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BUREAU OF ECONOMIC GEOLOGY

GEOLOGICAL SURVEY

PRELIMINARY REPORT

GROUND-WATER RESOURCES OF THE RURAL MUNICIPALITY OF BIG QUILL No. 308 SASKATCHEWAN

BY

B. R. MacKay, H. N. Hainstock & G. Graham

Water Supply Paper No. 70

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GROUND WATER RESOURCES OF THE RURAL MUNICIPALITY OF BIG QUILL, NO. 308, 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 factsobtained 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 give 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 ago.

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

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

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

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

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

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

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

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

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

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

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

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

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

Unconsolidated Deposits. The mantle or covering of alluvium and glacial drift consisting of loose sand, gravel, clay, and boulders that 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 rest 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 Big Quill, No. 308, consists of twelve townships west of the second meridian, but only nine of these i.e., townships 30, 31, and 32, ranges 16, 17, and 18, are discussed in this report. The northern parts of township 32, ranges 17 and 18, totalling 15 square miles, are occupied by Quill lakes, leaving the land area at approximately 22½ and 30 square miles, respectively. Parts of township 30, ranges 17 and 18, are occupied by Indian reserves, Nos. 87 and 88, the water possibilities of which areas are not discussed in this report. The total area under discussion consists of approximately 294 square miles. The centre of this municipality is 162 miles west of the Manitoba boundary and 88 miles north and slightly east of the city of Regina. Wynyard, on the Saskatoon-Winnipeg branch of the Canadian Pacific railway, in township 32, range 16, is the largest town in the area. The towns of Dafoe and Kandahar are also on the same branch line.

Touchwood hills occur in the southern part of the municipality and from an elevation of 2,250 feet in this area the ground surface slopes down to an elevation of 1,703 feet at Big Quill lake. Many small valleys and coulées trend in a general northerly direction and drain into Big Quill lake. A strip approximately 6 miles in width, running in a general northeasterly direction across the northern part of the area, is mantled by boulder clay or glacial till. The southern part of the municipality is covered by part of a large moraine. In a small level area to the south of Big Quill lake in township 32, range 18, the boulder clay is overlain by glacial lake clays.

Water-bearing Horizons in the Unconsolidated Deposits

The ground water resources of this municipality are only fair, but in most of the townships only the upper 100 feet of the glacial drift has as yet been prospected by wells. In the north-

western third of the municipality most of the wells yield a sufficient supply of water for farm needs, but in the southeastern two-thirds the water shortage is more acute.

The uppermost water-bearing horizon in the municipality is formed by widely scattered pockets of sand and gravel in the upper 30 feet of the drift. A number of wells tapping these pockets are intermittent in character and dry up in the late summer and autumn months if drought conditions are severe. Many dry holes have been dug in an attempt to locate a pocket of sand or gravel that would yield sufficient water for farm needs. As a rule the water from this horizon is used for all purposes, but the supply in most cases is insufficient for farm requirements for at least part of the year.

A second water-bearing horizon is formed by pockets of sand and gravel in the glacial drift at depths of 40 to approximately 180 feet. These pockets are also of scattered occurrence and the horizon is only continuous in small areas, such as in the western half of township 31, range 18. Many dry holes have been sunk in the vicinity of producing wells. The majority of the wells that have tapped this horizon are non-flowing artesian in character, the water being under sufficient hydrostatic pressure to rise a considerable distance above the top of the aquifer. A few wells, however, are non-artesian in type. The water from this aquifer is harder, and contains more mineral salts in solution, than the water from the shallower water-bearing horizon. However, due to the shortage of water over most of the area, the available water is used in most cases for both humans and stock, even though it is highly mineralized.

One well located on the NW. $\frac{1}{4}$, sec. 4, tp. 31, range 18, is reported to be obtaining a good supply of soft water at a depth of 165 feet below the surface. As wells of the same depth, and in the immediate vicinity, are obtaining hard water, it is possible that this soft water horizon is of very small extent.

A few wells in the southwestern corner of township 31, range 18, in the western half of township 32, range 18, and one in the northwestern corner of township 30, range 18, appear to obtain water from a common aquifer. The wells in the northern part vary in depth from 100 to 140 feet, whereas those in the southern part vary from 210 to 260 feet, but the water-bearing horizon in both areas occurs at an approximate elevation of 1,600 feet above sea-level, and the water is of similar quality and under hydrostatic pressure. No information regarding this aquifer was obtained in the intervening area, but it is possible that this water-bearing horizon will be encountered at the approximate depths given above, depending upon the elevation of the ground surface. The horizon may extend some distance to the east and west. The water from these wells is under hydrostatic pressure, and in two wells in township 32, range 18, it flows above the surface, and in a third it rises to a level 6 inches below the ground surface. In township 31, range 18, where the surface is higher, the water rises to a point 90 feet below the surface. The water is very hard, and contains a large amount of mineral salts in solution. It is used for stock, but is only used for drinking when water of better quality is not obtainable.

Two wells in township 32, range 16, and one in township 32, range 17, have been drilled to depths of 300 feet and have encountered a water-bearing horizon at an approximate elevation of 1,500 feet above sea-level. It is thought that this aquifer is formed by sand and gravel deposits that occur at the base of the drift immediately over the bedrock, but its areal extent is not defined. The water is under sufficient hydrostatic pressure to rise to a point 50 feet below the surface. In one well, however, the yield is insufficient for farm needs. In another, the supply is more than adequate, but it is not used as it is too highly mineralized.

The impervious nature of the boulder clay in this area is particularly adaptable to the retention of water in dugouts. Over a large area there are many small ravines that could be dammed and a supply of water retained for stock use. The many small lakes throughout the area can be used for watering stock throughout the year. The severe water shortage in this area might be partly remedied by constructing dams and excavating dugouts for retaining run-off water for stock, and by the use of shallow wells that would yield a sufficient supply for household needs.

Water-bearing Horizons in the Bedrock

Throughout the area under discussion the glacial drift is underlain by the Marine Shale series. The contact of the drift and the bedrock is probably about 1,500 feet above sea-level.

Unless a few of the wells mentioned in the latter part of the discussion on the water-bearing horizons in the unconsolidated deposits are obtaining water from a bedrock aquifer, no wells in this municipality have encountered the Marine Shale. If a bedrock aquifer was encountered it would possibly yield a water that contained a relatively large amount of mineral salts in solution especially common salt.

GROUND WATER CONDITIONS BY TOWNSHIPS

Township 30, Range 16

The difference in topographic relief in this township is less than 100 feet. The entire township is mantled by part of a moraine, and the surface is characterized by knolls and undrained depressions.

No continuous water-bearing horizons have been tapped in the upper 100 feet of the drift in this township, and as there are no deeper wells the water conditions at greater depths are unknown. A few residents are obtaining small supplies of water from shallow wells dug in the vicinity of low-lying areas, which tap scattered pockets of sand or gravel in the boulder clay. Some of these wells yield sufficient water for local needs, but generally they are insufficient. In some areas, small supplies of water are being obtained from small pockets of sand and gravel at depths of 40 to 80 feet in the glacial drift. Many dry holes have been dug in all parts of the township showing the limited extent and local distribution of the aquifers. Generally the water from the shallow wells is not so hard as that obtained at greater depths, but all of it is suitable for farm purposes.

Residents in this township would be well advised to use dugouts for the storage of water for stock, and shallow dug wells as a means of securing a supply of water for domestic needs.

Township 30, Range 17

The surface of this township is mantled by part of the moraine that forms Touchwood hills, and is characterized by knolls and undrained depressions. The difference in topographic relief is slightly in excess of 100 feet. Due to an inconsistency in the original land survey, this township is only $5\frac{1}{2}$ miles in width. Indian reserves Nos. 87 and 88 occupy the southeastern and southern parts of the township, the ground water resources of which were not investigated.

Most of the wells in the area examined are shallow, and tap small pockets of sand or gravel in the clay, or are dug into the clay in low-lying areas. Most of these wells are intermittent and dry up in late summer, especially in periods of prolonged drought. In most wells the water is used only for domestic purposes, the stock being watered at sloughs and lakes. Unless adequate supplies of water can be obtained at depth in this township, the residents are advised to excavate dugouts for the storage of water for stock.

Township 30, Range 18

The elevation of the surface of this township varies from less than 1,850 feet in the northwestern part to over 2,100 feet above sea-level in the southeastern part. It is mantled by moraine, the surface of which is characterized by knolls and depressions. Small, intermittent streams occur in the northern and western parts of the township.

Ground water conditions in this township are better than in those townships to the east, but there are many residents who have not sufficient water for their needs. Larger supplies of water are obtainable in the southwestern half of the township than in the northeastern half. There does not appear to be a continuous water-bearing horizon present, but many wells are obtaining fair supplies of water from depths of 50 to 115 feet below the surface. As dry holes are encountered throughout the area, it is probable that the above wells are encountering small, isolated pockets of sand and gravel in the boulder clay. The water in most of these wells is under hydrostatic pressure, and in a few places rises to a point 30 feet below the surface. The water is hard and contains a relatively large amount of mineral salts in solution, iron being especially noticeable, but the water from most of the wells is being used for drinking and other domestic purposes.

One well located on the NW. $\frac{1}{4}$, section 30, is deriving a large supply of water from an aquifer at a depth of 250 feet below the surface, or at an elevation of 1,600 feet above sea-level. It is thought that this aquifer is in the glacial deposits, but it may be in the upper part of the bedrock. The areal extent of this water-bearing horizon is not known, but it is possible that it may be tapped elsewhere in the northern part of the township. The water is hard, contains iron and other mineral salts in solution, and is used only for stock.

Township 31, Range 16

Township 31, range 16, is a fractional township having an area of approximately $22\frac{1}{2}$ square miles. The land surface rises from an elevation of less than 2,000 feet in the north-eastern part, to an elevation of 2,125 feet along the southern boundary. The township is mantled by part of the moraine that forms Touchwood hills, except a small area in the extreme north-eastern corner which is covered by boulder clay or glacial till. A number of small ravines, containing intermittent streams, occur throughout the township.

Only the upper 110 feet of the drift has been pierced by wells. Small quantities of water are being obtained from small pockets of sand and gravel that occur in places in the upper 100 feet of the glacial drift. Numerous dry holes have been dug throughout the area, some of them exceeding 100 feet in depth. A few wells yield a supply that is sufficient for local needs, but the supply from most of the wells must be augmented by the use of dugouts or dams, or by hauling water from wells and lakes having a permanent supply. The water varies from comparatively soft to hard, and contains varying amounts of mineral salts in solution. Most of the water is being used for drinking, but in a few cases it is used only for stock. When a supply of water that is sufficient for domestic needs can be obtained at shallow depth,

the construction of small dams or the excavation of dugouts should be considered before drilling a deep well for stock requirements. It is possible that water-bearing horizons occur at greater depth, but this can only be determined by drilling.

Township 31, Range 17

An area in the northwestern corner of this township is mantled by glacial till or boulder clay having a gently undulating surface. The remainder of the township is covered by moraine, the surface of which is characterized by knolls and depressions. Small lakes are common in this area. The elevation of the land surface rises from 1,850 feet in the northwestern corner, to 2,250 feet in the southeastern corner.

The supply of ground water in this township is small, but larger supplies are obtained in the till-covered northwestern part than in the southeastern part of the township underlain by moraine. Some water is being obtained from sand and gravel pockets near the base of the weathered zone of the drift. This water-bearing horizon is dependent upon the amount of annual precipitation for its supply of water; the supply is greater in wet years than in dry years. Where this horizon outcrops in valleys, such as in the northern part of the township, springs are fairly common. The water from this aquifer varies from comparatively soft to hard and in certain areas it contains a considerable amount of mineral salts in solution. In some localities the supply from this horizon is sufficient only for domestic use and the small lakes are used for stock.

A second water-bearing horizon is formed by scattered pockets or lenses of sand and gravel in the boulder clay, at depths ranging from 40 to 95 feet. Numerous dry holes, up to 80 feet in depth, dug throughout the township, prove the small extent and scattered distribution of these pockets of sand and gravel. The water from the deeper wells is hard. The supply in some wells is insufficient for house needs and in a few others is more than

sufficient for farm requirements. The water from some of the wells is so highly mineralized that it is unfit for drinking.

