CANADA
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WATER SUPPLY PAPER No. 7

GROUND-WATER RESOURCES OF THE RURAL MUNICIPALITY OF MOUNT PLEASANT, NO. 2 SASKATCHEWAN

By
B. R. MacKay and H. N. Hainstock

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CONTENTS

Illustrations

GROUND WATER RESOURCES OF THE RURAL MUNICIPALITY OF MOUNT PLEASANT, NO. 2, 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 Mount Pleasant covers an area of 298 square miles in the southeastern corner of the province of Saskatchewan. It embraces nine township blocks described as townships 1, 2, and 3, ranges 32, 33, and 34, west of the Principal or 1st meridian. The municipality is covered by a mantle of unconsolidated glacial drift, 200 to 300 feet thick. The upper 10-to 30-foot zone of the drift consists of yellow clay, sand, and gravel. This zone is underlain by 170 to 300 feet of blue clay which contains a few lenses of sand. Crossing the northern part of the municipality at the boundary of townships 2 and 3 is a belt approximately 3 miles wide in which a bed of gravel and sand 5 to 20 feet in thickness intervenes between the blue clay and the bedrock. This appears to mark the course of a buried pre-glacial stream valley.

There are three water-bearing horizons in these unconsolidated deposits, namely, the gravel and sand deposits lying above the impervious blue clay, the few sand lenses within the blue clay, and the gravel and sand that lie between the blue clay and the bedrock.

Water-bearing horizons in the unconsolidated Deposits

The sand and gravel deposits that form the upper water-bearing horizons are found over most of the municipality. They occur as narrow strips flooring most of the gullies and creek valleys, as more extended patches of glacial sands and knolls of terminal moraines, and as small isolated lenses and pockets occurring within the yellow clay. These form the source of the water for all the shallow wells in the municipality. In years of normal rainfall most of these shallow wells yield a supply of hard, potable water that is sufficient for 25 to 100 head of stock.

The water-bearing sand pockets in the blue clay have been tapped by a few wells in the municipality, but the supply of water from them is small and is usually too "alkaline" for use.

The water-bearing horizon that lies between the blue clay and the bedrock occurs as a belt 2 or 3 miles in width, that starts about 3 miles east of the western border of the municipality and runs in an easterly direction to the eastern edge. Its southern limit lies a mile south of the boundary between townships 2 and 3, whereas its northern limit lies 1 to 2 miles north of this boundary as far east as Carnduff where it swings northeast to continue along the eastern side of township 3, range 32. The water from this horizon is hard and contains a considerable amount of iron oxide, and the hydrostatic pressure is sufficient to cause the water to flow 3 to 10 feet above the surface or to rise within a few feet of it. The supply from each well is ample for 50 to 200 head of stock.

Water-bearing Horizons in the Bedrock

The Ravenscrag formation that underlies the glacial deposits throughout the municipality consists of 200 to 300 feet of consolidated sediments, composed of shale and sandy shale strata that contain one or more lignite coal seams. There are four water-bearing horizons in this formation, namely the principal coal seam and three sandy horizons occurring at various depths below. The wells deriving their water from the aquifer in the coal seam are confined to the northwestern corner of the municipality. This water-bearing horizon occurs at elevations of from 1,475 to 1,550 feet. The other three water-bearing horizons occur throughout the municipality at depths of 280 to 300 feet, 325 to 375 feet, and 410 to 460 feet. An abundant supply of soft, salty water, satisfactory for stock purposes, but not desirable for domestic uses, can usually be obtained from these horizons. The hydro-

static pressure is sufficient to cause the water to flow in a few wells or to rise close to the surface. The areas in which flowing wells occur, both from the bedrock and the gravel above it, are shown on the accompanying map of the municipality. The artesian conditions that exist in this area may be due to the fact that a highland area, Moose Mountain, lies to the northwest. The highland area contains numerous lakes, and forms a good collecting ground for rainfall, part of which may pass down into the sandy beds of the Ravenscrag formation that underlies the highland area. This water would be under considerable pressure, due to the head produced by the difference in elevation of the horizons, and when the water-bearing horizons are tapped, the water rises to near the surface or flows above it. The type of well thus obtained depends upon the porosity of the water-bearing horizon, and the distance from the intake area. When the sandy beds of the Ravenscrag formation are small and at considerable distance from the intake area, such as in the southern part of the municipality, the wells are non-flowing artesian in character. Similar wells also occur within the flowing-artesian areas, and in such instances the water-bearing horizons are less sandy than those that are tapped by flowing-artesian wells.

GROUND WATER CONDITIONS BY TOWNSHIPS

Township 1, Range 32

In township 1, range 32, there is only one water-bearing horizon in the glacial drift that produces a sufficient supply of water for local needs. This horizon lies within 25 feet of the surface and consists of sand and gravel, either in the form of lenses within the yellow clay or as outwash strips flooring the bottoms of the small ravines. Its elevation varies from 1,620 to 1,640 feet in the eastern half of the township and from 1,640 to 1,675 feet in the western half, the rise to the west and northwest corresponding to the rise in surface elevation.

Along the western side of the creek that flows in a southeast direction through sections 28, 27, 22, 14, 11, and 1 there is a fairly intensive deposit of gravel. It is 10 feet thick along the creek and thins westward until it finally disappears about $\frac{3}{4}$ mile to the west. Good supplies of water can be obtained from shallow wells dug into this belt of gravel. To the east of the creek there is little gravel and yellow and blue clays come to the surface. In section 23, however, an excellent supply of water having a yellowish tinge is obtained from a gravel deposit, and in the northwest quarter of the section a sand bed overlying the gravel yields clear water. Elsewhere throughout the township numerous dry holes have been dug before a water-bearing lens was located. In years of normal rainfall these wells have yielded a sufficient supply of potable water for at least 30 head of stock.

A small supply of strongly "alkaline" water is being obtained in some wells dug into the underlying blue clay in the northwest quarter of section 2 and in the southeast quarter of section 32. It is not advisable, however, to dig far into this thick deposit, for as a rule only a small supply of "alkaline" water can be expected.

The Ravenscrag formation which immediately underlies the blue clay contains two water-bearing horizons. The uppermost horizon was pierced in NW. $\frac{1}{4}$ section 26, SW. $\frac{1}{4}$, section 16, and SE. $\frac{1}{4}$, section 7, at depths of 282, 327, and 355 feet or at elevations of 1,390, 1,393, and 1,395 feet, respectively. This horizon is formed by a sandstone bed which usually immediately underlies a small lignite coal seam. The water is soft and salty and is under sufficient pressure to cause it to rise to within 10 to 30 feet of the surface. The lower water-bearing horizon is also a sandstone bed. It has been tapped in NW. $\frac{1}{4}$, section 15 and in NW. $\frac{1}{4}$, section 6 at depths of 370 and 407 feet or at elevations of 1,285 and 1,304 feet,

respectively. It also produces an abundant supply of soft, salty water, which is under sufficient pressure to cause it to rise to within 10 to 50 feet of the surface. Should other deep wells be drilled throughout the township it is logical to assume that they would derive an abundant supply of water from these two horizons or others that probably exist below them.

