955	95	1,915	Glacial sand	Hard, "alkaline"	41	D, S	Waters 40 head stock.
47	NW.	36	"	"	"	Bored	65	2,010	- 57	1,953			Glacial drift	Hard	42	D, S	Supplies 20 barrels daily.
48	NE.	36	"	"	"	Bored	80	2,000	- 40	1,960	80	1,920	Glacial drift	Hard, "alkaline"	41	D, S	Waters 26 head stock.
1	SW.	2	27	12	3	Drilled	407	1,900	- 28	1,872	407	1,493	Belly River	Soft, salty	44	D, S	Abundant supply; #.
2	SE.	3	"	"	"	Drilled	420	1,895	- 20	1,875	420	1,475	Belly River	Soft, salty	46	D, S	Abundant supply; #.
3	NW.	3	"	"	"	Drilled	280	1,890	-260	1,630			Belly River(?)	Hard, iron, odorous	43	D, S	Insufficient; supplies 2 barrels a day.
4	SE.	4	"	"	"	Drilled	117	1,890	- 50	1,840	117	1,773	Glacial blue sand	Hard, iron	46	D, S	Oversufficient; waters 20 head 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.

WELL RECORDS—Rural Municipality of MILDEN, NO. 286, SASKATCHEWAN.

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
5	NW.	4	27	12	3	Drilled	16	1,895	- 9	1,886	9	1,886	Glacial fine sand	Hard, lime	42	D, S	Sufficient; waters 10 barrels a day.
6	NW.	4	"	"	"	Bored	70	1,890	- 66	1,824	66	1,824	Glacial gravel and sand	Hard, "alkaline"	48	D, S	Oversufficient; yields 60 barrels a day.
7	S.½	5	"	"	"	Bored	45	1,925	- 33	1,892			Glacial drift	Hard		D, S	Sufficient supply.
8	NW.	6	"	"	"	Dug	33	1,900	- 15	1,885	33	1,867	Glacial sand	Hard, iron, slightly "alkaline"	48	D, S	Abundant supply.
9	SE.	8	"	"	"	Bored	24	1,895	- 21	1,874	21	1,874	Glacial fine sand	Hard, iron, red sediment	46	D, S	Insufficient; yields 2 barrels a day.
10	SW.	10	"	"	"	Dug	20	1,880	- 17	1,863			Glacial fine sand	Hard	45	D, S	Intermittent supply.
11	NE.	10	"	"	"	Bored	80	1,890	- 60	1,830	80	1,810	Glacial drift	Hard, iron, red sediment	48	D, S	Sufficient; waters 12 head stock; laxative.
12	SW.	13	"	"	"	Dug	14	1,895	- 9	1,886	9	1,886	Glacial gravel	Hard, slightly "alkaline"	48	D, S	Sufficient for 10 head stock.
13	NE.	14	"	"	"	Bored	119	1,890	-114	1,776	114	1,776	Glacial fine sand	Very hard, cloudy	48	N	Insufficient; unsuitable for use.
14	SE.	14	"	"	"	Dug	18	1,890	- 10	1,880	10	1,880	Glacial sand	Hard, "alkaline"		S	Yields 10 barrels daily.
15	SW.	14	"	"	"	Bored	18	1,890	- 4	1,886	18	1,872	Glacial sand	Hard, iron, "alkaline"	48	S	Yields 10 barrels a day.
16	NW.	15	"	"	"	Bored	75	1,860	- 45	1,815	75	1,785	Glacial drift	Hard, iron, red sediment		D, S	Abundant supply.
17	E.½	15	"	"	"	Bored	83	1,865	- 73	1,792	83	1,782	Glacial drift	Hard, "alkaline"	48	D, S	Waters 14 head stock; laxative.
18	NW.	16	"	"	"	Bored	60	1,865	- 30	1,835	60	1,805	Glacial drift	Hard, iron, red sediment	46	D, S	Sufficient; waters 20 head stock.
19	SW.	16	"	"	"	Bored	50	1,870	- 45	1,825	45	1,825	Glacial fine sand	Hard, iron, red sediment		D, S	Insufficient; yields 4 barrels daily.
20	NE.	17	"	"	"	Drilled	180	1,870	- 15	1,855	180	1,690	Belly River(?)	Hard, iron, slightly "alkaline"			Abundant supply; #.
21	NE.	17	"	"	"	Bored	80	1,865	- 50	1,815	80	1,785	Glacial drift	Hard, iron, "alkaline"	46	S	Yields 50 barrels a day; laxative.
22	NE.	18	"	"	"	Dug	18	1,875					Glacial drift	Hard, iron, "alkaline"	48		
23	NE.	20	"	"	"	Drilled	190	1,855	-120	1,735	190	1,665	Belly River(?)	Hard, iron, red sediment	42	D, S	Oversufficient; yields 32 barrels a day.
24	NE.	21	"	"	"	Dug	8	1,850	- 0	1,850			Glacial fine sand	Hard, "alkaline"		S	Sufficient; waters 30 head stock.
25	SW.	22	"	"	"	Dug	16	1,855	- 12	1,843	12	1,843	Glacial sand	Soft	46	D	Sufficient; yields 3 barrels a day.
26	NW.	22	"	"	"	Dug	12	1,855	- 0	1,855			Glacial drift	Soft	48	S	Intermittent supply; 160-foot dry hole base in glacial drift; (?).
27	NE.	22	"	"	"	Bored	65	1,900	- 61	1,839	61	1,839	Glacial fine sand	Hard, iron	49	D, S	Sufficient; yields as limit 2 barrels a day.
28	NW.	23	"	"	"	Bored	60	1,900	- 59	1,841	59	1,841	Glacial sand	Hard, slightly "alkaline"	48	D, S	Sufficient; waters 10 head stock.
29	SW.	23	"	"	"	Bored	60	1,890	- 58	1,832	58	1,832	Glacial sand	Hard, iron, "alkaline"	48	D, S	Very poor supply.
30	NE.	23	"	"	"	Bored	80	1,905	- 76	1,829	76	1,829	Glacial sand	Hard, iron, "alkaline"	48	S	Sufficient; yields 10 to 12 barrels a day; too "alkaline" for drinking.