By excavating dugouts, or by damming small ravines, a supply of run-off water can be retained for stock use. Sufficient supplies of water for domestic needs can usually be obtained from shallow dug wells.

Township 31, Range 18

The elevation of the land surface of this township rises from approximately 1,725 feet in the northwestern corner, to 2,025 feet above sea-level in the southeastern corner. Dafoe brook has its headwaters in the southeastern part and flows to Quill lake. A small area in the northwestern corner is mantled by glacial lake clays. A larger area in the southeastern corner is covered by moraine and the remainder of the township is mantled with boulder clay or glacial till. In the eastern half of this township there appears little continuity in any water-bearing horizon, but fairly continuous water-bearing horizons appear to be present in the western part.

A few wells obtain sufficient water for local needs from scattered pockets of sand and gravel within the upper 25 feet of the drift. Generally, the water is hard but it is suitable for all farm requirements.

Most of the wells in this township tap a water-bearing horizon at depths of 50 to 140 feet below the surface or at an elevation of 1,710 to 1,665 feet above sea-level. This horizon seems to be continuous in the western half, and the sand and gravel deposits are possibly larger. The water is under sufficient hydrostatic pressure to rise to a point 50 feet below the surface, and in a few places as high as 10 feet below the surface. The yield from the wells in the western half is usually more than sufficient for local needs, but the supply from the wells in the remainder of the township is barely sufficient. The water is hard and in the

western area is highly charged with mineral salts in solution, and in many wells is used only for stock.

The water in a well 165 feet deep on the NW. $\frac{1}{4}$, section 4, is reported to be soft. This is the only well that is obtaining soft water from a depth between 50 and 260 feet below the surface.

Two wells located on the SE. $\frac{1}{4}$, section 5, and the SE. $\frac{1}{4}$, section 15, obtain fair supplies of water from an aquifer at depths of 200 and 198 feet below the surface, or at elevations of 1,662 and 1,652 feet above sea-level. The hydrostatic pressure is sufficient to cause the water to rise 100 feet above the top of the aquifer. The water from the well on section 15 is used only for stock. Three wells located on the NE. $\frac{1}{4}$, section 6, the SE. $\frac{1}{4}$, section 8, and the SW. $\frac{1}{4}$, section 16, obtain water at depths of 240, 260, and 210 feet below the surface, respectively. The aquifer encountered occurs at elevations of 1,570 to 1,615 feet above sea-level. It is not known if this water-bearing horizon is continuous over a large area, but wells in township 32, range 18, encounter water at similar elevations. The hydrostatic pressure is sufficient to cause the water to rise to a point 170 feet below the surface. The water is hard and contains a large amount of mineral salts in solution, but in only one instance is it not being used for drinking.

One well, drilled to a depth of 150 feet, and located on the NW. $\frac{1}{4}$, section 18, appears to have tapped a local pocket of sand or gravel in the boulder clay. The water is under pressure and rises 70 feet above the top of the aquifer. It is hard, highly mineralized, and is used only for stock.

Township 32, Range 16

The elevation of the land surface in this township rises from 1,710 feet at Quill lake, to 2,060 feet above sea-level in the southwestern corner. Many small creeks the chief being Wynward and Magnussan, drain into Quill lake. These flow in a general northerly direction and all are intermittent in character. Except for a small

area along the southern border, which is mantled by moraine, the township is covered by boulder clay or glacial till.

Scattered pockets of sand and gravel in the weathered zone, or upper 30 feet of the glacial drift, form the first water-bearing horizon. Wells tapping these pockets yield fair supplies of comparatively soft to hard water that can be used for all farm purposes. Dry holes near producing wells show that these pockets do not form a continuous aquifer.

A number of wells in this area obtain water from scattered pockets of sand and gravel at depths ranging from 35 to 100 feet below the surface. These pockets are not continuous as dry holes 118 feet deep have been dug in the vicinity of producing wells. The supply from this source is varied, a number of wells are not deriving a supply sufficient for even household needs. The water is hard and in a few cases it is so highly charged with mineral salts that it is unfit for drinking. The supply for stock may be increased by constructing small dams or by excavating dugouts to retain the run-off water.

Two wells located on the NW. $\frac{1}{4}$, section 13, and the SW. $\frac{1}{4}$, section 18, obtain water at depths of 180 and 182 feet below the surface, or at elevations of 1,720 and 1,793 feet above sea-level. It is not known if these wells tap a continuous aquifer or if they have tapped isolated pockets of sand or gravel. The water rises to an approximate elevation of 1,880 feet above sea-level in both wells. It is hard and is used for drinking and for stock.

One well, located on the NE. $\frac{1}{4}$, section 17, yields hard water that is used only for stock, from a sand aquifer at a depth of 250 feet or an elevation of 1,670 feet above sea-level. Another well, located on the SW. $\frac{1}{4}$, section 25, obtains hard, usable water from a sand aquifer at a depth of 200 feet, or at an elevation of 1,600 feet above sea-level. In both these wells the water is under

pressure, but there is not sufficient evidence to say that the aquifer tapped is continuous.

Two wells, located on the NE. $\frac{1}{4}$, section 23, and the NE. $\frac{1}{4}$, section 25, are drilled to a depth of 300 feet below the surface, and encounter aquifers at elevations of 1,530 and 1,490 feet above sea-level, respectively. These wells are believed to be drawing their water from sand and gravel beds that occur at the base of the glacial drift but they may tap bedrock aquifers. The areal extent of the horizon is undefined. The water in the wells is under hydrostatic pressure and in both instances it is very hard and contains iron salts in solution. The water of one well is not used, but that of the other well is being used for domestic purposes as well as for stock. The residents of this township would be well advised to consider the possibility of using a shallow well for domestic needs, and conserving the run-off water for stock by the construction of dams or the excavation of dugouts, rather than risk the uncertainty of obtaining large supplies of usable water at depth.

Township 32, Range 17

The elevation of the land surface of this township rises from 1,703 feet at Quill lake, to 2,050 feet in the southeastern corner. The surface is cut by several small ravines that drain into the lake. The township is mantled throughout by boulder clay or glacial till except for a very small area to the southwest of Quill lake, where the till is covered by glacial lake clays.

Although a few residents in this township obtain small supplies of hard, usable water from shallow wells dug in pockets of sand and gravel along the banks of small coulées, it cannot be inferred that a general water-bearing horizon exists. In the western part of the township where these deposits outcrop in the ravines, springs are commonly found.

In some localities in the township a few wells tap isolated pockets of sand and gravel at depths ranging from 55 to 90 feet below the surface. Two wells, 40 and 112 feet in depth, are assumed to have encountered a similar type of water-bearing deposit. Dry holes dug to similar depths show the scattered distribution of the sand and gravel pockets. When water is obtained, however, the supply is usually sufficient for local needs and is used for all purposes.

One well, located on the NE. $\frac{1}{4}$, section 6, obtains some water from a depth of 300 feet below the surface. Water-bearing sands were encountered at an elevation of 1,642 feet above sea-level, although the bottom of the well is at an elevation of 1,502 feet. The bottom of this well is probably near the base of the glacial drift, but it is not thought that the bedrock has been pierced. The water is under pressure and rises to a point 50 feet below the surface, but the supply is insufficient for local needs. The water is highly mineralized and contains iron, but it is being used for all purposes.

Dugouts could be excavated throughout this township to retain a supply of run-off water for stock.

Township 32, Range 18

From a maximum elevation of 1,840 feet in the south-eastern corner, the ground surface of this township slopes towards the north, to an elevation of 1,703 feet at Quill lake. Dafoe and other small brooks have cut small ravines in the glacial drift, and drain into Quill lake.

Most of the southeastern half of this township is mantled with boulder clay or glacial till, whereas over the remainder of the township the boulder clay is concealed by glacial lake clays. It is not likely that any general water-bearing horizon exists in the first 100 feet of the drift covering, but a number of wells

obtain small supplies of water from scattered sand and gravel pockets in the boulder clay. These pockets are generally located at depths ranging between 25 and 80 feet below the surface. The local distribution of these pockets may be inferred from the number of dry holes that have been dug, many of them in the vicinity of producing wells. The water from most of the wells that tap these pockets is being used for drinking and for stock, but it is not always of sufficient quantity for farm needs.

Three wells, located on the NE. $\frac{1}{4}$, section 6, the SW. $\frac{1}{4}$, section 18, and the SW. $\frac{1}{4}$, section 29, obtain water at depths of 140, 100, and 120 feet below the surface, or at elevations of 1,585, 1,620, and 1,615 feet above sea-level. The areal extent of this water-bearing horizon is not known, but it is assumed that it extends to the southwest, as wells of similar character occur in the municipality to the west. It may also extend to the south as a few wells of similar character occur in the southern part of township 31, range 18. These latter wells are of greater depth due to a higher topographic relief, but the elevation of the water-bearing horizon is similar. The water from two of the wells in township 32, range 18, is under sufficient pressure to flow above the surface, and in the third, where the elevation of the ground is slightly higher, it rises to within a foot of the surface. The waters from these wells are highly charged with mineral salts in solution, iron being in considerable quantity, and they are not used for drinking when water of a better quality can be obtained.

STATISTICAL SUMMARY OF WELL INFORMATION IN RURAL MUNICIPALITY OF BIG QUILL, NO. 308, SASKATCHEWAN

West of 2nd meridian — Township	30	30	30	31	31	31	32	32	32	Total No. in municipality
Range	16	17	18	16	17	18	16	17	18	
Total No. of Wells in Township	77	52	57	65	83	83	103	44	44	608
No. of wells in bedrock	0	0	0	0	0	1	0	0	0	1
No. of wells in glacial drift	77	52	57	65	83	82	103	44	44	607
No. of wells in alluvium	0	0	0	0	0	0	0	0	0	0
Permanency of Water Supply										
No. with permanent supply	29	22	47	35	63	60	62	38	40	396
No. with intermittent supply	16	10	3	9	8	0	4	2	1	53
No. dry holes	32	20	7	21	12	23	37	4	3	159
Types of Wells										
No. of flowing artesian wells	0	0	0	0	0	0	0	0	2	2
No. of non-flowing artesian wells	18	5	21	9	19	23	23	18	15	151
No. of non-artesian wells	27	27	29	35	52	37	43	22	24	296
Quality of Water										
No. with hard water	41	31	45	38	69	49	63	31	40	407
No. with soft water	4	1	5	6	2	11	3	9	1	42
No. with salty water	0	0	0	0	0	0	0	0	0	0
No. with "alkaline" water	3	7	11	8	9	13	19	11	26	107
Depths of Wells										
No. from 0 to 50 feet deep	63	50	35	45	67	35	65	32	31	423
No. from 51 to 100 feet deep	14	2	19	18	16	35	27	10	9	150
No. from 101 to 150 feet deep	0	0	2	2	0	7	5	1	4	21
No. from 151 to 200 feet deep	0	0	0	0	0	3	3	0	0	6
No. from 201 to 500 feet deep	0	0	1	0	0	3	3	1	0	8
No. from 501 to 1,000 feet deep	0	0	0	0	0	0	0	0	0	0
No. over 1,000 feet deep	0	0	0	0	0	0	0	0	0	0
How the Water is Used										
No. usable for domestic purposes	43	29	45	41	57	51	58	35	29	388
No. not usable for domestic purposes	2	3	5	3	14	9	8	5	12	61
No. usable for stock	45	30	49	43	67	60	61	40	40	435
No. not usable for stock	0	2	1	1	4	0	5	0	1	14
Sufficiency of Water Supply										
No. sufficient for domestic needs	29	20	46	34	63	59	60	38	40	389
No. insufficient for domestic needs	16	12	4	10	8	1	6	2	1	60
No. sufficient for stock needs	22	14	39	29	48	46	51	31	28	308
No. insufficient for stock needs	23	18	11	15	23	14	15	9	13	141

ANALYSES AND QUALITY OF WATER

General Statement

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

Total Dissolved Mineral Solids

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

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

Mineral Substances Present

Calcium and Magnesium

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

Sodium

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

Sulphates

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

Chlorides

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

Iron

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

Hardness

Calcium and magnesium salts impart hardness to water. Hardness of water is commonly recognized by its soap-destroying powers as shown by the difficulty of obtaining lather with soap. The total hardness of a water is the hardness of the water in its original state. Total hardness is divided into "permanent hardness" and "temporary hardness". Permanent hardness is the hardness of the water remaining after the sample has been boiled and it represents the amount of mineral salts that cannot be removed by boiling. Temporary hardness is the difference between the total hardness and the permanent hardness and represents the amount of mineral salts that can be removed by boiling. Temporary hardness is due mainly to the bicarbonates of calcium and magnesium and iron, and permanent harness 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 Big Quill, No. 308, 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.	Alkalinity	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.	SW.	26	32	16	2	20	606											(3)	(1)		(2)		(4)		(5)	* 1

Water samples indicated thus, * 1, are from glacial drift.
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 No. 1 by Provincial Analyst.
For interpretation of this table read the section on Analyses and Quality of Water.