Township 1, Range 33

In township 1, range 33, only one water-bearing horizon occurs in the glacial drift. It is formed by the sand and gravel deposits that lie above the blue clay. Its elevation varies from 1,700 to 1,730 feet in the east and northeast and to 1,755 feet in the west and northwest, and the wells deriving water from it are rarely over 20 feet deep. The best supply from this horizon is found in the nine sections lying in the northeast corner of the township. Here the gravel comes to the surface in many places and sufficient water for 20 to 60 head of stock can be obtained from most of the wells. Elsewhere throughout the township the possibilities of getting an abundant supply of water from the shallow wells are poor. The best location for shallow wells is along the ravines and draws, where gravel deposits are generally fairly extensive. "Alkaline" water occurs in the wells located in SE. ¼, section 2, SW. ¼, section 4, and SW. ¼, section 14. These wells are dug into pockets and lenses of sandy yellow clay or sandy blue clay.

Two water-bearing horizons occur in the Ravenscrag formation in this township. The upper horizon is a sand bed which occurs at or near the top of the formation. In places it is overlain directly by the blue clay and elsewhere it is capped by shale beds varying up to 50 feet in thickness. The water from this horizon is under sufficient pressure to cause it to rise to within 20 to 150 feet from the surface, depending

upon the part of the township tapped. The water is soft and salty in character, and these qualities confirm its bedrock source. In the western third of the township this water-bearing horizon is struck at depths of 300 to 325 feet or at elevations of 1,455 to 1,465 feet. In the central third it is pierced at depths of 328 to 356 feet or at elevations of 1,400 to 1,420 feet, and in the eastern third at depths of 320 to 350 feet or at elevations of 1,385 to 1,388 feet. The uniformity in depth of the wells is largely due to the corresponding rise of 60 feet in surface elevation from the eastern to the western border of the township. An abundant supply of soft, salty water can doubtless be obtained from deep wells tapping this horizon throughout the township.

Soft, salty water is also obtained from a water-bearing horizon occurring at a depth of 425 feet or at an elevation of 1,300 feet. The water rises to within 75 feet of the surface, but the supply has decreased during the last ten years and is insufficient for local needs at the present time.

Township 1, Range 34

The water resources from the glacial drift in township 1, range 34, are only fair. Small pockets of sand and gravel appear to be fairly numerous in the zone of drift above the blue clay, but the supply of water from them is entirely dependant on the amount of rainfall. Along Souris river springs are common and these are used for both stock and domestic purposes. An adequate supply of water can be obtained in most instances from the gravel deposits that occur in the draws tributary to the river, but elsewhere the supply may be only sufficient for domestic use and 15 to 20 head of stock. As a rule the water is hard and "non-alkaline" in character, but in the northeast quarter of section 20 and the southwest of 28 where the wells are excavated into the blue clay, the water is "alkaline" in character, due to the

dissolving out of mineral salts contained in the clay.

Deep wells in the township obtain their water from three different water-bearing horizons in the Ravenscrag formation. In the northwest of section 5 a sandstone bed is encountered at a depth of 252 feet, or at an elevation of 1,548 feet, and an abundant supply of soft, salty water with a soda taste, which is accompanied by a small gas flow, is obtained from it. It is under sufficient pressure to cause it to rise to within 50 feet of the surface. The same kind of water occurs in SE. $\frac{1}{4}$, section 25, at a depth of 325 feet or at an elevation of 1,455 feet, and in NE. $\frac{1}{4}$, section 24 at 438 feet in depth or at an elevation of 1,348 feet. The water in these two wells rises to within 100 feet of the surface. Adequate supplies of water can be obtained from these horizons throughout the township.

Township 2, Range 33

The water supply from the shallow wells in this township is poor. It is wholly derived from deposits of sand and gravel occurring as pockets in the yellow clay and lying at elevations of from 1,650 to 1,680 feet.

In sections 31 and 32 and in NE. 5, SE, 7, NE. 8, SE. 9, SE. and SW. 10, and NE. 23 the glacial outwash gravel and sand deposits are fairly extensive and wells dug in them provide a supply of hard, clear water that is sufficient for 50 to 100 head of stock. In most of these wells the best supply comes from the fine sands rather than the gravels. Throughout the remainder of the township it is difficult to obtain a satisfactory supply of water from shallow wells. Several holes have usually to be dug before a small pocket of water-bearing gravel is located. Many farmers have to use two or more wells in order to obtain a sufficient supply for stock, and during the drought period practically all these wells were dry.

Many holes have been dug to a depth of 85 feet into the underlying blue clay and at most only small trickles of water have been obtained.

The second water-bearing horizon in the glacial drift is formed by the glacial sand and gravel deposits lying between the Ravenscrag formation and the blue clay. This horizon was tapped in NE. $\frac{1}{4}$, section 36, at a depth of 248 feet or at an elevation of 1,427 feet. The water was under sufficient pressure to cause it to flow 4 feet above the surface. It is hard with a high iron oxide content and is of a slightly yellow colour. This aquifer was not observed in the other deep wells and apparently the sand and gravel deposits that form it occur only in the northeast corner of the township.

A water-bearing horizon in bedrock occurs in the Ravenscrag formation throughout the township at depths of 273 to 380 feet, or at elevations of 1,305 to 1,392 feet. The water from this horizon is soft, sometimes salty and usually has a soda taste. In a well located in the NW.$\frac{1}{4}$ of section 7, the hydrostatic pressure is sufficient to cause the water to flow 4 feet above the surface. In the other five wells the water rises to within 15 feet of the surface. Future drilling throughout the township into this horizon should produce at least non-flowing artesian wells, with the possibility of flowing wells in the northerly part of the township.

Township 2, Range 33

There are two water-bearing horizons in the glacial drift in township 2, range 33. The sand and gravel deposits that occur in the zone of drift lying above the blue clay form the first horizontal depths of 8 to 20 feet. These deposits are extensive around the town of Carnduff and sandpoints can be used here to obtain an abundant supply of good water. Else-

where small patches and pockets of sand and gravel occur within the yellow clay and in years of normal rainfall wells dug in them yield a supply of water sufficient for 30 to 100 head of stock.

Wells dug into the blue clay may yield some water, but it will probably prove to be too "alkaline" for either stock or domestic use.

The second horizon is formed by the sand and gravel deposits lying between bedrock and the blue clay. This zone yields a hard water, high in iron and slightly yellow in colour. The water is under pressure and flows 20 feet above the surface from two wells located at Carnduff. This water-bearing horizon occurs at depths of 232 to 272 feet, or at elevations of 1,463 and 1,500 feet, respectively.

