CANADA
DEPARTMENT OF MINES
AND
TECHNICAL SURVEYS

GEOLOGICAL SURVEY OF CANADA

WATER SUPPLY PAPER No. 185

PRELIMINARY REPORT

GROUND-WATER RESOURCES OF THE RURAL MUNICIPALITY OF KING GEORGE NO. 256 SASKATCHEWAN

By

B. R. MacKay & D. C. Maddox

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INTRODUCTION

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

Publication of Results

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

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

How to Use the Report

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

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

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

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

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

GLOSSARY OF TERMS USED

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

WATER-BEARING HORIZONS OF THE MUNICIPALITY

The rural municipality of King George, No. 256, covers an area of 324 square miles in southern Saskatchewan and comprises nine townships described as tps. 24, 25, and 26, ranges 10, 11, and 12, W. 3rd mer. The centre of the municipality lies 35 miles west and 68 miles south of the city of Saskatoon. The population of the municipality, which in 1931 was 1,141, is entirely rural as there are no towns or villages. Steeledale and Rossduff are post offices only and the nearest towns are Dinsmore and Wiseton situated north of this municipality, on the Eatonia Section of the Canadian National railways. Missouri coteau passes in a generally northeastern direction through the municipality, and the coteau is characterized by rough, hilly country in which there are many small lakes and undrained depressions in which surface water accumulates. Most of the municipality is over 2,000 feet above sea-level, and the summits of some of the hills in the coteau are over 2,500 feet above sea-level, but in the southeast the surface falls to elevations a little below 2,100 feet above sea-level, and in the northwest the land slopes towards the upper part of the valley of Macdonald creek which lies west of this municipality.

Most of the municipality is mantled with moraine, but in the less elevated parts of the southeast and the northwest boulder clay and glacial lake clay occur. In the southeast a very irregular band of boulder clay occupying about 10 square miles borders the moraine in township 24, range 10, and an area of about 10 square miles in the same township is underlain by glacial lake clay. A very small area of dune sands occurs in sections 20 and 29; and in the northwest part of the municipality a zone of boulder clay, which covers about 16 square miles, borders the moraine area in the east. On the northwest side there is an area of about 19 square miles underlain by glacial lake clay.

Water-bearing Horizons in the Unconsolidated Deposits

Ground water is found in the boulder clay or till and in the moraine areas only in irregularly distributed lenses or pockets of stratified sand and gravel that were deposited along with the unsorted boulder clay, or were laid down during times of retreat of the ice. The uncertainty as to the position and extent of these aquifers is increased by the fact that at least three ice-sheets have successively advanced and retreated over the land surface. There are two general types of aquifers in the drift that may be rather wide-spread in this part of the province. One of these consists of pockets and beds of sand and gravel that lie at the contact of the glacial drift and the uneven top of the bedrock surface. A study of well records in this municipality does not indicate the presence of any well-defined pre-glacial river valley, but the presence of aquifers at fairly uniform elevations over comparatively large areas in township 25, range 12, and townships 26, ranges 11 and 12, suggests that these aquifers lie probably at or near the base of the glacial drift. The sand and gravel deposited by streams flowing at the base of the ice-sheets or by waters resulting from the melting ice at the front of the ice-sheets would form aquifers. Such aquifers will be very irregularly distributed through the almost impervious clay or sandy clay that forms so large a proportion of the till and the moraine. In this municipality, aquifers in the upper part of the till and the moraine supply water to a number of shallow wells, but many of these wells produce only a small supply of water. The deeper wells, however, produce larger supplies of water, the quality of which is unusually good, except in the southeastern part of the municipality. The glacial lake clay in this municipality appears to contain very few beds or lenses of sand, as only one well, 15 feet deep, on the NW.$\frac{1}{4}$, sec. 6, tp. 26, range 12, obtained water from this clay, and the remaining wells in the areas underlain by glacial lake clay

have passed into the underlying boulder clay and obtained water from sand and gravel pockets in it.

Water-Bearing Horizons in the Bedrock

The Bearpaw formation underlies the glacial drift over the entire municipality. The Bearpaw formation consists principally of dark grey shales that contain little or no water, but it occasionally contains layers of sand, interbedded with the shales, that carry soft water. The Belly River formation underlies the Bearpaw formation. It consists chiefly of sandstones and shales that were deposited in fresh or in brackish water, but also contains sandstones and shales that were laid down in the sea. There are no outcrops of bedrock in this municipality, no detailed logs of the deep wells are available, and the elevation of the contact of the Bearpaw and the Belly River formations is not known. Geological conditions elsewhere, however, lead to the conclusion that the aquifers that supply the three wells on secs. 20, 21, and 22, tp. 26, range 11, 778, 789, and 774 feet deep, respectively, with large amounts of soft water, are in the upper part of the Belly River formation, and that in these sections the Bearpaw formation does not contain water. No wells elsewhere in the municipality have tapped the aquifers mentioned and no wells as far as known have been drilled into the Bearpaw formation in search of water. The Bearpaw formation in some localities south and southeast of the rural municipality of King George contains aquifers that yield large amounts of soft water to wells drilled into them, but these aquifers may not extend into the rural municipality of King George. The water in the three deep wells mentioned can be used for all purposes except irrigation.

GROUND WATER CONDITIONS BY TOWNSHIPS

Township 24, Range 10

The northwest and southwestern parts of the township are hilly and the surface here rises to over 2,300 feet above sea-level, but elsewhere the country is comparatively flat. There are three small lakes in sections 31, 32, and 33, and a lake bed lying at about 2,072 feet above sea-level in sections 8, 16, 17, 20, and 21 occupies about two square miles and is marshy in wet seasons. Glacial lake clay underlies and borders this lake bed and extends to the eastern boundary of the township. A very irregular belt of boulder clay borders the lake clay, and extends to points near the northern and western boundaries of the townships. The northwestern and southwestern parts of the township are mantled by moraine. A very small area of dune sands occurs on the SE.¼, section 20, and the NE.¼, section 29.

The glacial lake clay does not appear to contain much water, as two wells, 80 and 128 feet deep, passed through it and obtained water from sand deposits in the underlying boulder clay. The glacial till and the moraine supply water to a number of wells from 6 to 160 feet deep. There are at least three general aquifers; one that is 2,080 to 2,072 feet above sea-level supplies wells on the NW.¼, section 18, and the NE.¼, section 22, 80 and 48 feet deep, respectively, and probably also supplies a spring on the NE.¼, section 10; another aquifer about 2,060 to 2,040 feet above sea-level provides small supplies of water, which are used only for stock, to wells on the SE.¼, section 32, and the NW.¼, section 34, 150 and 160 feet deep, respectively; and a third about 1,985 to 2,020 feet above sea-level is tapped by two wells each 80 feet deep on the SW.¼, section 23, and the NW.¼, section 24.

The water in three wells, 38, 80, and 30 feet deep, on the NE.¼, section 23, the NW.¼, section 23, and the NW.¼, section 36, is "alkaline", but is used for drinking. The water in most of the wells

over 40 feet deep in the northwest half of the township is too "alkaline" to be fit for drinking, and shallow wells are used to provide water for domestic purposes, whereas the water in the remaining wells is hard and can be used for all purposes. At three farms the water supply is not sufficient for local requirements, and a dry hole 100 feet deep was put down on the NE.¼, section 4.

Township 24, Range 11

This township is entirely underlain by moraine and is hilly. Its surface rises towards the western third of the township, most of which area is over 2,400 feet above sea-level and is thinly settled. In the northern half of sections 13 and 14 there is a lake, the elevation of which is about 2,151 feet above sea-level, and other small lakes occur in sections 7 and 36.

The depth of the wells in this township ranges from 10 to 287 feet and most of the wells appear to be supplied from three fairly well-defined aquifers. The first aquifer is about 2,210 to 2,220 feet above sea-level and supplies two wells, 60 and 50 feet deep, on sections 2 and 11, with small amounts of water. The second aquifer is about 2,170 feet above sea-level and may lie at the base of the glacial drift. It is tapped on the NW.¼, and the SW.¼ of section 16 by wells 230 and 232 feet deep, and probably supplies the spring on the NW.¼, section 24. The third aquifer is about 2,140 feet above sea-level. It is penetrated by wells on sections 12 and 22, at depths of 65 and 112 feet, respectively, and appears to outcrop as a spring on the NE.¼, section 13.

At five farms in this township the supply of well water is inadequate for local requirements, whereas the water in the wells on the NW.¼, section 10, the NE.¼, section 11, and the NE.¼, sections 26, 33, 50, and 287 feet deep, respectively, can be used only for stock. Should the last-mentioned aquifer lie at the base of the glacial drift it may underlie a large part of the

township, and farmers with inadequate supplies of ground water may possibly obtain more water by drilling to this horizon.

Township 24, Range 12

Moraine mantles the entire township, the surface of which deposit is characterized by numerous hillocks and undrained depressions. An elevated tract over 2,400 feet above sea-level occupies a large part of the southern and eastern parts of the township and rises to a maximum elevation of over 2,500 feet above sea-level. From this highland the land slopes northwestward to a depression about 2,300 feet above sea-level in which there are several small lakes, and eastward to the southeast corner of the township where other small lakes occur. West of the depression, in sections 19 and 30, the land surface again rises to over 2,450 feet above sea-level.