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 MILDEN, NO. 286, SASKATCHEWAN.

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE: Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED: Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
31	NE.	24	27	12	3	Bored	30	1,920	+ 27	1,893	27	1,893	Glacial sand	Hard, "alkaline"	45	D	Supplies 2 to 3 barrels a day.
32	SW.	24	"	"	"	Drilled	739	1,900	-639	1,211	739	1,161		Soft, soda, salty	46	D, S	Abundant supply.
33	NE.	26	"	"	"	Drilled	350	1,915	- 50	1,865	350	1,565	Glacial drift	Very hard, "alkaline", iron	46	D, S	Abundant supply; waters 40 head stock.
34	NW.	27	"	"	"	Dug	64	1,875					Glacial drift	Hard		N	Sufficient for 15 to 20 head stock; but caved in and now unused.
35	SW.	27	"	"	"	Bored	29	1,870	- 8	1,862	29	1,841	Glacial drift	Hard	44	D, S	Abundant supply; waters 10 head stock.
36	SE.	28	"	"	"	Dug	13	1,860	- 10	1,850	10	1,850	Glacial drift	Medium hard, salty		D, S	Waters 10 horses.
37	SE.	30	"	"	"	Bored	38	1,860	- 2	1,858	38	1,822	Glacial sand	Hard, iron, "alkaline"	43	D, S	Abundant supply; waters 20 head stock.
38	NW.	30	"	"	"	Dug	18	1,850	- 13	1,837	13	1,837	Glacial fine sand	Hard, iron, slightly "alkaline"	42	D, S	Sufficient for 10 head stock.
39	NW.	32	"	"	"	Dug	18	1,850	- 13	1,837	13	1,837	Glacial fine sand	Hard, iron, "alkaline"	48	D, S	Sufficient; waters 20 head stock.
40	NE.	32	"	"	"	Bored	35	1,850	- 30	1,820	30	1,820	Glacial sand	Hard		N	Insufficient and too hard for use.
41	SW.	33	"	"	"	Dug	13	1,845	- 10	1,835	10	1,835	Glacial fine sand	Hard, iron	44	D, S	Abundant supply; yields over 100 barrels a day.
42	SW.	34	"	"	"	Bored	80	1,880	- 60	1,820	80	1,800	Glacial sand	Hard, iron, red sediment	44	D, S	Abundant supply; yields 20 barrels a day.
43	SE.	34	"	"	"	Bored	80	1,905	- 76	1,829	76	1,829	Glacial fine sand	Hard, iron, red sediment	48	D, S	Insufficient; yields 4 barrels a day.
44	NE.	35	"	"	"	Bored	100	1,920	- 70	1,850	100	1,820	Glacial drift	Hard, iron, red sediment	46	D, S	Abundant supply.
45	NE.	36	"	"	"	Dug	70	1,925	- 66	1,859	66	1,859	Glacial drift	Hard, iron	48	D, S	Limited supply.
1	NW.	2	28	11	3	Bored	70	1,970	- 62	1,908	62	1,908	Glacial sand	Hard, sulphur	42	D, S	Supplies 20 barrels a day.
2	SW.	2	"	"	"	Dug	64	1,990	- 32	1,958	64	1,926	Glacial sand	Very hard		D, S	Abundant supply; laxative; now filled in.
3	S.½	3	"	"	"	Bored	62	1,980	- 52	1,928	52	1,928	Glacial sand	Hard, iron, slightly "alkaline"	41	D, S	Yields 50 barrels a day.
4	SE.	4	"	"	"	Bored	85	1,970	- 71	1,899	85	1,885	Glacial sand	Hard, cloudy, "alkaline"	41	D, S	Sufficient for 20 head stock; #.
5	SE.	6	"	"	"	Bored	160	1,940	-100	1,840	160	1,780	Glacial sand	Hard, iron, red sediment	41	D, S	Yields 20 barrels a day.
6	NE.	8	"	"	"	Bored	90	1,945	- 74	1,871	90	1,855	Glacial drift	Hard, iron, "alkaline"	41	D, S	Abundant; waters 14 head stock.
7	NE.	10	"	"	"	Bored	92	1,950	- 82	1,868	82	1,868	Glacial sand	Hard, odorous		S	Insufficient; waters 2 head stock; hauls domestic water.
8	NW.	10	"	"	"	Bored	115	1,950	- 90	1,860	115	1,835	Glacial gravel	Hard, iron, "alkaline"	41	D, S	Oversufficient; waters 30 head stock.
9	SW.	12	"	"	"	Dug	72	1,915	- 67	1,848	67	1,848	Glacial drift	Hard	41	D, S	Sufficient; waters 40 head stock.
10	SE.	12	"	"	"	Spring							Glacial drift			S	
11	NE.	12	"	"	"	Spring							Glacial drift			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 MILDEN, NO. 286, SASKATCHEWAN.