The sandy shale beds that comprise the upper part of the underlying Ravenscrag bedrock formation form a water-bearing horizon. It yields an abundant supply of soft, salty water which has a soda taste, and it is under sufficient hydrostatic pressure to cause it to rise to within 10 feet of the surface or to flow up to a foot above the surface. This horizon is tapped at depths of from 300 to 370 feet, or at elevations of from 1,340 to 1,460 feet, the higher elevations occurring in the western part of the township. Tapping of this horizon elsewhere throughout the township should produce similar types of wells. No water can be expected beyond a depth of 640 feet, as at this depth a thick, non-water-bearing, Marine Shale formation is encountered.

Township 2, Range 34

The sand and gravel deposits that form the water-bearing horizon for the shallow wells in township 2, range 34, occur as lenses within the yellow clay at elevations varying from 1,770 to 1,790 feet. The best supply noted was in the southern halves of section 21, 22, and 23, and N.$\frac{1}{2}$, section 24,

where the water supply from the individual wells is sufficient for 100 head of stock. Elsewhere throughout the township the supply varies, some wells producing sufficient water for 100 head of stock whereas others yield a poor supply or are entirely dry.

In the southeast quarter of section 14 a small pocket of sand was encountered in the blue clay at a depth of 80 feet, but the water from it was to "alkaline" for either domestic or stock use. This condition undoubtedly exists in other sections.

In the northeast quarter of section 34 a well 290 feet deep is drawing water from gravel, which is believed to lie between the blue clay and the bedrock. The water is medium hard, but the supply is very small.

There are two water-bearing horizons in the Ravenscrag formation. The upper most is composed of sandy shale beds which occur at depths of 300 to 310 feet, or at elevations of 1,475 to 1,490 feet. The water from this horizon is abundant in quantity, soft and slightly salty in character, and tastes of soda. It is under sufficient pressure to cause it to rise to within 60 to 100 feet of the surface. The lower horizon is in sandy shale beds which occur at a depth of 460 feet, or at an elevation of 1,335 feet. The water from this horizon has the same characteristics as that from the horizon lying above it, but the hydrostatic pressure is greater and the water rises to within 45 feet of the surface in one well located in SW.$\frac{1}{4}$, section 10, and flows 4 feet above the surface in another well located in NE. $\frac{1}{4}$, section 14. Both these water-bearing horizons should produce an abundant supply of water should they be tapped by other wells.

Township 3, Range 32

In township 3, range 32, deposits of gravel and sand that occur in the glacial drift overlying the blue clay form a water-bearing horizon which is the source of water for all the shallow 8 to 15 foot wells of the township. The

gravel deposits are fairly extensive along the creeks and the best water supply is obtained close to these drainage courses. Away from the creeks the gravel occurs in lenses within the yellow clay and it is more difficult to obtain a permanent supply. In some places water has to be hauled during dry spells and the winter months.

A small water-bearing sand pocket lying within the blue clay was struck at a depth of 80 feet, but only a small supply of "alkaline" water was obtained from it. This is to be expected, and it is not advisable to try to obtain water from the blue clay.

The deposits of sand and gravel that occur immediately below the blue clay and above the bedrock, at depths of from 260 to 300 feet or at elevations varying from 1,400 to 1,458 feet, form a water-bearing horizon. These sand and gravel deposits are believed to be glacial in origin, but they may be part of the Ravenscrag formation. Flowing wells deriving their water from this horizon occur in SW. $\frac{1}{4}$, section 7, NW. $\frac{1}{4}$, section 12, and NW. $\frac{1}{4}$, section 24, and possibly the flowing wells located in SW. $\frac{1}{4}$, section 13, and NW. $\frac{1}{4}$, section 14, are deriving their water from the same horizon. The water flows from 2 to 15 feet above the surface and is medium soft to hard and non-salty in character. This horizon appears to be confined to the southern and southeastern parts of the township.

Two water-bearing horizons occur in the Ravenscrag formation. The upper one is a sandy shale bed and it is struck at depths of 300 to 400 feet, or at elevations of 1,360 to 1,400 feet. The water obtained from it is soft and slightly salty in character, and the hydrostatic pressure is sufficient to cause it to flow 2 feet above the surface in the southwest of section 12 and rise to within 40 feet of the surface in wells located in the northern part of the township. The lower horizon, which was pierced at a depth of 425 feet, or at an elevation of

1,277 feet, is also formed by a sandy shale bed. The water from this horizon rises to within 90 feet of the surface and is medium hard and non-saline in character. Two holes were drilled to a depth of 400 feet, in the northeastern part of the township, without locating water. In these instances the sandy phases of the bedrock are either lacking or the water horizon was drilled through unnoticed. To the writer's knowledge no drilling has been done in the northwestern part of the township, but should deep holes be drilled, an abundant supply of water will undoubtedly be found in the two bedrock horizons mentioned above, or in others that may occur below them.

Township 3, Range 33

With the exception of the northeastern and southwestern corners of township 3, range 33, where the gravel and sand occur as pockets within yellow clay, most of the township is covered by a deposit of fine, glacial lake or flood-plain sands. During years of normal rainfall a good supply of water could be obtained from these water-bearing sands at depths up to 20 feet. During the drought periods, however, the supply decreased, especially in wells located some distance from Antler river, and a number of farmers were forced to haul water from deep wells in the neighbourhood.

In NE. $\frac{1}{4}$, section 25, a water-bearing sand was struck at a depth of 45 feet in the blue clay, but the water derived from it was very "alkaline". Similar sand pockets will probably occur in other parts of the township, but the water will doubtless prove too "alkaline" for domestic use.

In the southwestern part of the township a water-bearing horizon consisting of a sand and gravel, believed to be glacial in origin, overlies the Ravenscrag formation. This horizon occurs at depths of 296 to 330 feet, or at elevations varying from 1,440 to 1,490 feet. The water

derived from this horizon is hard in character and contains a considerable amount of iron. The hydrostatic pressure is sufficient to cause the water to rise to within 40 to 50 feet of the surface. These deposits appear to have been laid down in a depression in the pre-glacial bedrock land surface, as the water-bearing horizon at the same elevation in the northeastern part of the township is definitely in the Ravenscrag formation.

A zone consisting of a lignite coal seam and its enclosing sandy shale beds forms a water-bearing horizon in the Ravenscrag formation for deep wells in the northern part of the township. This horizon is tapped at depths of 260 to 345 feet, or at elevations of 1,498 to 1,420 feet, and an abundant supply of soft, slightly salty water, often with a soda taste, is derived from it. The hydrostatic pressure is sufficient to cause the water to rise to within 15 to 45 feet of the surface. This horizon underlies all of the township and it undoubtedly will yield an abundant supply of water if tapped by other deep wells.