This township is very thinly settled and the records of only eight wells, 8 to 30 feet deep, were obtained from it. Of these wells, the two located on the SE.$\frac{1}{4}$, section 4, and the SW.$\frac{1}{4}$, section 32, yield soft water, and the two wells 30 and 18 feet deep, on section 24, produce "alkaline" water that is used for drinking. In the other four wells the water is hard and "non-alkaline". At four farms the supply of well water is inadequate for local requirements, and at the farm on the SE.$\frac{1}{4}$, section 4, a spring helps to supply the local needs.

Township 25, Range 10

A broad, low ridge extends in a northeasterly direction through the township and forms the divide in this part of Missouri coteau. It rises gradually from about 2,300 feet above sea-level at the western boundary to over 2,500 feet above sea-level in the northeast corner of the township. From this ridge the land slopes gently away towards the northwest and the southeast. In the southeast corner the elevation drops to about 2,150 feet above sea-level.

There are four small lakes in the low areas in the southwest corner and other lakes on sections 12 and 13 in the southeast corner, and on section 32 in the northwest part of the township.

This township is very thinly settled. No well records were obtained from the northern third, but in the southern two-thirds records were obtained of eight wells, 4 to 64 feet deep. Seven of these wells supply sufficient hard water for farm requirements. The well, 50 feet deep, on the SW.¼, section 12, however, does not yield an adequate supply of water.

Township 25, Range 11

The topography of this township is typical of moraine, being characterized by low, rounded hills and undrained depressions, many of which are occupied by lakes. The relief is about 200 feet, the northwest corner of the township being a little less than 2,200 feet above sea-level and the southwest corner and the southern flank of a hill in section 34 being about 2,400 feet above sea-level. Most of the lakes in the eastern third of the township occupy depressions that are less than 2,250 feet above sea-level.

Of the forty-three wells in this township, thirty-two are less than 25 feet deep, and the supplies of water from fourteen of these shallow wells are insufficient for local needs. The upper part of the moraine in this township does not appear to be a reliable source of ground water. The water in thirteen of these shallow wells is soft, in one it is "alkaline", but is used for drinking, and in two wells it is too "alkaline" for drinking.

Nine wells, 45 to 85 feet deep, and a spring on the NW.¼, section 36, obtain water from aquifers about 2,200 to 2,250 feet above sea-level that possibly occur at the base of the glacial drift and yield considerable amounts of water to wells that tap them. In only one well, 87 feet deep on the NE.¼, section 23, is this water too "alkaline" to be fit for drinking. Owners of shallow wells that yield only small supplies of water are advised to attempt

to reach this aquifer. The old land surface is probably undulating and the elevation of this aquifer may vary considerably.

Two wells, 66 and 85 feet deep, obtain soft water from aquifers that probably are in the bedrock. Of these wells the one 66 feet deep on the SW.¼, section 6, obtains water from an aquifer at about 2,324 feet above sea-level which may be in the bedrock of a pre-glacial hill that has been concealed by moraine. The other well, 85 feet deep, on the NW.¼, section 14, obtains water from a bedrock aquifer, described as "blue sand", at about 2,210 feet above sea-level, which occurs probably close to the top of the Bearpaw formation at that point.

Township 25, Range 12

This township is located on the western flank of Missouri coteau and its surface rises from about 1,950 feet above sea-level in the northwest corner to about 2,400 feet above sea-level in the southeast corner. The drainage of the township is northwesterly towards the upper part of Macdonald creek. Part of the surface drainage in the eastern two-thirds of the township is into the lakes on sections 21 and 24, and to other undrained depressions. Moraine mantles the entire township except the northwestern corner. There it is bordered by a belt of boulder clay about three-fourths of a mile wide that extends in a northeasterly direction across this part of the township. About one-half a square mile in section 36 is underlain by glacial lake clay. The logs of twenty wells in this township show the presence of a thick deposit of clay underlain by sand and gravel. In section 4 the clay is 95 to 100 feet thick; elsewhere in the township it is 35 to 90 feet thick.

Fifteen wells, 38 to 102 feet deep, eleven of which are in the south half of the township and four of which are in the northeast quarter of the township, obtain water from aquifers about 2,150 to 2,220 feet above sea-level that are probably at the base

of the glacial drift; the supply of water from several of these wells is large and in only two wells is the supply insufficient for local requirements. The quality of the water in these aquifers is mostly good, as only two wells contain water too "alkaline" to be used for drinking; another aquifer that is about 2,120 feet above sea-level supplies two wells each 50 feet deep, on section 28, with moderately large supplies of hard water; and another aquifer that is about 1,995 feet above sea-level supplies two wells, 65 and 56 feet deep, on section 30, with hard water.

Thirteen wells in this township are less than 35 feet deep. In eight of these wells, 10 to 16 feet deep, the water is soft, in six wells, 11 to 20 feet deep, the supply of water is insufficient for local needs, and in four wells, 11 to 30 feet deep, the water is reported as being "alkaline", but is being used for drinking. All the wells in this township that are over 35 feet deep, except two on the SE.$\frac{1}{4}$, section 6, and the NW.$\frac{1}{4}$, section 34, obtained adequate supplies of water, and no dry holes are reported, so that it would seem advisable to dig deeper wells when the supply of water from shallow wells is inadequate.

Township 26, Range 10

In this township the surface rises southeastwards from about 2,175 feet above sea-level in the northwest to about 2,525 feet above sea-level at the summit of Missouri coteau in the southeast. The southern end of a valley that drains northeastward into Stockwell lake, however, traverses the northeast part of the township for several miles. Moraine mantles the entire township, and there are small lakes on sections 5, 13, and 15 and undrained depressions elsewhere. There are no farms on sections 4, 5, and 6 and the eastern half of the township is only thinly settled.

The producing wells in the glacial drift of this township are 7 to 168 feet deep, and the following aquifers appear to be

present. The first is about 2,090 to 2,115 feet above sea-level and supplies three wells, on sections 30, 31, and 32, 75 to 98 feet deep, with hard water. The second is about 2,032 to 2,045 feet above sea-level and provides two wells, on sections 18 and 19, 168 and 105 feet, respectively, with abundant supplies of hard water.

Of the fifteen wells less than 30 feet deep in the glacial drift, three yield soft water and one yields a small supply of water.

The water in a well 63 feet deep on the SW.¼, section 34, is soft, but the water has not been analysed and no log of the well is available. It seems probable that the aquifer that supplies this well is in the bedrock and that the top of the bedrock in this township rises towards the northeast.

Township 26, Range 11

In the southern half of this township there are two hills one of which, in section 3, rises to over 2,450 feet above sea-level and the other, in section 18, rises to over 2,350 feet above sea-level. The slopes of both these hills are very gentle, and the country north of the hills is comparatively flat, although in the northwest there is a gentle slope towards the valley of Macdonald creek. The maximum range of elevations in the township is about 500 feet. Moraine forms the hills and covers the flat northern part of the township, except an area of about 6 square miles to the northwest that is underlain by boulder clay, and an area of about one-eighth of a square mile in the extreme northwest corner that is underlain by glacial lake clay.

No wells were put down in the area underlain by glacial lake clay, and the ground water conditions in the boulder clay and moraine are so similar that the two types of glacial deposits may be considered as a unit. The mantle of glacial drift is very thick, and the depth of the wells in it ranges from 10 to 205.

The distribution of ground water in the boulder clay and moraine is erratic, but the following aquifers are probably continuous between the wells or groups of wells mentioned. An aquifer at about 2,017 to 2,033 feet above sea-level supplies a well 140 feet deep on the NW.¼, section 21, and three wells, 108, 110, and 117 feet deep, on section 28, with hard water that is used for all purposes except irrigation. An aquifer at about 2,034 to 2,052 feet above sea-level supplies two wells, 166 and 128 feet deep on the SE.¼, section 26, and the SW.¼, section 36, respectively, with large amounts of hard water. An aquifer outcrops and a spring on the NE.¼, section 10, issues from it, but is apparently not tapped by wells in the vicinity. No record of the logs of most of the deep wells was available, but the log of a 150-foot well, on the NW.¼, section 1, records the presence of 65 feet of soil and clay underlain by 50 feet of quicksand. This in turn is underlain by 45 feet of sand and gravel, which apparently contains water only near the base of the well. The great thickness of sand and gravel is unusual, and the base of the well is probably close to the top of the bedrock. The log of another well, on the NW.¼, section 16, shows the presence of a bed of sand and gravel, 30 feet thick, overlying clay. The logs of the wells on the SW.¼, section 19, the NW.¼, section 24, the SE.¼, section 26, and the SW.¼, section 36, indicate the presence of beds of clay, 80, 90, 90, and 60 feet, thick, respectively, overlying beds of sand.