Water from the Unconsolidated Deposits

One sample of water from the glacial drift in the municipality of Big Quill was analysed by the Provincial Analyst, and the results are listed in the accompanying table. The sample is from a depth of 20 feet and may not be representative of the type of water that is usually derived from the drift in this municipality. It has a total dissolved solid content of 606 parts per million, an exceptionally small amount for most of the well waters from the glacial drift in this region.

In general, the water from the shallow wells in the drift ranges from moderately soft to hard. The dissolved mineral salt content in a few of the waters is so high that the water cannot be used for drinking or even for stock, but most of the waters are usable. The harmful salts present are the sulphates of magnesium and sodium.

In the deeper drift wells the waters are usually harder and contain a greater concentration of mineral salts in solution. Many of these waters are termed "alkaline", but most of them are being used for drinking and domestic purposes, as well as for stock. The water from a few of the deeper drift wells has a laxative effect on those who are not accustomed to the use of highly mineralized water. The large amount of $MgSO_4$ (Epsom salts) and Na_2SO_4(Glauber's salt) present in solution in some of the waters renders the water unfit for use.

Iron is present in relatively large amounts in many of the waters from the deeper drift wells, and in some cases it is in sufficient quantities to render the water unfit for domestic use. The effects of the iron may be greatly reduced if the water is allowed to stand in contact with the air for a considerable time before using. By so doing, much of the iron settles as a red precipitate. The water should then be filtered through a sand filter to remove the precipitated iron.

Water from the Bedrock

No water is known to be obtained from the bedrock in the municipality. Should water be encountered in the bedrock, the chief mineral salts in solution would probably be Na_2SO_4, Na_2CO_3, $NaCl$, $MgSO_4$, and $CaSO_4$, but the relative amounts of the salts dissolved in the water may not be in the same order as given. The water will vary from soft to hard, depending upon the amount of sodium salts present. In general, the water should be suitable for stock, but may not be usable for drinking and will probably be unfit for irrigation.

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Map of the municipality.

Figure 1. Map showing surface and bedrock geology that affect the ground water supply.

Figure 2. Map showing relief and the location and types of wells.

WELL RECORDS—Rural Municipality of BIG QUILL NO. 308 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
1	SE.	1	30	16	2	Bored	60	2,130	- 35	2,095	60	2,070	Glacial sand	Hard,clear		D, S	Sufficient for 10 head stock.
2	SW.	1	"	"	"	Bored	80	2,140	- 25	2,115	80	2,060	Glacial sand	Hard,clear		D, S	Sufficient for local needs.
3	SE.	2	"	"	"	Bored	73	2,140	- 23	2,117	73	2,067	Glacial gravel	Hard,clear, "alkaline"		D, S	Sufficient for local needs.
4	NE.	2	"	"	"	Dug	15	2,140	- 12	2,128	12	2,128	Glacial clay	Hard,clear		D	Sufficient for domestic use only.
5	NE.	3	"	"	"	Bored	100										Dry hole.
6	NE.	4	"	"	"	Dug	20	2,140	- 10	2,130	10	2,130	Glacial clay	Hard,clear		D	Sufficient for domestic use only.
7	SW.	4	"	"	"	Bored	38	2,155	- 20	2,135	38	2,117	Glacial sand	Hard,clear		D, S	Sufficient for 40 head stock.
8	NE.	5	"	"	"	Dug	14	2,145	0	2,145			Glacial clay	Hard,clear		D, S	Insufficient for local needs.
9	NW.	9	"	"	"	Dug	26	2,145	- 21	2,124	21	2,124	Glacial sand	Hard,clear		D, S	Insufficient for local needs.
10	SW.	9	"	"	"	Bored	40	2,160	- 30	2,130	30	2,130	Glacial clay	Hard,clear		D, S	Sufficient for 10 head stock.
11	NW.	10	"	"	"	Bored	30	2,135	- 14	2,121	30	2,105	Glacial sand	Hard,clear		D, S	Sufficient for local needs.
12	SW.	10	"	"	"	Dug	16	2,140	0	2,140			Glacial clay	Hard,clear		D, S	Insufficient for local needs.
13	NE.	11	"	"	"	Dug	14	2,140	0	2,140			Glacial clay	Hard,clear		D, S	Insufficient for local needs.
14	NE.	12	"	"	"	Dug	15	2,140	- 10	2,130	10	2,130	Glacial clay	Soft,clear		D	Sufficient for domestic use only.
15	SE.	12	"	"	"	Dug	16	2,125	- 10	2,115	16	2,109	Glacial sand	Soft,clear		D, S	Sufficient for local needs.
16	NW.	12	"	"	"	Bored	80	2,150	- 60	2,090	80	2,070	Glacial clay	Hard,clear		D, S	Insufficient for local needs.
17	NE.	13	"	"	"	Dug	20	2,140	- 10	2,130	20	2,120	Glacial clay	Hard,clear		D	Sufficient for domestic use only.
18	SW.	13	"	"	"	Dug	13	2,150	- 10	2,140	10	2,140	Glacial clay	Soft,clear		D	Sufficient for domestic use only.
19	SE.	13	"	"	"	Bored	69	2,150	- 15	2,135	69	2,081	Glacial sandy clay	Hard		S	Sufficient for local needs.
20	NW.	15	"	"	"	Bored	95	2,170					Glacial drift				Dry hole.
21	NW.	16	"	"	"	Dug	20	2,155	- 11	2,144	18	2,137	Glacial gravel	Hard,clear		D, S	Sufficient for local needs.
22	SW.	16	"	"	"	Dug	20	2,145	- 10	2,135	20	2,125	Glacial sand	Soft,clear		D, S	Insufficient for local needs.
23	SE.	17	"	"	"	Dug	12	2,170	- 9	2,161	12	2,158	Glacial sand	Hard,clear		D, S	Sufficient for local needs.
24	NE.	17	"	"	"	Dug	15	2,165	- 12	2,153	12	2,153	Glacial clay	Hard,clear		D	Sufficient for domestic use only.
25	SW.	17	"	"	"	Dug	10	2,145	0	2,145			Glacial clay	Hard,clear		D, S	Insufficient for local needs.
26	SE.	18	"	"	"	Dug	14	2,150	0	2,150			Glacial clay	Hard,clear		D, S	Insufficient for local needs.
27	NE.	21	"	"	"	Dug	21	2,160	- 18	2,142	21	2,139	Glacial sand	Hard, clear		D, S	Insufficient for local needs.
28	SE.	21	"	"	"	Dug	20	2,170	- 10	2,160			Glacial clay	Hard,clear		D, S	Sufficient for local needs.

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 BIG QUILL NO. 308, 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.	21	30	16	2	Dug	37	2,170	- 23	2,147	23	2,147	Glacial sand	Hard, clear, "alkaline"		D, S	Sufficient for local needs.
30	NW.	22	"	"	"	Dug	24	2,154	- 24	2,130	16	2,138	Glacial sand	Hard, clear		D, S	Sufficient for local needs.
31	SW.	22	"	"	"	Dug	26	2,165	- 13	2,152	26	2,139	Glacial sand	Hard, clear		D, S	Sufficient for local needs.
32	NE.	22	"	"	"	Dug	4	2,165	0	2,165			Glacial clay	Soft, clear		D	Insufficient for local needs.
33	NE.	23	"	"	"	Dug	16	2,150	- 15	2,135	15	2,135	Glacial clay			S	Insufficient for local needs.
34	SW.	25	"	"	"	Dug	32	2,150	- 22	2,128	32	2,118	Glacial clay	Hard, clear		D, S	Sufficient for domestic use only.
35	NE.	27	"	"	"	Dug	20	2,155	- 1	2,154	20	2,135	Glacial gravel	Hard, clear		D, S	Sufficient for 30 head stock.
36	SW.	27	"	"	"	Dug	18	2,180	- 10	2,170	18	2,162	Glacial gravel	Hard, clear		D, S	Sufficient for local needs.
37	SE.	27	"	"	"	Dug	16	2,160	- 10	2,150	16	2,144	Glacial sand	Hard, clear		D, S	Sufficient for local needs.
38	SE.	28	"	"	"	Dug	45	2,160	- 35	2,125	35	2,125	Glacial clay	Hard, clear		D, S	Sufficient for local needs.
39	NW.	33	"	"	"	Bored	40	2,120	- 14	2,106	40	2,080	Glacial drift	Hard, clear, "alkaline"		D, S	Insufficient for local needs.
40	SE.	34	"	"	"	Dug	20	2,160	- 7	2,153	20	2,140	Glacial gravel	Hard, clear		D, S	Sufficient for local needs.
41	NE.	34	"	"	"	Dug	30	2,140					Glacial drift				Dry hole.
42	SE.	35	"	"	"	Dug	12	2,125					Glacial drift				Dry hole.
43	SW.	35	"	"	"	Dug	20	2,150	- 10	2,140	20	2,130	Glacial sand	Hard, clear		D, S	Sufficient for local needs.
44	SE.	36	"	"	"	Dug	20	2,110					Glacial drift				Dry hole.
1	NW.	4	30	17	2	Dug	13	2,120	- 10	2,110	10	2,110	Glacial clay	Hard, clear		D, S	Insufficient for local needs.
2	NE.	5	"	"	"	Dug	10	2,100	- 8	2,092	8	2,092	Glacial sand	Hard, clear		D	Intermittent supply; stock use slough.
3	NW.	7	"	"	"	Dug	12	2,130	- 4	2,126	12	2,118	Glacial sand	Hard, clear		D, S	Sufficient for local needs.
4	NE.	7	"	"	"	Dug	10	2,190	0	2,190			Glacial clay	Hard, clear		D, S	Insufficient for local needs.
5	SW.	9	"	"	"	Dug	20	2,150	- 15	2,135	15	2,135	Glacial sand	Soft, clear		D	Sufficient for local needs.
6	SW.	16	"	"	"	Dug	12	2,170	- 6	2,164	6	2,164	Glacial clay	Hard, clear		D	Insufficient for local needs.
7	NE.	18	"	"	"	Dug	14	2,150	- 12	2,138	12	2,138	Glacial clay	Hard, clear		D	Insufficient for local needs.
8	SE.	18	"	"	"	Dug	12	2,180	0	2,180			Glacial clay	Hard, clear		D, S	Insufficient for local needs.
9	NW.	18	"	"	"	Bored	20	2,124	- 12	2,112	20	2,104	Glacial sand	Hard, clear		D, S	Sufficient for local needs.
10	SW.	19	"	"	"	Dug	10	2,100	0	2,100			Glacial clay	Hard, clear		D, S	Intermittent supply, freezes in winter.
11	SW.	20	"	"	"	Dug	26	2,170	- 16	2,154	26	2,164	Glacial sand	Hard, clear		D	Sufficient for local needs.