Township 3, Range 34

Only a few scattered pockets of sand and gravel occur in the glacial drift that overlies the blue clay in this township. In the northeastern part of the township four shallow wells are deriving a fair supply of water from pockets of gravel. Throughout the remainder of the township pockets of gravel are absent and the upper 30 to 40 feet of the drift consists wholly of yellow clay. This clay is so impervious that little or no water is obtained in shallow wells dug into it. The water supply in this township is of necessity obtained at depth from lower water-bearing horizons.

Sand and gravel deposits lying beneath the blue clay and above the Ravenscrag formation, and believed to be glacial in origin, form a water-bearing horizon in sections 3,

10, and 11. Four wells have tapped this horizon at depths of from 270 to 300 feet, and it appears to be confined to these sections. The water from it is hard with a noticeable iron oxide content, the iron frequently settling out as a red, flocculent precipitate, and the pressure is sufficient to cause it to rise within 60 to 100 feet of the surface.

The other deep wells in the township are obtaining water from five water-bearing horizons in the Ravenscrag formation. Most of these wells derive their water from the upper two horizons. The uppermost horizon is formed by a coal seam and its associated sand beds. It is struck at depths of 270 to 300 feet, or at elevations of from 1,520 to 1,540 feet. The water rises to within 30 to 80 feet of the surface and is soft in character with a soda taste; it is often of a slightly brownish colour due to the presence of organic matter derived from the coal. The second horizon occurs at depths of from 325 to 350 feet, or at elevations of 1,460 to 1,475 feet. It is formed by a gravel bed and the water from it is hard in character and contains some iron and soda. The hydrostatic pressure is sufficient to cause the water to rise to within 10 to 60 feet of the surface, and the water from one well located on SE. $\frac{1}{4}$, section 25, flowed 9 feet above the surface for a year after it was drilled. A sandy strata occurring at a depth of 410 feet, or at an elevation of 1,410 feet, forms the third water-bearing horizon. The water from this horizon rises to within 60 feet of the surface in a well located on SE. $\frac{1}{4}$, section 21, and it is soft in character. One well located on SW. $\frac{1}{4}$, section 14, is deriving its water from a fourth horizon which occurs at a depth of 465 feet. This aquifer is a gravel bed and the water from it rises to within 50 feet of the surface; it is hard in character, with an iron and soda content. A sandy strata occurring at a depth of 513 feet, or an elevation of 1,294 feet, forms the fifth water-bearing horizon in the Ravenscrag formation. This horizon is tapped by a well located on SW. $\frac{1}{4}$, section 13, which yields an abundant supply of soft water.

STATISTICAL SUMMARY OF WELL INFORMATION IN RURAL MUNICIPALITY OF MOUNT PLEASANT, NO. 2, SASKATCHEWAN

Township	1	1	1	2	2	2	3	3	3	Total No. in
West of 1st mer. Range	32	33	34	32	33	34	32	33	34	Municipality
Total No. of wells in Township	76	48	24	111	64	40	66	77	123	629
No. of wells in bedrock	5	13	3	8	10	6	11	4	14	74
No. of wells in glacial drift	71	35	20	103	54	34	55	73	109	554
No. of wells in alluvium			1							1
Permanency of Water Supply										
No. with permanent supply	49	37	22	34	48	27	49	42	28	336
No. with intermittent supply	9	2	1	17	5	2	7	7	2	52
No. dry holes	18	9	1	60	11	11	10	28	93	241
Types of Wells										
No. of flowing artesian wells				2	3	1	6		1	13
No. of non-flowing artesian wells	5	14	3	5	8	7	3	9	16	70
No. of non-artesian wells	53	25	20	44	42	21	47	40	13	305
Quality of Water										
No. with hard water	53	25	20	44	44	23	51	45	20	325
No. with soft water	5	14	3	7	9	6	5	4	10	63
No. with salty water	5	13	3	7	9	6	3	2		48
No. with alkaline water	7	3	1	2		1		3	1	18
Depths of Wells										
No. from 0 to 50 feet deep	71	33	21	91	52	31	46	60	106	511
No. from 51 to 100 feet deep				10		1	7	1		19
No. from 101 to 150 feet deep				1						1
No. from 151 to 200 feet deep										
No. from 201 to 500 feet deep	5	15	3	9	11	8	13	16	17	97
No. from 501 to 1,000 feet deep					1					1
No. over 1,000 feet deep										
How the Water is used										
No. usable for domestic purposes	49	32	22	48	50	28	54	46	29	358
No. not usable for domestic purposes	9	7	1	3	3	1	2	3	1	30
No. usable for stock	52	38	23	51	53	28	56	49	29	379
No. not usable for stock	6	1				1			1	9
Sufficiency of Water Supply										
No. sufficient for domestic needs	58	39	23	51	53	29	56	49	29	387
No. insufficient for domestic needs									1	
No. sufficient for stock needs	43	34	14	35	48	26	43	38	27	308
No. insufficient for stock needs	15	5	9	16	5	3	13	11	3	80

ANALYSES AND QUALITY OF WATER

General Statement

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

Total Dissolved Mineral Solids

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

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

Mineral Substances Present

Calcium and Magnesium

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

Sodium

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

Sulphates

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

Chlorides

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

Iron

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

Hardness

Calcium and magnesium salts impart hardness to water. Hardness of water is commonly recognized by its soap-destroying powers as shown by the difficulty of obtaining lather with soap. The total hardness of a water is the hardness of the water in its original state. Total hardness is divided into "permanent hardness" and "temporary hardness". Permanent hardness is the hardness of the water remaining after the sample has been boiled and it represents the amount of mineral salts that cannot be removed by boiling. Temporary hardness is the difference between the total hardness and the permanent hardness and ropresents 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 Mount Pleasant, No. 2, Saskatchewan.

NO.	LOCATION					Depth of Well, Ft.	Total dis'vd Solids	Cl.	HARDNESS			CONSTITUENTS AS ANALYSED					CONSTITUENTS AS CALCULATED IN ASSUMED COMBINATIONS								Source of Water
	Qtr.	Sec.	Tp.	Rge.	Mer.				Total	Perm.	Temp.	Alkalimity	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.	NE.	22	1	32	1	7	400	8	280	260	20	230	80	43	53	29	303	143		73	24		50	15		x 1
2.	SW.	23	1	32	1	12	1,820	165	1000	850	150	350	140	173	295	132	972	251		84	369			249		x 1
3.	NW.	16	1	33	1	336	2,100	810	30	not	det.	720	20	4	4	1129	2,101	36		8		715	6	1336		x 2
4.	NW.	5	1	33	1	252	1,900	660	35	not	det.	775	10	11	16	1040	1,928	18		23		774	24	1089		x 2
5.	SE.	14	2	34		360	2,680	1180	35	not	det.	630	20	4	4	1397	2,616	35		8		619	6	1947		x 2
6.	NE.	35	2	33	1	12	1,110										1,110					(2)	(4)	(1)	(3)	x 1
7.	NE.	35	2	33	1	232	1,044	134	293					84		290	970			293		424		270		x 1

Water samples indicated thus, x 1, are from glacial drift.
Water samples indicated thus, x 2, are from bedrock, Ravenscrag formation.
Analyses are reported in parts per million; where numbers (1), (2), (3), and (4) 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 ($CaCO_3$).