A well, 75 feet deep, on the NW.¼, section 2, is reported as obtaining a very small supply of water that is described as soft from an aquifer about 2,275 feet above sea-level. The nature of this water suggests a bedrock origin, but as most of the aquifers in the bedrock yield large supplies, and as an aquifer at about 2,110 feet above sea-level supplies a well, 150 feet deep, on the NW.¼, section 1, with hard water it is believed that the softness of the water in the 75-foot well is due to other causes. The water in

seventeen other wells, 10 to 20 feet deep, is soft and in two wells 108 and 205 feet deep on the NW.¼, section 28, and the SW.¼, section 34, the water is moderately "alkaline", but in only one well, 125 feet deep on the SW.¼, section 14, is the water too "alkaline" to be fit for drinking. The supply of water from the wells in this township is not very satisfactory as a well 75 feet deep, on the NW.¼, section 2, a well 117 feet on the NE.¼, section 28, and eighteen shallow wells, 10 to 30 feet deep, in other parts of the township, produce supplies of water too small for local requirements, but some of the deeper wells in the northern half of the township yield large supplies of water.

Three wells in this township obtain water from aquifers thought to be in the upper part of the Belly River formation. An aquifer that is about 1,403 feet above sea-level supplies one of these wells, 778 feet deep, on the NE.¼, section 20, with an abundant supply of soft, salty water, and another aquifer that is about 1,470 to 1,487 feet above sea-level supplies the other two wells, 789 and 774 feet deep, on the SE.¼, section 21, and the SW.¼, section 22, respectively, with large amounts of soft water. The water is used for all purposes except irrigation. No other wells in this municipality have tapped these aquifers and their lateral extent is unknown.

Township 26, Range 12

This township lies on the eastern flank of Missouri coteau and the land rises from a little less than 1,900 feet above sea-level in the northwest to a little over 2,350 feet above sea-level at the summit of a hill on section 13. The higher parts of the township, comprising about eight square miles in the southeast, are mantled with moraine. West of the moraine a belt of boulder clay about a mile in average width crosses the township in a northeasterly direction, and west of the boulder clay belt glacial lake clay occupies an area of about 19 square miles of which

the greater part is in the northwest half of the township.

The glacial lake clay in this township yields very little water, as a well, 15 feet deep, on the NW.¼, section 6, obtains only a small supply. The remaining two wells in the glacial lake clay area are 30 to 110 feet deep and obtain their water from from sand and gravel beds in the boulder clay that underlies the glacial lake clay. The wells in that part of the township covered by boulder clay and moraine are 8 to 90 feet deep, and although the distribution of the water-bearing deposits in the boulder clay and moraine is very irregular, the aquifers here outlined probably extend continuously between the wells mentioned. One of these aquifers is about 1,865 to 1,875 feet above sea-level and supplies two wells, 80 and 60 feet deep, on the NE.¼, section 7, and the SE.¼, section 18, respectively, with water that is too "alkaline" to be fit for drinking. Another aquifer is about 1,874 to 1,890 feet above sea-level and supplies four wells, 45 to 66 feet deep, on sections 17, 18, and 20, with hard water. A third aquifer is about 1,825 to 1,851 feet above sea-level and supplies five wells, 45 to 70 feet deep, on sections 19, 20, 29, and 32, with hard water. A fourth aquifer is about 1,795 to 1,830 feet above sea-level and supplies four wells, 70 to 110 feet deep, on sections 28, 29, and 32, with hard water. A fifth aquifer in the northeast part of the township is about 1,940 to 1,945 feet above sea-level and supplies two wells each 50 feet deep, on the NW.¼, section 25, and the NE.¼, section 26, with small supplies of moderately "alkaline" water, and the sixth aquifer, north of the fifth, is about 1,885 to 1,900 feet above sea-level and supplies two wells, 70 and 50 feet deep, on sections 34 and 36. The stratigraphic position of these aquifers is not known, but it appears probable that at least the deeper aquifers are at the base of the glacial drift.

The water in seven wells, 8 to 110 feet, is moderately "alkaline", but in four wells, 60 to 80 feet deep, in the southern

half of the township, the water is decidedly "alkaline", whereas four wells, 15 to 60 feet deep, in the southern third of the township, do not provide enough water for local requirements.

STATISTICAL SUMMARY OF WELL INFORMATION IN RURAL MUNICIPALITY OF KING GEORGE, NO. 256, SASKATCHEWAN

West of 3rd meridian — Township / Range	24 10	24 11	24 12	25 10	25 11	25 12	26 10	26 11	26 12	Total No. in municipality
Total No. of Wells in Township	32	21	9	10	41	37	32	51	28	265
No. of wells in bedrock	0	0	0	0	2	0	0	3	0	5
No. of wells in glacial drift	32	21	9	10	43	37	32	48	28	260
No. of wells in alluvium	0	0	0	0	0	0	0	0	0	0
Permanency of Water Supply										
No. with permanent supply	30	19	5	10	28	35	31	33	24	215
No. with intermittent supply	0	2	4	0	14	2	0	18	4	44
No. dry holes	2	0	0	0	1	0	1	0	0	4
Types of Wells										
No. of flowing artesian wells	0	2	1	0	1	0	0	0	1	5
No. of non-flowing artesian wells	14	6	0	4	10	20	12	14	15	95
No. of non-artesian wells	16	13	8	6	31	17	19	37	12	159
Quality of Water										
No. with hard water	29	21	7	10	29	29	27	31	27	210
No. with soft water	1	0	2	0	13	8	4	20	1	49
No. with salty water	0	0	0	0	0	0	0	0	1	1
No. with "alkaline" water	11	5	3	1	10	10	1	6	16	83
Depths of Wells										
No. from 0 to 50 feet deep	19	24	9	9	36	20	20	29	14	180
No. from 51 to 100 feet deep	10	3	0	1	7	15	9	7	13	65
No. from 101 to 150 feet deep	2	1	0	0	0	2	1	9	1	16
No. from 151 to 200 feet deep	1	0	0	0	0	0	1	1	0	3
No. from 201 to 500 feet deep	0	3	0	0	0	0	1	2	0	6
No. from 501 to 1,000 feet deep	0	0	0	0	0	0	0	3	0	3
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	20	16	9	8	38	33	26	50	21	221
No. not usable for domestic purposes	10	5	0	2	4	4	5	1	7	38
No. usable for stock	29	21	9	10	42	37	31	50	27	256
No. not usable for stock	1	0	0	0	0	0	0	1	1	3
Sufficiency of Water Supply										
No. sufficient for domestic needs	30	20	5	10	32	34	31	32	27	221
No. insufficient for domestic needs	0	1	4	0	10	3	0	19	1	38
No. sufficient for stock needs	24	15	5	9	31	29	27	32	25	197
No. insufficient for stock needs	6	6	4	1	11	8	4	19	3	62

ANALYSES AFT QUALITY OF WATER

General Statement

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

Total Dissolved Mineral Solids

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

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

Mineral Substances Present

Calcium and Magnesium

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

Sodium

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

Sulphates

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

Chlorides

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

Iron

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

Hardness

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

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

Analyses of Water Samples from the Municipality of King George, No. 25o, Saskatchewan.

No.	LOCATION					Depth of Well, Ft.	Total dis'vd solids	HARDNESS			CONSTITUENTS AS ANALYSED						CONSTITUENTS AS CALCULATED IN ASSUMED COMBINATIONS								Source of Water
	Qtr.	Sec.	Tp.	Rge.	Mer.			Total	Perm.	Temp.	Cl.	Alkalinity	CaO	MgO	SO_4	Na_2O	Solids	$CaCO_3$	$CaSO_4$	$MgCO_3$	$MgSO_4$	Na_2CO_3	Na_2SO_4	NaCl	$CaCl_2$	
1	SW.	16	24	11	3	230	2,003												(2)		(4)	(3)	(1)	(5)		* 1
2	NW.	10	25	12	3	75	3,000												(3)		(2)		(1)	(4)		* 1
3	SW.	2o	25	12	3	14	389											(2)	(1)		(3)				(4)	* 1
4	SE.	2o	25	12	3	o7	2,203											(4)	(1)		(2)		(3)		(5)	* 1
5	SW.	14	2o	11	3	125	3,o54											(4)	(1)		(2)		(3)		(5)	* 1
o	NE.	20	2o	11	3	778	1,200															(1)		(2)		* 2
7	NW.	3o	2o	12	3	Spring	980												457	180	118		207	18		* 1

Water samples indicated thus, * 1, are from glacial drift or other unconsolidated deposits.
Water samples indicated thus, * 2, are from bedrock, Belly River formation.
Analyses are reported in parts per million; where numbers (1), (2), (3), (4), and (5) are used instead of parts per million, they represent the relative amounts in which the five main constituents are present in the water.
Hardness is the soap hardness expressed as calcium carbonate ($CaCO_3$).

Analyses Nos. 1, 3, 4, and 7, by Provincial Analyst, Regina; Analyses Nos. 2 and 6 by Saskatoon University; No. 7 by Canadian National railways.