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
12	SE.	13	28	11	3	Spring							Glacial drift			S	
13	NW.	14	"	"	"	Bored	64	1,930	- 58	1,872	58	1,872	Glacial gravel	Hard, iron, red sediment	42	D, S	Sufficient for 50 head stock.
14	NE.	16	"	"	"	Bored	115	1,955	- 85	1,870	115	1,840	Glacial fine gravel	Hard, "alkaline"	41	D, S	Sufficient for 40 to 50 head stock.
15	SE.	17	"	"	"	Bored	75	1,945	- 65	1,880	75	1,870	Glacial sand	Very hard, iron	41	D, S	Oversufficient; waters 20 head stock.
16	NW.	18	"	"	"	Drilled	260	1,920	- 80	1,840	260	1,660	Belly River	Hard, iron	41	D, S	Waters 25 head stock; 70-foot well yields good supply.
17	SW.	18	"	"	"	Bored & Dug	109	1,920	- 75	1,845	109	1,811	Glacial fine sand	Hard, iron	41	D, S	Sufficient for 100 head stock.
18	SE.	18	"	"	"	Bored	100	1,925	- 90	1,835	100	1,825	Glacial sand	Hard, iron	41	D, S	Waters 15 head stock.
19	SE.	19	"	"	"	Bored	67	1,920	- 66	1,854	66	1,854	Glacial drift	Hard, iron, "alkaline"		S	Intermittent; insufficient supply.
20	NW.	20	"	"	"	Bored	85	1,900	- 65	1,835	85	1,815	Glacial gravel	Hard, iron, "alkaline", cloudy	41	D, S	Sufficient for 50 head stock.
21	NW.	21	"	"	"	Bored	87	1,905	- 78	1,827	78	1,827	Glacial drift	Hard, iron	41	D, S	Waters 7 head stock.
22	SW.	22	"	"	"	Dug & Bored	75	1,940	- 60	1,880	75	1,865	Glacial gravel	Hard, iron	41	D, S	Waters 50 head stock.
23	NW.	22	"	"	"	Dug	40	1,935	- 36	1,899	36	1,899	Glacial gravel	Hard	41	D, S	Oversufficient; waters 25 head stock.
24	SE.	22	"	"	"	Bored	50	1,930	- 47	1,883	47	1,883	Glacial drift	Hard	41	D, S	Waters 7 head stock; also a similar well.
25	NW.	25	"	"	"	Dug	65	1,905	- 61	1,844	61	1,844	Glacial fine sand	Hard, iron, "alkaline"	41	D, S	Sufficient; waters 25 head stock.
26	NW.	26	"	"	"	Bored	18	1,900	- 14	1,886	14	1,886	Glacial fine sand	Hard	41	D, S	Oversufficient; waters 50 head stock; supplies neighbours.
27	NE.	27	"	"	"	Bored	50	1,905	- 25	1,880	25	1,880	Glacial sand	Hard	41	D, S	Oversufficient; waters 50 head stock.
28	SE.	28	"	"	"	Dug	40	1,910	- 36	1,874	36	1,874	Glacial gravel	Hard		D, S	Sufficient for 20 head stock.
29	SE.	30	"	"	"	Bored	65	1,900	- 50	1,850	65	1,835	Glacial sand	Hard, iron	41	D, S	Waters 15 head stock; oversufficient.
30	NE.	31	"	"	"	Dug	19	1,890	- 11	1,879	11	1,879	Glacial sand	Hard	42	D, S	Waters 20 head stock; oversufficient.
31	SE.	32	"	"	"	Dug	16	1,910	- 12	1,898	12	1,898	Glacial sand	Hard, lime	41	D, S	Waters 25 to 30 head stock.
32	SW.	32	"	"	"	Bored	40	1,905					Glacial sand			N	
33	NE.	32	"	"	"	Dug	30	1,910	- 22	1,888	22	1,888	Glacial drift	Hard, "alkaline", red sediment	41	D, S	Oversufficient supply.
34	SW.	33	"	"	"	Dug	16	1,890	- 10	1,880	10	1,880	Glacial sand	Hard	41	D, S	Sufficient; waters 26 head stock.
35	SE.	33	"	"	"	Bored	60	1,900	- 40	1,860	60	1,840	Glacial sand	Hard, "alkaline"	42	S	Waters 15 to 16 head stock.
36	NW.	34	"	"	"	Bored	80	1,905					Glacial fine sand	Hard, iron, "alkaline"		N	Insufficient supply; scours stock.
37	N.½	35	"	"	"	Bored	120	1,915	-100	1,815	100	1,815	Glacial drift	Hard, iron, "alkaline"	41	S	Sufficient; waters 25 head stock; hauls drinking water.

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 6 MILDEN, NO. 286, SASKATCHEWAN.