Analysis No. 6, by Provincial Analyst, Regina.
For interpretation of this table read the section on Analyses and Quality of Water.

Water from the Unconsolidated Deposits

The total dissolved solid content of the waters analysed from the glacial drift of this municipality, varies from 400 to 1,820 parts per million. This content is relatively low as most waters from the glacial drift in Saskatchewan have a total dissolved solid content ranging from 1,800 to 3,000 parts per million or even more. All of the samples analysed are quite hard, the total hardness ranging from 200 to 1,000 parts per million.

On the basis of their low mineral salt content, the waters analysed are suitable for drinking as well as for stock. It is advisable, however, to have them examined for bacteria, as the sample taken from the 12 foot well on the NE. $\frac{1}{4}$, section 35, and analysed by the provincial analyst, shows traces of nitrites and is possibly being contaminated by surface waters. The water from this well differs from that derived from the other shallow wells in the glacial drift, and this is due to the fact that the overflow from a bedrock well has been diverted into the shallow well.

One sample of water that is being derived from the sands that occur at the base of the blue clay was analysed. It has a total dissolved solid content of 1,044 parts per million, and a total hardness of 293 parts per million. This water is suitable for drinking, but it is unsatisfactory for irrigation as it contains a fairly large amount of sodium carbonate (black alkali).

Water from the Bedrock

Three samples of water from the Ravenscrag formation were analysed. The total dissolved solid content of these waters ranges from 1,900 to 2,600 parts per million. Unlike the water from the glacial drift, the water from the Ravenscrag formation is low in calcium and magnesium salts, and is high in sodium salts. It is very soft, the total hardness being only 35 parts per million.

The sodium chloride (common salt) content is high, being from 1,100 to 1,950 parts per million, and the water is too salty for drinking but it is suitable for stock. The sodium carbonate (black alkali) content is also high, 619 to 775 parts per million, and the water is unfit for irrigation purposes.

WELL RECORDS—Rural Municipality of MOUNT PLEASANT NO.2

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	NE.	2	1	32	1	Dug	9	1,625	- 4	1,621	4	1,621	Glacial, quick-sand	Hard, clear	52	D. S.	Waters 30 head of stock. 5 dry holes, dug.
2	SE.	4	"	"	"	"	22	1,665	- 12	1,653	18	1,647	Glacial, sand	Hard, cloudy		D. S.	Sufficient for local needs. Same source as well 1½ miles southeast.
3	NW.	6	"	"	"	Drilled	407	1,710	- 50	1,660	406	1,304	Ravenscrag, sand-stone	Soft, salty, grey colour	45	S. D.	Abundant supply. Inflammable gas present.
4	NW.	7	"	"	"	Dug	14	1,705	- 10	1,695	10	1,695	Glacial, gravel	Hard, clear	45	D S.	Waters 20 head of stock.
5	SW.	11	"	"	"	"	13	1,628	- 7	1,621	11	1,617	" " "	" "		D. S.	" 25 " " " .
6	SE.	12	"	"	"	"	11	1,644	- 8	1,636	9	1,635	" sand	" "	50	D. S.	" 60 " " " .
7	NE.	13	"	"	"	"	15	1,655	- 13	1,642	15	1,640	" " blueclay	" "		D. S.	" 7 " " " . Water hauled from 1930- 1934.
8	SE.	15	"	"	"	"	16	1,642	- 14	1,628	14	1,628	" gravel	" "		D. S.	Waters 30 head of stock.
9	NW.	15	"	"	"	Drilled	370	1,655	- 10	1,645	370	1,285	Ravenscrag, sand stone			D. S.	Pumps 3½ gals. a minute. Infammable gas present.
10	SW.	16	"	"	"	"	327	1,678	- 20	1,658	285	1,393	Ravenscrag, sand stone	Soft, salty	45	D. S.	Waters 50 head of stock.
11	NW.	17	"	"	"	Dug	13	1,680	- 5	1,675	5	1,675	Glacial, gravel	Hard, clear	46	D. S.	2 similar wells produce sufficient supply.
12	SE.	19	"	"	"	"	16	1,690	- 11	1,679	13	1,677	" sand	" "		S.	Well goes dry in winter.
13		19	"	"	"	"	9	1,680	- 4	1,676	4	1,676	" gravel	" "		D. S. M.	Pumps 12 bbls. a hour.
14	S.	20	"	"	"	"	12	1,680	- 8	1,672	8	1,672	" "	" "	48	D. S.	Waters 30 head of stock.
15	NE.	21	"	"	"	"	10	1,660	- 8	1,652	8	1,652	" "	" alkaline		D. S.	" 25 " " " , in summer. Well goes dry in winter.
16	SE.	22	"	"	"	"	10	1,640	- 6	1,634	6	1,634	" "	" clear		D. S.	Abundant supply.
17	NW.	22	"	"	"	"	12	1,655	- 7	1,648	8	1,647	" sand	" "	46	D. S.	Waters 30 head of stock.
18	NE.	22	"	"	"	"	7	1,640	- 3	1,637	3	1,637	" "	" alkaline		S.	" 30 " " " , #.
19	SE.	23	"	"	"	"	20	1,645	- 10	1,635	10	1,635	" gravel	" yellow colour		S.	" 70 " " " .
20	SW.	23	"	"	"	"	18	1,648	- 10	1,638	10	1,638	" "	Hard, yellow colour		S.	Cannot pump water below 16', #.
21	SW.	23	"	"	"	"	18	1,648	- 10	1,638	10	1,638	" sand	Hard, clear		D. S.	Only sufficient for domestic use.
22	NW.	24	"	"	"	"	?	1,635	- 5	1,630	?	?	" "	" "		D.S.	Very good supply.
23	SE.	26	"	"	"	"	15	1,660	- 10	1,650	11	1,649	" "	" "		D. S.	Waters 40 head of stock.
24	NW.	26	"	"	"	Drilled	282	1,672	- 30	1,642	282	1,390	Ravenscrag, sand stone	Soft, salty,	45	D. S.	Abundant supply, laxative.
25	SW.	27	"	"	"	Dug	11	1,638	- 31	1,635		1,632	Glacial, sand	" clear	51	S.	
26	NW.	27	"	"	"	"	12	1,640	- 8	1,632	8	1,632	" "	" "		D. S.	Waters 20 head of stock, ever hour.
27	SE.	28	"	"	"	"	15	1,652	- 11	1,641	11	1,641	" "	Hard "	46	D. S.	" 25 " " " .