Water from the Unconsolidated Deposits

The materials forming the glacial drift have been assembled by a variety of processes and have been subjected to a number of agencies that have affected their physical and chemical condition. Thus the ice-sheets have transported material for considerable distances and have in many places mixed this material with local sediments. The water from the melting ice has transported and sorted some of these sediments. The retreating ice-sheets dammed back the water resulting from melting ice-sheets and formed glacial lakes in which sands or clays were deposited. Readvancing ice-sheets passed over the deposits of previous ice-sheets and mixed up or altered them in various ways; percolating waters have carried oxygen and carbon dioxide in solution into the upper part of the glacial drift, and have caused chemical changes in the composition of the sediments. These conditions help to explain the great variation in the chemical composition of ground water in the glacial drift. In general the water from the finer sediments is less highly mineralized than water from the coarser sediments, and the water from the shallow wells is less highly mineralized than waters from the deep wells. Spring water, the water of spring-fed wells, and the water of wells that are situated near valleys are as a rule not very highly mineralized, as the circulation of water in the aquifers that supply these springs and wells is comparatively rapid.

Samples Nos. 1 to 5, on the table of analyses, are from wells in the glacial drift. The predominance of the sulphates over the carbonates and the chlorides is well shown in the table. Calcium sulphate ($CaSO_4$) is present in all these samples from the glacial drift and in three samples it is the chief constituent. Magnesium sulphate, ($MgSO_4$), is present in all five samples, but in four it is subordinate to calcium sulphate. Sodium sulphate is the chief constituent in two samples and is present in smaller proportions in two others. Sample No. 3 represents soft water that contains only 389 parts per million of dissolved solids, and the well from which the water was taken may

be fed by an aquifer that supplies water to the lake about 1½ miles southwest of the well. Samples Nos. 1, 2, 4, and 5 contain 2,003 to 3,654 parts per million of dissolved solids, and although the analyses do not give the amounts of the constituents it is evident that all the waters are excessively hard, and are also laxative as they contain the sulphates of sodium and magnesium. Water No. 5 is not used for any purpose and water No. 2 is rather highly mineralized for drinking, but is reported as being used for this purpose. Sample No. 7 is from a spring, and contains rather a high proportion of dissolved solids. This water is very hard, but is not appreciably laxative and can be used for all purposes.

Water from the Bedrock

The waters from bedrock aquifers in the Bearpaw and Belly River formations are generally soft, but are fairly highly mineralized, and some of them may be salty. Sulphate, carbonate, and chloride of sodium are the chief constituents of these waters, and the proportion of calcium salts is very small so that the waters are well adapted for laundry purposes; and if they are not too highly mineralized and do not contain too large a proportion of common salt, they can be used for drinking. Some of the waters are slightly laxative, due to the sodium sulphate they contain, and in some the "soda" taste, which is particularly noticeable when the water is not quite cold, is rather objectionable. The presence of so much "black alkali" and "white alkali", and the absence of considerable proportions of calcium sulphate, make these waters harmful for irrigation purposes, and the sodium carbonate that some of them contain in large proportions extracts the colouring matter from vegetable compounds such as tea or coffee.

Sample No. 6 is from an aquifer thought to be in the Belly River formation and the well from which it is taken is 778 feet deep. The analysis shows that the water contains only 1,200 parts

per million of dissolved solids which consist entirely of sodium carbonate and sodium chloride, this water is soft and is not laxative, but it has a salty, "soda" taste, and is useless for irrigation as it appears to contain so large a proportion of "black alkali".

WELL RECORDS—Rural Municipality of KING GEORGE, NO. 256, 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	NW.	2	24	10	3	Bored	78	2,150	- 63	2,087	78	2,072	Glacial sand	Hard	43	D, S	Sufficient for 6 barrels a day.
2	NE.	4	"	"	"	Bored	70	2,155	- 63	2,092	70	2,085	Glacial quick-sand	Hard	42	D, S	Sufficient for 3 barrels a day; 100-foot dry hole; 20-foot well in sand.
3	NW.	4	"	"	"	Bored	68	2,200	- 38	2,162	68	2,132	Glacial drift	Hard, iron, slightly "alkaline"	42	D, S	Sufficient for 12 head stock.
4	NW.	6	"	"	"	Dug	32	2,230	- 17	2,213	32	2,198	Glacial sand	Hard, slightly iron	42	D, S	Sufficient for 20 head stock.
5	NW.	10	"	"	"	Bored	66	2,100	- 58	2,042	66	2,034	Glacial sand	Hard	44	S	Insufficient supply.
6	NE.	10	"	"	"	Dug	6	2,070	- 2	2,068	6	2,064	Glacial sand	Hard, iron	56	D, S	Sufficient for 10 head stock; numerous springs in valley give ample supply.
7	NW.	12	"	"	"	Bored	128	2,020			128	1,892	Glacial sand	Hard, iron	43	S	Sufficient supply; dam also for stock.
8	SE.	18	"	"	"	Bored	50	2,105	- 36	2,069	50	2,049	Glacial drift	Hard, slightly "alkaline"	42	D, S	Sufficient; waters 32 head stock; 37-foot well unused.
9	NW.	18	"	"	"	Bored	80	2,160	- 50	2,110	80	2,080	Glacial drift	Hard, "alkaline"	42	S	Ample supply for 15 head stock.
10	SW.	19	"	"	"	Springs		2,150					Glacial drift	Hard, slightly "alkaline"	42	S	Several springs; abundant supply.
11	NE.	22	"	"	"	Bored	48	2,120	- 8	2,112	48	2,072	Glacial sand and gravel	Hard	44	D, S	Sufficient for 100 head stock.
12	NE.	23	"	"	"	Drilled	38	2,085	- 28	2,057	38	2,047	Glacial drift	"Alkaline"		D, S	Insufficient supply.
13	SW.	23	"	"	"	Bored	80	2,065	- 60	2,005	80	1,985	Glacial drift	Hard	46	S	Sufficient supply.
14	NW.	24	"	"	"	Bored	80	2,100			80	2,020	Glacial drift	Hard, "alkaline"	43	D, S	Sufficient for 12 head stock.
15	SE.	26	"	"	"	Bored	30	2,110	- 28	2,082	30	2,080	Glacial drift		50	D, S	Insufficient supply in dry years; waters 8 head stock.
16	SW.	28	"	"	"	Bored	56	2,125	- 36	2,089	56	2,069	Glacial sand	Hard, "alkaline"	42	S	Sufficient for 20 head stock; 9-foot well of soft water.
17	SE.	30	"	"	"	Bored	45	2,165	- 26	2,139	45	2,120	Glacial sand	Hard, "alkaline"		S	Sufficient supply; also dam for stock.
18	SE.	32	"	"	"	Bored	150	2,210			150	2,060	Glacial sand	Hard, "alkaline"	43	S	Sufficient; 14-foot well waters 30 head stock
19	NW.	34	"	"	"	Drilled	160	2,200	-100	2,100	160	2,040	Glacial sand	Hard, "alkaline"	42	S	Sufficient for 25 head stock; 6-foot well, good supply.
20	NE.	35	"	"	"	Bored	30	2,170	- 0	2,170	30	2,140	Glacial sand	Hard	48	D, S	Sufficient; waters 12 head stock.
21	NW.	36	"	"	"	Dug	30	2,155	- 22	2,133	30	2,125	Glacial drift	Hard, "alkaline"	43	D, S	Sufficient; waters 4 head only; 14-foot well also supplies stock.
22	SE.	36	"	"	"	Dug	15	2,135	- 8	2,127	15	2,120	Glacial drift	Soft	48	D, S	Sufficient for 12 head stock, also a dry hole in glacial drift.
1	NE.	2	24	11	3	Bored	60	2,200	- 20	2,240	60	2,200	Glacial drift	Medium hard	43	D, S	Insufficient supply; intermittent.
2	SE.	3	"	"	"	Dug	13	2,350	- 5	2,345	13	2,337	Glacial gravel	Medium hard	43	D, S	Sufficient supply.
3	SE.	4	"	"	"	Dug	20	2,382	- 16	2,366	20	2,362	Glacial drift	Hard, iron	42	S	Insufficient supply.
4	SW.	4	"	"	"	Dug	16	2,380	- 7	2,373	16	2,364	Glacial gravel	Hard		D, S	Sufficient supply.