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 BIG QUILL NO. 308, 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	NE.	20	30	17	2	Dug	10	2,155	- 6	2,149	10	2,145	Glacial clay	Hard, "alkaline"		N	Stock water at lake; haul water for house.
13	NW.	20	"	"	"	Dug	9	2,150	- 6	2,144	9	2,141	Glacial clay	Hard, clear, "alkaline"		D	Insufficient for local needs.
14	NW.	25	"	"	"	Dug	15	2,230	- 8	2,222			Glacial clay	Hard, clear, "alkaline"		D	Sufficient for domestic use only.
15	SW.	25	"	"	"	Dug	12	2,210	- 10	2,200	10	2,200	Glacial clay	Hard, clear, "alkaline"		D, S	Insufficient for local needs.
16	SW.	26	"	"	"	Dug	12	2,240	- 6	2,234	6	2,234	Glacial gravel	Hard, clear		D	Sufficient for domestic use only.
17	NW.	26	"	"	"	Dug	16	2,250	- 14	2,236	16	2,234	Glacial gravel	Hard, clear, "alkaline"		N	Stock use the lake, water hauled for domestic use.
18	NW.	27	"	"	"	Dug	10	2,170	- 4	2,166	10	2,160	Glacial sand	Hard, clear		D, S	Sufficient for domestic use only.
19	SW.	27	"	"	"	Dug	7	2,150	- 4	2,146	4	2,146	Glacial clay	Hard, clear		D, S	Sufficient for local needs.
20	NW.	30	"	"	"	Dug	10	2,080	- 5	2,075	10	2,070	Glacial gravel	Hard, clear		D, S	
21	NE.	30	"	"	"	Dug	13	2,100	- 5	2,095	5	2,095	Glacial clay	Hard, clear		D, S	Insufficient for local needs.
22	SW.	31	"	"	"	Bored	65	2,045					Glacial drift				Dry hole.
23	SE.	31	"	"	"	Bored	30	2,150	- 20	2,130	30	2,120	Glacial drift	Hard, clear, "alkaline"		D, S	Insufficient for local needs.
24	NW.	31	"	"	"	Dug	21	2,045	- 15	2,030	21	2,024	Glacial clay	Hard, clear		D	Sufficient for local needs.
25	NW.	32	"	"	"	Dug	20	2,100	- 10	2,090	20	2,080	Glacial clay	Hard, clear		D, S	
26	SW.	32	"	"	"	Dug	20	2,110	- 10	2,100	10	2,100	Glacial clay	Hard, clear		D, S	Insufficient for local needs.
27	NE.	32	"	"	"	Dug	5	2,135									Dry hole.
28	SW.	33	"	"	"	Dug	12	2,100	- 5	2,095	12	2,088	Glacial gravel	Hard, clear		D, S	Sufficient for local needs.
29	NE.	33	"	"	"	Dug	8	2,205									Dry hole.
30	NW.	34	"	"	"	Dug	9	2,200									Dry hole.
31	SW.	34	"	"	"	Dug	10	2,180	- 5	2,175	10	2,170	Glacial gravel	Hard, clear		D, S	Sufficient for local needs.
32	SE.	35	"	"	"	Dug	18	2,250	- 9	2,241	9	2,241	Glacial clay	Hard		D, S	Sufficient for domestic use only.
33	SW.	35	"	"	"	Dug	25	2,225									Dry hole.
34	NW.	35	"	"	"	Dug	21	2,219	- 19	2,200	19	2,200	Glacial sand	Hard, clear, "alkaline"		D	Insufficient for local needs.
35	SW.	36	"	"	"	Dug	12	2,210	- 10	2,200			Glacial clay	Hard, clear		D	Sufficient for domestic use only.
36	NW.	36	"	"	"	Dug	12	2,215	- 8	2,207	8	2,207	Glacial clay	Hard, clear		D	Insufficient for local needs.
1	SW.	2	30	18	2	Dug	8	2,080	- 4	2,076	8	2,072	Glacial gravel	Hard, clear		D, S	Sufficient for local needs; in Indian reserve.
2	NW.	3	"	"	"	Dug	16	2,040			16	2,024	Glacial sand	Hard, clear		D, S	Sufficient for local needs.

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 BIG QUILL NO. 308 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	NE.	4	30	18	2	Bored	70	1,875	- 50	1,825	70	1,805	Glacial sand	Hard,iron		D, S	Sufficient for local needs.
4	SW.	5	"	"	"	Bored	104	1,968	- 70	1,898	104	1,864	Glacial sand	Hard,iron, "alkaline" cloudy		D, S	Sufficient for local needs.
5	SE.	7	"	"	"	Bored	85	1,970	- 80	1,890	85	1,885	Glacial sand	Hard,cloudy, iron,"alkaline"		D, S	Sufficient for local needs.
6	SW.	8	"	"	"	Bored	96	1,970	- 93	1,877	96	1,874	Glacial sand	Hard,iron		D, S	Sufficient for local needs.
7	NW.	9	"	"	"	Bored	78	2,010	- 40	1,970	78	1,932	Glacial sand	Hard,clear, iron,"alkaline"		D, S	Sufficient for 50 head stock.
8	SW.	10	"	"	"	Bored	80	2,025	- 75	1,950	80	1,945	Glacial sand	Hard,clear, iron,"alkaline"		D, S	Sufficient for 8 head stock.
9	NE.	10	"	"	"	Bored	30	2,050	- 19	2,031	30	2,020	Glacial sand	Hard,clear		D, S	Sufficient for 20 head stock.
10	NW.	10	"	"	"	Bored	93	2,050	- 30	2,020	93	1,957	Glacial sand	Hard,"alkaline"		D, S	Sufficient for local needs.
11	NW.	11	"	"	"	Bored	93	2,090	- 33	2,057	93	1,997	Glacial sand	Hard,clear		D, S	Insufficient for local needs.
12	NE.	13	"	"	"	Bored	42	2,140	- 36	2,104	36	2,104	Glacial gravel	Hard,clear		D, S	Insufficient for local needs.
13	SE.	14	"	"	"	Dug	35	2,050	- 24	2,026	35	2,015	Glacial sand	Hard, clear		D, S	Intermittent supply; dry in dry years.
14	SW.	14	"	"	"	Bored	50	2,090	- 35	2,055	35	2,055	Glacial sand	Hard		D, S	Sufficient for local needs.
15	SE.	16	"	"	"	Dug	20	2,050	- 4	2,046	4	2,046	Glacial gravel	Hard,clear		D, S	Insufficient for local needs.
16	NE.	16	"	"	"	Bored	77	2,044	- 45	1,999	77	1,967	Glacial gravel	Hard,iron, "alkaline" cloudy		D, S	Sufficient for local needs.
17	NW.	17	"	"	"	Drilled	64	1,950	- 53	1,897	64	1,886	Glacial sand	Hard,iron, "alkaline"		D, S	Sufficient for local needs.
18	SW.	17	"	"	"	Dug	45	1,930	- 37	1,893	37	1,893	Glacial gravel	Hard,clear, iron		D, S	Sufficient for local needs.
19	SE.	18	"	"	"	Bored	75	1,965	- 45	1,920	75	1,890	Glacial sand	Hard,clear		N	Good supply.
20	NE.	18	"	"	"	Bored	48	1,960	- 39	1,921	48	1,912	Glacial sand	Hard,clear		D, S	Sufficient for local needs.
21	NE.	19	"	"	"	Dug	18	1,905	- 11	1,894	11	1,894	Glacial gravel	Soft,clear		S	Sufficient for local needs.
22	NW.	20	"	"	"	Dug	50	1,910	- 15	1,895	50	1,860	Glacial sand	Hard,clear, iron		D, S	Sufficient for local needs.
23	SE.	20	"	"	"	Bored	50	1,955	- 43	1,912	50	1,905	Glacial sand	Hard,iron		D, S	Sufficient for local needs.
24	NE.	20	"	"	"	Drilled	115	1,950			115	1,835	Glacial sand	Hard,iron, "alkaline" red sediment		D, S	Sufficient for 12 head stock.
25	SW.	20	"	"	"	Bored	55	1,955	- 25	1,930	55	1,900	Glacial sand	Hard,iron		D, S	Sufficient for local needs.
26	SW.	22	"	"	"	Drilled	86	2,048	- 40	2,008	86	1,962	Glacial gravel	Hard,clear, iron		D, S	Sufficient for 15 head stock.