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 MOUNT PLEASANT NO. 2

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
28	NW.	28	1	32	1	Dug	10	1,660	- 7	1,653	7	1,653	Glacial, gravel	Hard, clear		D. S.	Waters 50 head of stock during drought.
29	SE.	32	"	"	"	"	14	1,655	- 10	1,645	10	1,645	" "	" "		D. S.	" 20 " " " . Alkaline water found 200 yds. north.
30	SW.	32	"	"	"	"	16	1,665	- 13	1,652	13	1,652	" "	" "		D. S.	Insufficient supply, necessary to haul water.
31	NE.	34	"	"	"	"	13	1,655	- 7	1,648	11	1,644	Glacial, clay "	" "	46	D. S.	Waters 50 head of stock, 60 bbls. a day.
32	NW.	36	"	"	"	"	21	1,665	- 18	1,747	18	1,647	Sandy clay	" "		D. S.	Domestic use only. Haul water for stock.
33	SE.	36	"	"	"	Drilled	355	1,650	- 12	1,638	355	1,295	Ravenscrag	Soft, salty		S.	Abundant supply.
1	SE.	2	1	33	1	Dug	8	1,742	- 3	1,739	3	1,739	Glacial, gravel	Hard, clear	48	N.	
2	SW.	2	"	"	"	Drilled	338	1,738	- 40	1,698	338	1,400	" sand	Soft, salty	45	D. S.	Pumps 4½ gals. a minute.
3	SW.	3	"	"	"	Dug	18	1,745	- 5	1,740	9	1,736	" gravel	Hard, clear	48	D. S.	Waters 50 head of stock. Also 4 holes 7 feet deep.
4	SW.	4	"	"	"	"	25	1,762	- 20	1,742	10	1,752	Sandy clay	" Alkaline	46	S.	Waters 15 head of stock in wet season.
5	NE.	8	"	"	"	"	18	1,762	- 8	1,754	8	1,754	Yellow clay	Hard, clear		S.	Insufficient supply.
6	SW.	8	"	"	"	Drilled	325	1,770	- 60	1,710	313	1,457	Ravenscrag, sand	Soft, salty	45	D. S. I.	Pumps 3½ gals. a minute.
7	SE.	9	"	"	"	Dug	18	1,750	- 7	1,743	12	1,738	Glacial, gravel	Hard, clear	48	D. S.	
8	NW.	11	"	"	"	Drilled	425	1,725	-275	1,450	425	1,300	Ravenscrag?	Soft, salty		D. S.	Insufficient supply.
9	NW.	12	"	"	"	Dug	12	1,717	- 10	1,707	10	1,707	Sandy clay	Hard, clear	46	D. S.	Waters 25 head of stock. Also 2 similar wells
10	SW.	13	"	"	"	"	12	1,715	- 9	1,706	9	1,706	Glacial sand	" "	46	D. S.	Was almost dry in 1935.
11	SW.	14	"	"	"	"	12	1,720	- 8	1,712	8	1,712	Sandy clay	" alkaline	48	N.	Too alkaline for use. Farmer hauls water.
12	NW.	16	"	"	"	Drilled	356	1,755	- 22	1,733	336	1,419	Glacial, white sand	Soft, salty	44	D. S.	Waters 100 head of stock. Kills plants.
13	NE.	18	"	"	"	Dug	12	1,765	- 4	1,761	7	1,768	Glacial, gravel	Hard, clear	46	D. S.	Sufficient water to supply 8 farms.
14	NE.	20	"	"	"	"	14	1,755	- 2	1,753	2	1,753	" sand	" "	45	D. S.	Poor supply.
15	NE.	20	"	"	"	Drilled	300	1,755	- 80	1,675	295	1,460	Ravenscrag, sand	Soft, salty	46	D. S.	Waters 80 head of stock. Water stroke at 250 in a 500' hole- drain out.
16	NE.	21	"	"	"	Dug	12	1,750	- 7	1,743	6	1,744	Glacial, gravel	Hard, clear	45	D. S.	Waters 40 head of stock. Also use similar well
17	NW.	22	"	"	"	"	9	1,735	- 3	1,732	6	1,729	" "	" "	45	D. S.	" 30 " " " " " " " "
18	SE.	22	"	"	"	"	10	1,735	- 6	1,729	6	1,729	" "	" "	45	D. S.	" 20 " " " " " " " "
19	NW.	24	"	"	"	"	8	1,705	- 5	1,700	5	1,700	" "	" "	46	D.	Sufficient supply for domestic use.
20	NW.	24	"	"	"	Drilled	320	1,708	- 50	1,658	315	1,393	Ravenscrag, sand	Soft, salty	45	S.	Waters 75 head of 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 MOUNT PLEASANT NO. 2

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	NW.	26	1	33	1	Drilled	300	1,720	- 12	1,708	300	1,420	Ravenscrag	Soft, salty	46	D. S.	Abundant supply. Kills plants.
22	SE.	27	"	"	"	"	350	1,738	- 20	1,718	350	1,388	"	" "	45	S.	Sufficient, brown precipitate.
23	NE.	30	"	"	"	"	290	1,765			290	1,475	"	" "	46	D. S.	Waters 100 head of stock.
24	SE.	30	"	"	"	"	306	1,768	- 40	1,728	306	1,462	"	" "	45	D. S. I.	" 120 " " " . Upper sand in pocket.
25	NE.	32	"	"	"	"	300	1,755	- 150	1,605	300	1,455	"	" "	46	D. S.	" 100 " " " . Kills plants.
26	SW.	34	"	"	"	Dug	10	1,740	- 2	1,738	7	1,733	Glacial, gravel	Hard, clear	50	D. S.	" 60 " " " . Also use similar well.
27	NE.	34	"	"	"	"	12	1,730	- 7	1,723	7	1,723	" "	" "	46	D. S.	" 50 " " " .
28	SE.	34	"	"	"	Drilled	350	1,735	- 114	1,721	350	1,385	Ravenscrag	Soft, salty	45	D. S. I.	" 150 " " " .
29	NW.	34	"	"	"	"	328	1,750			328	1,422	"			D. S.	No information.
30	NW.	35	"	"	"	Dug	10	1,720	- 7	1,713	7	1,713	Glacial, gravel	Hard, clear	46	D. S.	Well cannot be pumped dry.
31	NW.	36	"	"	"	"	10	1,700	- 5	1,695	5	1,695	" sand	" "	46	D. S.	Waters 50 head of stock.
32	SW.	36	"	"	"	Drilled	330	1,715	- 40	1,675	330	1,385	Ravenscrag	Soft, salty	45	S.	" 100 " " " . Kills plants.
1	NW.	3	1	34	1	Dug	25	1,640	- 20	1,620	20	1,620	Glacial, gravel	Hard, clear		D.	Fair supply. Same water level as river.
[illegible]	[illegible]	4	"	"	"	Spring		1,628					Fine gravel	" "		D.	Sufficient for house use.
3	[illegible]	4	"	"	"	Dug	15	1,760	- 8	1,752	8	1,752	Glacial, sand	" "		D. S.	Poor supply. Has a dam in coulee.
4	NW.	5	"	"	"	Drilled	300	1,800	- 50	1,750	300	1,500	Ravenscrag, sandstone	Soft, salty	42	D. S.	Steady supply. Water turns cloudy before storm. High soda contents, #.
5	SE.	9	"	"	"	Spring		1,630					Glacial, gravel	Hard, clear	46	D.	Abundant supply.
6	SW.	10	"	"	"	"		1,630					" "	" "		D. S.	" " .
7	NE.	14	"	"	"	Dug	16	1,790	- 10	1,780			" clay	" "		N.	Farmer hauls all water.
8	SW.	15	"	"	"	"	22	1,700	- 8	1,692	11	1,689	" gravel	" "		D.	Sufficient for domestic use.
[illegible]	NE.	16	"	"	"	"	20	1,650	- 18	1,632	19	1,631	" " sand	" "	45	D. S.	" " " " . Petrified wood located at base of well.
10	NE.	20	"	"	"	"	22	1,750	- 19	1,731	7	1,743	Glacial, sand	" alkaline	56	D.	Only sufficient for house use.
11	SE.	21	"	"	"	"	22	1,690	- 15	1,675	15	1,675	" yellow clay	" clear		D.	" " " " " .
12	SW.	21	"	"	"	"	18	1,630	- 14	1,616	14	1,616	Glacial, gravel	" "		D. S.	Well cannot be pumped dry.
[illegible]	[illegible]	23	"	"	"	"	25	1,793	--				" yellow clay			N.	Dry hole.
1	[illegible]	24	"	"	"	Drilled	438	1,780	- 100	1,680	432	1,348	Ravenscrag, shale sand	Soft, soda, salty		S.	Pumps 2½ gals. a minute.
[illegible]	[illegible]	25	"	"	"	"	325	1,780	- 25	1,655	325	1,455	Ravenscrag, sand	Soft, salty		D. S.	Waters 80 head of 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 MOUNT PLEASANT NO. 2