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

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

WELL RECORDS—Rural Municipality of KING GEORGE, NO. 256, 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.	6	24	11	3	Dug	12	2,375	- 0	2,375	12	2,303	Glacial sand and gravel	Hard, "alkaline"	43	D, S	Sufficient supply.
6	SE.	6	"	"	"	Bored	28	2,300	- 13	2,307	28	2,352	Glacial sand	Hard	43	D	Sufficient supply.
7	NW.	10	"	"	"	Dug	33	2,382	- 15	2,307	33	2,349	Glacial gravel	Hard, iron, "alkaline"	42	S	Sufficient supply.
8	NE.	11	"	"	"	Bored	50	2,225	+ 1	2,226	15	2,210	Glacial fine sand	Hard, "alkaline"	44	S	Sufficient supply.
9	NW.	12	"	"	"	Bored	65	2,205	- 55	2,150	65	2,140	Glacial sand	Hard, "alkaline"	43	D, S	Insufficient supply.
10	SW.	16	"	"	"	Drilled	230	2,400			230	2,170	Glacial sand	medium hard, cloudy	43	D, S	Sufficient supply; #.
11	NW.	16	"	"	"	Drilled	232	2,405	-132	2,273	232	2,173	Glacial drift				
12	SE.	22	"	"	"	Dug	112	2,250	- 3	2,247	112	2,138	Glacial gravel	Hard	43	D, S	Sufficient supply.
13	SE.	23	"	"	"	Dug	10	2,200	- 0	2,200	10	2,190	Glacial gravel	Medium hard	43	D, S	Sufficient supply.
14	NW.	24	"	"	"	Dug	10	2,200	- 6	2,194	10	2,184	Glacial gravel	Hard, iron, "alkaline"	43	D, S	Sufficient supply; flowing spring here.
15	NE.	26	"	"	"	Drilled	287	2,250	-152	2,098	287	1,963	Glacial drift	Hard, iron	43	S	Sufficient supply.
16	W.½	26	"	"	"	Dug	13	2,250	- 0	2,250	13	2,237	Glacial drift	Medium hard	43	D, S	Insufficient supply.
17	NE.	31	"	"	"	Bored	20	2,400	- 8	2,392	20	2,380	Glacial gravel	Medium hard	43	D, S	Sufficient supply.
18	NW.	32	"	"	"	Dug	15	2,420	- 5	2,415	15	2,405	Glacial sand	Medium, iron, cloudy	43	D, S	Insufficient supply.
19	SE.	36	"	"	"	Bored	70	2,286	- 60	2,226	70	2,216	Glacial sand	Hard, iron, odourous	43	S	Sufficient supply.
20	SW.	36	"	"	"	Dug	16	2,235	- 0	2,235	16	2,219	Glacial sand	Hard, clear	43	D, S	Sufficient supply.
1	SE.	4	24	12	3	Dug	8	2,300	- 5	2,295	8	2,292	Glacial sand	Soft	42	D, S	Sufficient supply; also a flowing spring.
2	NW.	12	"	"	"	Dug	18	2,400	- 6	2,394	18	2,382	Glacial drift	Medium hard, slightly "alkaline"	44	D, S	Intermittent supply.
3	NW.	24	"	"	"	Dug	18	2,425	- 3	2,422	18	2,407	Glacial drift	Medium hard, "alkaline"	44	D, S	Insufficient supply; intermittent.
4	SW.	24	"	"	"	Dug	30	2,450	- 25	2,425	30	2,420	Glacial gravel	Hard, "alkaline"	43	D, S	Intermittent supply.
5	NW.	28	"	"	"	Dug	18	2,300	- 10	2,290	18	2,282	Glacial drift	Hard	44	D, S	Sufficient supply.
6	NE.	30	"	"	"	Dug	14	2,335	- 0	2,335	14	2,321	Glacial drift	Hard	43	D, S	Intermittent supply.
7	SW.	32	"	"	"	Dug	16	2,315	- 12	2,303	16	2,299	Glacial sand	Soft	44	D, S	Sufficient supply.
8	NE.	32	"	"	"	Dug	10	2,255	- 6	2,249	10	2,245	Glacial gravel	Hard, iron	45	D, S	Sufficient supply.
1	SE.	1	25	10	3	Bored	32	2,160	- 24	2,136	32	2,128	Glacial gravel	Hard	43	D, S	Sufficient; supplies school and 2 farms.
2	NE.	6	"	"	"	Bored	64	2,250	- 58	2,192	64	2,180	Glacial gravel	Hard, iron	42	D, S	Abundant supply.
3	SE.	7	"	"	"	Dug	20	2,240	- 16	2,224	20	2,220	Glacial sand	Hard	42	D, S	Sufficient for 14 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 KING GEORGE, NO. 256, 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	SW.	12	25	10	3	Bored	50	2,260	- 20	2,240	50	2,210	Glacial sand	Hard, slightly "alkaline"	42	D, S	Insufficient for 10 head stock; seven-foot seepage well supplies 20 head stock.
5	NW.	13	"	"	"	Dug	12	2,325	- 6	2,319	12	2,313	Glacial sand	Hard	42	D, S	Sufficient for 12 head stock.
6	NE.	10	"	"	"	Dug	23	2,340	- 11	2,329	23	2,317	Glacial sand	Hard		D, S	Ample for 10 head stock; 15-foot well waters 15 head stock.
7	NW.	22	"	"	"	Dug	4	2,390	- 2	2,388	4	2,386	Glacial sand	Hard	45	D, S	Good supply.
8	NW.	24	"	"	"	Dug	11	2,350	- 2	2,348	11	2,339	Glacial sand	Hard	42	D, S	Sufficient supply.
1	NW.	2	"	11	3	Dug	18	2,350	- 13	2,337	18	2,332	Glacial drift	Soft	44	D	Sufficient only for household.
2	SW.	2	"	"	"	Dug	18	2,340	- 13	2,327	18	2,322	Glacial drift	Very hard, "alkaline", iron	45	S, I	Intermittent supply.
3	SE.	2	"	"	"	Dug	18	2,250	- 0	2,250	18	2,232	Glacial drift	Soft	45	D, S	Sufficient; waters 6 head stock.
4	SW.	3	"	"	"	Dug	12	2,350	- 5	2,345	12	2,338	Glacial sand	Hard, odorous	44	D, S	Waters 22 head stock.
5	SE.	4	"	"	"	Dug	16	2,355	- 13	2,342	16	2,339	Glacial drift	Medium hard	41	D, S	Intermittent supply.
6	NE.	4	"	"	"	Dug	12	2,340	- 0	2,340	12	2,328	Glacial drift	Medium hard	45	D, S	Intermittent; waters 10 head stock.
7	NW.	4	"	"	"	Dug	14	2,390	- 5	2,385	14	2,376	Glacial drift	Medium hard, slightly "alkaline"	45	D	Sufficient for school needs.
8	SW.	4	"	"	"	Dug	16	2,355	- 0	2,355	16	2,339	Glacial drift	Medium hard, slightly "alkaline"	41	D, S	Insufficient; waters 12 head stock.
9	SE.	5	"	"	"	Dug	20	2,390	- 0	2,390	20	2,370	Glacial drift	Moderately hard		D, S	Intermittent, insufficient supply; waters 4 head stock.
10	SW.	6	"	"	"	Bored	66	2,390	- 62	2,328	66	2,324	Bearpaw	Soft	41	D, S	Yields 150 gallons a day; waters 12 head stock; 30-foot dry hole.
11	SE.	10	"	"	"	Dug	20	2,300	- 16	2,284	20	2,280	Glacial sand	Hard, iron, "alkaline"	42	D, S	
12	NE.	12	"	"	"	Dug	24	2,300	- 18	2,282	24	2,276	Glacial sand and gravel	Hard	43	D, S	Sufficient for 40 head stock.
13	NW.	12	"	"	"	Bored	50	2,300	- 20	2,280	50	2,250	Glacial drift	Hard, iron, slightly "alkaline"	44	D, S	Sufficient supply.
14	NW.	14	"	"	"	Bored	85	2,295	- 20	2,275	85	2,210	Bearpaw	Soft	44	D, S	Yields 40 barrels daily.
15	SE.	16	"	"	"	Bored	60	2,310	- 54	2,256	60	2,250	Glacial gravel	Moderately hard, iron, slightly "alkaline"		D, S	Sufficient for 75 head stock.
16	SW.	16	"	"	"	Dug	16	2,300	- 12	2,288	16	2,284	Glacial sand	Soft	42	D, S	Insufficient supply; intermittent.
17	NW.	17	"	"	"	Dug	10	2,310	- 0	2,310	10	2,300	Glacial gravel	Soft	44	D, S	Sufficient for 20 head stock.
18	SE.	18	"	"	"	Dug	16	2,305	- 0	2,305	16	2,289	Glacial sand	Soft		D, S	Sufficient for 6 head stock.
19	NW.	18	"	"	"	Dug	10	2,300	- 6	2,294	10	2,290	Glacial gravel	Hard, iron, red sediment	41	D, S	Sufficient; yields 6 barrels daily.
20	NE.	18	"	"	"	Dug	16	2,275	- 0	2,275	16	2,259	Glacial drift	Hard	41	D, S	Sufficient supply.