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
38	NE.	36	28	11	3	Dug	40	1,920	- 35	1,885	35	1,885	Glacial drift	Hard, iron, "alkaline"	42	D, S	Waters 15 head stock.
39	SE.	36	"	"	"	Dug	65	1,915	- 55	1,860	55	1,860	Glacial sand	Hard, iron, "alkaline"	42	D, S	Waters 40 head stock.
40	NW.	36	"	"	"	Bored	90	1,915	- 85	1,830	85	1,830	Glacial sand			D, S	Insufficient supply; caved in.
41	NE.	36	"	"	"	Bored	80	2,000	- 40	1,960	80	1,920	Glacial sand	Hard, "alkaline"		D, S	Sufficient; waters 26 head stock.
1	NW.	2	28	12	3	Dug	75	1,910	- 72	1,838	72	1,838	Glacial fine sand	Hard, iron, "alkaline"	42	D, S	Sufficient; yields 30 barrels a day.
2	SW.	2	"	"	"	Bored	100	1,910	- 90	1,820	100	1,810	Glacial sand	Hard, iron, slightly "alkaline"	41	D, S	Sufficient; yields 24 barrels a day.
3	SW.	3	"	"	"	Bored	83	1,900	- 77	1,823	77	1,823	Glacial gravel	Hard	41	D, S	Oversufficient; yields 25 barrels a day.
4	NW.	4	"	"	"	Dug	24	1,900	- 20	1,880	20	1,880	Glacial fine sand	Hard	41	D, S	Sufficient; yields 36 barrels a day.
5	SW.	4	"	"	"	Dug	6	1,900	- 3	1,897	3	1,897	Glacial sand	Hard, "alkaline"	42	S	Sufficient for 20 head stock.
6	NE.	4	"	"	"	Dug	75	1,900	- 65	1,835	75	1,825	Glacial sand	Hard, iron, red sediment	41	D, S	Sufficient for 50 head stock.
7	NE.	6	"	"	"	Dug	8	1,845	- 0	1,845	8	1,837	Glacial gravel	Hard	41	D, S	Supply abundant; spring base.
8	SW.	7	"	"	"	Driven	20	1,855	- 17	1,838	17	1,838	Glacial sand	Soft	41	D	Sufficient supply.
9	SE.	9	"	"	"	Bored	71	1,900	- 64	1,836	64	1,836	Glacial sand	Hard, iron, red sediment	41	D, S	Sufficient for 50 head stock.
10	NW.	10	"	"	"	Dug	65	1,900	- 64	1,836	64	1,836	Glacial sand	Hard, iron	41	D, S	Sufficient for 20 head stock.
11	SW.	12	"	"	"	Dug	80	1,920	- 76	1,844	76	1,844	Glacial fine sand	Hard, iron, "alkaline"	41	D, S	Sufficient; yields 30 barrels a day.
12	SE.	12	"	"	"	Bored	112	1,925	- 92	1,833	112	1,813	Glacial fine sand	Hard, iron	41	D, S	Sufficient; waters 30 to 50 head stock.
13	NE.	13	"	"	"	Dug	70	1,915	- 62	1,853	62	1,853	Glacial sand	Hard, iron, "alkaline"		D, S	Sufficient; yields 16 barrels a day; caved in.
14	NE.	14	"	"	"	Dug	120	1,905	- 80	1,825	120	1,785	Glacial sand	Hard, iron, slightly "alkaline"	41	S	Waters 4 head stock; sufficient for 40 head stock; hauls drinking water.
15	SW.	14	"	"	"	Dug & Bored	128	1,900	- 68	1,832	128	1,772	Glacial drift	Hard, iron, slightly "alkaline"	41	D, S	Sufficient for 100 head stock.
16	SE.	14	"	"	"	Dug	80	1,905	- 70	1,835	80	1,825	Glacial gravel	Hard, iron, "alkaline"	41	D, S	Sufficient for 20 head stock; caved in.
17	SW.	15	"	"	"	Drilled	140	1,900	- 60	1,840	140	1,760	Glacial sand	Hard, iron, red sediment	41	D, S	Sufficient for 25 head stock.
18	NE.	15	"	"	"	Bored	123	1,900	- 68	1,832	123	1,777	Glacial sand	Hard, iron, red sediment	41	D,S	Sufficient; yields 16 barrels a day
19	SW.	16	"	"	"	Bored	20	1,880	- 13	1,867	13	1,867	Glacial sand	Hard, iron	41	D, S	Sufficient; yields 16 barrels a day.
20	NE.	16	"	"	"	Dug	90	1,905					Glacial drift	Hard, iron, red sediment		D, S	Limited supply; filled in.
21	SE.	16	"	"	"	Bored	42	1,850	- 33	1,817	33	1,817	Glacial gravel	Hard	42	S	Intermittent supply; laxative.
22	NE.	16	"	"	"	Dug	20	1,870	- 8	1,862	8	1,862	Glacial sand and gravel	Soft		D, S	Insufficient; yielded 2 barrels a day; filled in; spring with abundant supply, soft water for stock and house.

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 MILDEN, NO. 286, SASKATCHEWAN.

