Environment CANADA Environnement
00157641

CANADA. GEOLOGICAL SURVEY. WATER SUPPLY PAPER
OOFF

This document was produced by scanning the original publication.

Ce document est le produit d'une numérisation par balayage de la publication originale.

CANADA
DEPARTMENT OF MINES

HON.T. A. CRERAR, MINISTER; CHARLES CAMSELL, DEPUTY MINISTER

BUREAU OF ECONOMIC GEOLOGY

GEOLOGICAL SURVEY

PRELIMINARY REPORT

GROUND-WATER RESOURCES OF THE RURAL MUNICIPALITY OF GULL LAKE No. 139 SASKATCHEWAN

BY

B. R. MacKay, H. H. Beach & R. Johnson

Water Supply Paper No. 96

OTTAWA

1936

CANADA

DEPARTMENT OF MINES

BUREAU OF ECONOMIC GEOLOGY

GEOLOGICAL SURVEY

GROUND WATER RESOURCES OF THE RURAL MUNICIPALITY OF GULL LAKE NO. 139 SASKATCHEWAN

BY

B.R. MacKAY, H.H. BEACH, and R. JOHNSON

WATER SUPPLY PAPER NO.96

CONTENTS

Illustrations

GROUND WATER RESOURCES OF THE RURAL MUNICIPALITY OF GULL LAKE, NO. 139 SASKATCHEWAN

INTRODUCTION

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

Publication of Results

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

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

How to Use the Report

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

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

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

---

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

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

GLOSSARY OF TERMS USED

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Porvious 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 Gull Lake covers an area of 324 square miles in the southwestern part of Saskatchewan, the centre of the municipality being located 40 miles west and 7 miles south of Swift Current. It is described as townships 13, 14, and 15, ranges 19, 20, and 21. The main line of the Canadian Pacific railway extends along the southern boundary of the area, and on it are located the towns of Gull Lake and Tompkins.

The land surface of the municipality is rolling with a gradual slope to the north from elevations between 2,600 and 2,700 feet above sea-level along the southern boundary, to elevations between 2,350 and 2,450 feet in the northern townships. A large area of sand hills approximately 6 miles in width extends, in a northeasterly direction, from the southern half of the western boundary of the municipality across the centre to within a short distance of the eastern boundary. Most of the low hills and sand dunes occurring throughout this area are sparsely covered with brush. The topography of the area lying to the north of the sand hills is more irregular and hilly. Individual hills rise to elevations exceeding 2,450 feet and between them are narrow valleys in which the surface water collects to form sloughs. In the southern townships fewer hills are present and sloughs are less common. Whitegull lake, lying immediately south of Roscommon siding, is the largest lake, but during the recent drought period it has been nearly dry. Bridge creek, which flows intermittently, extends in a northeasterly direction along a shallow valley in the southeast corner of the municipality. Throughout the west-central and northern townships of the municipality little difficulty has been experienced in obtaining an adequate water

supply from wells most of which are less than 100 feet deep. In the southern and southeastern parts the conditions are more variable, sloughs and wells are both used, and adequate supplies are usually obtained. In limited areas, however, considerable prospecting has been necessary before a satisfactory water supply was obtained. The bedrock underlying the municipality is almost entirely unproductive and the search for water is thus confined to the unconsolidated Recent and glacial deposits.

Water-bearing Horizons in the Unconsolidated Deposits

The unconsolidated deposits consist of dune sands forming the sand hills, and of glacial deposits of various types covering the remainder of the area. The dune sands are a comparatively recent accumulation and are formed entirely by wind action. The glacial deposits were laid down by a great continental ice-sheet that many thousands of years ago advanced and retreated over Saskatchewan, and by the waters formed from the melting ice. The glacial deposits, collectively referred to as drift, are of three types, differentiated by their method of deposition, the character of the sediments comprising them, and the type of topographic relief they present. As the ice-sheet advanced and retreated it laid down a layer of till composed essentially of compact, bluish grey boulder clay, through which are interspersed irregular beds and pockets of sands and gravels that are generally water-bearing. The till presents a flat or gently rolling land surface. In this area the till is largely concealed by a covering of more recent lake clays. In areas where the retreating ice-sheet paused for any considerable length of time a more porous type of drift known as moraine was deposited. The moraine is also comprised

largely of sandy boulder clay interspersed with beds and lenses of sands and gravels. The surface of the moraine is irregularly rolling, with many low knolls and intervening, undrained depressions. The northern third of the municipality and small areas in township 14, range 19, are covered by moraine.

As the waters from the melting ice accumulated large lakes were formed into the deeper parts of which were washed fine silts and coarser sands around the margins. The areal extent of one of these glacial lakes is marked by a large area of lake clays covering the till in township 13, ranges 19, 20, and part of 21. Surrounding this area and extending over the greater part of township 13, range 21, the coarser lake sands are present. The areal distribution of these various types of deposits is indicated on Figure 1 of the accompanying map.

In the areas where the recent dune and glacial lake sands occur, the major part of the ground water supplies used are obtained from wells dug in the sand to depths seldom exceeding 20 feet. The sand is underlain at shallow depths by glacial lake clay or boulder clay which is impervious to the passage of the water that percolates downward from the surface. This water, consequently, collects in the sand in depressions on the surface of the underlying clay. The supplies obtainable by sinking wells to these reservoirs will depend largely on the catchment area surrounding the depressions. In the areas overlain by the lake sands there is generally some conformity between the ground surface and the surface of the underlying clay. For this reason wells sunk in the small valleys and depressions are likely to be more productive than those sunk on the knolls and ridges. This condition does not generally apply to the area of sand hills where the surface topography has been affected by drifting sand. However, little difficulty

is experienced in obtaining ample supplies of water for range stock from shallow wells and dugouts in the sand.

The glacial lake clays underlie the sands of the southern parts of the municipality and occur at the surface over a large area, as indicated on the accompanying map. These deposits are seldom more than 20 feet in thickness. The small pockets and thin beds of sand interspersed in the clay will generally yield only small supplies of water. However, many residents of th southeastern part of the municipality derive their water supplies from shallow wells in this material. These wells are fed by seepage from sloughs. It is found necessary in many cases to use two or more of these wells to obtain sufficient water for stock requirements. The water obtained is generally hard, but seldom too highly mineralized to be used for drinking.

In the northern, moraine-covered parts of the municipality it is generally possible to obtain sufficient supplies of water for household requirements and 10 to 20 head of stock from wells penetrating sand and gravel pockets at depths not exceeding 40 feet. It is usually necessary to sink several test holes before a productive sand or gravel pocket is encountered in the boulder clay, as they are widely scattered and there is generally little or no surface indication of their occurrence at depth. The wat r from these shallow wells is hard, but usually of good quality for household use. In the small areas where the glacial drift occurs at the surface, in townships 13 to 14, range 19, similar conditions to the above exist, except that the water-bearing sand and gravel pockets will be less numerous than in the more porous moraine deposits.

In order to obtain adequate supplies of water for stock many residents of this municipality have sunk wells to depths between 50 and 150 feet. Throughout most of the municipality

these wells do not indicate the presence of any extensive water-bearing beds in the lower part of the glacial drift. However, within the boundaries of the "A" and "B" lines shown on the geological map (Figure 1) there is a possibility that continuous horizons exist. Within the "A" line fairly large supplies of water are being obtained from sand and gravel aquifers at depths between 50 and 110 feet. It is possible that there is a continuous aquifer under this area lying at elevations between 2,430 and 2,380 feet above sea-level. The water obtained from this horizon is hard, and is characteristic of water from the deeper drift sources in being in some places too highly mineralized to be used for drinking. The water commonly contains iron salts. Within the area bounded by the "B" line moderately large supplies of water are being obtained at depths between 40 and 120 feet, and the available information would indicate that individual aquifers have considerable areal extent in this area. Production is reached at elevations between 2,540 and 2,500 feet above sea-level. The water obtained from these horizons is under a slight hydrostatic pressure and rises in the wells a few feet above the aquifer. It is hard and iron-bearing and in some wells is considered unfit for domestic use.

Many wells outside the areas bounded by the "A" and "B" lines yield fairly large supplies of water from sand and gravel beds in the lower part of the glacial drift, at depths between 50 and 120 feet. Evidently these beds are not present at all places, as many holes sunk to sufficient depths to reach such porous beds, should they occur either near the base of the drift or at the contact of the drift and the bedrock, are either dry or yield only small seepages of highly mineralized water. In all parts of the municipality, except within the areas bounded by the "A" and "B" lines, careful prospecting

of the drift at shallow depths appears to be advisable rather than deeper drilling down to horizons that may or may not be productive.

Water-Bearing Horizons in the Bedrock

The dark grey shales of the Bearpaw formation underlie the unconsolidated deposits throughout the entire municipality. These shales are exposed at the surface near the centre of township 14, range 21, but in most parts of the municipality lie at depths of 100 to 200 feet from the surface. It is not generally advisable to continue drilling wells after these shales are reached, as only small supplies of highly mineralized water can be expected from them. These shales resemble to some extent the blue-grey boulder clays of the overlying glacial drift. They may be readily recognized in drilling, however, by the absence in them of boulders and stones, their darker colour being nearly black when wet; their soapy feel to the touch; the small, roughly cubical, iron-stained fragments into which the shales gradually crumble upon being exposed to the air, and by the presence of occasional fossil shells. In the southeastern part of the municipality, holes have been drilled to depths between 400 and 600 feet without penetrating water-bearing beds in these shales.

GROUND WATER CONDITIONS BY TOWNSHIPS

Township 13, Range 19

Fairly large supplies of soft or only moderately hard water are being obtained from the Recent dune sands that cover a small area in the west-central part of this township. This layer of sand rarely exceeds 20 feet in thickness and is underlain by glacial clay. Ground water occurs in the sand only in areas where the underlying clay forms impervious basins in which the water can collect. It will generally be found that the wells sunk in the depressions and shallow valleys will be the most productive.

As shown on the accompanying map the surface material over the greater part of the township is glacial lake clay. This material also underlies the dune sand of the area already described. The thickness of the lake deposits seldom exceeds 20 feet. Except in the vicinity of sloughs it is very rarely possible to derive any appreciable supply of water from the scattered pockets of sand that occur interspersed in the clay. The water obtained from shallow wells in these deposits is generally hard and highly mineralized, but some of these wells yield water that can be used for domestic requirements.

The glacial lake clays are underlain by glacial till and in the absence of these overlying beds the till is exposed at the surface in small areas in the southeastern and northern part of the township.

In the areas where the glacial till occurs at the surface residents obtain water at depths not exceeding 40 feet from scattered sand and gravel pockets that it contains. In the areas overlain by the lake clays it is generally necessary to sink wells into the glacial drift to obtain sufficient supplies for more than a few head of stock. At many points

throughout the township, wells sunk to depths between 50 and 120 feet have generally encountered water-bearing beds of sand or gravel. Within the area bounded by the "B" line the supplies being obtained from these wells are fairly large and there is a possibility that a continuous aquifer exists under the area at elevations between 2,540 and 2,500 feet above sea-level. Outside the area bounded by the "B" line the supplies are generally smaller from the deep wells, but are usually adequate for local requirements unless large herds of stock are being watered. The water is generally hard and much of it too highly mineralized to be fit for domestic use. The water of some wells is reported to be unfit even for stock. In the southeastern part of the township considerable difficulty is experienced in obtaining supplies that are suitable for household use, from either shallow or deep wells.

A well drilled to a depth of 150 feet on the NW.$\frac{1}{4}$, section 24, yields a large supply of soft water from sand aquifers in the glacial drift. This well provides a large part of the water used in the town of Gull Lake. Other wells in the town from 75 to 85 feet deep yield hard water containing varying quantities of mineral salts. Some of these supplies are quite suitable for domestic use, whereas others are altogether unfit for this purpose.