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

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

WELL RECORDS—Rural Municipality of KING GEORGE, NO. 256, 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
21	SE.	19	25	11	3	Dug	18	2,300	- 12	2,288	18	2,282	Glacial sand	Hard, iron	41	D, S	Sufficient; waters 19 head stock.
22	SW.	20	"	"	"	Dug	13	2,305	- 8	2,297	13	2,292	Glacial gravel	Soft	41	D, S	Sufficient for 23 head stock.
23	NW.	20	"	"	"	Dug	14	2,260	- 0	2,260	14	2,246	Glacial drift	Soft	41	D	Sufficient for house use.
24	NE.	20	"	"	"	Bored	85	2,290	- 45	2,245	85	2,205	Glacial blue sand	Hard, iron, red sediment	42	D, S	Watered 26 head stock; ample for 50 head stock.
25	NW.	22	"	"	"	Bored	60	2,300	- 45	2,255	60	2,240	Glacial blue sand	Hard, iron, "alkaline"	42	D, S	Waters 20 head stock; yields 40 barrels daily.
26	NE.	23	"	"	"	Bored	85	2,310	- 35	2,275	85	2,225	Glacial blue sand	Hard, iron, red sediment	43	S	Watered 35 head stock.
27	NE.	24	"	"	"	Bored	47	2,300	- 12	2,288	47	2,253	Glacial coarse sand	Hard	43	D, S	Oversufficient; waters 75 head stock.
28	NW.	24	"	"	"	Bored	80	2,300	- 70	2,230	80	2,220	Glacial sand	Hard	43	D, S	Intermittent supply.
29	S.½	25	"	"	"	Dug	12	2,300			12	2,288	Glacial drift	Hard, iron		D, S	Intermittent supply; now caved in.
30	NE.	26	"	"	"	Dug	12	2,250	- 9	2,241	12	2,238	Glacial fine sand	Soft	46	D, S	Waters 5 head stock.
31	NW.	28	"	"	"	Bored	50	2,280	- 30	2,250	50	2,230	Glacial gravel	Hard, iron	42	D, S	Sufficient for 30 head stock.
32	NW.	29	"	"	"	Dug	12	2,250	- 0	2,250	12	2,238	Glacial drift	Hard, "alkaline"	42	S	Intermittent supply.
33	NE.	30	"	"	"	Dug	18	2,240	- 14	2,226	18	2,222	Glacial fine sand	Hard, iron, slightly "alkaline"	41	D, S	Intermittent supply.
34	SE.	31	"	"	"	Dug	20	2,230	- 0	2,230	20	2,210	Glacial drift	Hard	42	S	Intermittent supply.
35	SW.	31	"	"	"	Dug	13	2,225	- 0	2,225	13	2,212	Glacial drift	Hard	41	D, S	Intermittent supply.
36	SE.	32	"	"	"	Dug	15	2,270	- 11	2,259	15	2,255	Glacial gravel	Hard	42	D, S	Oversufficient; waters 20 head stock.
37	NW.	32	"	"	"	Dug	10	2,240	- 0	2,240	10	2,230	Glacial drift	Soft, odorous	45	D, S	Intermittent supply.
38	NE.	32	"	"	"	Dug	20	2,255	- 12	2,243	20	2,235	Glacial gravel	Soft, iron	43	D, S	Supplies 10 barrels daily; waters 25 head stock.
39	NE.	35	"	"	"	Dug	12	2,270	- 6	2,264	12	2,258	Glacial drift	Soft	46	D, S	Intermittent supply.
40	SE.	36	"	"	"	Dug	14	2,250	- 9	2,241	14	2,236	Glacial fine sand	Hard	43	D, S	Abundant supply; waters 12 head stock.
41	NE.	36	"	"	"	Dug	4	2,250			4	2,246	Glacial gravel	Hard	41	D, S	Abundant for 20 head stock; this is a flowing spring.
42	NW.	36	"	"	"	Drilled	50	2,265	- 42	2,223	50	2,215	Glacial fine sand	Hard, slightly "alkaline"	41	D, S	Yields 90 barrels daily.
1	NW.	4	25	12	3	Bored	102	2,255	- 62	2,193	102	2,153	Glacial sand	Hard, iron, "alkaline"		D, S	Sufficient for 25 head stock.
2	NE.	4	"	"	"	Bored	95	2,270	- 55	2,115	95	2,175	Glacial sand	Hard, iron, "alkaline"	42	D, S	Sufficient for 50 head of stock.
3	SW.	4	"	"	"	Bored	96	2,255	- 56	2,199	96	2,159	Glacial sand	Hard, iron, "alkaline"		S	Waters 75 head stock; not suitable for man.
4	SW.	5	"	"	"	Dug	10	2,200	- 8	2,192	10	2,190	Glacial gravel	Soft	41	D, S	Oversufficient; waters 50 to 40 head stock.
5	SE.	6	"	"	"	Bored	75	2,275	- 55	2,220	75	2,200	Glacial sand	Hard, iron	43	D, S	Insufficient; waters 4 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 KING GEORGE, NO. 256, 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
6	NE.	6	25	12	3	Dug	6	2,180	- 4	2,176	6	2,174	Glacial gravel	Hard, iron	41	D, S	Abundant supply; water 18 head stock.
7	SE.	7	"	"	"	Bored	44	2,160	- 38	2,122	44	2,116	Glacial gravel	Hard, iron	42	D, S	Sufficient for 10 head stock.
8	NW.	9	"	"	"	Bored	90	2,250	- 10	2,240	90	2,160	Glacial sand	Hard, iron, sulphur	42	D, S	Sufficient for 100 head stock.
9	NE.	10	"	"	"	Bored	70	2,245	- 30	2,215	70	2,175	Glacial drift	Hard, iron	42	D, S	Sufficient for 30 head stock.
10	SE.	10	"	"	"	Bored	70	2,280	- 35	2,245	70	2,210	Glacial drift	Hard, iron, "alkaline"		S	Good supply; but not in use at present.
11	NW.	10	"	"	"	Bored	75	2,250	- 25	2,225	75	2,175	Glacial drift	Hard, iron	42	D, S	Yields 32 barrels daily; #.
12	NW.	14	"	"	"	Bored	60	2,250	- 20	2,230	60	2,190	Glacial black sand	Hard	42	D, S	Abundant supply; waters 40 head stock.
13	SW.	14	"	"	"	Dug	10	2,260	- 4	2,256	10	2,250	Glacial gravel	Soft	43	D, S	Supplies 10 head stock.
14	SE.	14	"	"	"	Dug	10	2,300	- 0	2,300	10	2,290	Glacial drift	Soft	42	D, S	Supplies 10 head stock.
15	SW.	16	"	"	"	Bored	60	2,210	- 40	2,170	60	2,150	Glacial sand	Hard, "alkaline"	41	D, S	Sufficient for 15 head stock.
16	NE.	16	"	"	"	Bored	60	2,200	- 5	2,195	60	2,140	Glacial sand	Hard, iron, slightly "alkaline"	42	D, S	Waters 80 to 90 head stock; oversufficient.
17	SE.	18	"	"	"	Bored	30	2,140	- 18	2,122	30	2,110	Glacial sand	Hard, iron, "alkaline"	41	D, S	Waters 20 head stock.
18	NW.	20	"	"	"	Bored	20	2,140	- 14	2,126	20	2,120	Glacial sand	Hard, "alkaline"	42	D, S	Insufficient supply.
19	NE.	21	"	"	"	Bored	20	2,175	- 16	2,159	20	2,155	Glacial drift	Hard, "alkaline"		D	Sufficient for household use.
20	NW.	22	"	"	"	Dug	11	8,180	- 8	2,172	11	2,169	Glacial drift	Hard, "alkaline"	42	D, S	Insufficient; waters 15 head stock.
21	NE.	23	"	"	"	Dug	16	2,240	- 0	2,240	16	2,224	Glacial gravel	Soft		D, S	Intermittent supply.
22	NW.	23	"	"	"	Bored	50	2,210	- 30	2,180	50	2,160	Glacial gravel	Hard	41	D, S	Waters 16 to 18 head stock.
23	W.½	24	"	"	"	Bored	70	2,250	- 35	2,215	70	2,180	Glacial sand	Hard, iron	41		Sufficient for 30 head stock.
24	SE.	24	"	"	"	Dug	10	2,250	- 6	2,244	10	2,240	Glacial gravel	Soft	41	D, S	Yields 30 barrels daily.
25	SE.	25	"	"	"	Bored	74	2,200	- 24	2,176	74	2,126	Glacial blue sand	Hard, iron	41	S	Waters 100 head stock; 14-foot well near slough for drinking.
26	SW.	26	"	"	"	Dug	14	2,210	- 0	2,210	14	2,196	Glacial drift	Soft	45	D, S	Intermittent supply; #.
27	SE.	26	"	"	"	Bored	67	2,215	- 35	2,180	67	2,148	Glacial gravel	Hard, cloudy		S	Waters 30 head stock; laxative; #.
28	SE.	27	"	"	"	Bored	38	2,190	- 12	2,178	38	2,152	Glacial gravel	Hard, iron		D, S	Waters 20 head stock.
29	NE.	28	"	"	"	Bored	50	2,170	- 25	2,145	50	2,120	Glacial sand	Hard, iron	42	D, S	Sufficient for 25 head stock.
30	SE.	28	"	"	"	Bored	50	2,170	- 25	2,145	50	2,120	Glacial sand	Very hard, iron	42	D, S	Sufficient for 45 head stock.
31	NE.	30	"	"	"	Bored	65	2,060	- 55	2,005	65	1,995	Glacial sand	Hard, iron	42	D, S	Sufficient for 85 head stock.
32	SW.	30	"	"	"	Bored	56	2,050	- 46	2,004	56	1,994	Glacial sand	Hard, iron	41	D, S	Yields 25 barrels daily.

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 KING GEORGE, NO. 255, SASKATCHEWAN.

