CANADA

DEPARTMENT OF MINES

AND

TECHNICAL SURVEYS

GEOLOGICAL SURVEY OF CANADA

WATER SUPPLY PAPER No. 92

PRELIMINARY REPORT

GROUND-WATER RESOURCES OF THE RURAL MUNICIPALITY OF MAPLE BUSH NO. 224 SASKATCHEWAN

By

B. R. MacKay, and D. C. Maddox

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BUREAU OF ECONOMIC GEOLOGY

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CONTENTS

Illustrations

GROUND WATER RESOURCES OF THE RURAL MUNICIPALITY OF MAPLE BUSH, NO. 224, SASKATCHEWAN

INTRODUCTION

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

Publication of Results

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

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

How to Use the Report

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

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

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

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

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

GLOSSARY OF TERMS USED

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

WATER-BEARING HORIZONS OF THE MUNICIPALITY

The rural municipality of Maple Bush occupies an area of about 325 square miles, comprising the whole of townships 22 and 23, ranges 4, 5, 6, township 24, range 4, and parts of townships 22 and 23, range 7, and of township 24, ranges 5 and 6, W. 3rd mer. The southeast corner of township 24, range 7, comprising about 2 square miles, is also within the municipality. The irregular shape of the municipality is due to the fact that the western boundary is formed by Saskatchewan river. The approximate centre of the municipality is about 60 miles northwest of Moose Jaw and about 86 miles south of Saskatoon. The Canadian National railways operate two lines within the municipality. Lawson, Gilroy, and Riverhurst are the chief centres of population, Riverhurst being the terminus of the southern line of railway.

The greater part of the municipality is rolling country. The highest part is a north-trending, elevated area in township 22, range 6, which is over 2,100 feet above sea-level, Gilroy station being 2,121 feet above sea-level. From this elevated area the land slopes towards the east and northeast to the valleys of Ridge creek, Summit creek, and Aiktow creek; towards the north to the valley of Sage creek; and towards the west to South Saskatchewan river. In the northeast the Elbow forest reserve occupies an area of about 30 square miles and a large part of it, especially in the east, is occupied by low sand hills characteristic of dune topography. South Saskatchewan river lies in a rather narrow valley; its water-level at the southern boundary of the municipality is about 1,695 feet above sea-level and at the northern boundary about 1,664 feet above sea-level. The southwest part of the river is about 250 feet below prairie level and the banks are steep. Elevation of prairie level decreases towards the north and the river banks become lower and less

steep in that direction. Sage creek is an intermittent stream that occupies a shallow valley, part of which in township 23, range 5, is marshy during wet seasons. This creek drains a considerable area in the central and eastern parts of the municipality. Aiktow creek occupies a valley that in its lower part is over 150 feet below prairie level; farther upstream in the forest reserve the valley widens and the valley slopes are gentle. Aiktow creek is the only permanent creek in the municipality and, with its tributaries, drains a large part of the northern and eastern parts of the municipality. Middagh lake is a shallow, muddy, permanent lake in the creek valley, the water level being about 1,740 feet above sea-level. Two other small lakes occur in the creek valley about 3 miles upstream from Middagh lake. Ridge creek, a tributary of Qu'Appelle river, drains a part of the southeast corner of the municipality and a divide between the drainage basins of Qu'Appelle river and Aiktow creek lies in this part of the municipality. Two small depressions 2 to 3 miles northeast of Riverhurst provide for storage of local run-off and there are several similar areas on and near the north boundary of township 22. Elevation of land surface ranges from about 1,665 feet above sea-level in the valley of Aiktow creek to about 2,130 feet above sea-level on the highland south of Gilroy.

Water-bearing Horizons in the Unconsolidated Deposits

A large area in the northeastern part of the municipality in townships 23 and 24, range 4, and a small area at the eastern boundary of township 24, range 5 is underlain by dune sands in which water of good quality usually occurs at such slight depths that it may be obtained by the use of sandpoints. Glacial lake sands underlie most of the remainder of the forest reserve and occupy a large part of the northern two-thirds of the municipality. South of Riverhurst a large part of township 22, range 7, is underlain by glacial lake clays, and

isolated patches of glacial lake clays occur in the glacial lake sands area, and in the valley of Ridge creek south of Bridgeford. Ground water is usually found near the surface in the lake sands unless the sands are exceptionally thin. Ground water conditions are not so good in the lake clays as in the lake sands, but beds of sand are in many places found interbedded with the clay, and where the clays were laid down near the shores of the glacial lake they will probably be more sandy than those laid down far from the shore. Water in the till plain type of glacial deposits is found only in pockets, lenses, or discontinuous beds of sand or gravel that are enclosed in the boulder clay, which forms most of the glacial drift. The presence of the water-bearing beds is not usually shown by any surface features and actual tests by digging or boring are usually the only method of locating them.

Water-bearing Horizons in the Bedrock

The Bearpaw formation, which consists chiefly of dark grey marine shale, but which contains also beds of sand, underlies the glacial drift over the entire municipality. It is only exposed on the banks of South Saskatchewan river and in the valleys of some of the creeks. Sands thought to be at or near the base of the Bearpaw formation supply a number of wells in this municipality with soft water which is suitable for all purposes except irrigation. The depth of these wells in this municipality ranges widely. The limits of the Bearpaw sands from which these wells obtain water is not known, but it seems probable that these sands underlie the greater part of the southern half of the municipality, and may possibly extend into the northern half.

GROUND WATER CONDITIONS BY TOWNSHIPS

Township 22, Range 4

The ground surface in this township is practically flat or very gently rolling. The general slope of the surface is towards the northeast at the rate of about 16 feet to the mile. Ridge creek passes through the eastern part of the township in a very shallow valley and the upper part of Aiktow creek passes through the northwest part. Both these creeks are intermittent. Drainage is to Ridge creek and thence to Qu'Appelle river or to Aiktow creek which flows into Saskatchewan river. Elevations range from a little less than 1,900 feet above sea-level in the valley of Ridge creek to about 2,040 feet above sea-level in the southwest corner. The township is underlain by boulder clay or glacial till (ground moraine), except for an area of about 3 square miles in the valley of Ridge creek which is underlain by glacial lake clays.

The wells in the glacial drift are comparatively shallow--10 to 40 feet deep. There are several seepage wells in the township, but the supply in many of the wells in the drift is not sufficient for all purposes. None of the aquifers can be traced over any considerable distances. Ground water in the following wells was too "alkaline" for use and the wells were abandoned: the NE.$\frac{1}{4}$, section 2, 35 feet deep; the SW.$\frac{1}{4}$, section 6, 14 feet deep; the NW.$\frac{1}{4}$, section 14, 22 feet deep; and the SW.$\frac{1}{4}$, section 16, 32 feet deep. Three dry holes one of which was 123 feet deep, were put down on the NE.$\frac{1}{4}$, section 16. A ravine in the SE.$\frac{1}{4}$, section 15, appears to offer good conditions for storage of water. No springs are reported in the township and the creeks are dry during a large part of the year. The well water is hard and in some wells it is slightly "alkaline",

but in most of the wells in use it is not too "alkaline" to be fit for drinking. The thickness of the drift at Euclid station on the SW.¼, section 30, is 38 feet; its thickness elsewhere is not known.

The sands of the Bearpaw formation provide soft water that may be used for all purposes except irrigation to nine wells ranging from 120 feet to 460 feet deep. Elevation of water-level in those wells ranges from 1,899 feet, to 1,949 feet above sea-level. The elevation of the aquifer in the well on the NW.¼, section 12, is 1,460 feet above sea-level. This is the only flowing well in the township. The elevation of the aquifer in the well on the SE.¼, section 24, is 1,788 feet above sea-level. Elevation of aquifers in the other seven wells is 1,532 to 1,580 feet above sea-level. It seems probable that the water-bearing sands in the Bearpaw underlie the entire township.

Township 22, Range 5

The relief in this township is very slight. Elevations range from about 2,070 feet in the southwest to about 1,950 feet in the northeast. General slope of land surface is towards the northeast. Drainage is to Aiktow creek and its tributaries, but there are no permanent streams. The surface is more rolling towards the north, but even there the slopes are usually very gentle. The entire township is underlain by ground moraine and water conditions in the glacial drift are uncertain and difficult to predict.

No well-defined ground water horizons in the boulder clay of this township appear to exist. The wells range in depth from 7 feet to 47 feet, and many are less than 25 feet deep. The supply of ground water is not very satisfactory. At five farms the well water is too "alkaline" for drinking and at one farm all water is hauled. Dugouts are used to supplement the well water supply on several farms. An abandoned well on the SE.¼, section 3, obtained

brown water from coal in the drift. Drilling showed that the coal did not extend far from the well, and it appears to be a transported block in the glacial drift.

Three wells, located in sections 8, 9, and 10, ranging from 470 feet to 532 feet deep, were drilled to the Bearpaw sands and obtained soft water that can be used for all purposes except irrigation. Elevation of water-level in these wells ranges from 1,951 feet to 1,980 feet above sea-level and the elevation of the aquifers ranges from 1,514 feet to 1,576 feet above sea-level. No wells have been drilled into the bedrock in the northern two-thirds of the township, but it seems probable that the water sands underlie this part.