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

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of BIG QUILL NO. 308, 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
27	SE.	22	30	18	2	Bored	60	2,030	- 57	1,973	60	1,970	Glacial gravel	Hard, clear		D, S	Sufficient for 6 head stock.
28	NW.	22	"	"	"	Dug	72	2,050	- 70	1,980	70	1,980	Glacial gravel	Hard, clear, iron		D, S	Sufficient for local needs.
29	SE.	24	"	"	"	Dug	30	2,090	- 23	2,067	30	2,060	Glacial sand	Hard, clear		S	Sufficient for 22 head stock.
30	NE.	24	"	"	"	Dug	30	2,090	- 27	2,063	30	2,060	Glacial sand	Hard, clear		D	Sufficient for domestic use only.
31	SW.	24	"	"	"	Dug	10	2,075	- 6	2,069	10	2,065	Glacial gravel	Soft, clear		D, S	Sufficient for local needs.
32	NE.	25	"	"	"	Dug	10	2,080	- 7	2,073	10	2,070	Glacial gravel	Soft, clear		D, S	Sufficient for 15 head stock.
33	NW.	25	"	"	"	Bored	66	2,050	- 15	2,035	66	1,984	Glacial gravel	Hard, clear		D, S	Sufficient for 30 head stock.
34	SW.	27	"	"	"	Bored	50	2,042	- 10	2,032	50	1,992	Glacial sand	Soft, clear		D, S	Sufficient for local needs.
35	NW.	27	"	"	"	Bored	65	2,025	- 63	1,962	63	1,962	Glacial gravel	Hard, clear		D, S	Insufficient for local needs.
36	NW.	29	"	"	"	Bored	40	1,900	- 8	1,892	40	1,860	Glacial sand	Hard, iron		D, S	Sufficient for 50 head stock.
37	NE.	30	"	"	"	Bored	26	1,900	- 8	1,892	26	1,874	Glacial sand	Hard, iron		D, S	Sufficient for local needs.
38	SW.	30	"	"	"	Dug	48	1,880	- 23	1,857	48	1,832	Glacial sand	Hard, iron		D, S	Sufficient for local needs.
39	NW.	30	"	"	"	Dug	38	1,850	- 29	1,821	29	1,821	Glacial clay	Hard, iron		D, S	Sufficient for domestic use only.
40	NW.	30	"	"	"	Drilled	250	1,850	- 80	1,770	250	1,600	Glacial? sand	Hard, iron, "alkaline"		S	Sufficient for 20 head stock.
41	NW.	32	"	"	"	Dug	20	1,900	- 10	1,890	10	1,890	Glacial gravel	Hard, clear, iron, "alkaline"		D, S	Sufficient for 25 head stock.
42	SW.	33	"	"	"	Bored	48	1,970	- 38	1,932	48	1,922	Glacial sand	Hard, clear, iron, "alkaline"		D, S	
43	SW.	34	"	"	"	Bored	50	2,000	- 49	1,951	50	1,950	Glacial sand	Hard, clear, iron		D, S	Sufficient for local needs.
44	SE.	35	"	"	"	Bored	80	2,022					Glacial drift				Dry hole.
45	NW.	35	"	"	"	Bored	78	2,000	- 75	1,925	75	1,925	Glacial sand	Hard, clear, iron, "alkaline"		D, S	Sufficient for local needs.
46	NE.	36	"	"	"	Dug	24	2,035	- 20	2,015	24	2,011	Glacial sand	Hard		D, S	Sufficient for 15 head stock.
47	NW.	36	"	"	"	Dug	25	2,046	- 21	2,025	25	2,021	Glacial gravel	Hard, clear		D, S	Intermittent supply; dry in dry years.
48	SW.	36	"	"	"	Bored	60	2,016	- 54	1,962	60	1,956	Glacial sand	Hard		D, S	Intermittent supply; dry in dry years.
1	NW.	13	31	16	2	Bored	80	2,080	- 32	2,048	80	2,000	Glacial sand	Hard, clear, iron		D, S	Sufficient for local needs.
2	SE.	13	"	"	"	Dug	13	2,100	0	2,100			Glacial sandy clay	Soft, clear		D, S	Insufficient for local needs.
3	SW.	13	"	"	"	Dug	25	2,120					Glacial drift				Dry hole.
4	NE.	14	"	"	"	Dug	25	2,140	- 22	2,118	25	2,115	Glacial sand	Soft, clear		D, S	Insufficient for local needs.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of BIG QUILL NO. 308, 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.	14	31	16	2	Dug	10	2,100	- 5	2,095	10	2,090	Glacial sand	Soft,clear		D, S	Sufficient for local needs.
6	SE.	15	"	"	"	Dug	16	2,125	- 14	2,111	14	2,111	Glacial gravel	Soft,clear		D, S	Sufficient for local needs.
7	NE.	15	"	"	"	Dug	40	2,100	- 30	2,070	30	2,070	Glacial clay	Hard,clear		D	Sufficient for domestic use only.
8	NE.	16	"	"	"	Dug	12	2,130	- 8	2,122	12	2,118	Glacial sand			D	Sufficient for domestic use only.
9	SE.	17	"	"	"	Bored	36	2,120	- 30	2,090	36	2,084	Glacial clay	Hard,clear		D, S	Sufficient for domestic use only.
10	NW.	18	"	"	"	Dug	14	2,110	- 14	2,096	14	2,096	Glacial sand	Soft,clear		D	Insufficient for local needs.
11	NE.	18	"	"	"	Dug	14	2,100	- 9	2,091	9	2,091	Glacial clay	Hard,clear		D	Insufficient for local needs.
12	NE.	20	"	"	"	Dug	42	2,115	- 40	2,075	40	2,075	Glacial sand	Hard,iron, cloudy		D	Sufficient for local needs.
13	SE.	21	"	"	"	Dug	16	2,120	- 4	2,116	16	2,104	Glacial gravel	Hard,clear, "alkaline"		D, S	Sufficient for 23 head stock.
14	NE.	21	"	"	"	Bored	40	2,080	- 20	2,060	40	2,040	Glacial sand	Hard,clear		D, S	Sufficient for local needs.
15	SW.	22	"	"	"	Dug	15	2,105	0	2,105	15	2,090	Glacial clay	Hard,clear		D, S	Intermittent supply; dry in dry years.
16	NE.	22	"	"	"	Dug	30	2,060	- 25	2,035	25	2,035	Glacial clay	Hard,clear		D	Sufficient for domestic use only.
17	SW.	23	"	"	"	Bored	100	2,100	- 92	2,008	100	2,000	Glacial sand	Hard,iron		D, S	Insufficient for local needs.
18	NW.	23	"	"	"	Bored	50	2,055	- 45	2,010	50	2,005	Glacial drift	Hard,clear, iron		D, S	Insufficient for local needs.
19	NE.	23	"	"	"	Dug	24	2,052	- 18	2,034	24	2,028	Glacial sand	Hard,clear		D, S	Sufficient for 10 head stock.
20	SE.	23	"	"	"	Dug	50	2,100	- 15	2,085	50	2,050	Glacial sand	Hard,clear, iron		D, S	Sufficient for 6 head stock.
21	SW.	24	"	"	"	Bored	65	2,050	- 37	2,013	65	1,985	Glacial sand	Hard,clear, iron,"alkaline"		D, S	Well has now caved in to 40 feet and is now only sufficient for 2 head stock.
22	NE.	24	"	"	"	Bored	45	2,055	- 25	2,030	45	2,010	Glacial sand	Hard,clear		D, S	Sufficient for 70 head stock.
23	NW.	25	"	"	"	Dug	25	2,025	- 22	2,003	22	2,003	Glacial clay	Hqrd,clear		D, S	Intermittent supply; dry in dry years.
24	SE.	25	"	"	"	Dug	20	2,140	- 10	2,130	20	2,120	Glacial gravel	Hard,clear		D, S	Sufficient for 20 head stock.
25	SE.	26	"	"	"	Bored	30	2,050	- 20	2,030	20	2,030	Glacial clay	Hard,clear		D, S	Insufficient for local needs.
26	NE.	26	"	"	"	Dug	20	2,040	- 15	2,025	15	2,025	Glacial clay	Hard,clear		D	Sufficient for domestic use only.
27	NW.	27	"	"	"	Dug	25	2,062	0	2,062	0	2,062	Glacial clay	Hard,clear		D, S	Intermittent supply; dry in dry years.
28	SE.	28	"	"	"	Bored	96	2,090	- 25	2,065	96	1,994	Glacial sand	Hard,iron		D, S	Sufficient for local needs.
29	SW.	28	"	"	"	Bored	65	2,160	- 40	2,120	65	2,095	Glacial sand	Hard, iron		D, S	Sufficient for local needs.
30	NE.	28	"	"	"	Dug	12	2,060	- 8	2,052	12	2,048	Glacial gravel	Soft,clear		D, S	Sufficient for local needs.
31	NE.	29	"	"	"	Dug	23	2,070	- 17	2,053	23	2,047	Glacial sand	Hard,clear		S	Sufficient for local needs.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of BIG QUILL NO. 308, 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
32	NW.	31	31	16	2	Dug	20	2,040	- 8	2,032	8	2,032	Glacial clay			D, S	Sufficient for domestic use only.
33	NW.	32	"	"	"	Dug	12	2,050	- 9	2,041	12	2,038	Glacial sand	Hard,clear		D, S	Sufficient for 4 head stock.
34	NW.	33	"	"	"	Dug	14	2,055	- 10	2,045	10	2,045	Glacial sand	Hard,iron		D, S	Sufficient for 20 head stock.
35	NE.	33	"	"	"	Dug	18	2,030	- 10	2,020	18	2,012	Glacial gravel	Hard,clear		D, S	Insufficient for local needs.
36	SE.	33	"	"	"	Dug	15	2,050	- 10	2,040	15	2,035	Glacial sand	Hard		D, S	Sufficient for local needs.
37	SW.	34	"	"	"	Dug	24	2,036	- 22	2,014	24	2,012	Glacial gravel	Hard,clear		D, S	Sufficient for 25 head stock.
38	SE.	34	"	"	"	Bored	50	2,030	- 20	2,010	50	1,980	Glacial sand	Hard, clear		S	Sufficient for 15 head stock.
39	NE.	34	"	"	"	Bored	75	2,010	- 72	1,938	72	1,938	Glacial clay	Hard,"alkaline"		D	Sufficient for domestic use only.
40	NW.	34	"	"	"	Bored	60	2,025	- 50	1,975	60	1,965	Glacial sand	Hard,clear, iron		D, S	Insufficient for local needs.
41	SE.	35	"	"	"	Bored	83	2,040	- 28	2,012	83	1,957	Glacial sand	Hard, iron "alkaline"		D, S	Sufficient for local needs.
42	NW.	35	"	"	"	Bored	89	2,020	- 85	1,935	85	1,935	Glacial sand	Hard,clear		D, S	Intermittent supply; dry in dry years.
43	SW.	36	"	"	"	Bored	50	2,015	- 45	1,970	50	1,965	Glacial drift	Hard,clear, iron		D, S	Sufficient for local needs.
1	SW.	2	31	17	2	Dug	12	2,200	- 4	2,196	4	2,196	Glacial clay	Hard,clear		D	Sufficient for local needs.
2	NE.	3	"	"	"	Bored	30	2,175	- 22	2,153	22	2,153	Glacial sand	Hard,clear		D	Sufficient for local needs.
3	SW.	4	"	"	"	Dug	28	2,085	- 12	2,073	12	2,073	Glacial clay	Hard,clear		D	Insufficient for local needs.
4	NE.	4	"	"	"	Bored	55	2,074	- 50	2,024	50	2,024	Glacial sandy clay	Hard,clear, "alkaline"		S	Intermittent supply; dry in dry years.
5	SE.	4	"	"	"	Bored	25	2,100	- 15	2,085	25	2,075	Glacial sand	Hard,clear		D	Sufficient for domestic use only.
6	SE.	5	"	"	"	Bored	42	2,070	- 30	2,040	30	2,040	Glacial sand	Hard,clear, "alkaline"		D, S	Insufficient for local needs.
7	NE.	5	"	"	"	Bored	40	2,065	- 35	2,030	35	2,030	Glacial gravel	Hard,clear		S	Sufficient for 6 head stock.
8	SE.	6	"	"	"	Bored	32	2,050	- 30	2,020	32	2,018	Glacial gravel	Hard,clear		D, S	Sufficient for 10 head stock.
9	SW.	6	"	"	"	Dug	28	2,030	- 22	2,008	28	2,002	Glacial clay	Hard,clear, iron		N	
10	NE.	6	"	"	"	Dug	27	2,045	- 22	2,023	27	2,018	Glacial gravel	Hard,clear		D, S	Sufficient for local needs.
11	SW.	7	"	"	"	Bored	45	2,000	- 20	1,980	45	1,955	Glacial sand	Hard,clear, "alkaline" iron		D, S	Insufficient for local needs.
12	SE.	7	"	"	"	Bored	20	2,050	- 10	2,040	20	2,030	Glacial sand	Soft,clear		D, S	Sufficient for local needs.
13	NE.	8	"	"	"	Dug	16	2,060	- 10	2,050	16	2,044	Glacial sand	Hard,clear		S	Insufficient for local needs.
14	NW.	9	"	"	"	Dug	14	2,075	0	2,075			Glacial sand	Soft,clear		D, S	Sufficient for 20 head stock.
15	SW.	9	"	"	"	Dug	9	2,070	- 4	2,066	4	2,066	Glacial sand	Soft,clear		D, S	Sufficient for local needs.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of BIG QUILL NO.308, 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
16	SE.	10	31	17	2	Bored	47	2,135	- 42	2,093	47	2,088	Glacial sand	Hard,clear		D, S	Sufficient for 27 head stock.
17	SW.	10	"	"	"	Dug	40	2,100	0	2,100			Glacial clay	Hard,clear		S	Intermittent supply; sufficient in wet years only.
18	NW.	11	"	"	"	Dug	13	2,100	- 10	2,090	13	2,087	Glacial clay	Hard,clear		D	Intermittent supply; sufficient in wet years only.
19	SW.	14	"	"	"	Dug	8	2,078	- 5	2,073	5	2,073	Glacial clay	Hard,clear		D, S	Sufficient for domestic use only.
20	NW.	14	"	"	"	Dug	45	2,075	- 12	2,063	12	2,063	Glacial sand	Hard, clear		D, S	Sufficient for local needs.
21	SW.	15	"	"	"	Dug	23	2,060	- 21	2,039	23	2,037	Glacial sand	Hard,clear		D	Sufficient for domestic use only.
22	NE.	16	"	"	"	Dug	30	2,066	- 27	2,039	30	2,036	Glacial gravel	Hard,clear		D, S	Sufficient for 50 head stock.
23	SW.	16	"	"	"	Bored	30	2,065	- 20	2,045	30	2,035	Glacial sand	Hard,clear		D, S	Sufficient for local needs.
24	SE.	16	"	"	"	Dug	16	2,060	- 14	2,046	16	2,044	Glacial clay	Hard,clear		D	Sufficient for domestic use only.
25	SW.	17	"	"	"	Bored	55	2,025	- 43	1,982	43	1,982	Glacial clay	Hard,clear, "alkaline"		D, S	Sufficient for 30 head stock.
26	NW.	17	"	"	"	Bored	55	2,000	- 45	1,955	45	1,955	Glacial clay	Hard,clear, iron		D, S	Insufficient for local needs.
27	NW.	18	"	"	"	Bored	50	1,956	- 38	1,918	38	1,918	Glacial clay	Hard,clear, iron		D, S	Sufficient for domestic use only.
28	SE.	18	"	"	"	Bored	58	2,000	- 54	1,946	58	1,942	Glacial sand	Hard,clear, "alkaline"		D, S	Sufficient for local needs.
29	NE.	19	"	"	"	Bored	50	1,945	- 30	1,915	50	1,895	Glacial sandy clay	Hard,clear		D, S	Sufficient for local needs.
30	SE.	20	"	"	"	Bored	45	2,020	- 27	1,993	27	1,993	Glacial gravel	Hard,clear		D, S	Sufficient for domestic use only.
31	NE.	20	"	"	"	Dug	56	2,000			56	1,944	Glacial drift			N	Yields only 3 gallons a day.
32	SW.	20	"	"	"	Bored	58	1,975	- 46	1,929	58	1,917	Glacial gravel	Hard,clear, iron, "alkaline"		D, S	Sufficient for local needs.
33	NE.	22	"	"	"	Dug	34	2,094	- 17	2,077	34	2,060	Glacial drift	Hard,clear		D, S	Sufficient for local needs.
34	SE.	24	"	"	"	Dug	11	2,075	- 5	2,070	5	2,070	Glacial clay	Hard,clear		D, S	Intermittent supply; dry at times.
35	SW.	25	"	"	"	Dug	14	2,090	- 7	2,083	14	2,076	Glacial gravel	Hard,clear		D, S	Sufficient for 20 head stock.
36	NE.	25	"	"	"	Dug	25	2,060	- 23	2,037	23	2,037	Glacial sand	Hard,clear		S	Sufficient for local needs.
37	NW.	25	"	"	"	Bored	52	2,090					Glacial drift				Dry hole.
38	NE.	26	"	"	"	Bored	60	2,090	- 40	2,050	60	2,030	Glacial sand	Hard,clear, iron		D, S	Sufficient for 40 head stock.
39	SE.	27	"	"	"	Dug	31	2,076	- 28	2,048	31	2,045	Glacial sand	Hard,clear		D, S	Sufficient for local needs.
40	SE.	28	"	"	"	Bored	34	2,050	- 20	2,030	34	2,016	Glacial sand	Hard,clear		S	Sufficient for local needs.
41	NE.	28	"	"	"	Dug	16	2,010									
42	NW.	28	"	"	"	Bored	36	1,964	- 18	1,946	36	1,928	Glacial sand	Hard,clear		D	Insufficient for local needs.