There is little hope of obtaining better water supplies by deeper drilling into the Bearpaw formation which underlies the glacial drift of this township. Only small seepages of highly mineralized water can be expected from the compact marine shales comprising this formation. Dry holes drilled to depths between 400 and 600 feet in this and adjoining townships to the north and west indicate the absence of water-

bearing beds in the formation. The marine shales will probably be encountered at depths of less than 50 feet in the extreme southeast corner of the township, and at depths between 150 and 200 feet over the greater part of the area. Careful prospecting of the drift is strongly advised instead of deeper drilling into bedrock. The excavation of dugouts may be necessary on many farms and in areas remote from the dune sands these excavations can be expected to hold water for considerable periods of time.

Township 13, Range 20

In the small areas covered by lake sands in the southern and northwestern parts of this township it is generally possible to obtain fairly large supplies of soft or only moderately hard water from dug wells at depths less than 25 feet. Wells sunk in the depressions and shallow valleys are found to be more generally productive than those sunk on the ridges.

Many residents of the remaining area of the township, which is mantled by glacial lake clay, derive their supplies from scattered sand pockets occurring in the clay at depths of less than 20 feet. The supplies obtained from wells of this type are seldom sufficient for more than 10 or 15 head of stock, and a few residents use two or more wells to satisfy their requirements. In order to obtain supplies in this type of deposit it is usually necessary to sink wells in the vicinity of sloughs, for the clay itself is unproductive. The water obtained from these shallow wells is generally hard, but of good quality for domestic use.

A few scattered wells sunk to depths between 60 and 120 feet, penetrating the glacial drift that underlies the lake sands and the lake clays, are producing fairly large

supplies of water from quicksand and gravel aquifers. Equally as many dry holes and wells yielding only small supplies of water have been sunk to similar depths. These conditions indicate that the productive sand and gravel pockets occurring in boulder clay at these depths are of limited individual areal extent and it is, therefore, not advisable to sink wells to depths exceeding 40 feet unless shallower wells prove altogether unsatisfactory.

The marine shales of the Bearpaw formation underlie the glacial drift of the entire township. These shales were reported to have been encountered at a depth of 100 feet in a well on the SW.$\frac{1}{4}$, section 27. They will probably occur at depths between 100 and 150 feet in most parts of this township. It is not advisable to sink wells into the shale, as only small seepages of highly mineralized water can be expected from them. A 565-foot dry hole on the NE.$\frac{1}{4}$, section 32, substantiates the belief that water-bearing beds do not exist at greater depths in the Bearpaw formation.

Township 13, Range 21

The ground water being used in this township is obtained chiefly from wells under 40 feet in depth drawing supplies from the dune sands, or from sand pockets in the glacial drift and from glacial lake deposits that cover part of the southeastern corner and that in places underlie the dune sand.

In the dune sand area in the northern part of the township shallow wells and dugouts in the sand furnish abundant supplies of water for range stock. The supply in the dugouts, as in the wells, is replenished by continual infiltration of water from the sands. In the remaining part of the township numerous wells are obtaining fairly large supplies of water from the lake sands at depths generally less than 20 feet.

Except in the vicinity of "alkali" sloughs and flats, the water from the sand is of good quality for domestic use, being soft or only moderately hard. Wells of this type furnish the requirements of the residents of the town of Tompkins.

Water is obtainable in the sand deposits only where the underlying impervious glacial clay forms basins in which the ground water can collect. For this reason many residents have been unable to obtain water supplies from the surface sand within the close vicinity of their dwellings, and hence have continued wells into the underlying glacial clay. Scattered pockets and thin beds of sand, and more rarely gravel, occur interspersed in the clay from which small supplies of water can be obtained. Occasionally a well of this type will yield a fairly large supply. The water obtained from wells penetrating these sand and gravel pockets is generally hard and "alkaline", but not too highly mineralized to be used for drinking.

A few wells have been sunk to depths between 50 and 100 feet in the glacial drift, but do not show the presence of any extensive aquifers at these depths. The supplies being obtained from these wells are not large and in general it appears to be inadvisable to sink wells below a depth of 40 feet unless thorough prospecting at shallow depths indicates the absence of suitable supplies.

The marine shales of the Bearpaw formation underlie the glacial drift in this township, at depths of 50 to 100 feet. The impervious nature of the beds comprising this formation suggests that it will not yield adequate supplies of water suitable for any farm use. All search for water in the township should be confined to the overlying unconsolidated Recent and glacial deposits.

Township 14, Range 19

In the small area overlain by recent dune sand along the western border of the township, little difficulty is experienced in obtaining ample supplies of water for range stock from wells not exceeding 25 feet in depth, or from dugouts. The water obtained from the sand in this area is in a few places too highly mineralized to be used for drinking, but is always suitable for watering stock.

The surface material over the greater part of the township is till or moraine. It is generally possible to obtain small supplies of water from scattered sand and gravel pockets occurring in the glacial deposits within 40 feet of the surface. These pockets will be slightly more numerous in the more irregularly rolling moraine-covered area in the southern part of the township than in the till-covered northern sections. The water derived from the shallow wells is generally hard, although suitable for household use. The supplies from the shallow wells are seldom sufficient for more than 10 head of stock, and therefore, frequently inadequate for the local requirements.

Many residents have sunk wells down to depths between 50 and 120 feet in attempts to obtain more abundant supplies. Some of these wells are yielding fairly large supplies of water. Others, however, are scarcely more productive than the shallow wells. The water from the deeper wells is usually hard and contains greater quantities of mineral salts than the water from the shallower sources. The concentration of these salts is seldom high enough to render the water unfit for drinking. There is no indication of the presence of any extensive aquifers in the lower part of the glacial drift of the township and hence there can be no certainty of encountering water-bearing beds in wells sunk on any particular site.

The dark grey marine shales of the Bearpaw formation underlying the glacial drift throughout the entire area are almost entirely unproductive and it is inadvisable to continue wells below the drift into the bedrock. It is believed that these shales will be reached at depths between 150 and 200 feet at any point in the township. A well drilled to a depth of 430 feet on the SE.$\frac{1}{4}$, section 5, did not penetrate any water-bearing beds in the formation.

Township 14, Range 20

Practically all of the ground water used in this township is obtained from the lake and dune sands that mantle the entire township, with the exception of small areas in the northwest and southeast corners. The sand rarely extends down to depths of more than 25 feet except on the ridges of the dunes. Fairly large supplies of water are generally available in the sand at depths of 20 feet. Dugouts excavated from 5 to 10 feet in depth are commonly used to supply water for range stock. Except in the vicinity of "alkali" sloughs and flats occurring largely in the southern part of the township, the water obtained from the sand is soft or only moderately hard, and suitable for domestic use.

Scattered water-bearing sand and gravel pockets will undoubtedly occur in the glacial drift and glacial lake clays that underlie the sand. However, the supplies to be obtained from the glacial drift are in no way comparable with those available in the sand, and it is seldom necessary to sink wells into the underlying glacial clays.

It is not advisable to drill wells into the compact marine shales of the Bearpaw formation that underlie the glacial drift of this township at depths between 100 and 150 feet.

Township 14, Range 21

Almost the entire water supply of this township is being derived from wells less than 20 feet in depth. These wells are sunk into the Recent deposits of dune sand in the southern part of the township and into sand and gravel pockets in the moraine that covers a small area along the northern boundary.

In the dune sand area it is generally possible to obtain fairly large supplies of soft or only slightly hard water at depths not exceeding 15 feet, but near the northern boundary of the area overlain by the dune sand a few residents have experienced difficulty in obtaining suitable supplies from the sand. There are, however, very few localities where ample supplies are not available from this source. Deeper wells tapping sand or gravel in the underlying glacial drift satisfy stock water requirements in areas where the upper sands are only sparingly productive. The water from the sand is soft or only moderately hard, except in the vicinity of "alkali" sloughs and flats in which localities it may prove to be unsuitable for domestic use.

Scattered sand and gravel pockets will probably occur at depths less than 40 feet in the glacial drift underlying the sand, from which small supplies of hard mineralized water are to be expected. However, it is seldom necessary or advisable to sink wells into the glacial drift underlying the sand.

The supplies obtained from the sand and gravel pockets in the moraine in the northern part of this township are generally sufficient for local requirements. The water is in some places highly mineralized, but not unfit for domestic use.

There is little prospect of obtaining better supplies by sinking wells to greater depths in this township, as the water-bearing sand and gravel pockets in the lower part of the drift will probably be of small individual areal extent and the supplies obtainable will not be appreciably larger than those derived from the shallow wells.

The Bearpaw shales that underlie the glacial drift are exposed at the surface near the central part of this township. At other points the shale probably lies at depths of 50 to 100 feet below the surface. It is not advisable to continue drilling wells after these shales are reached, due to the generally unproductive nature of this formation.

Township 15, Range 19

Fairly large supplies of water may be expected from shallow wells sunk into the dune sands that cover a small area in the southern part of this township. This sand seldom extends to depths greater than 20 feet and will be found to be productive where the water is retained in the sand-filled depressions in the underlying, impervious boulder clay.

Throughout the remainder of the township, many residents derive their ground water supplies from wells less than 30 feet in depth penetrating sand and gravel pockets in the moraine. These water-bearing pockets are fairly numerous in the upper 30 feet of the boulder clay and can generally be located by sinking a few test holes. The supplies, however, vary considerably and in many cases do not meet local stock requirements. A few of these wells yield adequate supplies for 40 head of stock, but generally they will only provide for 10 to 20 head. The water is hard and, in a few places, is reported to be too highly mineralized to be used for drinking.

Many residents have sunk wells to depths between 50 and 110 feet to obtain sufficient supplies for stock near their farm buildings. Throughout a large area in the central part of the township fairly large supplies of water are being obtained from sand and gravel aquifers at these depths. This area is indicated by the "A" line on the accompanying map. More or less continuous aquifers occurring at elevations between 2,430 and 2,380 feet above sea-level are known to be present in this area. The water being obtained from these horizons is hard and generally contains appreciable quantities of dissolved mineral salts. In a few places the water cannot be used for drinking due to the high concentration of these salts.

In the northeastern part of the township, outside the "A" line, many dry holes have been sunk to depths between 100 and 200 feet, indicating that no extensive water-bearing beds occur in the lower part of the glacial drift in this area.

It is inadvisable to continue drilling after the marine shales of the Bearpaw formation are reached. In a 202-foot well on the SE.$\frac{1}{4}$, section 28, the bedrock was reported to have been struck at a depth of 167 feet. It is probable that the marine shales will be reached at depths between 150 and 200 feet throughout the entire township. As in other townships, drilling into this formation will probably not yield an adequate water supply.

Township 15, Range 20

Many water-bearing sand and gravel pockets are scattered through the upper 30 feet of the moraine that mantles practically the entire township. A few residents have obtained fairly large supplies of water from shallow wells that have succeeded in tapping these pockets. In general, however, the supplies available from the shallow wells will provide only

enough water for a few head of stock and for domestic requirements. The water is usually hard, but suitable for household use.

Within the area bounded by the "A" line on the accompanying map, fairly large supplies of water are being obtained from sand and gravel beds encountered in the boulder clay at depths between 50 and 110 feet. Information collected seems to indicate that extensive water-bearing beds exist in this area at elevations between 2,430 and 2,380 feet above sea-level. The water being obtained from these horizons is hard and often highly mineralized. However, the water can generally be used for drinking.

A 115-foot dry hole on the SW.$\frac{1}{4}$, section 36, indicates that the horizon is not continuous in the northeastern corner of the township. A 70-foot well on the NE.$\frac{1}{4}$, section 31, yields a fairly large supply of hard water from a sand aquifer. No other wells have been sunk into the lower part of the glacial drift in the western part of the township and it is not known whether any of the extensive water-bearing beds present in the eastern parts extend farther west.

It is not advisable to sink wells into the marine shales of the Bearpaw formation, which are believed to underlie the glacial drift at depths probably nowhere exceeding 150 feet from the surface throughout the township.