Township 22, Range 6

The highest elevations in the municipality are within this township. An elevated area, somewhat over 2,100 feet above sea-level, is about 3½ miles wide at the southern boundary, but narrows to about 1½ miles at the northern boundary. The rise to this elevated area from the east is very gentle, being about 25 feet to the mile. The western slope of the elevated area is steeper than that from the east, especially in the northern part, but nowhere are the slopes steep. Several coulées lead eastward in the northwestern part of the township. There are no permanent streams in the township, but the direction of surface run-off is eastward or westward from the high area. Elevations range from a little less than 1,950 feet above sea-level in the northwest to about 2,130 feet above sea-level in the south. An area of about 2 square miles in the northwest corner of the township is underlain by glacial lake sands in which ground water is usually found near the surface. In this part the sands appear to be close to the shore of the glacial lake and they may be not very thick. The remainder of the township is underlain by boulder clay or glacial till in which the ground

water conditions are irregular and uncertain, and no widespread aquifer exists. Many of the wells in the drift are seepage wells and dugouts are used to supplement the well water supply. A dry hole 150 feet deep was put down on the NE.$\frac{1}{4}$, section 11. The water in most of the wells is hard and in a few wells it is slightly "alkaline", but in only one well was it too "alkaline" for drinking. The supply of water from most wells is sufficient for domestic use, but not always sufficient for stock requirements.

Four wells, 508 to 560 feet deep, obtain water from the sands of the Bearpaw formation. Elevation of water-level in these wells ranges from 1,948 feet to 1,985 feet above sea-level and depth to aquifers ranges from 1,550 feet to 1,569 feet above sea-level; the water is soft and can be used for all purposes except irrigation, but the well on the NE.$\frac{1}{4}$, section 13, is sanded up and is not now in use. A fifth well located on the NE.$\frac{1}{4}$, section 35, is 640 feet deep; water-level is 2,039 feet above sea-level and the aquifer is 1,499 feet above sea-level. The water is too salty for human use. It seems probable that this well obtained water from the Belly River formation which underlies the Bearpaw formation.

Township 22, Range 7

In this township, South Saskatchewan river lies about 250 feet below prairie level, which over a large part of the township, is from 1,950 to 2,000 feet above sea-level, the lowest elevation in the valley of South Saskatchewan river being about 1,700 feet above sea-level. The river banks are quite steep in the southern part of the township, but flatten out considerably west and north of Riverhurst. Back from the river banks the country is gently rolling and rises to the southeastern corner where elevations of over 2,050 feet above sea-level occur. A surface depression about 4$\frac{1}{2}$ miles long and about $\frac{1}{4}$ to $\frac{1}{2}$ mile wide runs from the southern

boundary to a point almost ½ mile west of the eastern boundary, and receives the surface run-off in the vicinity. About 2½ square miles in the southeastern part of the township is underlain by boulder clay, about 6 square miles in the northern part of the township is underlain by glacial lake sands, and the remainder and greater part of the township is underlain by glacial lake clays.

The depth of the wells in the drift ranges from 14 feet to 80 feet and in it no widespread aquifers can be traced. In only one well on the NE.¼, section 17, is the water too "alkaline" for drinking. The supply in many of the wells in the drift is not sufficient, for a large number of stock and dugouts are used to supplement it. "Sulphuretted" water is reported in a well on the SW.¼, section 10.

The sands of the Bearpaw formation provide soft water which can be used for all purposes except irrigation to five wells from 348 to 387 feet deep. Elevation of water-level in the wells is 1,926 feet to 1,964 feet, and in two of the wells the water rises above the surface. Elevation of the aquifer ranges from 1,567 feet to 1,611 feet above sea-level. The supply from most of these wells is more than sufficient for all purposes, but the well on the SE.¼, section 10, flows only at the rate of one-sixth of a gallon a minute. The sand aquifer is very fine-grained and the small flow may be due to the choking up of the well with sand.

Township 23, Range 4

The valley of Aiktow creek passes through the township from about the centre of the southern boundary to a point a little east of the centre of the northern boundary, elevations falling from about 1,900 feet to about 1,745 feet above sea-level

between the north and south limits of the valley within the township. Summit creek joins Aiktow creek about a mile south of the lake that is in the northeast part of the township. Both these creeks are intermittent above their confluence. The headwaters of Qu'Appelle river are about half a mile southeast of this lake. Within the township the valley of Aiktow creek is wide and the valley sides slope gently. Summit creek occupies a shallow valley. Drainage is to Aiktow creek and its tributaries, except for a small area near the eastern boundary which drains to Qu'Appelle river. In the southwest, elevations rise to a little over 1,950 feet above sea-level. Dune sands underlie the part of the forest reserve in this township and a small area north and west of Bridgeford, and the sands usually contain water of good quality at shallow depths. A large part of the township is underlain by glacial lake sands in which water is usually found within about 20 feet of the surface, but in this township the sand deposits will probably prove to be thin. In the lake clays, which occupy an area of about 2 square miles in the west-central part of the township, conditions for ground water are less favourable than in the glacial sands, although sandy beds in the clay occasionally contain ground water. Conditions for water in the glacial till that underlies the southern part of the township are not very good and the distribution of aquifers is erratic.

In the southern third of the township the wells are 15 to 25 feet deep. In sections 1 to 5 the water supply is not satisfactory, at several farms water is hauled, and in some wells the water contains much magnesium sulphate and is bitter and laxative. In the northern two-thirds of the township the wells range from 8 to 138 feet deep, but all except three of the wells are less than 30 feet deep. Springs flowing into Summit creek supply water to two farms near the creek valley. A well 8 feet deep in the

SE.¼, section 30, provides sufficient water for 50 head of stock, and as the water is reported to be near the surface in this quarter section, it is probable that sands similar to those of the forest reserve extend westwards into this quarter section.

No wells have been drilled to the sands in the Bearpaw formation. A well at Grainland station on the SW.¼, section 30, was reported as passing into shale at 78 feet, but the supply of water was small and the well was abandoned. It is not probable that any sandy beds in the shale were encountered in the course of drilling.

Township 23, Range 5

A low, flat area that is marshy in wet seasons occupies several square miles in the central and eastern parts of the township. Sage creek, an intermittent stream, rises in the southwest part of the township at an elevation of about 2,000 feet above sea-level and flows in a generally northwest direction towards South Saskatchewan river. Drainage is to Sage creek and its tributaries except for the southeastern quarter which drains to Summit creek. In a large part of the northern and eastern parts of the township the country has very low relief and elevations are less than 1,950 feet above sea-level. In the south the relief is greater, many elevations rising to over 2,000 feet above sea-level, whereas in the southwest corner the land surface rises to about 2,075 feet above sea-level. Most of the low, flat area in the centre of the township is underlain by glacial lake clays. The southern part is covered by boulder clay or glacial till. Glacial lake sands occupy a large part of the northern and central parts. Water conditions in the glacial lake sands are generally better than in the glacial lake clays. The distribution of aquifers in the glacial till is irregular and cannot be predicted. The wells in the drift, except two, are all less than 20 feet deep. The supply of ground water is not satisfactory. In the southern half of the township,

several wells yield water too "alkaline" for drinking and in the NE.¼, section 18, the water is very bitter, apparently due to the presence of considerable amounts of magnesium sulphate. Four dry holes 40 to 250 feet deep were put down in the SE.¼, section 4. Two wells in this part of the township are seepage wells. In the northern half of the township ground water supplies are a little better than in the southern half. A spring on the NE.¼, section 24, in the valley of Sage creek, is used to augment the water supply from wells. The deeper wells in the northern half of the township obtained "alkaline" water and in two wells 95 feet deep on the SE.¼, section 28, the water is to "alkaline" for use. In several of the shallower wells the water is fairly soft. In section 36, shallow wells supply large quantities of water, and it is probable that the sand deposits similar to those of the forest reserve extend into this section. The thickness of the drift on part of the SW.¼, section 22, is 14 feet, and in the northwest corner of the SW.¼, section 32, is 80 feet; its thickness elsewhere is not known.

Township 23, Range 6

Sage creek occupies a shallow valley in the northeast and, with its tributary, drains most of the township. Two, low marshy areas in the southwest accommodate surface run-off in that part of the township. The highest part of the township is in the southwest where elevations rise to over 2,100 feet above sea-level. In the eastern third several isolated elevations rise to over 2,000 feet above sea-level. Over the greater part of the western half of the township the relief is low, elevation of most of the land surface being from 1,850 feet to 1,950 feet above sea-level. In the valley of Sage creek elevations of a little less than 1,800 feet above sea-level occur. An area of about 8 square

miles in the southeastern quarter of the township and a higher area of about half a square mile lying south of Sage creek and near the eastern boundary of the township are underlain by glacial till or boulder clay. Over the remainder of the township the till is concealed by more recent glacial lake sands.

The depth of the wells in the drift in this township ranges from 8 to 30 feet, except two wells which are over 50 feet deep. No widespread aquifers are present in the drift. The water in most of the wells is of good quality; and in very few wells is it too "alkaline" for human use. The supply of water is fairly satisfactory, no water is hauled, but on several farms sloughs and dugouts are used to supplement the well supply. Several dry holes were put down on section 36. No springs are recorded in the township.

Two wells have been drilled to bedrock. The well on the NE.$\frac{1}{4}$, section 4, provides water that is used for all purposes ~~from an horizon~~ 1,677 feet ~~above sea-level~~. The water in the well on the SW.$\frac{1}{4}$, section 12, contains too much dissolved matter to be used for drinking and the water is slightly hard and quite unlike the water usually found in the wells that obtain water from the Bearpaw sands farther south. The aquifer for this well is about 100 feet lower than the aquifer for the well on the NE.$\frac{1}{4}$, section 4, and it seems probable that the well on the SW.$\frac{1}{4}$, section 12, obtains water from the Belly River formation.