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
23	SW.	19	28	12	3	Drilled	260	1,900	- 60	1,840	260	1,640	Belly River(?)	Moderately hard, iron, red sediment		S	Abundant supply; hauls drinking water.
24	SW.	20	"	"	"	Dug	65	1,850	- 3	1,847	3	1,847	Glacial gravel	Soft	41	D, S	Abundant supply; spring-fed.
25	SE.	22	"	"	"	Bored	100	1,900	- 98	1,802	98	1,802	Glacial sand	Hard, iron, "alkaline"		S	Oversufficient; waters 6 head stock; ample for 60 head; hauls house water.
26	NE.	22	"	"	"		160	1,910									Dry hole; base in glacial drift.
27	SE.	24	"	"	"	Dug	70	1,920	- 50	1,870	70	1,850	Glacial sand	Hard, iron, slightly "alkaline"	41	D, S	Sufficient; more than ample for 13 head stock.
28	NW.	24	"	"	"	Bored	120	1,905					Glacial sand	Hard, iron, "alkaline"	41	S	Insufficient; laxative.
29	SE.	25	"	"	"	Bored	70	1,900	- 62	1,838	62	1,838	Glacial sand	Hard, iron, "alkaline"	41	S	Sufficient; yields 16 barrels a day; hauls drinking water.
30	NW.	26	"	"	"	Dug	80	1,890					Glacial drift	Hard, iron	41	D, S	Limited supply; hauls water.
31	NE.	30	"	"	"	Drilled	400	1,915			400	1,515	Belly River				Unfit for use; 245- foot dry hole on SE.¼, section 30, base in Belly River (?).
32	NE.	30	"	"	"	Drilled	300	1,915	-100	1,815	300	1,615	Belly River (?)	Hard, iron, red sediment	41	D, S	Oversufficient; waters 20 head stock; laxative.
33	NW.	31	"	"	"	Drilled	242	1,950	-100	1,850	242	1,708	Belly River (?)	Hard, iron, "alkaline"	41	D, S	Sufficient supply.
34	NE.	32	"	"	"	Dug	80	1,905	- 65	1,840	80	1,825	Glacial sand	Hard, iron, red sediment	41	D, S	Oversufficient; waters 100 head stock.
35	NW.	32	"	"	"	Drilled	242	1,925	-100	1,825	242	1,683	Belly River (?)	Hard, iron, "alkaline"	41	D, S	Sufficient; waters 100 head stock.
36	SW.	33	"	"	"	Dug	4	1,885	- 3	1,882	3	1,882	Glacial sand	Soft	41	D, S	Abundant supply; waters 60 head stock.
37	SE.	33	"	"	"	Dug	4	1,840	- 3	1,837	3	1,837	Glacial sand	Soft	41	D, S	Abundant supply.
38	NW.	34	"	"	"	Dug	7	1,840	- 4	1,836	4	1,836	Glacial gravel	Soft	41	D, S	Abundant supply.
39	NW.	34	"	"	"	Dug	10	1,840					Glacial gravel	Soft			Abundant supply; used for locomotives; #.
40	SW.	34	"	"	"	Dug	6	1,845	- 4	1,841	4	1,841	Glacial drift	Soft	41	D, S	Ample for 6 head stock.
41	NE.	34	"	"	"	Dug	10	1,850	- 8	1,842	8	1,842	Glacial gravel	Hard	41	D, S	Sufficient; waters 15 head stock.
42	SW.	35	"	"	"	Bored	80	1,870					Glacial drift	Hard, iron, red sediment	41	D, S	Sufficient for 60 head stock.
43	NE.	35	"	"	"	Bored	65	1,860	- 30	1,830	65	1,795	Glacial drift	Hard, iron, "alkaline"	41	S	Sufficient; waters 15 head stock; hauls drinking water.
44	NW.	35	"	"	"	Dug	10	1,850	- 8	1,842	8	1,842	Glacial gravel	Hard	42	D, S	Waters 2 head stock.
45	NW.	36	"	"	"	Bored	76	1,855	- 61	1,794	76	1,779	Glacial gravel	Hard, iron, "alkaline"	41	D, S	Sufficient for 75 to 100 head stock.
46	SE.	36	"	"	"	Dug	70	1,870	- 62	1,808	62	1,808	Glacial sand	Hard, iron, "alkaline"		D, S	Sufficient; yielded 16 barrels daily until caved in.
1	SW.	2	29	11	3	Drilled	140	1,920	-100	1,820	140	1,780	Glacial drift	Hard, iron	46	S	Sufficient; waters 20 to 30 head stock.
2	NE.	2	"	"	"	Bored	125	1,920	- 75	1,845	125	1,795	Glacial drift	Hard, iron, "alkaline"	46	S	Oversufficient supply; laxative.

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 MILDEN, NO. 286, SASKATCHEWAN.

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
3	SW.	3	29	11	3	Bored	65	1,910	- 57	1,853	57	1,853	Glacial drift	Hard, slightly "alkaline"	48	D, S	Insufficient supply.
4	SE.	4	"	"	"	Dug	70	1,900	- 65	1,835	65	1,835	Glacial drift	Hard, "alkaline"	46	S	Insufficient; waters 25 head stock; also dugout for stock; hauls drinking water.
5	NW.	4	"	"	"	Bored	80	1,900	- 70	1,830	80	1,820	Glacial drift	Hard, iron, "alkaline"	48	D, S	Sufficient; waters 20 head stock; laxative.
6	NE.	7	"	"	"	Bored	60	1,865	- 50	1,851	60	1,805	Glacial drift	Hard, iron, "alkaline"		D, S	Sufficient; waters 8 head stock.
7	NE.	9	"	"	"	Dug	26	1,860	- 22	1,838	26	1,834	Glacial fine sand	Hard, "alkaline"	45	S	Sufficient; waters 50 head stock; two similar wells.
8	NE.	10	"	"	"	Bored	70	1,905	- 60	1,845	60	1,845	Glacial fine sand	Hard, iron, "alkaline"	44	S	Insufficient; waters 6 head stock.
9	NE.	12	"	"	"	Dug	40	1,920	- 25	1,895	40	1,880	Glacial drift	Hard, iron, odorous, cloudy		S	Just sufficient; waters 3 head stock.
10	NW.	12	"	"	"	Dug	45	1,920	- 30	1,890	45	1,875	Glacial gravel	Hard	46	D, S	Oversufficient; waters 20 head stock.
11	SE.	13	"	"	"	Dug	40	1,915	- 30	1,885	40	1,875	Glacial sand	Hard, iron	46	D, S	Sufficient; waters 25 head stock.
12	SW.	15	"	"	"	Bored	52	1,880	- 50	1,830	50	1,830	Glacial sand	Hard, iron, "alkaline"	48	S	Insufficient; waters 5 head stock; hauls water for house and stock.
13	SW.	16	"	"	"	Dug	40	1,860	- 35	1,825	35	1,825	Glacial drift	Hard, iron	46	D, S	Sufficient; waters 8 head stock.
14	NW.	17	"	"	"	Bored	84	1,905	- 51	1,854	84	1,821	Glacial drift	Hard, iron, "alkaline"	46	D, S	Abundant supply; laxative; #.
15	SE.	18	"	"	"	Bored	65	1,870	- 61	1,809	61	1,809	Glacial gravel	Hard, iron, "alkaline"	46	D, S	Insufficient; waters 30 head stock.
16	NE.	18	"	"	"	Bored	92	1,880	- 80	1,800	90	1,790	Glacial gravel	Hard, iron, "alkaline"	47	D, S	Oversufficient; waters 40 head stock.
17	SE.	19	"	"	"	Bored	85	1,890	- 75	1,815	85	1,805	Glacial sand	Hard, iron, "alkaline"		S	Sufficient for 15 head stock.
18	NE.	20	"	"	"	Bored	80	1,880	- 70	1,810	80	1,890	Glacial drift	Hard, iron	46	D, S	Sufficient supply.
19	SW.	21	"	"	"	Drilled	150	1,865	-120	1,745	150	1,715	Glacial fine sand	Hard, iron, "alkaline"	46	S	Oversufficient; unfit for human consumption.
20	SW.	22	"	"	"	Dug	23	1,860	- 21	1,839	21	1,839	Glacial gravel	Hard	46	D, S	Sufficient for 12 head stock.
21	SE.	24	"	"	"	Dug	45	1,915	- 30	1,885	45	1,870	Glacial gravel	Hard, iron, "alkaline"	46	D, S	Sufficient for 15 head stock; laxative.
22	SE.	25	"	"	"	Dug	45	1,880	- 30	1,850	30	1,850	Glacial drift	Hard, iron, "alkaline"	46	S	Insufficient; waters 15 head stock.
23	NW.	25	"	"	"	Dug	14	1,800	- 10	1,790	10	1,790	Glacial gravel	Hard	46	D, S	Sufficient for 10 head stock.
24	SW.	27	"	"	"	Dug	50	1,900	- 40	1,860	50	1,850	Glacial drift	Hard, iron, slightly "alkaline"	46	D, S	Sufficient supply; waters 16 head stock; also similar well.
25	NW.	29	"	"	"	Dug	120	1,900	-105	1,795	120	1,780	Glacial sand	Hard, iron	47	D, S	Sufficient; waters 15 head stock.
26	NE.	30	"	"	"	Drilled	160	1,910			160	1,750	Glacial sand	Hard, iron, "alkaline"	46	D, S	Insufficient now due to cave in.
27	NE.	32	"	"	"	Drilled	490	1,910	-100	1,810	490	1,420	Belly River	Soft	48	D, S	Ample supply.
28	SE.	32	"	"	"	Drilled	120	1,900	-104	1,796	120	1,780	Glacial sand	Hard, iron	45	D, S	Sufficient; yields 25 barrels a day.