Township 15, Range 21

Moraine covers the entire township. Practically all of the ground water used in the area is obtained from shallow wells tapping sand and gravel pockets in the upper porous zone of the moraine deposits. Only in a few places has difficulty been experienced in obtaining sufficient water for local requirements

from the shallow wells, although in some cases it is necessary to use two or more wells to ensure an adequate supply. The quality of the water varies considerably, but rarely contains sufficient amounts of mineral salts in solution to render it unfit for drinking.

The few holes that have been sunk to depths between 40 and 100 feet in this township have encountered water-bearing sand and gravel beds in the glacial drift. These wells do not indicate the presence of any extensive water-bearing beds at these depths, but it is probable that numerous small beds and pockets exist in the lower part of the glacial drift, at depths less than 100 feet, from which water supplies are generally obtainable.

The marine shales of the Bearpaw formation are believed to underlie the glacial drift of this township at depths nowhere exceeding 150 feet from the surface. Although no wells have penetrated the shales in this area the poor quality of the small supplies of water obtained from this formation in other townships of the municipality suggests that it is advisable to confine the prospecting for ground water to the glacial deposits.

STATISTICAL SUMMARY OF WELL INFORMATION IN RURAL MUNICIPALITY OF GULL LAKE, NO.139, SASKATCHEWAN

Township	13	13	13	14	14	14	15	15	15	Total No. in municipality
West of 3rd meridian Range	19	20	21	19	20	21	19	20	21	
Total No. of Wells in Township	75	73	53	100	25	38	78	45	58	545
No. of wells in bedrock	2	1	0	1	0	0	0	0	0	4
No. of wells in glacial drift	70	71	51	95	11	31	78	45	58	510
No. of wells in alluvium	3	1	2	4	14	7	0	0	0	31
Permanency of Water Supply										
No. with permanent supply	69	56	51	84	25	28	63	39	47	462
No. with intermittent supply	1	0	0	1	0	1	1	1	0	5
No. dry holes	5	17	2	15	0	9	14	5	11	78
Types of Wells										
No. of flowing artesian wells	0	0	0	0	0	0	0	0	0	0
No. of non-flowing artesian wells	20	7	0	14	4	0	19	13	1	78
No. of non-artesian wells	50	49	51	71	21	29	45	27	46	389
Quality of Water										
No. with hard water	59	36	40	71	18	22	61	30	31	368
No. with soft water	11	20	11	14	7	7	3	10	16	99
No. with salty water	0	0	0	0	0	1	0	0	0	1
No. with "alkaline" water	22	6	15	20	8	13	11	7	11	113
Depths of Wells										
No. from 0 to 50 feet deep	49	59	48	82	25	37	53	29	48	430
No. from 51 to 100 feet deep	18	10	5	14	0	1	14	14	10	86
No. from 101 to 150 feet deep	6	3	0	3	0	0	9	2	0	23
No. from 151 to 200 feet deep	0	0	0	0	0	0	1	0	0	1
No. from 201 to 500 feet deep	1	0	0	1	0	0	1	0	0	3
No. from 501 to 1,000 feet deep	1	1	0	0	0	0	0	0	0	2
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	49	52	46	60	19	17	51	29	34	357
No.not usable for domestic purposes	21	4	5	25	6	12	13	11	13	110
No. usable for stock	57	52	48	77	24	27	62	40	46	433
No. not usable for stock	13	4	3	8	1	2	2	0	1	34
Sufficiency of Water Supply										
No. sufficient for domestic needs	69	56	51	84	25	28	62	39	47	461
No.insufficient for domestic needs	1	0	0	1	0	1	2	1	0	6
No. sufficient for stock needs	43	43	33	55	23	18	42	29	42	328
No. insufficient for stock needs	27	13	18	30	2	11	22	11	5	139

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 Gull Lake, No. 139, Saskatchewan

LOCATION						Depth of Well, Ft.	Total dis'vd solids	HARDNESS			CONSTITUENTS AS ANALYSED						CONSTITUENTS AS CALCULATED IN ASSUMED COMBINATIONS								Source of Water
No.	qtr.	Sec.	Tp.	Rge.	Mer.			Total	Perm.	Temp.	Cl.	Alka-linity	CaO	MgO	SO_4	Na_2O	Solids	$CaCO_3$	$CaSO_4$	$MgCO_3$	$MgSO_4$	Na_2CO_3	Na_2SO_4	NaCl	CaCl	
1	SE.	3	13	20	3	12	520	450	300	150	18	275	40	72	144	124	490	72		150		25	213	30		×1
2	NE.	14	13	19	3	26	900																			×1
3	SE.	23	13	19	3	90	1,266												(1)		(2)		(3)		(4)	×1
4	NE.	32	13	19	3	102	1,060	850	550	300	39	745	90	169	197	263	1,044	161		353		174	292	64		×1
5	NW.	17	13	20	3	73	860	700	150	550	16	590	180	104	185	139	850	322		217		11	274	26		×1
6	NE.	26	13	20	3	62	380	300	100	200	6	305	110	29	33	48	354	197		61		37	49	10		×1
7	NW.	34	14	21	3	30	5,563																			×1
8	NE.	31	15	19	3	100	1,651												(2)		(3)	(4)	(1)	(5)		×1

Water samples indicated thus, ×1, are from glacial drift or other unconsolidated deposits.
Analyses are reported in parts per million; where numbers (1), (2), (3), (4), and (5) are used instead of parts per million, they represent the relative amounts in which the five main constituents are present in the water.
Hardness is the soap hardness expressed as calcium carbonate ($CaCO_3$).
Analyses Nos. 2, 3, 7, and 8, by Provincial Analyst, Regina.
For interpretation of this table read the section on Analyses and Quality of Water.

Water from the Unconsolidated Deposits

No samples of ground water derived from the Recent dune sands were taken for analysis by the Geological Survey. The first analysis recorded on the accompanying table is of water from a 12-foot well deriving its supply from glacial lake sands on sec. 3, tp. 13, range 20. Since the water conditions from both the Recent dune sands and the glacial lake sands are practically similar it is considered that this analysis is fairly representative of the type of water to be expected in both. This water is only moderately hard compared with many waters from the glacial drift, the hardness being 450 parts per million, of which 300 parts are permanent. Sodium sulphate (Glauber's salt) is present as 213 parts per million, representing nearly one-half of the calculated total solids. Such a concentration would have no injurious effects and would not give any appreciable taste to the water. Of the other salts present $CaCO_3$ and $MgCO_3$ contribute to the hardness. The NaCl (common salt) is not present in sufficient concentration to cause a salty taste. Many of the waters from these shallow sand beds may be even softer and rarely has the mineral salt concentration been sufficiently high to give the water a distinctly "alkaline" taste. Such waters if uncontaminated by surface pollution are well suited to domestic use. If, however, wells are sunk into these deposits in the vicinity of "alkaline" sloughs and flats the water from the wells is correspondingly highly charged with sulphate salts and may be unfit for drinking.

The character of the glacial deposits encountered within 40 feet of the surface varies considerably within small areas. Similar variations occur in the quality of water even from shallow wells sunk to the same depth only a short distance apart. The boulder clay is generally regarded as being the source of

the contaminating sulphate salts present in varying amounts in waters from the drift. Hence beds of sandsand gravels not covered by any appreciable thickness of boulder clay yield water that is soft or only moderately hard, whereas waters from porous beds under 30 feet or more of boulder clay are hard and "alkaline". Water from sand beds under the lake clays is not generally highly mineralized as indicated by analysis No. 2, on the accompanying table. The water has a total solid content of 900 parts per million which is not excessive. Analysis No. 7 is of water from the moraine in the northern part of the municipality. This water has a very high total solid content of 5,563 parts per million and is unfit for either domestic or stock use. This water comes largely from boulder clay. Another shallow well dug only a short distance from this well, however, yields a supply of good quality water. In general, the water from the sand and gravel pockets in the moraine deposits is of good quality for domestic use and supplies from shallow wells in till plain is of similar quality.

The water from wells 50 to 150 feet deep, drawing supplies from sand and gravel beds in the lower part of the glacial drift, is generally more highly mineralized than the water from the shallow wells. Analyses Nos. 3, 4, 5, 6, and 8 are of water from wells drawing their supplies from sand and gravel beds at these lower horizons in the glacial drift. The total dissolved solids present in these waters vary from 380 to 1,651 parts per million. These waters are very hard, but the sulphate salts are not present in sufficient quantities to render the water unfit for domestic use. Many wells throughout the municipality yield water that is very highly mineralized and unfit for domestic use. In a few cases the

water cannot be used for stock. In parts of township 13, range 19, it is difficult to obtain supplies of drinkable water from either shallow or deep wells.

Water from the Bedrock

Since no water is being obtained from the Bearpaw formation in this municipality no samples were available for analysis. Several analyses have been made of waters from this source in adjoining areas and all indicate that the part of the formation that is represented in this area yields a water of very poor quality. Sulphate salts and common salt are present in large amounts. The total solid content of the water usually exceeds 2,000 parts per million and may exceed 5,000 or 6,000 parts per million. Such water is unfit for household use and may cause scour in stock.

WELL RECORDS—Rural Municipality of GULL LAKE, NO. 139, 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	S½	1	13	19	3	Dug	10	2,700	- 7	2,693	7	2,693	Glacial gravel	Hard		D, S	Sufficient for 7 persons and 14 horses.
2	SW.	1	"	"	"	Dug	20	2,700	- 14	2,686	14	2,686	Glacial sandy clay	Hard, clear, "alkaline"		D, S	Insufficient for local needs. Other wells 10 feet deep; too "alkaline" to use.
3	SE.	2	"	"	"	Dug	34	2,700	- 12	2,688	34	2,666	Glacial fine sand	Hard, clear, "alkaline"		S	Sufficient for local needs. Two other wells dug; give poor supply.
4	SW.	3	"	"	"	Dug	24	2,675	- 8	2,667			Glacial clay and gravel	Soft, clear		D, S	Only good drinking water in neighbourhood.
5	SE.	4	"	"	"	Bored	34	2,675	- 38	2,637	64	2,611	Glacial sand	"Alkaline"		N	Not used; another similar well; a well near a dam supplies some water for stock.
6	SW.	4	"	"	"	Dug	65	2,680	- 60	2,620	65	2,615	Glacial sand	Hard, clear, iron		D, S	Sufficient for 20 head stock.
7	NW.	5	"	"	"	Dug	18	2,580	- 11	2,569	11	2,569	Glacial clay	Hard, clear, "alkaline"		D	Sufficient for household needs. Another well 17 feet deep sufficient for 30 head stock.
8	SW.	6	"	"	"	Dug	14	2,590	- 2	2,588	2	2,588	Glacial clay	Soft, iron		D, S	Sufficient for 100 head stock.
9	NE.	6	"	"	"	Dug	18	2,500	- 13	2,487	13	2,487	Glacial brown clay	Hard, "alkaline"		N	Sufficient for 12 head stock.
10	SW.	7	"	"	"	Dug	15	2,600	- 9	2,591	9	2,591	Recent sand	Soft		D, S	Sufficient for 100 head stock in wet years.
11	NE.	7	"	"	"	Dug	20	2,610	- 14	2,596	20	2,590	Glacial yellow clay	Hard, clear, iron		D, S	Intermittent supply. Another similar well 14 feet deep.
12	SE.	9	"	"	"	Dug	60	2,580	- 40	2,540	60	2,520	Glacial sand	Hard, clear, iron		D, S, I	Sufficient for 25 to 30 head stock. Another well too mineralized to use. Another well 35 feet deep plugged with sand.
13	NE.	10	"	"	"	Bored	40	2,570	- 10	2,560	40	2,530	Glacial gravel	Hard, clear, iron		D, S	Sufficient for local needs; another well in creek bottom gives poor water.
14	NW.	12	"	"	"	Dug	50	2,650	- 45	2,605	45	2,605	Glacial clay and sand	Hard, iron		D, S	Sufficient for 15 persons and 90 head stock.
15	S½	13	"	"	"	Dug	72	2,650	- 40	2,610	72	2,578	Glacial drift	Hard		D, S	Sufficient for 8 persons and 167 head stock. Also drilled to a depth of 400 feet for soft water but did not obtain any.
16	NE.	14	"	"	"	Dug	25	2,615	- 20	2,595	20	2,595	Glacial sandy clay	Hard, clear, iron		D, S, I	Twenty barrels a day. Another well 68 feet deep unfit for consumption. #.
17	SE.	16	"	"	"	Drilled	120	2,620	- 50	2,570	120	2,500	Glacial sand	Hard, clear, iron, "alkaline"		D, S	Sufficient for local needs.
18	NE.	18	"	"	"	Dug	20	2,000	- 17	1,983	17	1,983	Recent sandy loam	Soft		D	Sufficient for 4 persons.
19	NW.	18	"	"	"	Dug	14	2,600	- 10	2,590	10	2,590	Glacial drift	Soft, clear	44	D, S	Sufficient for local needs.
20	SE.	19	"	"	"	Dug	14	2,600	- 7	2,593	14	2,586	Glacial gravel	Hard, clear		D, S	Sufficient for local needs. Also a dry hole.
21	NW.	19	"	"	"	Bored	120	2,600	- 80	2,520	120	2,480	Glacial drift	Hard, clear, iron, "alkaline"	44	D, S	Insufficient for 500 head sheep; 4 other wells 120, 100, 60 and 50 feet deep.
22	NW.	20	"	"	"	Dug	14	2,600					Recent sand	Hard, clear	44	D, S	Sufficient for local needs.
23	SE.	21	"	"	"	Dug	40	2,620	- 36	2,584	36	2,584	Glacial sand	Soft, clear		D, S	Insufficient for local needs.
24	NW.	22	"	"	"	Dug	65	2,620	- 53	2,567	53	2,567	Glacial sand	Hard, clear, "alkaline"		N	Has not been used for 8 years. Another similar well 15 feet deep.
25	NW.	22	"	"	"	Dug	21	2,600	- 11	2,589	11	2,589	Glacial sand	Hard, "alkaline"		S	Sufficient for local needs. Also a spring on this farm.