Township 23, Range 7

Only slightly more than the eastern third of this township is in Maple Bush municipality. South Saskatchewan river in this township is about 150 feet to 200 feet below prairie level, and the valley slopes are only moderately steep. The land surface back from the river valley is rolling and several coulées extend back for

considerable distances from the river valley. Most of the township is between 1,900 feet and 1,950 feet above sea-level. There are no streams in the township, but direction of surface run-off is towards South Saskatchewan river; one coulée extends from the river nearly to the eastern boundary. Elevation of land surface ranges from a little over 1,950 feet above sea-level in the southwest to a little less than 1,700 feet above sea-level on the river banks. The township is underlain by glacial lake sands. The depth of producing wells ranges from 10 feet to 26 feet. No record of the formation pierced in the deep, dry hole on the SE.$\frac{1}{4}$, section 23, is available, but it seems probable that the well passed into the Bearpaw shale. The supply of well water is fairly satisfactory, but at some farms the supply is not enough for local needs. South Saskatchewan river supplies water for stock use, and as the river water is comparatively soft it is well adapted for washing purposes. The well water is hard and in some wells it is reported as slightly "alkaline", but it is not too "alkaline" for drinking.

Township 24, Range 4

The valley of Aiktow creek, which within the township limits is a permanent stream, passes in a northwesterly direction through the western two-thirds of the township. The creek occupies a valley that within the township is over 1$\frac{1}{2}$ miles wide. In the northwest the valley is over 100 feet deep, but the valley slopes are gentle. Middagh lake always contains water although it is shallow and muddy; elevation of water level is about 1,740 feet above sea-level. The creek drops about 76 feet from this lake to South Saskatchewan river. Drainage and general slope of land surface is towards Aiktow creek. Back from the valley of Aiktow creek the country is flat

or very gently rolling except in the southeast where low, rounded hills or ridges of the sand dune type of topography occur in Elbow forest reserve. Wind-blown sand deposits occupy the area of forest reserve and extend a short distance beyond the north and west boundaries of the reserve. The remainder of the township is underlain by glacial lake sands.

Ground water of good quality is usually found in the dune sands and in many places a large supply can be obtained by the use of sand-points driven into the sand. Middagh lake and Aiktow creek supply water for stock use to the ranchers in the valley of Aiktow creek. West of Aiktow creek the wells in the glacial lake sands are 8 feet to 25 feet deep. In sections 33 to 36, water has been obtained at 8 feet to 15 feet from the surface, but the amount of water obtained in the wells varies widely and the wells do not appear to be supplied by the same aquifer.

The only well that reached bedrock is one on the SW.$\frac{1}{4}$, section 30, which is reported to have been dug in the Bearpaw shale. The water was reported to be too "alkaline" for use. Several dry holes were put down on section 36.

Township 24, Range 5

South Saskatchewan river flows through the northwestern part of the township and the river forms the western limit of the municipality. Aiktow creek flows through the northeast corner of the township in a wide valley, that is about 150 feet deep, but in which the valley slopes are comparatively gentle. Back from the valleys of the river and the creek the country is flat to very gently rolling, the greater part lying between 1,850 feet and 1,900 feet above sea-level. The general slope of the country is towards the north. Drainage is to Aiktow creek and South Saskatchewan river. An area of about 2 square miles on and near the eastern boundary of the township is underlain by wind-blown sands. An

area of a little more than one square mile on and near the western boundary is underlain by glacial lake clays. The remainder of the township is underlain by glacial lake sands. Ground water is generally less abundant in the glacial lake clays than in the glacial lake sands.

Three wells in the western part of the township are 35 feet, 50 feet, and 60 feet deep, respectively. The remaining wells are 4 feet to 25 feet deep. Some shallow wells obtain water from the alluvium in the valley of Aiktow creek. Most of the wells supply sufficient water for a small number of stock. One well in section 36 is a dry hole. In several wells the water is reported to be soft. In only one well is the water too "alkaline" for drinking.

Township 24, Range 6

It is only the southern part of this township that is in the municipality of Maple Bush. South Saskatchewan river forms the northern boundary of this part of the township. The slopes of the river are comparatively gentle. The valley of Sage creek and a coulée about a mile west of it form the chief topographical features. East of Sage creek the country is flat or very gently rolling. Elevations range from a little less than 1,700 feet above sea-level in the valley of South Saskatchewan river to a little over 1,900 feet above sea-level in the southeast. An area of about 2 square miles in the southeast is underlain by glacial lake clays; the remainder of the township is underlain by glacial lake sands.

With one exception the wells are less than 25 feet deep. The water in all the wells is hard, in four wells the water is slightly "alkaline", but in only one well is the water too "alkaline" for drinking. On the SE.$\frac{1}{4}$, section 9, dry holes were put down to 85 feet and five other wells went dry after a short time; apparently the aquifer was a small pocket in the clay.

Township 24, Range 7

Only about 2 square miles in the southeast corner of this township, including section 1 and the southeastern halves of sections 2 and 12, lie in the municipality of Maple Bush. The valley slopes of South Saskatchewan river occupy a large part of the area and the land surface slopes northward and westward from the southeast corner of the township, where elevations over 1,900 feet above sea-level occur, to the river level at an elevation of 1,700 feet. The area is covered by glacial sands and gravels. No well records were obtained from this part of the township, but should wells be sunk the ground water conditions of the area will in all probability be found to be similar to those of the adjacent areas in township 23, ranges 6 and 7, and township 24, range 6.

STATISTICAL SUMMARY OF WELL INFORMATION IN RURAL MUNICIPALITY OF MAPLE BUSH, NO. 224, SASKATCHEWAN

Township	22	22	22	22	23	23	23	23	24	24	24	Total No. in municipality
West of 3rd meridian Range	4	5	6	7	4	5	6	7	4	5	6	
Total No. of Wells in Township	43	36	22	26	32	53	41	23	10	37	19	342
No. of wells in bedrock	9	3	4	5	0	0	2	0	1	0	0	24
No. of wells in glacial drift	34	33	18	21	32	48	39	22	8	35	19	309
No. of wells in alluvium	0	0	0	0	0	5	0	0	1	2	0	8
Permanency of Water Supply												
No. with permanent supply	32	33	18	25	31	45	39	19	9	36	12	299
No. with intermittent supply	8	3	2	0	1	4	2	3	1	1	0	25
No. dry holes	3	0	2	1	0	4	0	1	0	1	7	19
Types of Wells												
No. of flowing artesian wells	1	0	0	1	0	0	0	0	0	0	0	2
No. of non-flowing artesian wells	22	6	14	20	12	30	9	12	0	6	3	134
No. of non-artesian wells	17	30	8	5	20	19	30	10	10	31	9	189
Quality of Water												
No. with hard water	27	29	14	16	26	37	33	22	9	29	10	252
No. with soft water	8	3	4	5	4	3	2	0	0	6	0	35
No. with salty water	0	0	1	0	0	0	0	0	0	0	0	1
No. with "alkaline" water	5	4	1	1	2	9	6	0	1	2	2	33
Depths of Wells												
No. from 0 to 50 feet deep	30	33	14	17	31	43	38	22	10	35	15	288
No. from 51 to 100 feet deep	0	0	2	4	0	4	2	0	0	1	4	17
No. from 101 to 150 feet deep	2	0	1	0	1	0	0	0	0	0	0	4
No. from 151 to 200 feet deep	0	0	0	0	0	1	0	0	0	0	0	1
No. from 201 to 500 feet deep	8	2	0	5	0	1	1	1	0	0	0	18
No. from 501 to 1,000 feet deep	0	1	5	0	0	0	1	0	0	0	0	7
No. over 1,000 feet deep	0	0	0	0	0	0	0	0	0	0	0	0
How the Water is Used												
No. usable for domestic purposes	26	15	15	17	18	24	30	22	9	28	9	213
No. not usable for domestic purposes	4	8	2	1	4	22	5	0	1	4	2	53
No. usable for stock	30	25	17	23	27	34	38	22	9	35	12	272
No. not usable for stock	2	3	1	1	0	8	0	0	1	1	0	17
Sufficiency of Water Supply												
No. sufficient for domestic needs	26	15	14	17	18	24	23	22	7	15	8	190
No. insufficient for domestic needs	0	0	0	0	3	3	4	0	1	1	0	12
No. sufficient for stock needs	22	18	12	12	17	11	20	17	7	22	6	164
No. insufficient for stock needs	1	7	4	5	4	12	7	5	1	2	2	50

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 ban 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 Maple Bush, No. 224, Saskatchewan

LOCATION						Depth of well, Ft.	Total dis'vd solids	HARDNESS			CONSTITUENTS AS ANALYSED						CONSTITUENTS AS CALCULATED IN ASSUMED COMBINATIONS								Source of water
No.	¼tr.	Sec.	Tp.	Rge.	Mer.			Total	Perm.	Temp.	Cl.	Alka-linity	CaO	MgO	SO_4	Na_2O	Solids	$CaCO_3$	$CaSO_4$	$MgCO_3$	$MgSO_4$	Na_2CO_3	Na_2SO_4	NaCl	$CaCl_2$	
1	NW.	12	22	4	3	460	1,420				130	615														¤2
2	NE.	20	22	4	3	414	1,672												(4)		(5)	(2)	(1)	(3)		¤2
3	SW.	22	22	4	3	18	386											(3)	(1)		(2)				(4)	¤1
4	NW.	24	22	4	3	330	1,600				150	610														¤2
5	NW.	9	22	5	3	532	1,963															(2)	(1)	(3)		¤2
6	SE.	5	22	6	3		8,506											(1)	(3)	(2)	(4)				(5)	¤1
7.	NW.	15	22	6	3	560	1,671															(2)	(1)	(3)		¤2
8	NE.	26	22	7	3		786											(1)	(3)	(2)	(4)					¤1
9	NE.	26	22	7	3	386	1,577															(2)	(1)	(3)		¤2
10	NE.	1	23	4	3	22	3,014											(3)	(1)		(2)				(4)	¤1
11	SE.	16	23	4	3		871											(3)	(1)		(2)				(4)	Spring
12	SW.	12	23	6	3	505	4,037												(4)		(5)	(3)	(1)	(2)		¤3

Water samples indicated thus, ¤1, are from glacial drift.
Water samples indicated thus, ¤2, are from bedrock, Bearpaw formation.
Water samples indicated thus, ¤3, 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. 2, 3, 5, to 12, by Provincial Analyst, Regina
For interpretation of this table read the section on Analyses and Quality of Water.