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 MILDEN, NO. 286, SASKATCHEWAN.

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
29	SW.	34	29	11	3	Dug	117	1,905	-114	1,791	114	1,791	Glacial sand	Hard, "alkaline"	46	D, S	Sufficient; waters 30 head stock.
1	SW.	1	29	12	3	Bored	80	1,850	- 40	1,810	80	1,770	Glacial drift	Hard, iron, "alkaline"	48	D, S	Sufficient; waters 50 head stock; laxative.
2	SW.	3	"	"	"	Driven	18	1,845	- 12	1,833	12	1,833	Glacial gravel	Moderately hard	46	D, S	Sufficient; ample for a great number of stock.
3	SW.	4	"	"	"	Bored	90	1,900	- 40	1,860	90	1,810	Glacial drift	Hard, iron, "alkaline"	43	S	Oversufficient; waters 7 head stock; laxative.
4	SE.	4	"	"	"	Drilled	485	1,850	- 25	1,825	485	1,365		Hard, iron, slightly	42	D, S	Abundant supply.
5	NW.	10	"	"	"	Bored	60	1,837	- 56	1,781	56	1,781	Glacial sand	"alkaline" Hard, iron	48	D, S	Sufficient; waters 6 head stock.
6	NW.	12	"	"	"	Drilled	120	1,860	- 50	1,810	120	1,740	Glacial sand	Hard, "alkaline"	44	D, S	Oversufficient supply.
7	SW.	14	"	"	"	Dug	20	1,865	- 16	1,849	16	1,849	Glacial drift	Hard,	48	D, S	Insufficient; waters 6 head stock.
8	NW.	14	"	"	"	Bored	80	1,890	- 72	1,818	72	1,818	Glacial gravel	Hard, iron, "alkaline"	47	D, S	Sufficient; waters 20 head stock; laxative.
9	NE.	16	"	"	"	Drilled	420	1,900	-200	1,700	420	1,480	Belly River	Hard, iron	48	D, S	Insufficient; waters 2 head stock.
10	NE.	22	"	"	"	Bored	95	1,900	- 80	1,820	95	1,805	Glacial sand	Hard, iron	46	D, S	Oversufficient; waters 15 head stock; laxative.
11	SW.	23	"	"	"	Drilled	200	1,905	-130	1,775	200	1,705	Belly River (?)	Hard, iron, red sediment	44	S	Abundant supply.
12	SE.	25	"	"	"	Dug	100	1,905	- 80	1,825	100	1,805	Glacial drift	Hard, iron, "alkaline"	46	D, S	Oversufficient; waters 5 head stock.
13	SW.	26	"	"	"	Dug	10	1,905	- 6	1,899	6	1,899	Glacial sand	Soft	46	D, S	Sufficient; waters 10 head stock.
14	NW.	27	"	"	"	Bored	60	1,905	- 20	1,885	60	1,845	Glacial drift	Hard, iron, "alkaline"	47	D, S	Oversufficient; waters 12 head stock.
15	SW.	28	"	"	"	Dug	45	1,905	- 40	1,865	40	1,865	Glacial sand	Soft	46	D, S	Sufficient; waters 12 head stock.
16	SE.	29	"	"	"	Dug	40	1,910	- 35	1,875	35	1,875	Glacial drift	Hard	47	D, S	Insufficient; waters 9 head stock.
17	SW.	30	"	"	"	Drilled	300	1,910	-200	1,710	300	1,610	Belly River	Hard, iron, "alkaline"	47	D, S	Sufficient; waters 15 head stock; laxative.
18	SW.	32	"	"	"	Drilled	509	1,932	- 95	1,837	509	1,423	Belly River	Soft, iron	40	D, S	Yields 3 gallons a minute.
19	NW.	34	"	"	"	Bored	100	1,910	- 80	1,830	100	1,810	Glacial drift	Hard	48	D, S	Oversufficient; waters 20 head stock.
20	SW.	34	"	"	"	Bored	130	1,910	- 90	1,820	130	1,780	Glacial sand	Hard, iron, "alkaline"	45	D, S	Sufficient; waters 20 head stock.
21	NW.	35	"	"	"	Dug	120	1,905	-118	1,787	118	1,787	Glacial fine sand	Hard, iron, cloudy	45	D, S	Insufficient; waters 12 head stock; laxative.
22	NE.	36	"	"	"	Bored	115	1,900	- 85	1,815	115	1,785	Glacial drift	Hard, iron, "alkaline", odorous	48	D, S	Sufficient; waters 10 head stock; laxative.
23	SW.	36	"	"	"	Bored	135	1,890	- 75	1,815	135	1,755	Glacial fine sand	Hard, iron	46	D, S	Sufficient; watered 100 head stock.
1	SE.	1	30	11	3	Dug	25	1,810	- 22	1,788	25	1,785	Glacial drift	Hard, iron	48	D, S	Intermittent supply.
2	NE.	2	"	"	"	Drilled	240	1,890	- 40	1,850	240	1,650	Belly River (?)	Hard, iron	43	D, S	Oversufficient for 45 head 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.