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 BIG QUILL NO.308, 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
43	SW.	28	31	17	2	Bored	24	2,015	- 16	1,999	24	1,991	Glacial gravel	Hard,clear		D, S	Insufficient for local needs.
44	SE.	29	"	"	"	Bored	45	1,970	- 30	1,940	45	1,925	Glacial sand	Hard,clear		D, S	Sufficient for 20 head stock.
45	SW.	29	"	"	"	Bored	25	1,925	- 10	1,915	25	1,900	Glacial sand	Hard,clear		S	Sufficient for local needs.
46	SE.	30	"	"	"	Bored	35	1,930	- 20	1,910	35	1,895	Glacial sand	Hard,clear		D, S	Sufficient for 15 head stock.
47	SW.	30	"	"	"	Bored	23	1,922	- 21	1,901	22	1,900	Glacial gravel	Hard,clear		D, S	Sufficient for 15 head stock.
48	NE.	30	"	"	"	Dug	16	1,910	- 11	1,899	11	1,899	Glacial gravel	Hard,clear		D, S	Sufficient for 20 head stock.
49	NW.	30	"	"	"	Drilled	95	1,868	- 85	1,783	85	1,783	Glacial clay	Hard,cloudy, iron		D, S	Sufficient for 10 head stock.
50	NE.	31	"	"	"	Bored	35	1,850	- 20	1,830	35	1,815	Glacial gravel	Hard,clear		D, S	Sufficient for local needs.
51	SE.	32	"	"	"	Bored	55	1,970	- 51	1,919	55	1,915	Glacial sand	Hard,clear		D, S	Sufficient for local needs.
52	NW.	32	"	"	"	Bored	34	1,908	- 25	1,883	25	1,883	Glacial clay	Hard,clear		D, S	Sufficient for local needs.
53	NE.	32	"	"	"	Dug	13	1,900	- 7	1,893	13	1,887	Glacial gravel	Hard,clear		D, S	Sufficient for 40 head stock.
54	SW.	32	"	"	"	Bored	50	1,900	- 40	1,860	50	1,850	Glacial sand	Hard,clear		S	Sufficient for local needs.
55	SE.	34	"	"	"	Bored	30	2,050	- 15	2,035	30	2,020	Glacial gravel	Hard,clear, "alkaline"		D, S	Sufficient for 40 head stock.
56	NE.	34	"	"	"	Dug	18	2,000	- 12	1,988	18	1,982	Glacial gravel	Hard,clear		D, S	Sufficient for 26 head stock.
57	NW.	34	"	"	"	Dug	4	1,960	0	1,960			Glacial clay	Hard,"alkaline"		S	Sufficient for local needs.
58	NE.	35	"	"	"	Bored	65	2,052	- 40	2,012	65	1,987	Glacial sand	Hard,clear, iron		N	Insufficient for local needs.
59	SW.	35	"	"	"	Dug	52	2,042	- 30	2,012	52	1,990	Glacial sand	Hard,clear, iron,"alkaline"		D, S	Sufficient for local needs.
60	SW.	36	"	"	"	Bored	45	2,068	- 35	2,033	45	2,023	Glacial drift	Hard,clear, iron		D, S	Sufficient for 30 head stock.
61	SE.	36	"	"	"	Dug	10	2,055	- 1	2,054	10	2,045	Glacial sand	Hard,clear, iron		D, S	Sufficient for 60 head stock.
1	NE.	1	31	18	2	Dug	60	2,004	- 56	1,948	60	1,944	Glacial gravel	Hard,iron, cloudy		D, S	Insufficient for local needs.
2	NW.	1	"	"	"	Bored	62	1,990	- 55	1,935	62	1,928	Glacial clay	Hard,"alkaline"		D, S	Sufficient for local needs.
3	NW.	2	"	"	"	Dug	40	1,950	- 30	1,920	40	1,910	Glacial sand	Hard,iron, cloudy		D, S	Sufficient for local needs.
4	SW.	2	"	"	"	Dug	40	1,950	- 36	1,914	40	1,910	Glacial gravel	Hard,clear		D, S	Sufficient for local needs.
5	NW.	3	"	"	"	Dug	12	1,900	- 8	1,892	12	1,888	Glacial gravel	Soft,clear		D, S	Sufficient for local needs.
6	SE.	4	"	"	"	Bored	85	1,895	- 80	1,815	85	1,810	Glacial sand	Hard,clear, iron		D, S	Insufficient for local needs.
7	NW.	4	"	"	"	Drilled	165	1,860	- 80	1,780	165	1,695	Glacial sand	Soft,clear		D, S	Yields 10 barrels a day. #
8	SE.	5	"	"	"	Drilled	200	1,862	- 90	1,772	200	1,662	Glacial sand	Hard,clear, iron		D, S	Sufficient for local needs.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of BIG QUILL NO. 308, 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
9	NE.	6	31	18	2	Drilled	240	1,825	- 56	1,769	240	1,585	Glacial sand	Hard, cloudy, iron, "alkaline"		S	Sufficient for 30 head stock.
10	SE.	6	"	"	"	Dug	40	1,820	- 37	1,783			Glacial sand	Hard, clear,		D	Insufficient for local needs.
11	SE.	8	"	"	"	Drilled	260	1,830	- 90	1,740	260	1,570	Glacial sand	Hard, cloudy, iron, "alkaline"		S	Sufficient for local needs.
12	NW.	8	"	"	"	Drilled	140	1,808	- 40	1,768	140	1,668	Glacial sand	Hard, clear, iron		D, S	Sufficient for local needs.
13	SW.	10	"	"	"	Bored	80	1,945					Glacial gravel	Hard, iron, "alkaline"		S	Insufficient for local needs.
14	SE.	10	"	"	"	Dug	8	1,910	- 5	1,905	5	1,905	Glacial gravel	Hard, clear		D, S	Sufficient for local needs.
15	NW.	11	"	"	"	Bored	32	1,870	- 24	1,846	24	1,846	Glacial sand	Hard, clear		D, S	Sufficient for 20 head stock.
16	NE.	12	"	"	"	Bored	50	1,950	- 45	1,905	50	1,900	Glacial sand	Hard, clear, iron, "alkaline"		D, S	Sufficient for 10 head stock.
17	SW.	12	"	"	"	Dug	47	1,988	- 43	1,945	47	1,941	Glacial gravel	Hard, clear		D, S	Sufficient for 25 head stock.
18	SE.	13	"	"	"	Dug	39	1,954	- 35	1,919	39	1,915	Glacial gravel	Hard, clear, iron		D, S	Insufficient for local needs.
19	SW.	14	"	"	"	Dug	26	1,925	- 20	1,905	26	1,899	Glacial sand	Hard, clear		D, S	Sufficient for 45 head stock.
20	SE.	15	"	"	"	Drilled	198	1,850	- 90	1,760	198	1,652	Glacial sand	Hard, iron, clear		S	Sufficient for 30 head stock.
21	SW.	16	"	"	"	Drilled	210	1,825	- 60	1,765	210	1,615	Glacial sand	Hard, iron, cloudy		D, S	Sufficient for local needs.
22	NE.	16	"	"	"	Bored	125	1,815	- 45	1,770	125	1,690	Glacial sand	Hard, clear, iron, "alkaline"		S	Sufficient for local needs.
23	NE.	17	"	"	"	Drilled	140	1,805	- 50	1,755	140	1,665	Glacial sand	Hard, clear, iron		D, S	Sufficient for local needs.
24	SE.	18	"	"	"	Dug	8	1,864	- 6	1,858	8	1,856	Glacial sand	Soft, clear		D, S	Sufficient for 85 head stock.
25	NW.	18	"	"	"	Bored	150	1,770	- 80	1,690	150	1,620	Glacial sand	Hard, iron, cloudy		S	Sufficient for local needs.
26	SW.	18	"	"	"	Bored	85	1,780	- 30	1,750	85	1,695	Glacial sand	Hard, clear, iron		D, S	Sufficient for local needs.
27	NE.	20	"	"	"	Dug	10	1,785	- 6	1,779	6	1,779	Glacial sand	Soft, clear		D, S	Sufficient for 30 head stock.
28	SW.	20	"	"	"	Dug	12	1,790	- 8	1,782	8	1,782	Glacial gravel	Soft, clear		D, S	Sufficient for local needs.
29	SW.	21	"	"	"	Bored	120	1,805	- 35	1,770	120	1,685	Glacial sand	Hard, clear, iron		S	
30	SW.	22	"	"	"	Drilled	121	1,818	- 52	1,766	121	1,697	Glacial sand	Hard, "alkaline", iron, red sedimnet		S	Sufficient for 20 head stock.
31	NW.	22	"	"	"	Bored	105	1,816			105	1,711	Glacial sand	Hard, cloudy, iron, "alkaline"		D, S	Sufficient for local needs.
32	NE.	23	"	"	"	Dug	16	1,850	- 12	1,838	16	1,834	Glacial sand	Hard, clear		D, S	Sufficient for 22 head stock.