Water from the Unconsolidated Deposits

The composition of ground water is dependant on a number of conditions, the chief of which are: (1) the original composition of the water that enters the sediment; (2) the nature of the sediment with which the water comes in contact with special reference to the solubility and stability of the minerals of which the sediment is composed, and the fineness of grain of the sediment; and (3) the velocity of flow of water through the sediment. The glacial drift consists of a heterogeneous mixture of material, part of which is of local origin and part of which appears to have been transported for considerable distances, and consequently it is to be expected that ground water in the drift will vary greatly in composition. Most ground waters in the drift are very hard and contain 1,000 parts or more of dissolved solids. Reference to the Table of Analyses with regard to the five samples of water from glacial drift, i.e. Samples Nos. 3, 6, 8, 10, and 11, it will be observed, shows that samples Nos. 3, 8, and 11 contain less than 1,000 parts per million of total solids. Analysis No. 11 represents the water of a spring in which circulation of water through the sediments is comparatively rapid. Analysis No. 8 represents water from a well in Riverhurst village where the glacial drift is rather sandy and where underground circulation of water is favoured by the slope to South Saskatchewan river. Analysis No. 3 is difficult to explain unless the well is located on the edge of a coulée or in a similar location that favours rapid circulation of ground water. The five analyses fall into two groups: in one group (Nos. 3, 10, and 11) the sulphates of calcium and magnesium predominate; in the other group (Nos. 6 and 8) the carbonates of calcium and magnesium predominate. All the salts reported as present in solution in the water are salts of calcium and magnesium and they will make the waters

hard. Boiling the water will remove a larger proportion of the hardness from waters of the second group than from waters of the first group. The amount and the nature of dissolved solids must be considered in determining the possible uses of the water. The upper limit of dissolved solids in water for human consumption has been fixed by some health authorities as 1,000 parts per million. Many well waters in the prairies containing much more than 1,000 parts per million of total solids have been used for drinking for many years without harmful effects; the continual use of such waters apparently builds up a certain resistance to their effects. The nature of the dissolved salts is also important; sodium and magnesium sulphate have a laxative effect. Sodium sulphate is usually present in considerable quantities in water from the glacial drift, but is not recorded in any of the five analyses given. Magnesium sulphate is present in all the five waters, but only in the water of No. 10 is it likely to be present in quantities large enough to have a slightly laxative effect. Analysis No. 6 shows a water too high in dissolved solids for continued use by man or beast, although the water contains no sodium salts and the proportion of magnesium sulphate is probably low. For stock use a water that is very slightly laxative is useful when dry feed is given during the winter. Analyses Nos. 6 and 10 represent waters that are probably not well adapted for irrigation purposes under the conditions of climate and drainage that prevail in southern Saskatchewan.

Water from the Bedrock

The table of analyses shows the presence of two general types of bedrock waters. In the first type, the waters are soft and contain sodium sulphate, sodium carbonate, and sodium chloride, listed in the order of relative abundance. The total solids in this type of water generally range from 1,400 to 1,700 parts per million, but analysis No. 5 shows the presence of 1,963 parts per million. This type of

water is good for washing and for stock use and has been used for drinking for many years at a number of farms without any bad effects. The sodium carbonate, Na_2CO_3, gives the water a "soda" taste, but this is not noticeable if the water is drunk when cold. The presence of "white alkali", Na_2SO_4 and NaCl, and "black alkali" (Na_2CO_3), and the absence of calcium sulphate ($CaSO_4$) which tends to counteract the effect of "black alkali", make the water unsuitable for irrigation in this municipality unless the soft water from the bedrock was mixed with a considerable proportion of hard water from the drift. The amount of sodium sulphate in water of this type is not large enough to have a laxative effect unless large quantities of the water are consumed. If the water contains 1,000 parts per million of sodium sulphate, about 3 gallons would have to be taken before obtaining the full laxative dose of sodium sulphate.

The second type of bedrock water is that represented by analysis No. 12, in which the proportion of total solids is over twice that of the first type. This water is rather hard and contains the sulphates of calcium and magnesium. In this type, sodium chloride is more abundant than sodium carbonate. This water contains too large a proportion of dissolved solids for human use, and it is not well adapted for continuous use by stock. It would be unsuitable for irrigation purposes except under conditions of considerable rainfall and good drainage.

WELL RECORDS—Rural Municipality of MAPLE BUSH NO. 224, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
1	SE.	1	22	4	3	Dug	18	1,945	- 10	1,935	18	1,927	Glacial drift	Hard	43		Farm deserted.
2	SW.	2	"	"	"		40	1,960	- 8	1,952	40	1,920	Glacial drift	Hard	42	S	Supply insufficient for stock.
3	SW.	2	"	"	"	Dug	14	1,960	- 6	1,954	14	1,944	Glacial drift	Hard	43	D	
4	NE.	2	"	"	"	Dug	25	1,940	- 20	1,920	25	1,915	Glacial drift	Hard	43	D, S	Sufficient for 8 head stock.
5	NE.	2	"	"	"	Bored	35	1,940	- 28	1,912	35	1,905	Glacial drift	Hard, "alkaline"		N	Water too "alkaline" for stock use.
6	SE.	3	"	"	"	Drilled	435	1,976	- 27	1,949	435	1,541	Bearpaw sand	Soft	43	D, S	Large supply.
7	SW.	4	"	"	"	Dug	8	1,990	- 6	1,984	8	1,982	Glacial drift	Hard	44		Seepage well; farm deserted.
8	SE.	5	"	"	"	Dug	11	1,995	- 9	1,986	11	1,984	Glacial drift	Fairly soft	43	D, S	Supply sufficient.
9	SE.	6	"	"	"	Dug	17	2,020	- 11	2,009	17	2,003	Glacial drift	Hard		D, S	
10	SW.	6	"	"	"	Dug	20	2,020	- 13	2,007	20	2,000	Glacial drift	Hard, "alkaline"	42	D	Another well 14 feet deep; had bitter water, not usable.
11	SW.	10	"	"	"	Dug	19	1,980	- 8	1,972	19	1,961	Glacial drift	Hard	43	D, S	Sufficient for 10 head stock.
12	NW.	12	"	"	"	Drilled	460	1,920			460	1,460	Bearpaw sand	Soft		D, S	Well flows a sixth of a gallon a minute. #
13	SW.	14	"	"	"	Bored	21	1,940	- 9	1,931	21	1,919	Glacial drift	Hard	43		Farm deserted.
14	NW.	14	"	"	"	Dug	18	1,923	- 13	1,910	18	1,905	Glacial drift	Hard, slightly "alkaline"	43	D, S	Several other wells gave water too "alkaline" for use; supply insufficient.
15	SW.	16	"	"	"	Bored	30	1,980	- 20	1,960	30	1,950	Glacial drift	Hard	43	D	Another well 32 feet deep had very "alkaline" water.
16	NE.	16	"	"	"	Dug	20	1,970	- 14	1,956	20	1,950	Glacial drift	Hard	43	D	Stock use dam; three dry holes to 123 feet.
17	NE.	18	"	"	"	Drilled	410	1,981	- 60	1,921	410	1,571	Bearpaw sand	Soft	44	D, S	Large supply.
18	SW.	18	"	"	"	Dug	13	1,995	- 7	1,988	13	1,982	Glacial drift	Hard	43		Farm deserted.
19	NW.	19	"	"	"	Dug	12	1,953	- 10	1,943	12	1,941	Glacial drift	Hard	43		Farm deserted.
20	NE.	20	"	"	"	Drilled	414	1,970	- 50	1,920	414	1,556	Bearpaw sand	Fairly soft	43	D, S	Sufficient for 40 head stock. #
21	NW.	20	"	"	"	Dug	18	1,975	- 11	1,964	18	1,957	Glacial drift	Hard, slightly "alkaline"	43	D	Two other wells 8 feet and 10 feet deep.
22	SW.	21	"	"	"	Drilled	420	1,974	- 48	1,926	420	1,554	Bearpaw sand	Soft		D, S	Large supply.
23	SW.	22	"	"	"	Bored	18	1,930	- 14	1,916	18	1,912	Glacial drift	Hard, slightly "alkaline"		D	Sufficient for house only. #
24	NE.	22	"	"	"	Drilled	380	1,912	- 3	1,909	380	1,532	Bearpaw sand	Soft		D, S	Sufficient for at least 6 head stock.
25	SE.	24	"	"	"	Drilled	120	1,908	- 9	1,899	120	1,788	Bearpaw sand	Soft	45	D, S	Large supply.
26	NE.	24	"	"	"	Dug	10	1,898	0	1,898	10	1,888	Glacial drift	Hard	44		Farm deserted.
27	NW.	24	"	"	"	Drilled	330	1,910	- 1	1,909	330	1,580	Bearpaw sand	Soft		D, S	Large supply.
28	SE.	27	"	"	"	Dug	30	1,925	- 8	1,917	30	1,895	Glacial drift	Hard	44		Farm deserted.