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

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
26	SE.	23	13	19	3	Dug	90	2,630	- 63	2,567	84	2,546	Glacial sand	Hard, clear		D	Sufficient for local needs; #.
27	SE.	23	"	"	"	Bored	75	2,605	- 60	2,545			Glacial drift	Hard, clear, iron		I	Sufficient for local needs.
28	SE.	23	"	"	"	Drilled	90	2,600	- 75	2,525	75	2,525	Glacial clay	Hard, iron		S	Sufficient for stock needs.
29	NE.	23	"	"	"	Dug	9	2,560	- 7	2,553			Glacial drift			N	Not used.
30	SW.	24	"	"	"	Dug	74	2,625					Glacial drift	Hard	45	D, S	Sufficient for local needs.
31	NW.	24	"	"	"	Drilled	150	2,620	- 50	2,570	150	2,470	Glacial sand	Soft	45	D, S	Sufficient for local needs; water sold to residents of Gull Lake. Another well 600 feet deep flowed for a few days, then went dry.
32	NW.	25	"	"	"	Dug	24	2,590	- 18	2,572	18	2,572	Glacial sand and clay	Hard, clear, "alkaline"		D, S	At present sufficient for local needs.
33	NW.	26	"	"	"	Dug	28	2,620	- 22	2,598	22	2,598	Glacial clay and sand	Hard, clear	44	D, S	Insufficient for local needs.
34	SE.	29	"	"	"	Dug	11	2,600	- 7	2,593	10	2,590	Glacial sand	Hard, cloudy	44	D, S	Insufficient for local needs.
35	NW.	29	"	"	"	Dug	22	2,620	- 8	2,612	8	2,612	Glacial sand	Soft, clear		D, S	Insufficient for local needs.
36	NE.	30	"	"	"	Bored	80	2,640	- 34	2,606	80	2,560	Glacial sand	Hard, iron, cloudy	44	D, S	Insufficient; bought water for stock last winter.
37	SE.	31	"	"	"	Bored	56	2,640	- 41	2,599	41	2,599	Glacial clay and gravel	Soft, clear	44	D, S	Insufficient for local needs.
38	SW.	31	"	"	"	Dug	20	2,610	- 8	2,602	20	2,590	Glacial sand	Hard, clear	44	D, S	Sufficient; supplies neighbours; another well 14 feet deep, 2 feet of water.
39	NE.	32	"	"	"	Dug	102	2,620	- 35	2,585	90	2,530	Glacial clay and gravel	Hard, iron, cloudy	46	D, S	Sufficient for local needs; #.
40	SW.	32	"	"	"	Bored	50	2,640	- 20	2,620	50	2,590	Glacial clay and gravel	Hard, clear	44	D, S	Sufficient; supplies neighbours.
41	SE.	33	"	"	"	Dug	32	2,600	- 19	2,581	32	2,568	Glacial gravel	Hard, clear	44	D, S	Sufficient, but not used much. Another well 140 feet deep.
42	NW.	33	"	"	"	Dug	26	2,640					Glacial drift			S	Sufficient for local needs.
43	SE.	34	"	"	"	Dug	54	2,630	- 50	2,580	54	2,576	Glacial drift	Hard, clear		D	Sufficient for local needs; also a 50-foot dry hole.
44	NW.	34	"	"	"	Dug	18	2,620	- 14	2,606	14	2,606	Glacial sand	Hard, clear	44	D, S	Insufficient for local needs.
45	NW.	35	"	"	"	Dug	36	2,650	- 29	2,621	36	2,614	Glacial coarse sand	Hard, clear	44	D, S	Sufficient for local needs; also a dry hole.
46	SW.	35	"	"	"	Dug	18	2,630	- 14	2,616			Glacial clay and sand	Hard, clear	45	D, S	Well just being completed; old well 20 feet deep had insufficient supply.
47	SW.	36	"	"	"	Dug	20	2,600	- 13	2,587	20	2,580	Glacial sand	Hard, clear, "alkaline"	44	D, S	Sufficient for local needs.
48	SE.	36	"	"	"	Dug	18	2,610					Glacial drift	Soft, clear	44	D, S	Sufficient for local needs.
49	NW.	36	"	"	"	Bored	31	2,600	- 15	2,585			Glacial sand	Hard, clear	44	D, S	Sufficient for local needs; similar well filled in when cribbing became rotten.
1	NW.	2	13	20	3	Dug	32	2,650	- 24	2,626	24	2,626	Glacial sand	Soft, clear	44	D, S	Sufficient for local needs; another well 10 feet deep.
2	SE.	3	"	"	"	Dug	12	2,630	- 10	2,620	10	2,620	Glacial sand	Soft, clear	44	D, S	Sufficient for local needs; another well filled in due to rotten cribbing. #

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 GULL LAKE, NO. 139, 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.	3	13	20	3	Dug	32	2,650	- 24	2,626	26	2,624	Glacial sand	Soft, clear	44	D, S	Insufficient for local needs.
4	S½.	4	13	20	3	Dug	28	2,550	- 21	2,529	26	2,524	Glacial sand	Hard		D, S	Sufficient for 3 persons and 13 head stock.
5	NE.	5	"	"	"	Dug	18	2,650	- 16	2,634	16	2,634	Glacial sand	Hard, clear	44	D, S	Sufficient for local needs. Another well filled in due to rotten cribbing.
6	SW.	6	"	"	"	Dug	25	2,640	- 23	2,617	23	2,617	Glacial sand	Soft, clear	44	D, S	Sufficient for local needs; 4 other similar wells.
7	NW.	6	"	"	"	Dug	24	2,640	- 21	2,619	21	2,619	Glacial sand	Soft, clear	44	D, S	Sufficient for local needs. 3 other similar wells filled in due to rotten cribbing.
8	SE.	6	"	"	"	Dug	24	2,620	- 22	2,598	22	2,598	Glacial sand	Hard, clear, "alkaline"	44	D, S	Sufficient for local needs.
9	NE.	7	"	"	"	Drilled	22	2,700	- 20	2,680	20	2,680	Glacial drift	Hard, muddy		N	Insufficient; supply is very small.
10	SW.	10	"	"	"	Dug	15	2,630	- 12	2,618	12	2,618	Glacial sand	Hard, clear		D, S	Sufficient for local needs.
11	SW.	13	"	"	"	Dug	10	2,650	- 5	2,645	5	2,645	Glacial clay	Soft		D	Sufficient for 2 persons. No stock.
12	SE.	13	"	"	"	Dug	20	2,600	- 16	2,584	20	2,580	Recent sand	Hard, clear	44	D, S	Sufficient for local needs.
13	SW.	14	"	"	"	Dug	20	2,620	- 15	2,605	15	2,605	Glacial sandy clay	Soft, clear	44	D, S	Sufficient for local needs.
14	SW.	17	"	"	"	Dug	23	[illegible]	- 12	2,688	17	2,683	Glacial drift	Hard, clear		D, S	Sufficient for 125 head stock. [illegible] 2 other wells 34 feet and 35 feet deep.
15	NW.	17	"	"	"	Bored	73	2,700	- 47	2,653	73	2,627	Glacial coarse gravel	Hard, cloudy, iron	43	D, S	Sufficient for local needs. Several shallow wells were dug, but supply insufficient; #.
16	SW.	18	"	"	"	Dug	26	2,675	- 20	2,655	20	2,655	Glacial drift	Hard, clear	44	D, S	Sufficient for local needs. 4 other similar wells.
17	NW.	18	"	"	"	Dug	14	2,650	- 11	2,639	12	2,638	Glacial sand	Soft, clear		D, S	Sufficient for 5 head stock. Another similar well and a 34-foot dry hole.
18	NE.	18	"	"	"	Bored	69	2,700	- 44	2,656	69	2,631	Glacial gravel	Iron, clear	43	D, S	Sufficient for local needs;also a 100-foot dry hole.
19	SW.	19	"	"	"	Bored	55	2,650	- 30	2,620	55	2,585	Glacial gravel	Hard, clear		D, S	Well filled in now.
20	NE.	20	"	"	"	Dug	127	2,730	-102	2,628	102	2,628	Glacial soft yellow clay	Hard, clear, iron	43	D, S	Insufficient; enough for about 20 head stock.
21	SW.	21	"	"	"	Dug	22	2,650	- 17	2,633			Glacial clay	Soft, clear		D, S	
22	NE.	21	"	"	"	Dug	15	2,600	- 13	2,587	13	2,587	Glacial sandy clay	Soft, clear	44	D, S	Sufficient for 8 head stock.
23	NW.	22	"	"	"	Dug	25	2,610	- 15	2,595	22	2,588	Glacial black sand	Soft, clear	44	D, S	Sufficient for 12 head stock. Another similar well.
24	SW.	23	"	"	"	Dug	22	2,600	- 12	2,588	12	2,588	Glacial sand	Hard, clear	44	D, S	Sufficient for local needs and neighbours stock.
25	NE.	23	"	"	"	Dug	27	2,640	- 19	2,621	27	2,613	Glacial yellow clay	Hard, clear		D, S	Sufficient for local needs.
26	NE.	24	"	"	"	Dug	22	2,600	- 17	2,583	17	2,583	Glacial clay	Hard, clear	44	D, S	Three wells on this quarter supply sufficient water.
27	SE.	25	"	"	"	Bored	125	2,600									2 dry holes; glacial at base.
28	NE.	26	"	"	"	Dug	62	2,630	- 59	2,571	59	2,571	Glacial drift	Hard, clear	44	D, S	Sufficient for 10 head stock. Another similar well. #.
29	SW.	27	"	"	"	Dug	123	2,625	- 53	2,572	100	2,525	Glacial drift; Bearpaw at base	Hard, clear		D, S	Sufficient for local needs. Another well 12 feet deep.
30	SE.	27	"	"	"	Dug	23	2,610	- 18	2,592	22	2,588	Glacial sand	Soft, clear	44	D, S	Insufficient; used by neighbours. Another well 8 feet deep.

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 GULL LAKE, NO. 139, SASKATCHEWAN.