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WELL RECORDS—Rural Municipality of BIG QUILL NO.308, 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
33	SW.	23	31	18	2	Dug	10	1,850	- 6	1,844	6	1,844	Glacial gravel	Hard, clear		D, S	Insufficient for local needs.
34	SE.	24	"	"	"	Dug	20	1,924	- 10	1,914	10	1,914	Glacial gravel	Hard, clear		D	Sufficient for local needs.
35	NW.	24	"	"	"	Dug	24	1,910	- 21	1,889	20	1,890	Glacial sand	Hard, clear, "alkaline"		D, S	Sufficient for 24 head stock.
36	NE.	24	"	"	"	Dug	24	1,890	- 10	1,880	24	1,866	Glacial sand	Hard, clear		D, S	Sufficient for 35 head stock.
37	NE.	25	"	"	"	Spring		1,870	0	1,870	0	1,870	Glacial gravel	Soft, clear		D, S	Sufficient for local needs.
38	SE.	26	"	"	"	Bored	88	1,845					Glacial drift				Dry hole.
39	NE.	26	"	"	"	Bored	100	1,840	- 60	1,780	100	1,740	Glacial sand	Hard, clear, iron		D, S	Sufficient for local needs.
40	NW.	27	"	"	"	Dug	14	1,790	- 10	1,780	10	1,780	Glacial sand	Soft, clear		D, S	Sufficient for local needs.
41	SW.	28	"	"	"	Dug	16	1,780	- 10	1,770	10	1,770	Glacial sand	Soft, clear		D, S	Sufficient for local needs.
42	NE.	28	"	"	"	Dug	14	1,795	- 10	1,785	10	1,785	Glacial sand	Soft, clear		D, S	Sufficient for local needs.
43	NE.	29	"	"	"	Drilled	89	1,775	- 20	1,758	89	1,686	Glacial sand	Hard, clear, iron		D, S	Sufficient for 20 head stock.
44	NW.	32	"	"	"	Dug	22	1,750	- 6	1,744	9	1,741	Glacial drift	Hard, clear		D, S	Sufficient for local needs.
45	NE.	32	"	"	"	Bored	50	1,755	- 15	1,740	50	1,705	Glacial sand	Hard, cloudy, iron		S	Sufficient for local needs.
46	SE.	32	"	"	"	Bored	80	1,750	- 10	1,740	80	1,670	Glacial sand	Hard, "alkaline"		D, S	Sufficient for local needs.
47	NW.	33	"	"	"	Bored	85	1,765	- 20	1,745	85	1,680	Glacial drift	Hard, cloudy, iron		D, S	Sufficient for 18 head stock.
48	SW.	34	"	"	"	Bored	85	1,780	- 27	1,753	85	1,695	Glacial sand	Hard, clear, iron, "alkaline"		D, S	Sufficient for local needs.
49	SE.	34	"	"	"	Dug	64	1,805	- 50	1,755	64	1,741	Glacial sand	Hard, clear, iron		D, S	Sufficient for local needs.
50	SE.	35	"	"	"	Bored	70	1,825	- 65	1,760	70	1,755	Glacial sand	Hard, clear		D, S	Sufficient for 30 head stock.
51	NW.	35	"	"	"	Bored	36	1,790	- 33	1,757	36	1,754	Glacial sand	Hard, clear, iron		D, S	Insufficient for local needs.
52	SW.	36	"	"	"	Bored	78	1,825	- 68	1,757	78	1,747	Glacial gravel	Hard, cloudy, "alkaline"		D, S	Sufficient for 65 head stock.
53	NW.	36	"	"	"	Bored	78	1,846	- 70	1,776	78	1,768	Glacial sand	Hard, clear		D, S	Sufficient for local needs.
54	NE.	36	"	"	"	Bored	63	1,830	- 59	1,771	59	1,771	Glacial sand	Soft, clear		D, S	Sufficient for 10 head stock.
1	SW.	1	32	16	2	Dug	14	2,010	- 10	2,000	10	2,000	Glacial sand	Hard, clear		D, S	Sufficient for local needs.
2	SE.	2	"	"	"	Bored	48	2,010	- 40	1,970	48	1,962	Glacial sand	Hard, clear		D, S	Sufficient for domestic use only.
3	NE.	2	"	"	"	Dug	27	2,000	- 24	1,976	27	1,973	Glacial sand	Hard, clear		D, S	Sufficient for domestic use only.
4	SW.	3	"	"	"	Bored	80	2,010	- 79	1,931	80	1,930	Glacial sand	Hard, clear, iron, "alkaline"		D	Insufficient for local needs.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of BIG QUILL NO.308, 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.	3	32	16	2		100	1,995	- 95	1,900	100	1,895	Glacial drift	Hard, clear, iron		D	Sufficient for domestic use only.
6	SE.	4	"	"	"	Bored	90	2,010					Glacial drift				Dry hole.
7	SE.	5	"	"	"	Dug	8	2,050	- 5	2,045	8	2,042	Glacial gravel	Hard, clear		D, S	Sufficient for local needs.
8	NW.	5	"	"	"		11	2,020	- 8	2,012	11	2,009	Glacial sand	Hard, clear		D, S	Sufficient for local needs.
9	SE.	6	"	"	"	Bored	16	2,050	- 8	2,042	16	2,034	Glacial sand	Hard, clear		D, S	Sufficient for local needs.
10	NE.	6	"	"	"	Dug	20	2,015	- 1	2,014	20	1,995	Glacial sand	Hard, clear		D, S	Sufficient for local needs.
11	SW.	6	"	"	"	Bored	35	2,035	- 15	2,020	35	2,000	Glacial sand	Hard, clear		D, S	Sufficient for local needs.
12	SE.	7	"	"	"	Dug	25	2,000					Glacial drift				Dry hole.
13	SW.	7	"	"	"	Dug	40	2,000	- 30	1,970	40	1,960	Glacial sand	Hard, clear,		S	Insufficient for local needs.
14	NW.	7	"	"		Bored	80	1,950	- 15	1,935	80	1,870	Glacial sand	Hard, clear, iron, "alkaline"		D, S	Sufficient for local needs.
15	SE.	8	"	"	"	Dug	15	2,005	- 1	2,004	15	1,990	Glacial gravel	Soft, clear		D, S	Sufficient for local needs.
16	SW.	8	"	"	"	Dug	14	2,000	- 10	1,990	14	1,986	Glacial gravel	Hard, clear		D, S	Sufficient for 60 head stock.
17	NE.	9	"	"	"	Bored	35	1,950	- 33	1,917	33	1,917	Glacial sand	Hard, clear		D, S	Intermittent supply.
18	SE.	10	"	"	"	Dug	25	1,955	- 21	1,934	25	1,930	Glacial sand	Hard, clear		D, S	Sufficient for local needs.
19	SW.	10	"	"	"	Spring		1,900	0	1,900			Glacial sand	Hard, clear		D, S	Sufficient for local needs.
20	NE.	11	"	"	"	Dug	20	1,950	- 16	1,934	16	1,934	Glacial drift	Hard,		D	Insufficient for local needs.
21	SE.	12	"	"	"	Dug	22	1,970	- 17	1,953	22	1,948	Glacial sand	Hard, clear		D, S	Sufficient for 25 head stock.
22	NE.	12	"	"	"	Dug	40	1,940	- 37	1,903	40	1,900	Glacial gravel	Hard, clear		D, S	Sufficient for 11 head stock.
23	SW.	12	"	"	"	Dug	15	1,900	- 10	1,890	15	1,885	Glacial sand	Hard, clear		D, S	Sufficient for 15 head stock.
24	NW.	12	"	"	"	Bored	80	1,950					Glacial drift				Dry hole.
25	NE.	13	"	"	"	Bored	60	1,900	- 26	1,874	60	1,840	Glacial gravel	Hard, clear		D, S	Sufficient for 30 head stock.
26	NW.	13	"	"	"	Drilled	180	1,900	- 22	1,878	180	1,720	Glacial gravel	Hard, iron, "alkaline"		D, S	Sufficient for local needs.
27	SE.	14	"	"	"	Bored	33	1,865	- 27	1,838	33	1,832	Glacial drift	Hard, cloudy, "alkaline"		D, S	Insufficient for local needs.
28	SW.	14	"	"	"	Bored	20	1,890	- 10	1,880	20	1,870	Glacial gravel	Hard, clear		D, S	Sufficient for 8 head stock.
29	SE.	15	"	"	"	Bored	40	1,900	- 30	1,870	40	1,860	Glacial sand	Hard, clear		D,	Sufficient for domestic use only.
30	NW.	15	"	"	"	Bored	40	1,920	- 20	1,900	40	1,880	Glacial gravel	Hard, clear, "alkaline"		D, S	Sufficient for local needs.
31	NE.	16	"	"	"	Bored	65	1,890	- 35	1,855	65	1,825	Glacial sand	Hard, clear, "alkaline" iron		S	Sufficient for 30 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 BIG QUILL NO. 308, 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
32	SE.	16	32	16	2	Bored	24	1,930	- 8	1,922	8	1,922	Glacial clay	Hard, clear		D, S	Insufficient for local needs.
33	SW.	16	"	"	"	Bored	35	1,960	- 30	1,930	35	1,925	Glacial sand	Hard, clear, iron, "alkaline"		D	Sufficient for domestic use only.
34	NE.	17	"	"	"	Drilled	250	1,920	-150	1,770	250	1,670	Glacial sand	Hard, iron		S	Sufficient for local needs.
35	SE.	18	"	"	"	Bored	27	1,940	- 24	1,916	24	1,916	Glacial sand	Hard, clear, "alkaline"		D, S	Sufficient for local needs.
36	NE.	18	"	"	"	Dug	20	1,905	- 17	1,888	17	1,888	Glacial gravel	Hard, clear		D, S	Sufficient for domestic use only.
37	SW.	18	"	"	"	Drilled	182	1,975	- 90	1,885	182	1,793	Glacial sand	Hard, clear, iron		D, S	Sufficient for local needs.
38	NW.	18	"	"	"	Dug	30	1,900	- 10	1,890	10	1,890	Glacial sand	Hard, clear, "alkaline"		D, S	Sufficient for 30 head stock.
39	NE.	19	"	"	"	Dug	30	1,842	- 27	1,815	27	1,815	Glacial sand	Hard, clear		D, S	Sufficient for domestic use only.
40	SW.	19	"	"	"	Dug	8	1,850	- 4	1,846	4	1,846	Glacial sand	Hard, clear		D, S	Sufficient for local needs.
41	NW.	20	"	"	"	Bored	55	1,830	- 43	1,787	55	1,775	Glacial sand	Hard, iron, "alkaline" red sediment		D, S	Insufficient for local needs.
42	SE.	21	"	"	"	Bored	32	1,850	- 26	1,824	26	1,824	Glacial sandy clay	Hard, clear		D, S	Insufficient for local needs.
43	NE.	21	"	"	"	Dug	8	1,835	- 5	1,830	5	1,830	Glacial clay	Hard, clear		D, S	Intermittent supply; dry in dry years.
44	NW.	21	"	"	"	Bored	54	1,800	- 45	1,755	54	1,746	Glacial sand	Hard, clear		D, S	Sufficient for 18 head stock.
45	NE.	22	"	"	"	Bored	55	1,820	- 20	1,800	40	1,780	Glacial sand	Hard, clear, iron, "alkaline"		S	Sufficient for local needs.
46	NE.	23	"	"	"	Drilled	300	1,830			300	1,530	Glacial? sand	Hard, clear, iron, "alkaline"		N	Oversufficient for local needs.
47	SE.	24	"	"	"	Bored	50	1,875	- 43	1,832	50	1,825	Glacial clay	Hard, cloudy, "alkaline"		D, S	Insufficient for local needs.
48	NE.	24	"	"	"	Dug	20	1,830	- 17	1,813	20	1,810	Glacial sand	Soft, clear		D, S	Sufficient for local needs.
49	NW.	24	"	"	"	Dug	8	1,845	- 6	1,839	6	1,839	Glacial sand	Hard, clear		D, S	Sufficient for local needs.
50	SW.	24	"	"	"	Dug	11	1,860			11	1,849	Glacial sand	Hard, clear		D, S	Sufficient for 15 head stock.
51	NE.	25	"	"	"	Drilled	300	1,790	- 35	1,755	300	1,490	Glacial? sand	Hard, cloudy, iron, "alkaline"		D, S	Sufficient for local needs.
52	SW.	25	"	"	"	Drilled	200	1,800	- 60	1,740	200	1,600	Glacial sand	Hard, iron, "alkaline"		D, S	Oversufficient for 20 head stock.
53	SW.	26	"	"	"	Dug	20	1,820	- 16	1,804	16	1,804	Glacial gravel	Hard, clear		D	Sufficient for local needs. #
54	NE.	27	"	"	"	Bored	27	1,810	- 24	1,786	24	1,786	Glacial sand	Hard, clear		D	Sufficient for domestic use only.
55	NE.	28	"	"	"	Bored	75	1,812	- 23	1,789	75	1,737	Glacial sand	Hard, clear, iron, "alkaline"		D, S	Oversufficient for local needs.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of BIG QUILL NO. 308, 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
56	SW.	28	32	16	2	Dug	45	1,810	- 50	1,760	45	1,765	Glacial sand	Hard, iron, "alkaline"		N	Sufficient for domestic use only.
57	NE.	32	"	"	"	Dug	20	1,748	- 10	1,738	20	1,728	Glacial sand	Hard, clear		D, S	Sufficient for 250 head stock.
58	SW.	32	"	"	"	Drilled	60	1,770	- 30	1,740	60	1,710	Glacial sand	Hard, clear, iron, "alkaline"		N	Insufficient for local needs.
59	SE.	33	"	"	"	Bored	45	1,750	- 35	1,715	35	1,715	Glacial clay	Hard, clear, "alkaline"		S	Sufficient for 10 head stock.
60	SE.	34	"	"	"	Dug	18	1,800	- 13	1,787	18	1,782	Glacial sand	Hard, clear		D, S	Insufficient for local needs.
61	NE.	34	"	"	"	Bored	74	1,734	- 35	1,699	74	1,660	Glacial sand	Hard, clear, iron		D, S	Sufficient for local needs.
62	SE.	35	"	"	"	Dug	40	1,750	- 15	1,735	15	1,735	Glacial clay	Hard, clear		D, S	Intermittent supply; dry at times.
63	SW.	36	"	"	"	Dug	14	1,775	- 11	1,764	11	1,764	Glacial sand	Soft, clear		D, S	Oversufficient for local needs.
1	NE.	1	32	17	2	Dug	16	2,000	- 14	1,986	12	1,988	Glacial sand	Hard, clear		D, S	Sufficient for 35 head stock.
2	NW.	1	"	"	"		10	2,000	- 6	1,994	10	1,990	Glacial sand	Soft, clear		D, S	Sufficient for local needs.
3	NE.	2	"	"	"	Dug	14	2,005	- 7	1,998	7	1,998	Glacial gravel	Hard, clear		D, S	Sufficient for 30 head stock.
4	SW.	4	"	"	"	Dug	24	1,905	- 21	1,884	24	1,881	Glacial gravel	Soft, clear		D, S	Sufficient for 30 head stock.
5	NE.	4	"	"	"	Dug	34	1,872	- 15	1,857	15	1,857	Glacial sand	Soft, clear		D, S	Sufficient for 12 head stock.
6	SW.	5	"	"	"	Bored	40	1,855	- 28	1,827	28	1,827	Glacial sand	Hard, clear		D, S	Oversufficient for local needs.
7	SE.	6	"	"	"	Dug	26	1,850	- 22	1,828	22	1,828	Glacial sand	Soft, clear		D, S	Insufficient for local needs.
8	NE.	6	"	"	"	Drilled	300	1,802	- 50	1,752	160	1,642	Glacial sand	Hard, iron, "alkaline" red sediment		D, S	Insufficient for local needs.
9	SW.	6	"	"	"	Bored	65	1,846	- 30	1,816	65	1,781	Glacial sand	Hard, clear		D, S	Oversufficient for local needs.
10	NW.	7	"	"	"	Drilled	112	1,765	- 14	1,751	112	1,653	Glacial sand	Hard, clear, iron, "alkaline"		D, S	Oversufficient for local needs.
11	NE.	8	"	"	"	Dug	20	1,800	- 5	1,795	20	1,780	Glacial gravel	Hard, clear		D, S	Sufficient for local needs.
12	SW.	8	"	"	"	Drilled	70	1,800	- 30	1,770	70	1,730	Glacial sand	Hard, cloudy, iron		D, S	Sufficient for local needs.
13	SE.	9	"	"	"	Bored	35	1,900	- 15	1,885	35	1,865	Glacial sand	Soft, clear,		D	Sufficient for domestic use only.
14	NE.	10	"	"	"	Bored	34	1,855	- 32	1,823	32	1,823	Glacial sand	Hard, clear, "alkaline"		S	Very poor supply.
15	SW.	12	"	"	"	Dug	18	1,950	- 10	1,940	10	1,940	Glacial sand	Hard, clear		D, S	Insufficient for local needs.
16	SW.	13	"	"	"	Dug	12	1,900	- 9	1,891	3	1,897	Glacial gravel	Soft, clear		D, S	Sufficient for local needs.
17	NW.	13	"	"	"	Bored	90	1,884					Glacial drift				Dry hole.
18	NW.	14	"	"	"	Dug	10	1,850	- 5	1,845	10	1,840	Glacial gravel	Soft, clear		D, S	Sufficient for 16 head stock.