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 MAPLE BUSH NO. 224, 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.	28	22	4	3	Drilled	408	1,972	- 48	1,924	408	1,564	Bearpaw sand	Soft		D, S	Large supply.
30	NE.	28	"	"	"	Dug	24	1,930	- 4	1,926	24	1,906	Glacial drift	Hard, slightly "alkaline"	43	D, S	Sufficient for 12 head stock.
31	SE.	30	"	"	"	Dug	20	1,963	- 13	1,950	20	1,943	Glacial drift	Fairly soft		D, S	Thirty gallons an hour; Euclid well.
32	SW.	30	"	"	"	Bored	122	1,963	- 7	1,956	122	1,841	Glacial drift	Hard			Euclid station well; not used.
33	NE.	30	"	"	"	Dug	10	1,980	- 8	1,972	10	1,970	Glacial drift	Hard	43	D, S	Sufficient for 12 head stock.
34	SE.	30	"	"	"	Dug	9	1,989	- 6	1,983	9	1,979	Glacial drift	Hard	44	S	Sufficient for 5 head stock; seepage well.
35	SE.	30	"	"	"	Dug	13	1,995	- 9	1,986	13	1,982	Glacial drift	Hard	42	D	Sufficient for house.
36	NE.	34	"	"	"	Dug	16	1,913	- 12	1,901	16	1,897	Glacial drift	Hard, slightly "alkaline"	43	D, S	Sufficient for 20 head stock.
37	SE.	36	"	"	"	Bored	30	1,908	- 14	1,894	30	1,878	Glacial drift	Hard, "alkaline"	43	S	Another well 16 feet deep for house; water rather "alkaline" and laxative.
1	NE.	2	22	5	3	Dug	20	2,035	- 11	2,024	20	2,015	Glacial drift	Hard	43		Farm deserted.
2	SW.	2	"	"	"	Dug	14	2,040	- 10	2,030	14	2,026	Glacial drift	Fairly hard	43	D, S	
3	SE.	3	"	"	"	Dug	25	2,050	- 19	2,031	25	2,025	Coal in glacial drift	Soft, brown		N	
4	NE.	4	"	"	"	Dug	17	2,045	- 8	2,037	17	2,028	Glacial drift	Hard	45		Farm deserted.
5	SE.	6	"	"	"	Dug	10	2,085	- 8	2,077	10	2,075	Glacial sand	Hard	44	S	Supply usually insufficient for stock. Drinking water hauled.
6	NW.	8	"	"	"	Drilled	480	2,056	- 70	1,986	480	1,576	Bearpaw sand	Soft	47	D, S	Large supply.
7	NW.	9	"	"	"	Drilled	532	2,046	- 95	1,951	532	1,514	Bearpaw sand	Soft		D, S	Lawson town well. #
8	SW.	10	"	"	"	Dug	14	2,035	- 8	2,027	14	2,021	Glacial drift	Hard	44	D, S	Seepage well; sufficient for 6 head stock.
9	NE.	10	"	"	"	Drilled	470	2,034	- 58	1,976	470	1,564	Bearpaw sand	Rather hard		D, S	Large supply.
10	NW.	12	"	"	"	Dug	12	2,015	- 2	2,013	12	2,003	Glacial drift	Fairly soft	43	S	Insufficient supply; drinking water hauled.
11	NE.	16	"	"	"	Dug	14	2,025	- 8	2,017	14	2,011	Glacial drift	Hard, "alkaline"	44	N	
12	NE.	16	"	"	"	Dug	22	2,022	- 11	2,011	22	2,000	Glacial drift	Hard, "alkaline"		S	Drinking water hauled.
13	NW.	16	"	"	"	Dug	19	2,050	- 17	2,033	19	2,031	Glacial drift	Hard	43		Farm deserted.
14	SE.	17	"	"	"	Dug	15	2,050	- 8	2,042	15	2,035	Glacial drift	Hard	42	D, S	Seepage well; dugout also used for stock.
15	NE.	18	"	"	"	Bored	26	2,050	- 11	2,039	26	2,024	Glacial drift	Hard, "alkaline"	42	N	All water hauled.
16	SW.	18	"	"	"	Dug	16	2,075	- 14	2,061	16	2,059	Glacial drift	Hard	42	D, S	Sufficient for 16 head stock.
17	SW.	19	"	"	"	Dug	16	2,085	- 11	2,074	16	2,069	Glacial drift				Farm deserted.
18	NW.	19	"	"	"	Dug	17	2,085	- 11	2,074	17	2,068	Glacial drift	Hard		D, S	Another seepage well 12 feet deep not used.

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 MAPLE BUSH NO. 224, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE: Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED: Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
19	NE.	20	22	5	3	Dug	16	2,040	- 12	2,028	16	2,024	Glacial gravel	Hard	42	D, S	Another well 12 feet deep; insufficient supply.
20	SW.	20	"	"	"	Bored	26	2,050	- 11	2,039	26	2,024	Glacial drift	Hard	43		Farm deserted.
21	SE.	21	"	"	"	Dug	15	2,010	- 9	2,001	15	1,995	Glacial sandy gravel	Hard	42		Farm deserted.
22	SW.	22	"	"	"	Dug	10	2,010	- 8	2,002	10	2,000	Glacial sandy gravel	Hard	43	D	Sufficient for house.
23	NW.	22	"	"	"	Dug	30	2,008	- 28	1,980	30	1,978	Glacial sand	Hard	42	S	Insufficient supply; water hauled for house
24	NE.	24	"	"	"	Dug	11	2,010	- 10	2,000	11	1,999	Glacial drift	Hard	43		Farm deserted.
25	NW.	24	"	"	"	Dug	12	2,015	- 7	2,008	12	2,003	Glacial drift	Hard	43		Farm deserted; two other wells.
26	SE.	25	"	"	"	Dug	7	2,009	- 5	2,004	7	2,002	Glacial drift	Hard	42		No further information.
27	NE.	26	"	"	"	Dug	16	1,970	- 13	1,957	16	1,954	Glacial sand	Hard	44	D, S	Insufficient supply.
28	SE.	28	"	"	"	Dug	15	2,015	- 13	2,002	15	2,000	Glacial sand	Hard	42	D, S	Sufficient supply.
29	NE.	28	"	"	"	Dug	11	2,000	- 10	1,990	11	1,989	Glacial drift	Fairly soft		D	Small supply; stock use dugout for water.
30	SE.	30	"	"	"	Dug	14	2,065	- 10	2,055	14	2,051	Glacial drift	Hard,bitter	42	S	Small supply for stock; water hauled for hou
31	SW.	30	"	"	"	Dug	47	2,085	- 20	2,065	47	2,038	Glacial drift	Hard	42	N	Well in bad mechanical condition; use to hav a large supply of good water.
32	SE.	35	"	"	"	Dug	29	1,975	- 28	1,947	29	1,946	Glacial drift	Hard,"alka-		N	All water hauled.
33	SW.	36	"	"	"	Dug	12	1,975	- 9	1,966	12	1,963	Glacial quick-sand	Hard	41	D, S	Supply more than sufficient; another well feet deep not used.
1	NW.	2	22	6	3	Drilled	559	2,110	-150	1,960	559	1,551	Bearpaw sand	Soft	43	D, S	Large supply.
2	SE.	4	"	"	"	Dug	16	2,125	- 12	2,113	16	2,109	Glacial drift	Hard,slightly"alkaline"	46	D, S	Seepage well; sufficient supply.
3	SE.	6	"	"	"	Dug	56	2,100	- 47	2,053	56	2,044	Glacial drift	Hard,slightly"alkaline"	43	D, S	Well yields 1½ barrels a day; second seepage well 15 feet deep also used.
4	NW.	6	"	"	"	Dug	18	2,060	- 16	2,044	18	2,042	Glacial sand	Hard	43	D, S	Sufficient supply.
5	SW.	8	"	"	"	Bored	38	2,090	- 14	2,076	38	2,052	Glacial sand	Fairly hard	42	D, S	Sufficient supply.
6	NE.	11	"	"	"	Dug	16	2,095	- 16	2,079	16	2,079	Glacial sand	Hard		N	Well dry in 1935; dry hole 150 feet deep. Small supply from several shallow wells.
7	NW.	12	"	"	"	Dug	14	2,105	- 11	2,094	14	2,091	Glacial drift	Hard	42	D	Sufficient for house; dugout for stock.
8	NE.	13	"	"	"	Drilled	540	2,090	-140	1,950	540	1,550	Bearpaw sand	Soft	43	N	Well sanded up; another well 14 feet deep f house use; dugout for stock.
9	NW.	15	"	"	"	Drilled	560	2,129	-161	1,948	560	1,569	Bearpaw sand	Soft	42	D, S	Large supply. #
10	NW.	20	"	"	"	Bored	57	2,075	- 41	2,034	57	2,018	Glacial drift	Hard	42	D, S	Sufficient supply.
11	NW.	24	"	"	"	Bored	24	2,105			24	2,081	Glacial sand	Hard	42	D, S	Sufficient supply only in wet seasons.
12	NW.	32	"	"	"	Bored	30	1,988			30	1,958	Glacial sand	Hard,iron	42	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 MAPLE BUSH NO. 224, 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
13	SW.	32	22	6	3	Bored	18	2,018	- 14	2,004	18	2,000	Glacial sand	Hard	42	D, S	Insufficient supply; another well 33 feet deep also used.
14	NW.	33	"	"	"	Bored	26	2,023	- 14	2,009	26	1,997	Glacial gravel	Hard	42	D, S	Sufficient for 8 head stock.
15	NW.	33	"	"	"	Bored	100	2,100			100	2,000	Glacial gravel	Hard, "alkaline"		S	Two barrels a day; a dugout also used for stock
16	NE.	35	"	"	"	Drilled	640	2,139	-100	2,039	640	1,499	Belly River?	Soft, salty		N	Water originally used for stock.
17	NW.	36	"	"	"	Dug	25	2,100	- 15	2,085	25	2,075	Glacial sand	Fairly soft	44	D, S	Sufficient supply.
18	SE.	36	"	"	"	Drilled	508	2,075	- 90	1,985	508	1,567	Bearpaw sand	Soft	44	D, S	Sufficient supply.
1	NW.	1	22	7	3	Dug	24	2,025	- 12	2,013	24	2,001	Glacial sand	Hard, iron	42	D, S	Sufficient supply.
2	SE.	2	"	"	"	Dug	18	2,010	- 9	2,001	18	1,992	Glacial drift	Hard	42	D, S	Insufficient supply.
3	NW.	2	"	"	"	Dug	15	1,960	- 3	1,957	15	1,945	Glacial sand	Fairly soft	42	D, S	Sufficient supply.
4	NE.	4	"	"	"	Dug	24	2,020	- 20	2,000	24	1,996	Glacial sand	Hard	43	D, S	Sufficient supply.
5	NW.	4	"	"	"	Dug	21	2,012	- 11	2,001	21	1,991	Glacial drift	Hard	42	D, S	Sufficient supply; another well 19 feet deep.
6	SW.	10	"	"	"	Bored	80	2,000	- 45	1,955	80	1,920	Glacial drift	Fairly soft	43	D, S	Insufficient supply; another well 25 feet deep had sulphur water.
7	SW.	10	"	"	"	Bored	58	2,000	- 40	1,960	58	1,942	Glacial sandy clay	Hard	43	D, S	Insufficient supply.
8	SE.	10	"	"	"	Drilled	352	1,963	+ 1	1,964	352	1,611	Bearpaw sand	Soft	43	D, S	Flows 1/6 gallon a minute.
9	SE.	13	"	"	"	Drilled	387	1,998	- 40	1,958	387	1,611	Bearpaw sand	Soft	44	D, S	Sufficient supply.
10	SW.	14	"	"	"	Drilled	348	1,958	+ 1	1,959	348	1,610	Bearpaw sand	Soft	43	D, S	Flows 2 gallons a minute; another well 50 feet deep, water in gravel
11	SE.	15	"	"	"	Drilled	365	1,969	- 13	1,956	364	1,605	Bearpaw sand	Soft	45	D, S	Another well 65 feet deep; water hard.
12	NE.	17	"	"	"	Bored	78	1,960	- 63	1,897	78	1,882	Glacial gravel	Hard, iron	43	S	Insufficient supply; another well 20 feet deep has hard water.
13	NW.	22	"	"	"	Bored	65	1,980	- 53	1,927	65	1,915	Glacial sand	Hard, iron	43	D, S	Insufficient supply; dugout and another seepage well 16 feet deep used.
14	NE.	23	"	"	"	Bored	14	1,960	- 11	1,949	14	1,946	Glacial sand	Hard	42	D, S	Sufficient supply; another well 23 feet deep also used.
15	SE.	24	"	"	"	Dug	27	1,980	- 24	1,956	27	1,953	Glacial sand	Hard	42	D, S	Sufficient supply.
16	SE.	25	"	"	"	Bored	35	1,990	- 25	1,965	35	1,955	Glacial gravel	Hard, slightly "alkaline"	42	D, S	Only sufficient for 6 head stock; another seepage well 18 feet deep.
17	NE.	26	"	"	"	Drilled	386	1,953	- 27	1,926	386	1,567	Bearpaw sand	Soft		D, S	Riverhurst town well. #
18	SE.	30	"	"	"	Drilled							Glacial drift	Hard, "alkaline"	42	D, S	No further information available.
1	NE.	1	23	4	3	Dug	22	1,900	- 20	1,880	22	1,878	Glacial drift	Hard, bitter	43	S	Another well 21 feet deep for stock; enough for 9 head stock. Water hauled for house. #
2	NE.	2	"	"	"	Dug	16	1,920	- 13	1,907	16	1,904	Glacial sand	Hard	43	D	Another well 18 feet deep supplies enough for 14 head stock.
3	SE.	4	"	"	"	Dug	16	1,910	- 14	1,896	16	1,894	Glacial sand	Hard	43	D, S	Sufficient supply for 20 head stock.