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
31	SE.	28	13	20	3	Dug	23	2,540	- 12	2,528	12	2,528	Glacial sand	Soft, clear		D, S	Insufficient; used by neighbours. Seven dry holes from 14 to 100 feet deep.
32	NW.	29	"	"	"	Dug	25	2,580	- 17	2,563	20	2,560	Glacial gravel	Hard, clear	44	D, S	Not used except for drinking and small amount of stock.
33	SW.	31	"	"	"	Dug	22	2,750	- 8	2,742	18	2,732	Glacial coarse sand	Soft, clear	44	D, S	Sufficient for only 30 head stock.
34	SE.	31	"	"	"		22	2,700									Dry hole; glacial to base.
35	NE.	32	"	"	"	Drilled	565	2,550									Dry hole; Bearpaw at base. Wells to a depth of 40 feet give mineralized water.
36	SE.	33	"	"	"	Dug	22	2,540	- 18	2,522	18	2,522	Glacial sand and clay	Hard, clear		D, S	Sufficient for 10 head stock.
37	SE.	34	"	"	"	Dug	25	2,600	- 13	2,587	21	2,579	Glacial sand	Hard, clear	44	D, S	Sufficient for local needs. A dry hole 40 feet deep. Other wells give mineralized water.
38	NW.	34	"	"	"	Dug	24	2,550	- 12	2,538	12	2,538	Glacial yellow clay	Hard, clear, iron, "alkaline"	44	D, S	Insufficient for 4 head stock in 1934.
39	NW.	35	"	"	"	Dug	60	2,600	- 46	2,554	58	2,542	Glacial light clay	Hard, clear, iron	43	D, S	Sufficient for 60 head stock.
40	NE.	35	"	"	"	Dug	17	2,580	- 4	2,576	8	2,572	Glacial sandy clay	Hard, clear, "alkaline"	44	D, S	Sufficient for 8 to 10 head stock.
1	SW.	1	13	21	3	Dug	20	2,630	- 17	2,613	17	2,613	Glacial yellow clay	Hard, clear	42	D, S	Sufficient for local needs. Also a dry hole 35 feet deep.
2	SW.	2	"	"	"	Dug	37	2,660	- 30	2,630	30	2,630	Glacial sand and clay	Hard, clear, iron	43	D, S	Insufficient for local needs.
3	NW.	2	"	"	"	Dug	35	2,650	- 29	2,621	29	2,621	Glacial sandy clay	Hard, clear	43	D, S	Owner now in Vancouver. Well not used.
4	NW.	2	"	"	"	Dug	24	2,610	- 10	2,600	10	2,600	Glacial sand	Hard, clear, iron, "alkaline"	43	D, S	Sufficient for local needs.
5	SW.	3	"	"	"	Dug	53	2,650	- 48	2,602	48	2,602	Glacial clay	Hard, clear	46	I	Sufficient for cemetery flower gardens.
6	NW.	3	"	"	"	Dug	18	2,650	- 16	2,634	16	2,634	Glacial sand	Soft, clear	44	D	Can be pumped dry; water returns slowly.
7	NW.	3	"	"	"	Dug	47	2,660	- 35	2,625	35	2,625	Glacial sandy clay	Soft, clear	42	D	Suffient; can be pumped dry but returns quickly.
8	NE.	3	"	"	"	Dug	32	2,650	- 24	2,626	24	2,626	Glacial sand	Soft, clear	44	D, S	Sufficient for local needs.
9	SW.	4	"	"	"	Dug	96	2,600	- 93	2,507	93	2,507	Glacial; Bearpaw shale at base	Hard, cloudy, iron	47	D, S	Sufficient for local needs.
10	NE.	4	"	"	"	Dug	71	2,650	- 68	2,582	68	2,582	Glacial sand	Hard	46	D, S	Barely sufficient for local needs.
11	NE.	7	"	"	"	Dug	14	2,550	- 6	2,544	6	2,544	Glacial sand	Hard, clear, iron	48	D, S	Sufficient for local needs.
12	NW.	9	"	"	"	Dug	17	2,650	- 15	2,635	15	2,635	Glacial gravel	Hard, clear, iron	48	D, S	Sufficient for local needs.
13	SE.	10	"	"	"	Dug	19	2,640	- 17	2,623	17	2,623	Glacial sand	Hard, clear, "alkaline"	43	D	Sufficient for local needs.
14	SW.	10	"	"	"			2,630					Glacial sand	Hard, milky white, "alkaline"	44	N	53 wells have been sunk to depths from 15 feet to 80 feet, and none fit for use.
15	SW.	10	"	"	"	Dug	17	2,640	- 12	2,628	12	2,628	Glacial sandy clay	Hard, clear	44	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 GULL LAKE, NO. 139, 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	SW.	10	13	21	3	Bored	17	2,640	- 15	2,625	15	2,625	Glacial sand	Hard, clear	42	D, S	
17	SW.	10	"	"	"	Bored	5	2,630	- 4	2,626	4	2,626	Glacial sand	Soft, clear	43	D, S	Sufficient for local needs.
18	SE.	12	"	"	"	Dug	9	2,650	- 6	2,644	6	2,644	Glacial sand	Soft, iron, rusty	46	D, S	Other wells 15 feet deep; abandoned due to quicksand.
19	NE.	12	"	"	"	Dug	52	2,690	- 49	2,641	49	2,641	Glacial sand	Hard, clear	44	D, S	Insufficient for local needs. Another similar well.
20	SW.	13	"	"	"	Dug	13	2,630	- 6	2,624	6	2,624	Glacial sand	Soft, clear	46	D, S	Sufficient for local needs.
21	SW.	13	"	"	"	Dug	27	2,650	- 22	2,628	22	2,628	Glacial sand	Hard, clear	42	D, S	Sufficient for local needs.
22	SW.	14	"	"	"	Dug	11	2,530	- 8	2,522	8	2,522	Glacial sandy clay	Soft, clear	43	D, S	Sufficient for local needs. About 10 other wells not used due to "alkaline" water.
23	NE.	14	"	"	"	Dug	12	2,550	- 5	2,545	5	2,545	Glacial sand	Hard, clear, "alkaline"		D, S	Sufficient; 3 other similar wells.
24	SE.	16	"	"	"	Dug	13	2,550	- 12	2,538	12	2,538	Glacial sand	Hard, clear, "alkaline"	56	D, S	Barely sufficient; 2 other similar wells.
25	NW.	16	"	"	"	Dug	20	2,550	- 10	2,540	10	2,540	Glacial sand	Hard, clear, "alkaline"	43	D,S	Insufficient; 3 other similar wells.
26	NE.	16	"	"	"	Bored	18	2,560	- 13	2,547	13	2,547	Glacial sand	Hard, clear, "alkaline"	45	D	Sufficient; 2 other similar wells.
27	NW.	20	"	"	"	Dug	7	2,520	- 4	2,516	4	2,516	Glacial sand	Hard, irom, cloudy	52	S	Sufficient for local needs.
28	NW.	20	"	"	"	Dug	30	2,560	- 27	2,533	27	2,533	Glacial sandy clay	Hard, clear	48	D, S	Sufficient for local needs.
29	NE.	20	"	"	"	Dug	14	2,550	- 10	2,540	10	2,540	Glacial sandy clay	Soft, clear	42	D, S	Sufficient for local needs.
30	SW.	23	"	"	"	Bored	27	2,550	- 20	2,530	20	2,530	Glacial yellow clay	Hard, clear, "alkaline"	44	D, S	Insufficient for local needs.
31	SE.	24	"	"	"	Dug	22	2,650	- 19	2,631	19	2,631	Glacial sand	Soft, clear	42	D, S	Sufficient; also a 100-foot dry hole.
32	SW.	24	"	"	"	Dug	20	2,550	- 15	2,535	15	2,535	Glacial sand	Hard, clear	44	D, S	
33	SE.	27	"	"	"	Dug	26	2,560	- 19	2,541	19	2,541	Glacial sand	Hard, clear	43	D, S	Insufficient for local needs.
34	SW.	27	"	"	"	Dug	14	2,560	- 13	2,547	13	2,547	Glacial sand	Hard, clear	43	D, S	Sufficient for local needs.
35	SW.	27	"	"	"	Dug	18	2,560	- 15	2,545	15	2,545	Glacial clay	Hard, clear	43	D, S	Sufficient. Another well condemned.
36	SW.	28	"	"	"	Dug	15	2,550	- 10	2,540	10	2,540	Glacial clay	Hard, clear	42	D, S	Sufficient for local needs.
37	NW.	28	"	"	"	Dug	6	2,550	- 0	2,550	0	2,550	Glacial sandy clay	Soft, clear	44	D, S	Sufficient for local needs.
38	SE.	30	"	"	"	Dug	3	2,560	- 0	2,560	0	2,560	Recent sand	Soft, clear	48	D, S	Sufficient for local needs.
39	NW.	31	"	"	"	Dug	8	2,600	- 0	2,600	0	2,600	Recent sand	Hard, clear	46	S	Sufficient for local needs.
1	SW.	1	14	19	3	Dug	25	2,610	- 18	2,592	25	2,585	Glacial fine sand	Hard, clear		D, S	Sufficient for 10 head stock. Another similar well.
2	NW.	1	"	"	"	Bored	70	2,620					Glacial blue clay	Hard, clear, iron		D, S	Insufficient; 2 other similar wells 45 feet and 35 feet deep.
3	NE.	1	"	"	"	Dug	27	2,600	- 22	2,578			Glacial drift	Hard, cloudy		N	Not used. Another well 16 feet deep has 3½ feet of water.

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

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

WELL RECORDS—Rural Municipality of GULL LAKE, NO. 139, SASKATCHEWAN.