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WELL RECORDS—Rural Municipality of BIG QUILL NO. 308, 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
19	SW.	16	32	17	2	Drilled	48	1,800	- 25	1,775	48	1,752	Glacial gravel	Hard, clear		D, S	Sufficient for local needs.
20	NW.	16	"	"	"	Spring		1,765	0	1,765			Glacial drift				
21	NE.	17	"	"	"	Spring		1,740	0	1,740			Glacial drift				
22	SE.	17	"	"	"	Bored	39	1,752	- 10	1,742	39	1,713	Glacial clay	Hard, clear, iron, "alkaline"		D, S	Oversufficient for local needs.
23	NE.	18	"	"	"	Bored	25	1,744	- 15	1,729	15	1,729	Glacial gravel	Hard, clear		D, S	Sufficient for 28 head stock.
24	SW.	18	"	"	"	Bored	85	1,730	- 15	1,715	85	1,645	Glacial sand	Hard, clear, "alkaline"		D, S	Sufficient for local needs.
25	SW.	20	"	"	"	Bored	55	1,742	- 25	1,717	55	1,687	Glacial sand	Hard, clear, "alkaline" iron		D, S	
26	SE.	20	"	"	"	Dug	60	1,740	- 30	1,710	60	1,680	Glacial clay	Hard, cloudy, "alkaline"		D, S	Intermittent supply.
27	SW.	21	"	"	"		70	1,744			70	1,674	Glacial sand	Hard, clear, iron, "alkaline"		D, S	Oversufficient for local needs.
28	NE.	22	"	"	"	Dug	12	1,710	- 6	1,704	6	1,704	Glacial gravel	Soft, clear		D, S	Sufficient for 30 head stock.
29	NW.	22	"	"	"	Dug	15	1,715	- 10	1,705	8	1,707	Glacial gravel	Hard, clear		D, S	Sufficient for 15 head stock.
30	NW.	23	"	"	"	Bored	86	1,790	- 70	1,720	76	1,714	Glacial sand	Hard, clear		D, S	Sufficient for 10 head stock.
31	NE.	24	"	"	"	Dug	10	1,800	- 3	1,797	3	1,797	Glacial gravel	Hard, clear		D, S	Sufficient for domestic use only.
32	SW.	24	"	"	"	Dug	14	1,850	- 10	1,840	10	1,840	Glacial sand	Hard, clear, "alkaline"		S	Oversufficient for local needs.
33	NW.	25	"	"	"	Bored	77	1,734	- 40	1,694	77	1,657	Glacial drift	Hard, clear, "alkaline"		D, S	Sufficient for 30 head stock.
34	SW.	25	"	"	"	Dug	16	1,830	- 11	1,819	11	1,819	Glacial gravel	Hard, clear		D, S	Sufficient for 30 head stock.
35	NE.	26	"	"	"	Bored	60	1,745	- 40	1,705	60	1,685	Glacial sand	Hard, clear		D, S	Oversufficient for local needs.
36	SW.	27	"	"	"	Dug	12	1,750	- 4	1,746	12	1,738	Glacial gravel	Hard, clear		D, S	Sufficient for local needs.
1	NE.	1	32	18	2	Drilled	136	1,834	- 76	1,758	136	1,698	Glacial sand	Hard, clear, "alkaline" iron		D, S	Sufficient for local needs.
2	NE.	2	"	"	"	Bored	20	1,775	- 10	1,765			Glacial gravel	Soft,		D, S	Sufficient for local needs.
3	NW.	2	"	"	"	Dug	39	1,812	- 26	1,786	39	1,773	Glacial sand	Hard, clear		D, S	Sufficient for local needs.
4	SE.	3	"	"	"	Bored	36	1,786	- 30	1,756	36	1,750	Glacial sand	Hard, clear, iron, "alkaline"		D, S	Oversufficient for local needs.
5	NE.	4	"	"	"	Dug	30	1,765	- 20	1,745	30	1,735	Glacial sand	Hard, clear, iron		D, S	Oversufficient for local needs.
6	SW.	4	"	"	"	Dug	8	1,760	- 2	1,758	8	1,752	Glacial sand	Hard, clear, "alkaline"		D, S	Sufficient for local needs. #

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of BIG QUILL NO. 308, 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
7	SE.	5	32	18	2	Dug	25	1,755	- 13	1,742	10	1,745	Glacial sand	Hard, clear		D, S	Sufficient for local needs.
8	NE.	6	"	"	"	Drilled	140	1,725	0	1,725	140	1,585	Glacial sand	Hard, cloudy, iron, "alkaline"		D, S	Yields 3 barrels a minute.
9	NW.	9	"	"	"	Dug	3	1,744	0	1,744	3	1,741	Glacial drift	Hard, clear		D, S	Oversufficient for local needs.
10	SE.	10	"	"	"	Bored	26	1,755	- 14	1,741	26	1,729	Glacial sand	Hard, clear,		D, S	Sufficient for local needs.
11	SW.	10	"	"	"	Bored	65	1,760	- 30	1,730	65	1,695	Glacial sand	Hard, iron, "alkaline"		D, S	Sufficient for local needs.
12	NE.	10	"	"	"	Bored	70	1,750	- 20	1,730	70	1,680	Glacial sand	Hard		D, S	Sufficient for 20 head stock.
13	NW.	12	"	"	"	Bored	45	1,760	- 20	1,740	20	1,740	Glacial gravel	Hard, clear		D, S	Sufficient for domestic use only.
14	SW.	12	"	"	"	Bored	65	1,775	- 55	1,720	65	1,710	Glacial gravel	Hard, clear		D, S	Sufficient for 23 head stock.
15	NE.	12	"	"	"	Dug	12	1,760	- 6	1,754	6	1,754	Glacial sand	Hard, clear		D, S	Sufficient for 30 head stock.
16	NE.	14	"	"	"	Bored	117	1,750	- 45	1,705	117	1,633	Glacial gravel	Hard, iron, "alkaline"		D, S	Sufficient for local needs.
17	SW.	14	"	"	"	Dug	50	1,750	- 20	1,730	50	1,700	Glacial sand	Hard, clear, iron		D, S	Sufficient for 15 head stock.
18	NE.	16	"	"	"	Dug	14	1,750	- 13	1,737	14	1,736	Glacial gravel	Hard, "alkaline"		D, S	Sufficient for local needs.
19	SE.	17	"	"	"	Dug	30	1,735	- 20	1,715	18	1,717	Glacial drift	Hard, cloudy, iron, "alkaline"		D, S	Oversufficient for 30 head stock.
20	SW.	18	"	"	"	Drilled	100	1,720	+	1,720+	100	1,620	Glacial sand	Hard, cloudy, iron, "alkaline"		D, S	Oversufficient supply; yields 18 gallons an hour. Water is of a very poor quality.
21	NE.	19	"	"	"	Dug	8	1,720	- 4	1,716	8	1,712	Glacial sand	Hard, "alkaline"		N	Water unfit for man or beast.
22		20	"	"	"		67	1,750	- 40	1,710	67	1,683	Glacial sand	Hard, "alkaline"		N	No dwelling here.
23	SE.	21	"	"	"	Dug	28	1,740	- 13	1,727	28	1,712	Glacial drift	Hard, clear, iron		D, S	Oversufficient for 60 head stock.
24	NE.	22	"	"	"	Dug	40	1,720	- 35	1,685	40	1,680	Glacial drift	Hard, clear, "alkaline"		D, S	Sufficient for 35 head stock.
25	SE.	24	"	"	"	Bored	83	1,730	- 65	1,665	85	1,645	Glacial sand	Hard, clear, iron, "alkaline"		D, S	Sufficient for local needs.
26	SE.	24	"	"	"	Dug	54	1,735	- 34	1,701	54	1,681	Glacial sand	Hard, clear		D	Sufficient for domestic use only.
27	SW.	24	"	"	"	Bored	42	1,735	- 40	1,695	24	1,711	Glacial sand	Hard, clear, iron, "alkaline"		D, S	Oversufficient for local needs.
28	SW.	29	"	"	"	Drilled	120	1,735	- 1	1,734	120	1,615	Glacial sand	Hard, cloudy, iron, "alkaline"		D, S	Sufficient for local needs.
29	SE.	30	"	"	"	Dug	30	1,738	- 12	1,726	12	1,726	Glacial clay	Hard, clear, "alkaline"		D, S	Insufficient for local needs.

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(#) Sample taken for analysis.