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

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

WELL RECORDS—Rural Municipality of MAPLE BUSH NO. 224, 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.	5	23	4	3	Dug	15	1,940	- 13	1,927	15	1,925	Glacial drift	Hard,"alkaline"	43	S	Insufficient supply; water hauled.
5	SW.	6	"	"	"	Dug	21	1,980	- 15	1,965	21	1,959	Glacial sand	Hard,"alkaline"	43	S	Sufficient for 25 head stock; water for house hauled.
6	NW.	8	"	"	"	Dug	17	1,900	- 12	1,888	17	1,883	Glacial drift	Soft	44	D, S	Sufficient for 15 head stock.
7	SE.	10	"	"	"	Dug	25	1,910	- 23	1,887	25	1,885	Glacial drift	Hard	43	D, S	Sufficient for 35 head stock.
8	SW.	10	"	"	"	Dug	25	1,920	- 24	1,896	25	1,895	Glacial sand	Hard,iron	43	D, S	Sufficient for 30 head stock.
9	SE.	12	"	"	"	Dug	15	1,905	- 10	1,895	15	1,890	Glacial sand	Very hard "alkaline"	43	D	Another well 12 feet deep for stock; insuffi insufficient supply.
10	SW.	12	"	"	"	Dug	16	1,910	- 14	1,896	16	1,894	Glacial sand	Hard,slightly"alkaline"	43	D, S	Sufficient for 16 head stock.
11	SW.	14	"	"	"	Dug	22	1,910	- 19	1,891	22	1,888	Glacial sand	Rather hard	43	D, S	Sufficient for 35 head stock.
12	NW.	14	"	"	"	Dug	20	1,890	- 15	1,875	20	1,870	Glacial sand	Fairly hard	43	D, S	Sufficient for 24 head stock.
13	SW.	15	"	"	"	Dug	50	1,960	- 25	1,935	50	1,910	Glacial drift	Hard,slightly"alkaline"	42	D, S	Sufficient for 10 head stock.
14	NW.	16	"	"	"	Dug	29	1,890	- 26	1,864	29	1,861	Glacial sand	Hard	43		Farm deserted.
15	NE.	17	"	"	"	Dug	20	1,890	- 18	1,872	20	1,870	Glacial drift	Hard,slightly"alkaline"	43	D, S	Sufficient for 20 head stock.
16	SE.	18	"	"	"	Dug	17	1,905	- 16	1,889	17	1,888	Glacial drift	Hard	45	D	Another well 10 feet deep; waters 20 head stock.
17	NW.	19	"	"	"	Dug	27	1,880	- 23	1,857	27	1,853	Glacial drift	Hard	42	D, S	Sufficient supply.
18	SW.	20	"	"	"	Dug	12	1,860	- 10	1,850	12	1,848	Glacial drift	Hard,slightly"alkaline"	44	D	Another well 7 feet deep for stock. Spring and dugout also used.
19	NW.	20	"	"	"	Dug	11	1,885	- 9	1,876	11	1,874	Glacial sand	Soft	44	D, S	Another well 7 feet deep for stock; dugout also used; insufficient supply.
20	NW.	20	"	"	"	Dug	8	1,890	- 6	1,884	8	1,882	Glacial sand	Hard	44	D, S	Sufficient for 20 head stock.
21	NE.	22	"	"	"	Dug	10	1,810	- 8	1,802	10	1,800	Glacial gravel	Soft		N	Well went dry in 1932.
22	SE.	24	"	"	"	Bored	41	1,940	- 31	1,909	41	1,899	Glacial drift	Hard	43		Farm deserted.
23	SE.	30	"	"	"	Dug	8	1,885	- 5	1,880	8	1,877	Glacial drift	Soft	45	D, S	Sufficient for 50 head stock.
24	SW.	30	"	"	"	Dug	14	1,880	- 11	1,869	14	1,866	Glacial drift	Hard			Grainland station well; 2 barrels an hour.
25	SW.	30	"	"	"	Drilled	138	1,880	- 18	1,862	138	1,742	Glacial drift	Hard		N	Well abandoned.
26	NE.	31	"	"	"	Dug	8	1,880	- 6	1,874	8	1,872	Glacial drift	Fairly soft	44	D, S	Sufficient for 7 head stock.
1	SE.	4	23	5	3	Dug	45	2,010			45	1,965	Glacial drift	Laxative soda		D	Four dry holes 40 feet to 250 feet deep; two shallow wells in SW. ¼, section 3, also dugou used.
2	SW.	4	"	"	"	Dug	12	2,000	- 11	1,989	12	1,988	Glacial drift	Hard	43	D	Two other wells supply sufficient for 6 hors water usually hauled for stock.
3	NE.	14	"	"	"	Dug	13	1,890	- 12	1,878	13	1,877	Glacial drift	Hard,"alkaline"		D	Insufficient supply; water hauled for house and for stock when dugout dry.