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
33	NW.	32	25	12	3	Bored	45	2,040	- 40	2,000	45	1,995	Glacial gravel	Hard, iron	42	D, S	Waters 12 head stock.
34	NW.	34	"	"	"	Bored	104	2,150	- 34	2,060	104	2,046	Glacial drift	Hard, iron	42	D, S	Insufficient supply.
35	SE.	34	"	"	"	Dug	9	2,185	- 0	2,185	9	2,176	Glacial drift	Soft	45	D, S	Limited supply; intermittent.
36	NW.	36	"	"	"	Dug	15	2,200	- 12	2,188	15	2,185	Glacial fine sand	Soft	43	D, S	Waters 10 head stock only.
1	NW.	2	26	10	3	Dug	7	2,445	- 1	2,444	7	2,438	Glacial sand	Soft	52	D, S	Ample supply.
2	SE.	8	"	"	"	Bored	76	2,310	- 62	2,248	70	2,234	Glacial sand	Hard	42	D, S	Sufficient for 10 head stock.
3	NE.	8	"	"	"	Bored	75	2,280	- 50	2,230	75	2,205	Glacial drift	Hard	41	D, S	Sufficient for 12 head stock; small dam for stock.
4	NW.	10	"	"	"	Dug	11	2,355	- 6	2,349	11	2,344	Glacial sand	Hard	44	D, S	Sufficient.
5	SE.	14	"	"	"	Drilled	250	2,410									Dry hole; base in glacial drift.
6	NE.	14	"	"	"	Bored	86	2,345			86	2,259	Glacial sand	Hard, iron	42	D, S	Ample supply.
7	NE.	16	"	"	"	Bored	18	2,292	- 12	2,280	18	2,274	Glacial sand	Hard	40	D, S	Sufficient for 5 head stock.
8	SE.	16	"	"	"	Bored	18	2,290	- 12	2,278	18	2,272	Glacial sand	Soft	42	D, S	Sufficient for 6 head stock; 26-foot well waters stock in winter.
9	SW.	16	"	"	"	Dug	18	2,275	- 8	2,267	18	2,257	Glacial drift	Hard	40	D, S	Sufficient for 20 to 30 head stock.
10	NW.	16	"	"	"	Bored	29	2,235	- 13	2,222	29	2,206	Glacial sand	Hard	40	S	Sufficient for 20 head stock; 16-foot well for house use.
11	SW.	17	"	"	"	Dug	42	2,240	- 12	2,228	42	2,198	Glacial sand	Hard	40	D, S	Abundant supply.
12	NW.	18	"	"	"	Drilled	108	2,200	-148	2,052	168	2,032	Glacial sand	Hard, iron	42	D, S	Abundant supply.
13	NW.	19	"	"	"	Bored	105	2,150	- 82	2,068	105	2,045	Glacial sand	Hard, iron	40	D, S	Abundant supply.
14	SW.	20	"	"	"	Dug	45	2,205	- 25	2,180	45	2,160	Glacial sand	Hard, iron	44	D, S	Sufficient; waters 10 head stock; 25-foot seepage well.
15	NW.	22	"	"	"	Bored	15	2,265	- 4	2,261	15	2,250	Glacial sand	Hard	44	D, S	Sufficient for 14 head stock; also similar well.
16	NE.	28	"	"	"	Bored	60	2,225	- 27	2,198	60	2,165	Glacial drift	Hard, iron	41	S	Insufficient for 37 head stock; dam also used; well on NW.¼, section 28, supplies household water.
17	SW.	28	"	"	"	Dug	14	2,205	- 6	2,199	14	2,191	Glacial gravel	Soft	40	D, S	Sufficient for 10 to 15 head stock.
18	NW.	28	"	"	"	Dug	14	2,210	- 10	2,200	14	2,196	Glacial drift				Large yield of good water.
19	NE.	30	"	"	"	Bored	86	2,200	- 46	2,154	86	2,114	Glacial drift	Hard, "alkaline"	41	S	Abundant supply.
20	SE.	30	"	"	"	Dug	11	2,200	- 4	2,196	11	2,189	Glacial drift	Hard, cloudy	46	D, S	Insufficient in dry years.
21	SW.	30	"	"	"	Bored	98	2,190	- 62	2,128	98	2,092	Glacial drift	Hard, iron	42	D, S	Abundant supply; 12-foot well in slough,
22	SW.	31	"	"	"	Bored	90	2,180	- 81	2,099	90	2,090	Glacial drift	Hard, iron	43	D, S	Insufficient; waters 16 head stock; also 12-foot well in 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 KING GEORGE, NO. 256, SASKATCHEWAN.