WELL RECORDS—Rural Municipality of MILDEN, NO. 286, SASKATCHEWAN.

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.	2	30	11	3	Dug	100	1,905	- 75	1,830	100	1,805	Glacial sand	Hard, "alkaline"	43	D, S	Sufficient; waters 30 head stock.
4	NW.	4	"	"	"	Drilled	225	1,920	- 50	1,870	225	1,695	Belly River (?)	Hard, iron, "alkaline"		D, S	Sufficient; waters 35 head stock.
5	SE.	6	"	"	"	Drilled	500	1,910	- 50	1,860	500	1,410	Belly River	Soft	41	D, S	Oversufficient supply.
6	SE.	7	"	"	"	Drilled	265	1,910	- 35	1,875	265	1,645	Belly River (?)	Hard, iron, "alkaline"	43	D, S	Sufficient; waters 40 head stock.
7	NW.	8	"	"	"	Drilled	250	1,910	- 50	1,860	250	1,660	Belly River (?)	Hard, iron, "alkaline"	43	D, S	Sufficient; waters 35 head stock.
8	NW.	9	"	"	"	Drilled	145	1,915	-130	1,785	145	1,770	Glacial sand	Hard	49	D, S	Sufficient for 30 head stock.
9	SE.	10	"	"	"	Dug	100	1,910	- 98	1,812	98	1,812	Glacial sand	Hard	47	D, S	Oversufficient; waters 140 head stock.
10	NE.	12	"	"	"	Dug	20	1,855	- 18	1,837	18	1,837	Glacial fine sand	Hard, iron, "alkaline"	48	D, S	Insufficient; waters 5 head stock; laxative.
11	SW.	13	"	"	"	Bored	90	1,900	- 80	1,820	90	1,810	Glacial sand	Hard, iron, red sediment	44	D, S	Sufficient; yields 4 barrels a day.
12	NW.	14	"	"	"	Drilled	140	1,915	- 20	1,895	140	1,775	Glacial sand	Hard, iron, "alkaline"	41	D, S	Oversufficient supply.
13	NW.	15	"	"	"	Dug	122	1,920	-120	1,800	120	1,800	Glacial sand	Hard, slightly "alkaline"	48	D, S	Oversufficient; supplies 30 barrels a day; laxative.
14	NW.	21	"	"	"	Drilled	185	1,915	- 60	1,855	185	1,730	Glacial drift (?)	Hard, iron, "alkaline"		S	Sufficient for 10 head stock; has also a seepage well.
15	NW.	22	"	"	"	Dug	110	1,910	- 80	1,830	110	1,800	Glacial drift	Hard, iron, red sediment	44	D, S	Oversufficient; watered 15 head stock.
16	SW.	23	"	"	"	Drilled	150	1,910	- 50	1,860	150	1,760	Glacial gravel	Very hard, "alkaline", iron		D, S	Oversufficient; waters 30 head stock.
17	SW.	24	"	"	"	Drilled	110	1,905	- 95	1,810	110	1,795	Glacial fine sand	Hard, iron, red sediment	44	D, S	Sufficient; waters 35 head stock.
18	SW.	25	"	"	"	Dug	120	1,905	-105	1,800	120	1,785	Glacial drift	Hard, iron, red sediment	45	D, S	Sufficient; waters 30 head stock.
19	NE.	26	"	"	"	Bored	112	1,910	- 30	1,880	112	1,798	Glacial fine sand	Hard, iron, red sediment	44	D, S	Oversufficient; waters 20 head stock; 20-foot seepage well; soft water.
20	SW.	28	"	"	"	Dug	100	1,900	- 85	1,815	100	1,800	Glacial drift	Hard	44	S	Sufficient; waters 10 head stock; also 15-foot seepage well.
21	NE.	30	"	"	"	Drilled	250	1,925	- 30	1,895	250	1,675	Belly River	Hard, iron, "alkaline"		N	Used to water 12 head stock; cistern and two dams in use.
22	SE.	32	"	"	"	Drilled	105	1,900	- 40	1,860	105	1,795	Glacial sand	Hard, iron	44	D, S	Oversufficient; waters 60 head stock.
23	SE.	35	"	"	"	Drilled	350	1,910	- 50	1,860	350	1,560	Belly River (?)	Hard, iron, red sediment	42	D, S	Oversufficient for 100 head stock; 250-foot dry hole; four wells to 350-feet.
24	NW.	36	"	"	"	Dug	90	1,905	- 80	1,825	80	1,825	Glacial sand	Hard, "alkaline"		D, S	Sufficient; waters 60 head stock; 15-foot well for stock.
25	SE.	36	"	"	"	Dug	113	1,900	-106	1,794	106	1,794	Glacial sand and gravel	Hard, "alkaline"	46	D, S	Sufficient for 20 head stock.
1	SW.	3	30	12	3	Bored	105	1,910	- 97	1,813	105	1,805	Glacial fine sand	Hard, iron, "alkaline"	48	S	Sufficient for 100 head stock; also a dug-out.
2	NE.	4	"	"	"	Drilled	150	1,915	-100	1,815	150	1,765	Glacial sand	Hard, iron	44	D, S	Insufficient; waters 25 head stock.
3	SW.	5	"	"	"	Drilled	360	1,920	- 80	1,840	360	1,560	Belly River (?)	Hard, iron, "alkaline"	45	D, S	Sufficient; waters 10 head stock; laxative.