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

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

WELL RECORDS—Rural Municipality of MAPLE BUSH NO.224, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
4	NW.	14	23	5	3	Dug	13	1,900	- 11	1,889	13	1,887	Glacial drift	Hard	43	D	Two other wells yield "alkaline" water for stock use.
5	SE.	16	"	"	"	Dug	16	1,975	- 14	1,961	16	1,959	Glacial drift	Fairly soft		D, S	Sufficient supply.
6	NE.	18	"	"	"	Dug	19	1,940			19	1,921	Glacial drift	Very bitter		N	All water from dam on road near farm.
7	NW.	19	"	"	"	Dug	11	1,945	- 9	1,936	11	1,934	Glacial drift	Fairly soft	45	D	Another well 14 feet deep for stock; water hauled in autumn and winter.
8	SE.	21	"	"	"	Dug	8	1,910			8	1,902	Recent alluvium	Very hard	43	D,	Insufficient supply; two wells in SW.¼, section 21, also used.
9	SW.	21	"	"	"	Dug	16	1,910	- 15	1,895	16	1,894	Recent alluvium	Fairly hard	44	D, S	Just sufficient for 4 head stock.
10	NE.	21	"	"	"	Dug	7	1,910			7	1,903	Recent alluvium	Fairly soft		S	Another shallow well for house; water hauled for stock in winter.
11	SW.	22	"	"	"	Dug	12	1,925	- 10	1,915	12	1,913	Glacial drift	Soft		D	Just sufficient for house; three other wells 16 feet deep, water too "alkaline" for use.
12	NE.	24	"	"	"	Dug	13	1,900	- 11	1,889	13	1,887	Glacial drift	Fairly hard	44	D, S	Spring and dugout also used for stock.
13	SE.	24	"	"	"	Dug	12	1,900	- 10	1,890	12	1,888	Glacial gravel	Very hard		D, S	Sufficient for 18 head stock; except in dry seasons.
14	NW.	24	"	"	"	Dug	9	1,890	- 7	1,883	9	1,881	Glacial sand	Fairly soft		D, S	Sufficient for 18 head stock; supply decreases in mid-winter.
15	SE.	27	"	"	"	Dug	21	1,850	- 10	1,840	21	1,829	Glacial drift	Fairly soft		D, S	Sufficient for 10 head stock.
16	NE.	28	"	"	"	Dug	10	1,910	- 7	1,903	10	1,900	Glacial drift	Soft		D	Supply not always sufficient for 31 head stock; dugout and another well for cattle.
17	SE.	28	"	"	"	Dug	15	1,910	- 12	1,898	15	1,895	Glacial gravel	Hard		D, S	Another well 12 feet deep also used for 16 head stock; two wells 95 feet deep, water to "alkaline" for use.
18	NW.	28	"	"	"	Dug	12	1,915	- 10	1,905	12	1,903	Glacial gravel and sand	Hard, slightly "alkaline"		D, S	Sufficient supply for 100 head stock; another well 10 feet deep has large supply of water
19	SW.	29	"	"	"	Dug	12	1,900	- 9	1,891	12	1,888	Recent alluvium	Hard			Farm house removed.
20	NW.	30	"	"	"	Dug	7	1,890	- 6	1,884	7	1,883	Recent alluvium	Hard		D, S	Barely sufficient for 6 head stock.
21	NE.	31	"	"	"	Dug	7	1,910	- 5	1,905	7	1,903	Glacial sand	Soft		D, S	Insufficient supply; another well being dug in 1935.
22	NW.	31	"	"	"	Dug	14	1,900	- 12	1,888	14	1,886	Glacial sand and gravel	Hard		D	Water hauled for stock; five other wells 14 feet to 60 feet deep had very small supply.
23	SE.	31	"	"	"	Dug	11	1,900	- 10	1,890	11	1,889	Glacial drift	Hard		S	Farm house removed.
24	NE.	32	"	"	"	Bored	63	1,920	- 12	1,908	63	1,857	Glacial drift	Hard, "alkaline"		S	Another well 13 feet deep for house.
25	SW.	32	"	"	"	Dug	10	1,925	- 7	1,918	10	1,915	Glacial drift	Hard		D, S	Sufficient for over 50 head stock; sand-point for house; two other wells also.
26	NW.	36	"	"	"	Dug	14	1,910	- 9	1,901	14	1,896	Glacial quicksand	Fairly soft		D, S	Sufficient supply; dam also used for stock.
27	SE.	36	"	"	"	Dug	16	1,890	- 12	1,878	16	1,874	Glacial gravel	Fairly hard		D, S	Sufficient for 40 head stock; another well 15 feet deep.
1	NE.	4	23	6	3	Drilled	333	2,010	- 60	1,950	333	1,677	Bearpaw sand	Soft	45	D, S	Sufficient supply.
2	SE.	5	"	"	"	Bored	60	1,980			60	1,920	Glacial drift	Hard	42	D, S	Sufficient supply.
3	SE.	6	"	"	"	Dug	19	1,950	- 7	1,943	19	1,931	Glacial sand	Hard	46	D, S	Sufficient supply; another well 20 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 MAPLE BUSH NO.224, 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.	9	23	6	3	Dug	20	1,975	- 12	1,963	20	1,955	Glacial drift	Very hard	42	D, S	
5	SE.	10	"	"	"	Drilled	72	2,040			72	1,968	Glacial drift	Fairly soft		N	Originally large supply; dry in 1935.
6	SE.	12	"	"	"	Dug	20	2,050	- 15	2,035	20	2,030	Glacial drift	Hard	42	D	Slough and seepage wells for stock.
7	SW.	12	"	"	"	Drilled	505	2,084	- 80	2,004	505	1,579	Belly River ?	Soft,soda	45	S	Large supply. #
8	NW.	14	"	"	"	Dug	14	1,960	- 11	1,949	14	1,946	Glacial sand	Hard	42	D, S	Insufficient supply; another well 15 feet dee Dam for stock.
9	SE.	16	"	"	"	Dug	30	1,960	- 23	1,937	30	1,930	Glacial drift	Fairly hard	42	D, S	Sufficient supply.
10	NE.	16	"	"	"	Dug	15	1,950	- 11	1,939	15	1,935	Glacial drift	Hard,"alka-line"	43	D, S	Sufficient supply.
11	SE.	17	"	"	"	Dug	28	1,960	- 22	1,938	28	1,932	Glacial sand	Hard	43	D, S	Sufficient for 100 head stock; two other similar wells.
12	NE.	18	"	"	"	Dug	18	1,910			18	1,892	Glacial sand	Fairly soft	43	D, S	Sufficient for 10 head stock.
13	NW.	18	"	"	"	Dug	18	1,910	- 12	1,898	18	1,892	Glacial drift	Hard	44	D, S	Insufficient supply; another well 15 feet deep.
14	SW.	20	"	"	"	Dug	18	1,900	- 10	1,890	18	1,882	Glacial sand	Hard,"alka-line"	43	D, S	Slough for stock also.
15	NW.	22	"	"	"	Dug	13	1,925	- 11	1,914	13	1,912	Glacial sand	Hard,"alka-line"		D, S	Insufficient supply; another well for stock.
16	NE.	22	"	"	"	Dug	9	1,945	- 5	1,940	9	1,936	Glacial sand	Hard,"alka-line"	50	S	Sufficient for 30 head stock; two similar wells.
17	NE.	24	"	"	"	Dug	8	1,915	- 6	1,909	8	1,907	Glacial sand	Hard	50	D, S	Sufficient supply.
18	SW.	24	"	"	"	Dug	12	1,970	- 6	1,964	12	1,958	Glacial sand	Hard,"alka-line"	44	D, S	Insufficient supply; two other similar wells for stock.
19	NE.	25	"	"	"	Dug	9	1,880	- 7	1,873	9	1,871	Glacial sand	Hard	50	D, S	Sufficient for 10 head stock; well on SE.¼, section 36, also used for house and stock.
20	SE.	27	"	"	"	Dug	27	1,915	- 22	1,893	27	1,888	Glacial sand	Fairly soft	42	D, S	Sufficient supply.
21	SW.	29	"	"	"	Dug	14	1,915	- 8	1,907	14	1,901	Glacial sand and gravel	Fairly soft	43	D, S	Sufficient for 25 head stock; second well 12 feet deep.
22	SE.	36	"	"	"	Dug	12	1,905	- 9	1,896	12	1,893	Glacial sand	Fairly hard	43	D, S	Sufficient supply; another well in house.
23	NE.	30	"	"	"	Dug	16	1,905	- 13	1,892	16	1,889	Glacial sand	Fairly soft	43	D, S	Sufficient supply; another well in house.
24	SW.	30	"	"	"	Dug	24	1,910	- 16	1,894	24	1,886	Glacial sand and gravel	Hard,iron	44	S	Sufficient supply.
25	SW.	34	"	"	"	Dug	11	1,890	- 6	1,884	11	1,879	Glacial sand	Hard	45	D, S	Sufficient supply.
26	NW.	35	"	"	"	Dug	29	1,870	- 23	1,847	29	1,841	Glacial drift	Hard,slightly"alkaline"	44	D, S	Insufficient supply; another well 28 feet deep.
27	NE.	36	"	"	"	Dug	20	1,880	- 16	1,864	20	1,860	Glacial drift	Hard,"alka-line"	42	D, S	Sufficient for 4 head stock; several dry hole
1	NE.	1	23	7	3	Dug	21	1,930			21	1,909	Glacial drift	Fairly hard	42	D, S	Sufficient for 70 head stock.
2	NW.	2	"	"	"	Dug	20	1,950	- 10	1,940	20	1,930	Glacial sand	Fairly soft		D, S	Insufficient supply; two other similar seepage wells.
3	SW.	2	"	"	"	Dug	20	1,950	- 12	1,938	20	1,930	Glacial drift	Hard	44	D, S	Insufficient 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 MAPLE BUSH NO.224, 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	SE.	3	23	7	3	Dug	26	1,955	- 11	1,944	26	1,929	Glacial drift	Hard, slightly "alkaline"	43	D, S	River water also used for stock.
5	NW.	12	"	"	"	Dug	22	1,950	- 10	1,940	22	1,928	Glacial sand	Hard	43	D, S	Another similar well not used; dugout used for stock in summer.
6	SE.	12	"	"	"	Dug	16	1,920	- 8	1,912	16	1,904	Glacial sand	Hard	43	D, S	Sufficient supply; two other wells 10 feet and 12 feet deep.
7	NW.	14	"	"	"	Dug	14	1,855	- 7	1,848	14	1,841	Glacial drift	Fairly soft	44	D, S	Sufficient supply; spring near well.
8	SE.	14	"	"	"	Dug	22	1,920	- 18	1,902	22	1,898	Glacial drift	Hard	45	D, S	Insufficient supply; water hauled.
9	SE.	23	"	"	"	Drilled	362	1,950					Bedrock ?				Dry hole.
10	SE.	24	"	"	"	Dug	22	1,940	- 19	1,921	22	1,918	Glacial drift	Hard	44	D, S	Insufficient supply.
11	NE.	24	"	"	"	Dug	14	1,910	- 8	1,902	14	1,896	Glacial drift	Hard	44	D, S	Sufficient supply; another well 10 feet deep.
12	SE.	26	"	"	"	Dug	16	1,920	- 10	1,910	16	1,904	Glacial sand	Hard, slightly "alkaline"	43	D, S	Sufficient supply except in dry seasons.
13	SE.	35	"	"	"	Dug	22	1,920	- 19	1,901	22	1,898	Glacial sand	Hard	44	D, S	Sufficient for 40 head stock; another well 36 feet deep.
14	SW.	36	"	"	"	Dug	24	1,910	- 20	1,890	24	1,886	Glacial sand	Hard	45	D, S	Sufficient supply.
15	NE.	36	"	"	"	Dug	12	1,910	- 9	1,901	12	1,898	Glacial sand	Hard	44	D, S	Sufficient supply.
1	NW.	4	24	4	3	Dug	12	1,790	- 8	1,782	12	1,778	Glacial sand	Hard		D, S	Another well 8 feet deep; water from lake also used for stock.
2	SE.	5	"	"	"	Dug	10	1,825	- 8	1,817	10	1,815	Recent dune sand	Hard		D	Section house well, Aiktow station.
3	SW.	25	"	"	"	Dug	10	1,890	- 2	1,888	10	1,890	Glacial drift	Hard		D, S	Sufficient for 25 head stock; another well 10 feet deep for stock.
4	SW.	30	"	"	"	Dug	22	1,745					Bearpaw shale	"Alkaline", soda			Water too "alkaline" for use; stock use water from creek; water for house hauled.
5	NW.	33	"	"	"	Dug	8	1,880	- 5	1,875	8	1,872	Glacial sand	Fairly hard		D, S	Farm deserted; supply reported as enough for 60 head stock when farm occupied.
6	NW.	34	"	"	"	Dug	10	1,890	- 1	1,889	10	1,880	Glacial drift	Fairly hard		D, S	Insufficient for 7 head stock; dugout also used.
7	NW.	35	"	"	"	Dug	14	1,890			14	1,876	Glacial drift	Hard, slightly "alkaline"		D, S	Sufficient for large number of stock.
8	NW.	36	"	"	"	Dug	15	1,890	- 11	1,879	15	1,875	Glacial quicksand	Hard, slightly "alkaline"		D	Insufficient supply; dugout for stock, several dry holes to 25 feet deep.
1	SE.	1	24	5	3	Dug	18	1,905	- 16	1,889	18	1,887	Glacial quicksand	Hard		D, S	Sufficient for 8 head stock; slough also used for stock.
2	SW.	1	"	"	"	Dug	19	1,860	- 18	1,842	19	1,841	Glacial sand	Soft		D, S	Sufficient for 6 head stock; another well 8 feet deep for stock.
3	NW.	2	"	"	"	Dug	10	1,900	- 9	1,891	10	1,890	Glacial drift	Hard			No further information; another well on farm.
4	SW.	2	"	"	"	Dug	11	1,910	- 8	1,902	11	1,899	Glacial gravel	Hard		D, S	Sufficient supply.
5	NE.	7	"	"	"	Bored	60	1,900	- 9	1,891	60	1,840	Glacial drift	Hard, "alkaline"		S	Sufficient supply for 26 head stock; another well 22 feet deep for house, one 13 feet deep for stock.
6	NW.	8	"	"	"	Dug	9	1,905	- 8	1,897	9	1,896	Glacial sand	Hard, iron, "alkaline"		D, S	Sufficient supply for only 6 head stock. Water hauled for stock. Many dry holes to 75 feet.