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
23	NW.	32	26	10	3	Bored	75	2,190	- 40	2,150	75	2,115	Glacial sand	Hard, iron		D, S	Sufficient for 40 head stock.
24	SW.	34	"	"	"	Dug	63	2,200	- 30	2,170	63	2,137	Glacial sand	Soft	41	D, S	Sufficient for 40 head stock.
25	NE.	34	"	"	"	Bored	40	2,190	- 20	2,170	40	2,150	Glacial sand	Hard		D, S	Sufficient for 100 head stock.
1	NE.	1	26	11	3	Dug	12	2,265	- 9	2,256	12	2,253	Glacial gravel	Medium hard	40	D, S	Sufficient for 50 head stock.
2	NW.	1	"	"	"	Drilled	150	2,260	- 63	2,197	150	2,110	Glacial gravel	Hard, iron	41	D, S	Abundant; yields 3 barrels an hour.
3	NE.	2	"	"	"	Dug	10	2,260	- 0	2,260	10	2,250	Glacial drift	Soft	45	D, S	Insufficient; intermittent supply.
4	NW.	2	"	"	"	Bored	75	2,350	- 0	2,350	75	2,275	Glacial drift	Soft	43	D, S	Insufficient; intermittent supply; hauls water in dry seasons.
5	NW.	4	"	"	"	Dug	20	2,210	- 17	2,193	20	2,190	Glacial sand	Medium hard	42	D, S	Insufficient at times.
6	SE.	6	"	"	"	Dug	20	2,210	- 16	2,194	20	2,190	Glacial sand	Hard	43	D, S	Abundant supply; waters 10 head stock.
7	SW.	6	"	"	"	Dug	20	2,210	- 16	2,194	20	2,190	Glacial sand	Hard	42	D, S	Sufficient for 40 head stock.
8	NW.	8	"	"	"	Dug	18	2,240	- 0	2,240	18	2,222	Glacial drift	Soft	43	D, S	Intermittent supply.
9	NW.	7	"	"	"	Dug	14	2,300	- 0	2,300	14	2,286	Glacial drift	Soft	43	D, S	Intermittent supply.
10	NE.	7	"	"	"	Dug	15	2,275	- 0	2,275	15	2,260	Glacial drift	Soft	43	D, S	Intermittent supply; has 6 head stock.
11	NE.	10	"	"	"	Dug	12	2,280	- 8	2,272	12	2,268	Glacial sand	Hard, "alkaline"	42	D, S	Intermittent supply; also spring; sufficient for 100 head stock.
12	SW.	12	"	"	"	Dug	20	2,245	- 5	2,240	20	2,225	Glacial drift	Soft	42	D, S	Sufficient for 20 head stock.
13	NE.	12	"	"	"	Bored	66	2,235	- 60	2,175	66	2,169	Glacial gravel	Hard	41	D, S	Sufficient for 20 head stock.
14	SE.	12	"	"	"	Dug	16	2,250	- 10	2,240	16	2,234	Glacial gravel	Soft	41	D, S	Sufficient for 50 head stock.
15	SW.	13	"	"	"	Dug	15	2,225	- 0	2,225	15	2,210	Glacial drift	Soft		D, S	Intermittent supply.
16	NW.	13	"	"	"	Dug	15	2,210	- 0	2,210	15	2,195	Glacial drift	Soft	42	D, S	Intermittent supply; also similar well.
17	NE.	14	"	"	"	Dug	13	2,225	- 0	2,225	13	2,212	Glacial drift	Soft	42	D, S	Intermittent supply; usually sufficient for 5 head stock.
18	SW.	14	"	"	"	Bored	125	2,205	-110	2,095	125	2,080	Glacial drift	Hard, cloudy, "alkaline", odorous	42	N	Unfit for man or stock; #. 13-foot well used for D, S.
19	NW.	16	"	"	"	Bored	30	2,160	- 18	2,142	30	2,130	Glacial sand and gravel	Medium hard		D, S	Intermittent supply.
20	SE.	16	"	"	"	Dug	10	2,210	- 0	2,210	10	2,200	Glacial drift	Soft, odorous	43	D, S	Intermittent supply.
21	SW.	19	"	"	"	Bored	80	2,225	- 55	2,170	80	2,145	Glacial sand	Hard, iron	42	D, S	Sufficient for 25 head stock.
22	NE.	20	"	"	"	Drilled	778	2,181	-150	2,011	758	1,403	Belly River(?)	Soft, salt			Abundant supply; #.
23	SE.	21	"	"	"	Drilled	789	2,219	-184	2,035	749	1,470	Belly River(?)	Hard, iron, sulphur	44	D, S	Abundant supply; waters 40 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 KING GEORGE, NO. 256, 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
24	NW.	21	20	11	3	Bored	140	2,170	-133	2,037	140	2,030	Glacial gravel	Hard, iron, odorous	42	D, S	Oversufficient; ample for 50 head stock.
25	NE.	22	"	"	"	Dug	12	2,200	- 0	2,200	12	2,188	Glacial gravel	Soft	42	D, S	Sufficient for 10 head stock.
26	SW.	22	"	"	"	Drilled	774	2,221	-184	2,037	734	1,487	Belly River(?)	Soft, rusty	44	D, S	Oversufficient; waters 30 head stock.
27	SE.	23	"	"	"	Dug	14	2,220	- 0	2,220	14	2,206	Glacial drift	Soft	43	D, S	Insufficient; intermittent supply.
28	NW.	23	"	"	"	Dug	15	2,205	- 0	2,205	15	2,190	Glacial drift	Soft	43	D, S	Intermittent supply.
29	SW.	24	"	"	"	Dug	10	2,205	- 0	2,205	10	2,195	Glacial gravel	Medium hard	43	D, S	Sufficient for 25 head stock.
30	NW.	24	"	"	"	Drilled	282	2,200	-130	2,070	282	1,918	Glacial fine sand	Hard, iron, cloudy	42	D, S	Oversufficient supply; waters 20 head cattle and 150 head sheep.
31	NE.	24	"	"	"	Bored	96	2,195	- 93	2,102	96	2,099	Glacial gravel	Hard, slightly "alkaline"	42	D, S	Ample for 75 head stock.
32	NW.	25	"	"	"	Dug	16	2,190	- 0	2,190	16	2,174	Glacial drift	Soft	45		Intermittent supply; used only for washing.
33	SE.	26	"	"	"	Drilled	166	2,200	-124	2,076	166	2,034	Glacial gravel	Hard, iron	42	D, S	Ample for 100 head stock.
34	SW.	26	"	"	"	Dug	12	2,205			12	2,193	Glacial drift	Soft, odorous	48	D, S	Intermittent supply.
35	NE.	26	"	"	"	Dug	16	2,180	- 0	2,180	16	2,164	Glacial drift	Soft	42	D, S	Intermittent supply.
36	SW.	27	"	"	"	Bored	50	2,175	- 31	2,144	50	2,119	Glacial gravel	Hard, iron	42	D, S	Sufficient for 50 head stock.
37	E.½	27	"	"	"	Bored	22	2,175	- 6	2,169	22	2,153	Glacial gravel	Hard	42	D, S	Sufficient for 35 head stock.
38	NW.	28	"	"	"	Bored	108	2,125	-104	2,021	108	2,017	Glacial drift	Hard, "alkaline"	41	D, S	Sufficient; waters 20 head stock.
39	SW.	28	"	"	"	Bored	110	2,100	-102	2,058	110	2,050	Glacial gravel	Hard, iron, slightly "alkaline"		D, S	Sufficient for 30 head stock; place vacant at present.
40	NE.	28	"	"	"	Bored	117	2,150	-102	2,048	117	2,033	Glacial gravel	Hard		D, S	Intermittent supply; laxative.
41	NE.	30	"	"	"	Bored	60	2,045	- 20	2,025	60	1,985	Glacial sand	Medium hard	42	D, S	
42	NE.	31	"	"	"	Bored	60	2,000	- 57	1,943	60	1,940	Glacial sand	Hard	42	D, S	Sufficient for 10 head stock.
43	NE.	32	"	"	"	Bored	102	2,075	- 96	1,979	102	1,973	Glacial sand	Hard, iron, cloudy	41	D, S	Abundant for 20 head stock.
44	NE.	33	"	"	"	Bored	120	2,120	- 80	2,040	120	2,000	Glacial sand	Hard, iron, sulphur	41	D, S	Oversufficient; waters 20 to 30 head stock.
45	NW.	34	"	"	"	Dug	20	2,140	- 0	2,140	20	2,120	Glacial sand	Medium hard	43	D, S	Barely sufficient.
46	SW.	34	"	"	"	Drilled	205	2,145	-125	2,020	205	1,940	Glacial gravel	Hard, "alkaline"	42	D, S	Sufficient for 75 head stock.
47	NE.	35	"	"	"	Dug	14	2,160	- 0	2,160	14	2,146	Glacial drift	Soft	45	D, S	Insufficient supply; will water 6 head stock.
48	SW.	36	"	"	"	Drilled	128	2,180	-114	2,066	128	2,052	Glacial gravel	Hard	41	D, S	Sufficient for 50 head stock.
1	NW.	2	26	12	3	Bored	60	2,120	- 55	2,065	60	2,000	Glacial drift	Hard, iron, very "alkaline"	41	S	Limited; intermittent supply.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of KING GEORGE, NO. 256, 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
2	SW.	2	20	12	3	Bored	90	2,170	- 60	2,110	90	2,080	Glacial drift	Hard	43	D, S	Ample supply; only 2 head stock to water.
3	NW.	6	"	"	"	Dug	15	1,945	- 0	1,945	15	1,930	Glacial drift	Soft		S	Intermittent supply.
4	SW.	6	"	"	"	Bored	30	1,945	- 20	1,925	30	1,915	Glacial gravel	Hard, slightly "alkaline"	41	D, S	Sufficient for 20 head stock.
5	NE.	7	"	"	"	Bored	80	1,945	- 65	1,880	80	1,865	Glacial drift	Hard, "alkaline"	41	S	Waters 15 head stock; hauls drinking water.
6	SE.	9	"	"	"	Dug	20	2,000					Glacial drift	Medium hard	43	D, S	Intermittent; waters 5 head stock.
7	S. ½	12	"	"	"	Dug	20	2,205	- 0	2,205	20	2,185	Glacial sand			N	Intermittent supply.
8	NW.	14	"	"	"	Bored	60	2,040	- 40	2,000	60	1,980	Glacial drift	Hard, iron, very "alkaline"	41	S	
9	SE.	15	"	"	"	Dug	15	2,050	- 13	2,037	15	2,035	Glacial sand	Hard, soda, "alkaline", iron	41	D, S	Yields 15 barrels daily.
10	NW.	15	"	"	"	Dug	8	1,975	- 0	1,975	8	1,967	Glacial gravel	Hard, iron, "alkaline"	41	D, S	Waters 14 head stock; flowing well with abundant supply.
11	NW.	16	"	"	"	Bored	64	1,955	- 5	1,950	64	1,891	Glacial sand	Hard, iron "alkaline"	42	D, S	Abundant supply; laxative.
12	NW.	17	"	"	"	Bored	45	1,935	- 37	1,898	45	1,890	Glacial sand and gravel	Hard, iron, slightly "alkaline"	41	D, S	Abundant supply; ample for 200 head stock.
13	SW.	18	"	"	"	Bored	66	1,940	- 63	1,877	66	1,874	Glacial white sand	Hard, lime	41	D, S	Sufficient supply; yields 3 barrels daily.
14	SE.	18	"	"	"	Bored	60	1,935	- 15	1,920	60	1,875	Glacial gravel	Hard, iron, "alkaline", salty	41	S	Abundant supply.
15	NE.	18	"	"	"	Bored	45	1,940	- 43	1,897	45	1,895	Glacial gravel	Hard, iron	41	D, S	Waters 50 head stock; oversufficient.
16	NE.	19	"	"	"	Bored	64	1,915	- 58	1,857	64	1,851	Glacial sand	Hard, soda, "alkaline", iron	41	D, S	Yields 20 barrels daily; sufficient.
17	NE.	20	"	"	"	Bored	70	1,905			70	1,835	Glacial gravel	Hard		S	Sufficient supply.
18	SW.	20	"	"	"	Bored	45	1,925	- 43	1,882	45	1,880	Glacial gravel	Hard, iron	41	D, S	Sufficient for 20 head stock.
19	NW.	25	"	"	"	Bored	50	1,935	- 45	1,950	50	1,945	Glacial fine sand	Hard, iron, "alkaline"	42	D, S	Waters 15 head stock; sufficient supply.
20	NE.	26	"	"	"	Bored	50	1,990	- 45	1,945	50	1,940	Glacial drift	Hard, iron, "alkaline"	42	D, S	Sufficient; waters 10 head stock.
21	SW.	28	"	"	"	Bored	110	1,905	- 50	1,855	110	1,795	Glacial gravel	Hard, iron, "alkaline"	41	D, S	Oversufficient supply; waters 30 head stock.
22	NW.	29	"	"	"	Bored	70	1,895	- 30	1,865	70	1,825	Glacial gravel	Hard, iron, slightly "alkaline"		D, S	Oversufficient supply.
23	SE.	29	"	"	"	Bored	70	1,900	- 35	1,865	70	1,830	Glacial sand	Hard, iron	41	D, S	Abundant supply.
24	W. ½	32	"	"	"	Bored	45	1,895	- 15	1,880	45	1,850	Glacial gravel	Hard, iron, slightly "alkaline"	42	D, S	Abundant supply.
25	SE.	32	"	"	"	Bored	80	1,890	- 16	1,874	80	1,810	Glacial gravel	Hard, iron	41	D, S	Sufficient supply.
26	SW.	32	"	"	"	Bored	48	1,895	- 1	1,894	48	1,847	Glacial gravel	Hard, iron	41	D, S	Abundant supply.
27	SE.	34	"	"	"	Bored	70	1,955	- 30	1,925	70	1,885	Glacial gravel	Hard, iron, "alkaline"	41	D, S	Yields 95 barrels daily.
28	NE.	36	"	"	"	Bored	50	1,950	- 45	1,905	50	1,900	Glacial quicksand	Hard	42	D, S	Waters 15 head stock.

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