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 MILDEN, NO. 286, SASKATCHEWAN.

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
4	NW.	6	30	12	3	Drilled	300	1,930	-150	1,780	300	1,630	Belly River (?)	Hard, iron, red sediment	45	D, S	Sufficient; waters 12 head stock.
5	SW.	7	"	"	"	Dug	11	1,940	- 0	1,940	8	1,932	Glacial drift	Soft, cloudy	47	S	Sufficient; waters 20 head stock.
6	SW.	10	"	"	"	Bored	65	1,925	- 35	1,890	65	1,860	Glacial drift	Hard, "alkaline"	46	S	Sufficient; waters 10 head stock; laxative.
7	W.½	11	"	"	"	Drilled	117	1,915	- 67	1,848	117	1,798	Glacial fine sand	Hard, iron, red sediment		D, S	Sufficient; yields 14 barrels a day; laxative.
8	SE.	14	"	"	"	Dug	12	1,920	- 5	1,915	5	1,915	Glacial drift	Soft	48	D, S	Sufficient; waters 8 head stock.
9	SW.	15	"	"	"	Drilled	150	1,940	- 50	1,890	150	1,790	Glacial drift	Hard, iron, "alkaline"	48	D, S	Sufficient for 100 head stock.
10	NE.	16	"	"	"	Drilled	330	1,940	-130	1,810	330	1,610	Belly River (?)	Hard, iron	46	D, S	Oversufficient; waters 15 head stock.
11	NW.	17	"	"	"	Bored	248	1,945	-120	1,825	248	1,697	Belly River (?)	Hard, iron, "alkaline"	46	D, S	Sufficient; yields 24 barrels a day.
12	NE.	20	"	"	"	Drilled	112	1,955	- 82	1,873	112	1,843	Glacial sand	Hard, iron, "alkaline"	48	D, S	Sufficient; waters 8 head stock; laxative.
13	NW.	22	"	"	"	Bored	110	1,950	- 95	1,855	110	1,834	Glacial sand	Hard, "alkaline"	45	S	Laxative; also dugout.
14	SW.	23	"	"	"	Bored	135	1,940	-125	1,815	125	1,815	Glacial fine sand	Hard, "alkaline"	48	D, S	Insufficient; waters 8 head stock; laxative; also two dugouts.
15	W.½	25	"	"	"	Drilled	130	1,940	-100	1,840	130	1,810	Glacial sand	Hard, iron, "alkaline"	45	D, S	Sufficient; waters 25 head stock.
16	NW.	26	"	"	"	Drilled	150	1,950	- 50	1,900	150	1,800	Glacial drift	Hard, iron, "alkaline"	46	S	Sufficient; waters 15 head stock; laxative.
17	SW.	26	"	"	"	Drilled	130	1,950	-100	1,850	130	1,820	Glacial sand	Hard, iron, red sediment	46	D, S	Sufficient; waters 8 head stock.
18	NW.	29	"	"	"	Bored	90	1,950	- 50	1,900	90	1,870	Glacial drift	Hard, "alkaline"	46	D, S	Sufficient for 20 head stock.
19	NE.	31	"	"	"	Bored	75	1,960	- 70	1,890	70	1,890	Glacial sand	Hard, iron, "alkaline"	46	S	Just sufficient for 20 head stock; laxative.
20	NW.	32	30	12	3	Dug	12	1,960	- 8	1,952	8	1,952	Glacial drift	Moderately hard, "alkaline"	48	D, S	Insufficient; waters 1 head stock.
21	NE.	33	"	"	"	Dug	16	1,960	- 10	1,950	10	1,950	Glacial drift	Moderately hard	45	D, S	Insufficient; waters 18 head stock.
22	NW.	34	"	"	"	Bored	48	1,955	- 20	1,935			Glacial sand	Hard, iron, slightly "alkaline"	45	D, S	Intermittent supply; insufficient in dry years.
23	SW.	34	"	"	"	Dug	15	1,950	- 7	1,943	7	1,943	Glacial sand	Medium hard	48	D, S	Intermittent supply; usually waters 25 head stock.
24	NW.	35	"	"	"	Dug	19	1,955	- 7	1,948	17	1,946	Glacial sand	Hard, slightly "alkaline"	47	D, S	Intermittent; usually waters 18 head stock.
25	NE.	35	"	"	"	Dug	14	1,955	- 6	1,949	14	1,941	Glacial sand	Soft	48	D, S	Intermittent; usually waters 18 head stock.
26	NE.	36	"	"	"	Drilled	140	1,955	-110	1,845	140	1,815	Glacial sand	Hard, iron, "alkaline", salty	45	D, S	Sufficient; waters 12 head stock.

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

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(#) Sample taken for analysis.