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 MAPLE BUSH NO. 224, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
7	NW.	9	24	5	3	Dug	14	1,895	- 10	1,885	14	1,881	Glacial sand and gravel	Soft		D	Sufficient for 10 head stock; another well 13 feet deep for house.
8	NW.	10	"	"	"	Dug	13	1,910	- 10	1,900	13	1,897	Glacial sand	Hard		D, S	Sufficient for 15 head stock.
9	SW.	10	"	"	"	Dug	12	1,885	- 10	1,875	12	1,873	Glacial sand	Soft, iron		D, S	Sufficient, with dugout for 30 head stock.
10	NE.	12	"	"	"	Dug	88	1,825	- 9	1,816	8	1,817	Glacial sand	Hard			Farm deserted.
11	NW.	14	"	"	"	Dug	8	1,865	- 6	1,859	8	1,857	Glacial drift	Hard		D, S	Supply insufficient for stock.
12	SW.	14	"	"	"	Dug	8	1,870	- 6	1,864	8	1,862	Glacial drift	Hard			No further information.
13	NW.	16	"	"	"	Dug	8	1,865	- 7	1,858	8	1,857	Glacial sand	Fairly hard		D, S	Sufficient supply; another seepage well 18 feet deep for house.
14	NE.	20	"	"	"	Dug	6	1,870	- 5	1,865	6	1,864	Glacial sand	Fairly soft		D, S	Farm deserted.
15	NW.	20	"	"	"	Dug	16	1,875	- 14	1,861	16	1,859	Glacial sand	Fairly soft		D, S	Sufficient for 16 head stock.
16	SW.	20	"	"	"	Bored	50	1,870	- 45	1,825	50	1,820	Glacial sand	Fairly hard		D, S	Sufficient for 26 head stock.
17	SE.	21	"	"	"	Dug	15	1,880	- 14	1,866	15	1,865	Glacial sand	Fairly hard		D, S	Sufficient in both wells for 80 head stock; another well 16 feet deep also used for stock
18	NW.	22	"	"	"	Dug	20	1,895	- 19	1,876	20	1,875	Glacial drift	Soft			Had small supply; farm house deserted, well not used.
19	NE.	22	"	"	"	Dug	25	1,860	- 22	1,838	25	1,835	Glacial drift	Soft		S	Very large supply.
20	NW.	23	"	"	"	Dug	10	1,870	- 8	1,862	10	1,860	Glacial sand	Hard		D, S	Sufficient for 14 head stock.
21	SW.	25	"	"	"	Dug	4	1,800	- 1	1,799	4	1,796	Recent alluvium	Soft		S	Large supply; another well in house, spring also used for stock.
22	NE.	26	"	"	"	Dug	9	1,725	- 5	1,720	9	1,716	Recent alluvium	Fairly hard		D, S	Sufficient supply for 61 head stock.
23	SE.	27	"	"	"	Bored	35	1,850					Glacial drift				Farm deserted.
24	NE.	34	"	"	"	Dug	16	1,700	- 14	1,686	16	1,684	Glacial sand	Hard		D, S	Sufficient supply for 30 head stock; another well 16 feet deep also used for stock.
25	NW.	36	"	"	"	Dug	12	1,860									Dry hole; all water hauled.
1	SE.	3	24	6	3	Dug	11	1,900	- 8	1,892	11	1,889	Glacial drift	Hard, slightly "alkaline"	52	D	Insufficient supply.
2	NW.	4	"	"	"	Dug	15	1,800	- 9	1,791	15	1,785	Glacial gravel	Hard	43	D, S	Sufficient supply.
3	NE.	5	"	"	"	Dug	22	1,850	- 19	1,831	22	1,828	Glacial sand	Hard, "alkaline"	44	D, S	Supply not always sufficient; another well 20 feet deep for drinking.
4	SW.	5	"	"	"	Dug	18	1,860	- 9	1,851	18	1,842	Glacial sand	Hard, slightly "alkaline"	43	D, S	Sufficient supply; another well 12 feet deep.
5	SE.	9	"	"	"	Dug	12	1,800	- 9	1,791	12	1,788	Glacial sand	Hard	42	D, S	Two dry holes 85 feet deep; 5 wells went dry after short time in use.
6	NW.	11	"	"	"	Dug	10	1,800	- 7	1,793	10	1,790	Glacial sand	Hard, slightly "alkaline"	44	D	Well on NE.¼, section 11 used for cattle.
7	SW.	12	"	"	"	Dug	20	1,820	- 15	1,805	20	1,800	Glacial sand	Hard, slightly "alkaline"	48	D, S	Sufficient supply.
8	SE.	12	"	"	"	Bored	62	1,850	- 17	1,833	62	1,788	Glacial sand	Hard, "alkaline"	42	S	Similar well on NE.¼, section 12, 62 feet deep; another well 22 feet deep for house.

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

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