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE: Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED: Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
16	SW.	28	1	34	1	Dug	20	1,740	- 15	1,725	13	1,727	Glacial, gravel	Hard, alkaline		D. S.	Abundant supply, except in 1933 and 1934. Alkaline when low.
17	SW.	36	"	"	"		12	1,785	- 7	1,778	7	1,778	" sand	" clear		D. S.	Sufficient for 22 head of stock.
18	NW.	36	"	"	"	"	22	1,780	- 4	1,776	19	1,761	" gravel	" "	46	D. S.	Sufficient supply with 2 other similar wells.
1	NW.	1	2	32	1	Dug	12	1,655	- 4	1,651	8	1,647	" sand	" "	45	D.	Only sufficient for house use. Dry hole 399'.
2	SW.	2	"	"	"	Drilled	338	1,658	- ...		325	1,333	Ravenscrag, sand	Soft, soda	45	S.	
3	SE.	2	"	"	"	Dug	15	1,665	- 8	1,657	8	1,657	Glacial, sand	Hard, clear	44	D. S.	Waters 20 head of stock. Numerous dry holes dug into blue clay.
4	NE.	4	"	"	"	"	16	1,665	- 9	1,657	12	1,653	" "	" "	44	D. S. I.	Water 60 head of stock. 3 dry holes in blue clay.
5	NW.	5	"	"	"	"	13	1,690					" gravel		46	D. S.	Well never goes dry.
6	NW.	6	"	"	"	"	11	1,700	- 7	1,693	11	1,689	" "	Hard, clear	46	D. S.	Waters 35 head of stock. 4 dry holes in yellow clay.
7	NW.	7	"	"	"	Drilled	380	1,685	+ 3	1,688	380	1,305	Ravenscrag, sand	Soft, soda, brown colour	52	D. S. I.	Water flows into pit, and waters 25 head of stock,
8	SE.	7	"	"	"	Dug	25	1,710	- 10	1,700			Glacial, gravel	Hard, clear	47	D. S. I.	Dry in drought period. Waters 25 head of stock in 1935.
9	NE.	8	"	"	"	"	10	1,675	- 8	1,667	8	1,667	" "	" "	46	D.	
10	NE.	8	"	"	"	"	21	1,680	- 17	1,663	21	1,659	" sand	" "	46	D. S.	Only waters 8 head of stock. Another well with abundant supply of water.
[illegible]	SE.	9	"	"	"	"	15	1,670	- 5	1,665	7	1,663	" "	" "	46	D. S.	Waters 75 head of stock.
12	NE.	10	"	"	"	Drilled	345	1,660	- 15	1,645	345	1,315	Ravenscrag, sand	Soft, salty	42	D. S.	Waters 200 " " " .
13	SW.	12	"	"	"	"	350	1,655	- 15	1,640	350	1,305	" "	" yellow colour	46	S.	" 45 " " " . Shallow wells in sand pockets.
14	SE.	12	"	"	"	Dug	10	1,650	- 5	1,645			Glacial, yellow clay	Hard, sulphur clear	50	S.	Poor supply. Hauls water in winter.
15	SW.	13	"	"	"		12	1,660	- 5	1,655	10	1,660	Glacial, sand	Hard, clear	46	D. S.	Waters 50 head of stock.
16	SW.	14	"	"	"	"	8	1,665	- 5	1,660	5	1,660	" clay, gravel	Soft, "	48	S.	" 12 " " " .
17	NE	15	"	"	"	Drilled	320	1,670	- 40	1,630	320	1,350	Ravenscrag, sand	" salty, soda	43	D. S.	" 100 " " " , pumps dry, refills in 2 hours. Also 20 shallow wells in gravel pockets.
18	SE.	16	"	"	"	"	307	1,670	- 12	1,658	307	1,363	" "	Soft, soda	49	S.	Waters 100 head of stock. No water in shallow wells.
19	NE.	16	"	"	"	Dug	19	1,680	- 9	1,671	12	1,668	Glacial, sand	Hard, clear	45	D. S. I.	Waters 30 head of stock in summer dry in winter.
20	SW.	22	"	"	"	"	11	1,670	- 6	1,664			" clay	" alkaline	47	D. S.	Poor supply, goes dry in winter. Hauls all water.
21	NE.	23	"	"	"	"	20	1,650	- 16	1,634	16	1,634	" sand	" clear	44	D. S.	Waters 100 head of stock.
22	NE.	24	"	"	"	"	12	1,655	- 3	1,652	11	1,644	" "	" "	46	S.	Only waters 6 head of stock in winter.
23	SW.	24	"	"	"	"	15	1,640	- 12	1,628	11	1,629	" "	" "	45	D. S.	Poor supply.
[illegible]	[illegible]		"	"	"	Drilled	273	1,655	- 4	1,651	263	1,392	Ravenscrag	Soft, "	44	S.	Abundant 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 MOUNT PLEASANT NO. 2