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE: Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED: Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
4	NE.	2	14	19	3	Dug	96	2,650	- 77	2,573			Glacial drift	Soft, clear		D, S	Insufficient for local needs.
5	NE.	3	"	"	"	Dug	50	2,610	- 40	2,570	50	2,560	Glacial sand	Soft, clear		D, S	Insufficient for 40 head stock. Another similar well 35 feet deep.
6	NW.	4	"	"	"	Bored	46	2,650	- 37	2,613	37	2,613	Glacial fine sand	Hard		D, S	Sufficient for 8 head stock by using another similar well.
7	SW.	4	"	"	"	Dug	30	2,600	- 26	2,574	26	2,574	Glacial sandy clay	Hard, clear	44	D, S	Not used at present.
8	NW.	5	"	"	"	Dug	100	2,660	- 68	2,592	100	2,560	Glacial sand seams	Greenish, "alkaline"		D, S	Intermittent supply.
9	SE.	5	"	"	"	Dug	105	2,650	- 30	2,620	100	2,550	Glacial sand seams	Hard, clear	44	D, S	Sufficient; a 115-foot well caved in. A 30-foot well supplies drinking water. Also a 430-foot dry hole.
10	SW.	6	14	19	3	Dug	32	2,630	- 10	2,620	24	2,606	Glacial sand	Clear, "alkaline"		D, S	Insufficient in 1934.
11	NW.	6	"	"	"	Dug	12	2,620	- 8	2,612	10	2,610	Glacial sand seams	Clear, "alkaline"		D, S	Sufficient for 20 head stock.
12	SE.	6	"	"	"	Dug	28	2,600	- 22	2,578	26	2,574	Glacial sand	Hard, clear, "alkaline"	45	D, S	Sufficient for 11 head stock. Another well 20 feet deep.
13	SW.	7	"	"	"	Dug	29	2,600	- 15	2,585			Glacial sand	Hard, clear, "alkaline"	44	D, S	Sufficient supply. Also a 120-foot well not fit for use. Also a 20-foot well used for stock.
14	NE.	8	"	"	"	Dug	64	2,630	- 54	2,576	54	2,576	Glacial gravel	Hard, clear	44	D, S	Insufficient. Another well 35-feet deep has 2 feet of water in it. Hauls water.
15	NW.	9	"	"	"	Bored	60	2,600	- 52	2,548	52	2,548	Glacial sandy clay			N	Has not been used for 10 years.
16	NE.	10	"	"	"	Bored	33	2,600	- 29	2,571			Glacial clay	Hard, cloudy		S	Sufficient for 6 horses.
17	NW.	10	"	"	"	Dug	30	2,600	- 10	2,590	18	2,582	Glacial gravel	Hard, clear, odour	44	D, S	Sufficient. Another well 60 feet deep unfit for use.
18	NW.	11	"	"	"	Dug	28	2,630	- 23	2,607			Glacial sand clay	Soft, clear		S	Sufficient for 20 head stock.
19	NE.	11	"	"	"	Dug	45	2,640									Several dry holes from 30 to 45 feet deep in glacial drift.
20	SE.	11	"	"	"	Dug	33	2,650	- 29	2,621			Glacial clay	Hard, clear		S	Sufficient. Many wells dug from 50 to 60 feet, but were stopped by sand.
21	SE.	12	"	"	"	Dug	19	2,600	- 8	2,592	10	2,590	Glacial gravel	Hard, clear		S	Sufficient for local needs.
22	NW.	12	"	"	"	Dug	106	2,600	- 80	2,520	80	2,520	Glacial stony blue clay	Hard, clear, iron	44	D, S	Sufficient; cannot be pumped dry.
23	SE.	13	"	"	"	Dug	20	2,550	- 14	2,536	14	2,536	Glacial gravel	Soft, clear		D, S	Insufficient during dry seasons.
24	SW.	13	"	"	"	Dug	11	2,550	- 7	2,543	7	2,543	Glacial sand	Hard, clear	44	S	Sufficient; another well 10 feet deep.
25	SE.	14	"	"	"	Dug	12	2,580	- 8	2,572	8	2,572	Glacial sand and gravel	Hard, iron		D, S	Sufficient for 30 head stock. Another well 25 feet deep strongly mineralized. Several dry holes 16 to 25 feet deep.
26	NW.	14	"	"	"	Dug & Bored	80	2,600	- 40	2,560			Glacial sand	Hard, clear		N	Sufficient; has not been used for 10 years, although water good.
27	NE.	15	"	"	"	Dug	9	2,540	0	2,540			Glacial sand and gravel	Hard, clear, "alkaline"		S	Would water 100 head stock.
28	SE.	15	"	"	"	Dug	20	2,580	- 10	2,570	20	2,560	Glacial coarse sand	Soft, clear		D, S	Sufficient with well on SW. ¼, section 15 for 100 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 GULL LAKE, NO. 139, 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.	15	14	19	3	Bored	65	2,600	- 46	2,554	65	2,535	Glacial sand	Hard, clear, iron		D, S	Sufficient. Another well 40 feet deep.
30	SW.	16	"	"	"	Dug	45	2,600	- 40	2,560			Glacial sandy clay	Hard, iron, greenish, "alkaline"	44	D, S	Insufficient; another well 13 feet deep; hauls water from neighbours.
31	NW.	16	"	"	"	Dug	30	2,600	- 13	2,582	18	2,582	Glacial gravel and sandy clay	Hard, clear	44	S	Insufficient for local needs.
32	NW.	17	"	"	"	Dug	40	2,630	- 35	2,595	35	2,595	Glacial gravel	Hard, clear		D, S	Insufficient; enough for only 8 head stock in dry seasons. Three similar wells filled in.
33	SW.	17	"	"	"	Dug	14	2,630	- 11	2,619			Glacial sandy clay	"Alakaline"		D, S	Insufficient during dry seasons.
34	SE.	19	"	"	"	Dug	18	2,620	- 13	2,607	15	2,605	Recent sand	Hard	44	D, S	Insufficient in 1933 and 1934 for 45 head stock.
35	NE.	19	"	"	"	Dug	5	2,590	- 1	2,589	1	2,589	Recent blue sand	Hard, oily		S	Sufficient for 30 head stock.
36	NW.	20	"	"	"	Dug	25	2,600	- 22	2,578			Recent fine sand	Hard, clear		D, S	Insufficient; 2 similar wells caved in.
37	SW.	21	"	"	"	Dug	40	2,670	- 36	2,634			Glacial drift	Hard, clear		N	Not used for 10 years. Another well 20 feet deep.
38	NE.	21	"	"	"	Dug	20	2,540	- 18	2,522	18	2,522	Glacial sand	Hard, clear		D, S	Sufficient for local needs with another similar well
39	NW.	21	"	"	"	Dug	40	2,550					Glacial drift	Hard			Hard a good water supply but filled in. Also an 80-foot dry hole.
40	SE.	22	"	"	"	Bored	52	2,530	- 33	2,497			Glacial sand	Clear, "alkaline"	42	D, S	Sufficient for local needs.
41	NW.	22	"	"	"	Dug	25	2,530	- 22	2,508	24	2,506	Glacial gravel	Hard, clear, iron, "alkaline"		D, S	Sufficient for local needs with two other similar wells.
42	NE.	22	"	"	"	Dug & Bored	50	2,520	- 34	2,486	40	2,480	Glacial sandy clay	Hard, clear		D, S	Sufficient for 12 head stock. Another similar well caved in.
43	SE.	23	"	"	"	Dug	12	2,500	0	2,500	4	2,496	Glacial grey clay	Hard, clear		D, S	Sufficient for local needs. Two other wells 30 and 25 feet deep caved in.
44	SW.	24	"	"	"	Dug	35	2,550	- 30	2,520			Glacial drift	Soft, clear		D, S	
45	NW.	24	"	"	"	Bored	60	2,550									Dry hole; glacial yellow clay at base; several other dry holes.
46	NW.	25	"	"	"	Dug	37	2,480	- 30	2,450	36	2,444	Glacial gravel	Hard, iron		S	Insufficient even with another 60-foot well for 20 head stock.
47	NE.	26	"	"	"	Dug	17	2,460	- 14	2,446			Glacial sand				
48	NW.	26	"	"	"	Bored	82	2,475	- 32	2,443	82	2,393	Glacial dark blue sand	Hard, iron, cloudy, "alkaline"		D, S	Sufficient for local needs. Another well 8 feet deep.
49	SE.	27	"	"	"	Bored	78	2,500	- 15	2,485	76	2,424	Glacial gravel	Hard, iron	44	D, S	Insufficient for local needs. Another well 15 feet deep helps stock supply.
50	SW.	28	"	"	"	Dug	20	2,560	- 17	2,543	17	2,543	Glacial sand	Soft, clear		S	Sufficient for local needs.
51	NE.	28	"	"	"	Dug	38	2,510	- 9	2,501			Glacial fine white sand	Soft		D, S	Insufficient, in winter of 1934, for 14 head stock.
52	SW.	31	"	"	"	Dug	12	2,500	- 2	2,498	2	2,498	Recent sand	Hard, clear, "alkaline"		S	Sufficient for 100 head stock.
53	SE.	32	"	"	"	Dug	36	2,500	- 30	2,470	30	2,470	Glacial white sand	Hard, clear, "alkaline"	44	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 GULL LAKE, NO. 139, 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
54	NE.	33	14	19	3			2,425					Glacial fine sand	Soft		S	Supply very good; also a small dam.
55	SE.	33	"	"	"	Dug	14	2,500	- 5	2,495	12	2,488	Glacial gravel	Soft, clear		D, S	Insufficient in dry seasons. Also a 40-foot dry hole.
56	SE.	34	"	"	"	Dug	20	2,450	- 7	2,443			Glacial drift	Soft, clear		D, S	Sufficient for local needs.
57	SW.	35	"	"	"	Dug	17	2,450	- 11	2,439	17	2,433	Glacial sand	Hard, clear, "alkaline"		N	Sufficient but unfit for use; another 6-foot well supplies drinking water.
58	NE.	35	"	"	"	Spring		2,440					Glacial sandy clay	Hard, iron		S	Sufficient for 500 to 600 head stock.
59	NW.	35	"	"	"	Spring		2,430					Glacial sandy clay	Hard		S	Sufficient for local needs.
60	NW.	36	"	"	"	Dug	45	2,460	- 40	2,420	45	2,415	Glacial sand	Hard, clear, iron	44	D, S	Sufficient for only 6 head stock; another well 15 feet deep.
1	NW.	1	14	20	3	Dug	20	2,550	- 12	2,538	12	2,538	Glacial sand	Hard, clear		D, S	Sufficient for local needs.
2	SW.	4	"	"	"	Dug	23	2,500	- 23	2,477	28	2,472	Glacial blue sand	Hard, iron, "alkaline"		D, S	3 similar wells.
3	NE.	4	"	"	"	Dug	24	2,500	- 21	2,479	21	2,479	Glacial sand	Hard, clear, "alkaline"		D, S	Sufficient for local needs. Another well 15 feet deep.
4	SW.	10	"	"	"	Dug	[illegible]	2,530	- 16	2,514	16	2,514	Glacial fine sand and clay	[illegible]t, clear		D, S	Sufficient for local needs. [illegible]ther similar well.
5	NW.	11	"	"	"	Dug	20	2,540	- 14	2,526	[illegible]	2,526	Recent fine sand	Hard, clear		D, S	[illegible]fficient for local needs. Another similar well.
6	SE.	12	"	"	"	Dug	20	2,560	- 17	2,543	17	2,543	Glacial fine sand	Hard, clear, "alkaline"		D, S	Insufficient; will water 10 head stock. Another similar well.
7	NW.	12	"	"	"	Dug	16	2,580	- 12	2,568	12	2,568	Recent sand	Soft, clear		D, S	Sufficient for local needs.
8	NE.	15	"	"	"	Dug	9	2,500	- 5	2,495	5	2,495	Recent sand	Soft, clear		S	Sufficient for 40 head stock.
9	SW.	15	"	"	"	Dug	12	2,540	- 6	2,534	6	2,534	Recent sand	Soft, clear		S	Sufficient for 16 head stock.
10	SE.	18	"	"	"	Dug	12	2,550	- 6	2,544	6	2,544	Recent fine sand	Hard, clear		D, S	Sufficient for local needs.
11	NE.	18	"	"	"	Dug	14	2,570	- 8	2,562	8	2,562	Recent sand	Hard, clear		D, S	Sufficient for local needs.
12		19	"	"	"	Dug	5	2,550	- 2	2,548	2	2,548	Recent fine sand	Hard, clear		S	Sufficient for 150 head stock.
13	NE.	24	"	"	"	Dug	15	2,520	- 7	2,513	7	2,513	Recent coarse sand	Hard, clear, iron		D, S	Sufficient for 29 head head stock. 2 other wells 20 feet and 12 feet deep.
14	SW.	29	"	"	"	Dug	6	2,500	- 4	2,496	4	2,496	Recent sand				This well is used for sheep dipping.
15	NW.	32	"	"	"	Dug	10	2,470	- 5	2,465	5	2,465	Recent fine sand	Hard		S	Sufficient for 650 sheep.
16	SW.	32	"	"	"	Dug	8	2,460					Recent sand	Hard		S	Sufficient for local needs.
1	NW.	3	14	21	3	Dug	16	2,550	- 15	2,535	15	2,535	Recent fine sand	Hard, clear,	48	S	Intermittent supply.
2	SE.	11	"	"	"	Dug	6	2,550					Recent sand	Soft, clear	40	S	Insufficient for local needs.
3	SW.	13	"	"	"	Dug	15	2,600	- 12	2,588	12	2,588	Recent sand	Hard, cloudy	42	D, S	
4	SW.	13	"	"	"	Dug	8	2,600	- 6	2,594	6	2,594	Recent sand	Hard, clear	48	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 GULL LAKE, NO. 139, 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	SW.	13	14	21	3	Dug	6	2,550	- 3	2,547	3	2,547	Recent sand	Hard, clear	58	S	Sufficient for local needs.
6		14	"	"	"	Dug	5	2,55[illegible]	0	2,550	0	2,550	Recent sand	Soft, clear	50	S	
7	NE.	19	"	"	"	Dug	13	2,50[illegible]	- 9	2,491	9	2,491	Glacial sand	Hard, clear	44	D, S	Sufficient for local needs.
8	SW.	20	"	"	"	Dug	11	2,525	- 9	2,516	9	2,516	Glacial sand	Hard, clear, "alkaline"	46	S	Barely sufficient for local needs. 3 dry holes 12 to 20 feet deep.
9	SE.	20	"	"	"	Dug	9	2,500	- 8	2,592	8	2,492	Glacial sand	Soft, clear	46	D, S	Barely sufficient for local needs.
10	NE.	21	"	"	"	Bored	32	2,475					Glacial sand	Hard, clear, "alkaline"	42	D, S	Sufficient for local needs.
11	NE.	22	"	"	"	Dug	10	2,500	- 7	2,493	7	2,493	Glacial sand	Hard, clear, "alkaline"	45	S	Insufficient for local needs.
12	NE.	22	"	"	"	Dug	15	2,500					Glacial sandy clay	Hard, clear, "alkaline"	44	D, S	Insufficient for local needs.
13	NE.	23	"	"	"	Dug	6	2,550	- 4	2,546	4	2,546	Recent sand	Soft, clear	60	S	
14	SW.	26	"	"	"	Dug	2	2,550	0	2,550	0	2,550	Glacial sand	Hard			
15	NE.	26	"	"	"	Dug	20	2,550	- 18	2,532	18	2,532	Glacial sand	Soft, clear	46	D, S	
16	NE.	[illegible]	"	"	"	Dug	8	2,500	- 4	2,496	[illegible]	2,496	Glacial sand	Clear, "alkaline"	44	D, S	
17	SW.	27	"	"	"	Dug	16	2,475					Glacial sand and clay	Soft, clear	44	D, S	
18	SW.	30	"	"	"	Dug	54	2,525	- 49	2,476	49	2,476	Glacial sand	Hard,, clear, "alkaline"	42	S	Sufficient for local needs. Another similar well. One dry hole 50 feet deep.
19	NE.	30	"	"	"	Dug	21	2,500	- 19	2,481	19	2,481	Glacial sand	Clear, odour, "alkaline"	44	D, S	Barely sufficient for local needs.
20	SE.	33	"	"	"	Dug	18	2,450	- 12	2,438	12	2,438	Glacial sand	"Alkaline"	50	D, S	Insufficient in dry seasons. 3 other similar wells. One unfit for use due to salt.
21	SW.	34	"	"	"	Dug	22	2,500	- 20	2,480	20	2,480	Glacial gravel	Clear, "alkaline"	42	D, S	Sufficient for local needs.
22	NW.	34	"	"	"	Dug	18	2,475	- 16	2,459	16	2,459	Glacial sand	Soft, clear	42	D, S	Sufficient for local needs.
23	NW.	34	"	"	"	Dug	30	2,480	- 24	2,456	24	2,456	Glacial sand		41	N	Unfit for use; #.
24	SE.	35	"	"	"	Dug	17	2,550	- 14	2,536	14	2,536	Glacial sand	Clear, "alkaline"	42	D, S	
25	NW.	36	"	"	"	Dug	9	2,550	- 5	2,545	5	2,545	Glacial sand	Hard, clear	46	S	Sufficient for local needs.
1	SW.	2	15	19	3	Dug	20	2,450	- 16	2,434			Glacial clay	Hard, clear, iron, "alkaline"		D, S	Sufficient for local needs. Another well 26 feet deep was abandoned.
2	NE.	6	"	"	"	Dug	80	2,520	- 60	2,460			Glacial fine black sand	Hard, cloudy, iron, "alkaline"		S	Insufficient for 25 head stock.
3	NW.	7	"	"	"	Bored	80	2,500	- 68	2,432	80	2,420	Glacial gravel	Hard, iron, cloudy, red sediment, "alkaline"		S	Sufficient. Hauls household water. Several shallow dry holes.
4	NE.	7	"	"	"	Bored	75	2,500	- 40	2,460			Glacial drift	Hard, iron, red sediment		S	Sufficient for 40 head stock. Another well 20 feet deep with 10 feet of water.

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

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

WELL RECORDS—Rural Municipality of GULL LAKE, NO. 139, 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	NE.	9	15	19	3	Dug	55	2,530	- 33	2,497	48	2,482	Glacial gravel	Hard, clear		S	Sufficient for 8 head stock. Another well 21 feet deep.
6	NE.	12	"	"	"	Dug	22	2,450	- 15	2,435			Glacial sand	Hard, clear, "alkaline"		S	Insufficient for 12 head stock.
7	SE.	13	"	"	"	Dug	22	2,450	- 16	2,434	22	2,428	Glacial gravel	Hard, clear, "alkaline"		S	Sufficient for 18 head stock. Another well 33 feet deep supplies household needs only.
8	SW.	14	"	"	"	Dug	30	2,480	- 15	2,465	30	2,450	Glacial gravel	Hard, clear, iron		D, S	Insufficient for 70 head stock. A dry hole 40 feet deep. A 70-foot bored well supplies 12 head stock. Also a number of wells 8 to 30 feet deep.
9	NW.	14	"	"	"	Dug	60	2,510	- 15	2,495			Glacial white clay	Hard, clear		D, S	Sufficient for local needs.
10	SW.	15	"	"	"	Dug	16	2,530	- 8	2,522			Glacial gravel	Hard, clear		D, S	Not used except when other sources are exhausted.
11	SE.	15	"	"	"	Bored	25	2,530					Glacial clay	Hard, clear		S	Insufficient for local needs. 2 other wells 30 and 16 feet deep were unfit for use.
12	NE.	15	"	"	"	Dug	20	2,500	- 15	2,485	20	2,480	Glacial coarse sand	Hard, clear		D, S	Just sufficient for local needs.
13	NW.	15	"	"	"	Dug	43	2,460	- 31	2,429	43	2,417	Glacial fine blue sand	Hard, iron, red sediment		D, S	Sufficient for local needs. Another well 33 feet deep has a good supply.
14	SW.	16	"	"	"	Dug	30	2,510	- 20	2,490			Glacial gravel	"alkaline" Hard, clear		D, S	Sufficient for local need
15	SE.	16	"	"	"	Dug	21	2,530	- 14	2,516			Glacial blue clay	Hard, clear		D, S	Insufficient; hauls water.
16	NE.	17	"	"	"	Bored	25	2,500	- 10	2,490	22	2,478	Glacial gravel	Hard, clear, "alkaline"		D, S	Sufficient for 40 head stock.
17	NE.	18	"	"	"	Dug	30	2,510	- 25	2,485			Glacial clay	Hard, clear, "alkaline"		D, S	Insufficient; hauls water.
18	SW.	19	"	"	"	Bored	60	2,500	- 40	2,460			Glacial gravel	Hard, clear		D, S	Sufficient; large supply.
19	NE.	19	"	"	"	Bored	105	2,500	- 70	2,430	105	2,395	Glacial gravel	Hard, clear, iron		D, S	Sufficient; neighbors use well also.
20	NW.	20	"	"	"	Dug	30	2,455	- 71	2,384			Glacial sand	Hard, clear		D, S	Sufficient for 40 head stock.
21	NE.	20	"	"	"	Dug	20	2,480			18	2,462	Glacial gravel	Hard, clear		D, S	Sufficient for 20 head stock.
22	SE.	21	"	"	"	Dug	13	2,480	- 9	2,471			Glacial clay	Soft, clear		D	Sufficient for household needs only. Stock watered on SW.¼, section 22.
23	NW.	21	"	"	"	Dug	21	2,530	- 11	2,519	21	2,509	Glacial gravel	Hard, clear, iron		D, S	Sufficient for 40 head stock.
24	SW.	22	"	"	"	Bored	50	2,480					Glacial drift	Hard, clear, "alkaline"		S	Sufficient for 30 head stock. Another well 20 feet deep was highly mineralized so filled in.
25	SE.	22	"	"	"	Dug	20	2,490	- 10	2,480			Glacial blue clay	Hard, clear		D, S	
26	NW.	22	"	"	"	Dug	29	2,540	- 25	2,515	29	2,511	Glacial gravel	Hard, clear		D, S	Sufficient; neighbours use well also.
27	SW.	23	"	"	"	Dug & Bored	74	2,490	- 44	2,446			Glacial sand	Hard, clear, iron		D, S	
28	SE.	24	"	"	"	Dug	30	2,490	- 24	2,466			Glacial clay	Hard, clear, iron		D, S	Insufficient; hauls water. Another well 10 feet deep.
29	SW.	24	"	"	"	Dug	3	2,500					Glacial drift			S	Farmer on NE. 24 uses this well.

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 GULL LAKE, NO. 139, SASKATCHEWAN.

B 4-4

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (−) Surface	Elev.	Depth	Elev.	Geological Horizon				
30	NE.	24	15	19	3	Bored	105	2,480	- 70	2,410			Glacial gravel(?)	Hard, iron, cloudy, red sediment		D, S	Insufficient for local needs.
31	NW.	25	"	"	"	Dug	21	2,495	- 16	2,479	5	2,490	Glacial sand	Hard, clear		D, S	Insufficient; hauls water. Another well 15 feet deep; poor supply.
32	NE.	25	"	"	"	Dug	44	2,520	- 40	2,480			Glacial sand	Hard, clear		D, S	Sufficient for 25 head stock.
33	SW.	26	"	"	"	Bored	50	2,500	- 42	2,458	48	2,452	Glacial coarse gravel	Hard, clear, "alkaline"		D, S	Sufficient for 10 head stock.
34	SE.	27	"	"	"	Dug	11	2,540	0	2,540			Glacial clay	Soft, clear		S	Insufficient. A 66-foot well supplies house. 3 dry holes 102, 54 and 80 feet deep.
35	NE.	27	"	"	"	Bored	36	2,475	- 19	2,456			Glacial clay	Hard, clear		N	Not used at present. Another 12-foot well. 4 dry holes 124, 110, 20 and 12 feet deep.
36	SW.	28	"	"	"	Bored	103	2,475	- 33	2,442	102	2,373	Glacial blue sand	Hard, clear		D, S	Sufficient for local needs.
37	SE.	28	"	"	"	Dug	90	2,510	- 85	2,425	40	2,470	Glacial sand; Bearpaw at base	Hard, clear		D, S	Insufficient; hauls water.
38	SW.	30	"	"	"	Dug	30	2,410	- 28	2,382			Glacial clay	Hard, clear		D	Insufficient for household needs. Also many dry holes.
39	NW.	30	"	"	"	Dug	20	2,380	- 16	2,364	20	2,360	Glacial sand	Hard, clear		S	Sufficient for local needs.
40	NE.	31	"	"	"	Bored	50	2,390	- 50	2,340			Glacial clay	Hard, iron, cloudy, red sediment		D, S	Sufficient for local needs. seepage well 30 feet deep. #
41	NW.	32	"	"	"	Bored	122	2,400	- 62	2,338	122	2,278	Glacial gravel	Hard, clear		D, S	Sufficient for local needs.
42	SE.	34	"	"	"	Dug	10	2,430	- 7	2,423			Glacial sandy clay	Hard, clear		D, S	Sufficient for 6 head stock. 2 other wells; 28 feet and 26 feet deep.
43	SW.	35	"	"	"	Dug	20	2,430	- 10	2,420			Glacial coarse gravel	Hard, clear		D, S	Sufficient for 6 head stock. Also a 150-foot dry hole.
44	NE.	35	"	"	"	Dug	18	2,410	- 13	2,397	16	2,394	Glacial sand	Hard, clear		D, S	Sufficient for local needs. Another well 113 feet deep had sulphur odour. Also a dry hole 110 feet deep.
1	SW.	1	15	20	3	Dug	12	2,450	- 8	2,442			Glacial sand	Hard, clear, "alkaline"		S	Insufficient for local needs.
2	SW.	4	"	"	"	Dug	8	2,450	- 4	2,446			Glacial drift			S	
3	NE.	6	"	"	"	Dug	14	2,440	- 10	2,430	10	2,430	Glacial gravel	Soft, clear		D, S	Sufficient for 150 head stock. 2 other wells 25 and 20 feet deep.
4	SW.	6	"	"	"	Dug	14	2,450	- 8	2,442			Glacial sand	Hard, clear		S	Sufficient for 100 head stock.
5	SW.	7	"	"	"	Spring		2,410	0	2,410			Glacial sand	Hard, "alkaline"		S	Abundant supply.
6	NE.	9	"	"	"	Dug	65	2,450	- 17	2,433	65	2,385	Glacial sand	Hard, clear		S	Easily sufficient for 150 head stock.
7	NE.	10	"	"	"	Dug	20	2,430	- 5	2,425	14	2,416	Glacial sand	Soft, clear		D, S	Sufficient for 12 head stock.
8	NW.	14	"	"	"	Bored	60	2,450	- 52	2,398	60	2,390	Glacial sand	Hard, clear		D, S	Sufficient for 15 head stock.
9	SE.	15	"	"	"	Bored	60	2,450	- 35	2,415	35	2,415	Glacial gravel	Hard, clear, iron		D, S	Sufficient for 25 to 30 head stock.
10	NE.	15	"	"	"	Bored	65	2,450	- 35	2,415	65	2,385	Glacial gravel	Hard, clear, "alkaline"		S	Sufficient for local needs. Another well 27 feet deep.
11	NW.	16	"	"	"	Bored	48	2,460	- 27	2,433			Glacial drift	Hard, clear, iron, "alkaline"		D, S	Abundant supply. Also a 12-foot deep seepage well.

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 GULL LAKE, NO. 139, 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	SW.	22	15	20	3	Bored	58	2,450	- 50	2,400	58	2,392	Glacial sand	Hard, iron, cloudy, red sediement		D, S	Sufficient for 40 head stock.
13	NE.	22	"	"	"	Bored	93	2,450	- 20	2,430	93	2,357	Glacial gravel	Hard, clear		D, S	Sufficient for 30 head stock.
14	NW.	23	"	"	"	Bored	81	2,420	- 53	2,367			Glacial sandy clay	Hard, cloudy, red sediment, iron, "alkaline"		D, S	Sufficient for 50 head stock.
15	SE.	23	"	"	"	Bored	50	2,450	- 25	2,425	50	2,400	Glacial gravel	Hard, clear, iron		D, S	Easily sufficient for 45 head stock.
16	NE.	23	"	"	"	Dug	18	2,450	- 9	2,441			Glacial yellow clay	Soft, clear		D, S	Sufficient for 15 head stock. Another well 60 feet deep with 25 feet of water.
17	SW.	24	"	"	"	Bored	24	2,420	- 4	2,416			Glacial sand annd clay	Soft		D	Sufficient for household needs.
18	NE.	24	"	"	"	Bored	105	2,510	- 60	2,450	105	2,405	Glacial gravel	Hard, clear, iron		D, S	Sufficient for 40 head stock.
19	SW.	25	"	"	"	Bored	55	2,450	- 30	2,420			Glacial sandy clay	Hard, clear, iron		D, S	Sufficient for 30 head stock.
20	SE.	26	"	"	"	Bored	40	2,450	- 14	2,436	40	2,410	Glacial blue sand	Hard, clear		S	Sufficient for 40 head stock.
21	SE.	27	"	"	"	Bored	60	2,440	- 40	2,400	60	2,380	Glacial gravel	Hard, clear, "alkaline"		S	Another well 30-foot deep has 8 feet of water.
22	NW.	27	"	"	"	Dug	30	2,400	- 26	2,374	26	2,374	Glacial sand	Hard, clear, "alkaline"		S	Insufficient, hauls water. Another well 20 feet deep.
23	NE.	31	"	"	"	Bored	70	2,450	- 65	2,385			Glacial sand	Hard, clear		D, S	Sufficient for 30 head stock.
24	SW.	32	"	"	"	Dug	25	2,420	- 10	2,410	22	2,398	Glacial sand and gravel	Soft, clear		D, S	Insufficient for 35 head stock. Other wells from 20 to 30 feet deep have poor supply.
25	NE.	34	"	"	"	Bored	20	2,375	- 10	2,365			Glacial sand	Soft, clear		D, S	Sufficient for 30 head stock.
26	SE.	35	"	"	"	Dug	45	2,400	- 35	2,365	35	2,365	Glacial sand	Hard, clear		D, S	Insufficient for local needs. Another well 50 feet deep.
27	SW.	36	"	"	"	Dug	50	2,400	- 20	2,380			Glacial sand	Soft, brownish		S	Intermittent supply. Also dry holes from 35 to 115 feet deep.
28	SE.	36	"	"	"	Dug	30	2,360	- 23	2,337	29	2,331	Glacial gravel			D, S	Sufficient for 25 head stock. Also uses spring on NE. 36.
29	NE.	36	"	"	"	Spring		2,340	0	2,340			Glacial white gravel	Hard, clear		S	Sufficient for local needs.
1	SE.	1	15	21	3	Dug	22	2,425	- 16	2,409	16	2,409	Glacial sand	Soft, clear	42	D, S	Sufficient for 10 head stock.
2	SW.	2	"	"	"	Dug	18	2,400	- 16	2,384	16	2,384	Glacial sand	Clear, "alkaline"	45	S	Sufficient for local needs.
3	NW.	2	"	"	"	Dug	18	2,400	- 13	2,387	13	2,387	Glacial sand	Soft, clear	42	D, S	Sufficient for local needs.
4	NE.	3	"	"	"	Dug	18	2,400	- 12	2,388	12	2,388	Glacial sand	Soft, clear	42	D, S	Abandoned and filling with quicksand.
5	NW.	4	"	"	"	Dug	22	2,500	- 19	2,481	19	2,481	Glacial sand	Clear, "alkaline"	42	S	Two similar wells.
6	NE.	5	"	"	"	Dug	18	2,500	- 6	2,494	6	2,494	Glacial sand	Hard, clear	43	S	
7	NW.	6	"	"	"	Dug	17	2,550	- 3	2,547	3	2,547	Glacial sand	Soft, clear	62	D, S	Seepage from nearby slough.

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 GULL LAKE, NO. 139, SASKATCHEWAN.

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (−) Surface	Elev.	Depth	Elev.	Geological Horizon				
8	NW.	7	15	21	3	Dug	24	2,425	- 22	2,403	22	2,403	Glacial silt loam	Hard, clear	44	D, S	Sufficient for local needs. Another similar well.
9	SE.	10	"	"	"	Dug	19	2,425	- 18	2,407	18	2,407	Glacial sand	Soft, clear	42	D, S	Sufficient for local needs.
10	SE.	10	"	"	"	Dug	11	2,400	- 4	2,396	4	2,396	Glacial sand	Soft, clear	42	S	Sufficient together with another similar well for 50 head stock.
11	SW.	14	"	"	"	Dug	57	2,375	- 52	2,323	52	2,323	Glacial sand	Hard, clear	43	D, S	
12		15	"	"	"	Dug	55	2,400	- 48	2,352	48	2,352	Glacial drift	Hard		D, S	Sufficient for local needs.
13		16	"	"	"	Dug	27	2,450	- 23	2,427	23	2,427	Glacial sandy loam			D, S	Fair supply.
14	SE.	16	"	"	"	Dug	28	2,450	- 26	2,424	26	2,424	Glacial sandy loam	Hard, clear	42	D, S	Sufficient for local needs.
15	SW.	17	"	"	"	Spring		2,400	0	2,400			Glacial sandy clay	Soft, clear	58	D, S	
16	S½	18	"	"	"	Dug	14	2,500	- 5	2,495	5	2,495	Glacial clay	Soft, clear		D, S	
17	NW.	18	"	"	"	Dug	16	2,475	- 15	2,460	15	2,460	Glacial fine sand	Soft, clear	42	D, S	Abundant supply. Another well 12 feet deep has 2 feet of water.
18	NE.	19	"	"	"	Dug	45	2,450	- 44	2,406	44	2,406	Glacial sand	Soft, clear	42	D, S	Sufficient for household needs
19	SE.	20	"	"	"	Dug	28	2,450	- 26	2,424	26	2,424	Glacial gravel	Soft, clear	44	S	
20	NW.	20	"	"	"	Dug	17	2,425	- 15	2,410	15	2,410	Glacial yellow clay	Hard, clear	44	S	Sufficient; not used often.
21	NW.	21	"	"	"	Dug	20	2,460	- 15	2,445	15	2,445	Glacial gravel	Hard, clear, "alkaline"	42	D, S	
22	SW.	22	"	"	"	Dug	65	2,450	- 58	2,392	58	2,392	Glacial drift	Hard, clear	42	D, S	Sufficient for local needs.
23	SE.	22	"	"	"	Dug	43	2,475	- 41	2,434	41	2,434	Glacial sand	Soft, clear	43	D, S	Sufficient for local needs.
24	NE.	23	"	"	"	Dug	18	2,400	- 10	2,390	10	2,390	Glacial blue clay	Hard, clear, odour, "alkaline"	43	S	Sufficient for local needs.
25	N½	25	"	"	"	Dug	53	2,450	- 51	2,399	51	2,399	Glacial drift	Soft, clear		D, S	Sufficient for local needs.
26	SE.	26	"	"	"	Dug	67	2,475	- 53	2,422	53	2,422	Glacial blue clay	Soft, clear	43	D, S	Sufficient for local needs.
27	SW.	27	"	"	"	Dug	16	2,450	- 8	2,442	8	2,442	Glacial drift	Clear, "alkaline"	43	S	Sufficient for local needs.
28	NW.	27	"	"	"	Dug	25	2,450	- 23	2,427	23	2,427	Glacial clay	Hard, clear, odour	42	D, S	Sufficient for local needs.
29	SW.	28	"	"	"	Bored	54	2,450	- 49	2,401	49	2,401	Glacial fine dark clay	Hard, clear	46	D, S	
30	SW.	30	"	"	"	Dug	17	2,450	- 14	2,436	14	2,436	Glacial sandy clay	Soft, clear	42	D, S	Sufficient for local needs.
31	SE.	30	"	"	"	?	32	2,450					Glacial drift	Hard, "alkaline"		N	Water too highly mineralized for use and insufficient for local needs.
32	NE.	31	"	"	"	Dug	22	2,450	- 11	2,439	20	2,430	Glacial gravel	Hard, clear, odour	41	S	Sufficient for local needs.
33	NE.	31	"	"	"	Dug	27	2,468	- 23	2,445	23	2,445	Glacial sand	Soft, clear	43	D, S	

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

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

WELL RECORDS—Rural Municipality of GULL LAKE, NO. 139, SASKATCHEWAN.

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (−) Surface	Elev.	Depth	Elev.	Geological Horizon				
34	SW.	32	15	21	3	?	28	2,425	- 25	2,400	25	2,400	Glacial sand	Hard, clear	42	D, S	Sufficient in wet seasons. Six similar wells caved in owing to quicksand.
35	SE.	33	"	"	"	Dug	19	2,410	- 15	2,395	15	2,395	Glacial sand	Clear, "alkaline"	42	D, S	Insufficient for local needs.
36	NE.	33	"	"	"	Bored	100	2,400	- 85	2,315	85	2,315	Glacial drift	Hard, clear, "alkaline"	42	D, S	Numerous wells dug but all mineralized.
37	SW.	34	"	"	"	Bored	30	2,400	- 26	2,374	26	2,374	Glacial sand	Hard, clear, odour	42	D, S	2 other similar wells.
38	SW.	34	"	"	"	Dug	26	2,400	- 14	2,386	14	2,386	Glacial sand	Hard, clear	42	D, S	Sufficient for local needs.
39	NE.	34	"	"	"	Dug	28	2,420	- 16	2,404	16	2,404	Glacial sand	Hard, clear	43	D, S	
40	NW.	35	"	"	"	Bored	39	2,430	- 22	2,408	22	2,408	Glacial sand	Hard, clear, odour	43	D, S	Insufficient for local needs. Eleven dry holes from 25 to 65 feet deep.

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.