B 4-4
1860—10,000

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
25	SW.	30	2	32	1	Dug	12	1,695	- 5	1,690	9	1,686	Glacial, sand	Hard, clear	47	D. S. I.	Not suffic ent. Dry in winter. Haul water.
26	SE.	30	"	"	"	"	10	1,680	- 8	1,672	8	1,672	" gravel	" "	44	D. S.	Waters 4 head of stock. Dry in winters.
27	NW.	31	"	"	"	"	18	1,700	- 11	1,689	15	1,685	" sand	" "	45	D. S. I.	" 10 " " well in SW.¼ of sec. 31.
28	SW.	32	"	"	"	"	8	1,680	- 4	1,676	6	1,674	" "	" "	47	D. S. I.	" 13 " " " . 2 other similar wells.
29	NE.	34	"	"	"	"	15	1,660	- 12	1,648	15	1,645	Clay	" "	46	S.	" 5 " " " .
30	NE.	36	"	"	"	Drilled	248	1,675	+ 12	1,687	248	1,427	Glacial, gravel	" yellow	46	D. S.	Flows ¼" stream. High in iron.
1	NW.	2	2	33	1	Drilled	337	1,720	- 14	1,706	337	1,383	Ravenscrag, sand-stone	Soft, salty	45	D. S.	Can be pumped steadily.
2	SW.	3	"	"	"	Dug	12	1,730	- 6	1,724	6	1,724	Glacial, gravel	Hard, clear	48	D. S.	Good supply in summer, decreases in winter.
3	SE.	4	"	"	"	"	11	1,737	- 7	1,730	10	1,727	" sand	Soft, "	48	D. S.	Waters over 100 head of stock.
4	NW.	4	"	"	"	"	11	1,747	- 7	1,740	9	1,738	Yellow "	Hard, "	48	D. S.	" 60 head of stock. Water come in from Northwest.
5	SE.	6	"	"	"	Drilled	338	1,760			338	1,422	Ravenscrag, sandy shale	Soft, salty		D. S.	Pumps steadily. Ravenscrag 340' thick here. No water below.
6	SE	7	"	"	"	Dug	14	1,774									
7	NW.	6	"	"	"	"	12	1,774	- 11	1,763	11	1,763	Glacial, gravel	Hard, clear		D. S.	Sufficient. Decreased in dry years.
8	SE.	6	"	"	"	"	16	1,753	- 12	1,741	12	1,741	" sand	" alkaline		D.	Sufficient for house use only. Haul water from northwest.
9	SE.	10	"	"	"	"	14	1,720	- 6	1,714	8	1,712	" gravel	" clear	46	D. S.	Waters 50 head of stock.
10	NW.	11	"	"	"	"	12	1,720	- 8	1,712	10	1,710	" "	" "	47	D. S.	" 50 " " " .
11	SW.	12	"	"	"	Drilled	370	1,705	0	1,705	370	1,335	Ravenscrag, sand	Soft, salty, yellow	45	S.	Flows into cisten. 10 bbls. a day.
12	SW.	13	"	"	"	"	314	1,695	- 4	1,691	314	1,381	" "	Soft, salty	45	D. S.	Waters 50 head of stock. Kills plants.
13	SE	14	"	"	"	"	360	1,703	- 7	1,696	360	1,343	" "	" "		D. S.	Pumps steadily. Laxative effect on humans.#
14	NW.	14	"	"	"	"	315	1,710	0	1,710	315	1,395	" "	" "		S.	Abundant supply. Flows at ground level.
15	NE.	15	"	"	"	Dug	11	1,735	- 8	1,727	8	1,727	Glacial, gravel	Hard, Clear	46	D. S. I.	150 bbls. a day.
16	NE.	16	"	"	"	Drilled	325	1,730	- 8	1,722	270	1,460	Ravenscrag, sand layers	Soft, salty, soda		S.	Stands constant pumping.
17	SE.	17	"	"	"	Dug	10	1,740	- 8	1,732	8	1,732	Glacial, gravel	Hard, clear		D. S.	Waters over 25 head of stock.
18	NE.	17	"	"	"	Drilled							Bedrock!	Soft, salty		S.	
19	NE.	18	"	"	"	Dug	14	1,748	- 7	1,741	7	1,741	Glacial, gravel	Hard, clear		D. S.	Waters 30 head of stock in years of normal. rainfall.
20	SE	20	"	"	"	"	25	1,745	- 12	1,733	12	1,733	" "	" "	47	D. S.	Sufficient in years of normal rainfall.
21	NE	23	"	"	"	"	14	1,705	- 6	1,699	6	1,699	" "	" "		D. S.	~~100 head of stock waters from this and a~~ similar well.

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

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

WELL RECORDS—Rural Municipality of MOUNT PLEASANT NO. 2

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
22	NW.	26	2	33	1	Dug	12	1,683	- 5	1,678	7	1,676	Glacial, gravel	Hard, clear	48	S.	Waters 25 head of stock.
23	NE.	26	"	"	"	"	12	1,685	- 9	1,676	8	1,677	" "	" "	48	D. S.	Sufficient in years of normal rainfall.
24	NW.	27	"	"	"	"	12	1,711	- 4	1,707	8	1,703	" "	" "	48	D. S.	Cannot be pumped dry. 3 dry holes nearby.
25	SW.	28	"	"	"	"	10	1,742	- 3	1,739	8	1,734	" sand	" "	48	D. S.	Waters 25 head of stock. Dry hole dug nearby.
26	NW.	28	"	"	"	"	18	1,745	- 9	1,736	10	1,735	" gravel	" "		D. S.	Waters 33 " " " .
27	NE.	30	"	"	"	Drilled	282	1,750	- 30	1,720	278	1,472	Ravenscrag, sand in shale	Soft, salty, soda	45	S.	300 gals. a hour. Shallow wells poor. Kills house plants.
28	NE.	31	"	"	"	Dug	12	1,745	- 8	1,737	8	1,737	Glacial, gravel	Hard, clear		D. S.	Waters 50 head of stock.
29	SE.	32	"	"	"	"	15	1,735	- 12	1,723	13	1,722	" "	" "		D. S.	" 30 " " " . Use similar well also.
30	NE.	32	"	"	"	"	15	1,748	- 9	1,739	12	1,736	" "	" "		D.	Sufficient for house use only.
31	NE.	34	"	"	"	Drilled	272	1,735	+ 20	1,755	272	1,463	Sand above bed-rock.	" yellow	45	D. S.	Used to flow. Casings silted at present. Harmful to vegetables.
32	NE.	35	"	"	"	"	232	1,730	+ 40	1,770	230	1,500	Sand above bed-rock	" "	45	M.	Flows 10 gals. a minute, used for Carnduff swimming pool. # .
33	NE.	35	"	"	"	Dug	12	1,730	- 2	1,728	2	1,728	Glacial, gravel	" clear	48	S.	Used for C.P.R. boilers. # .
34	NE.	36	"	"	"	"	25	1,725	- 20	1,705	20	1,705	" sand	" "		D. S.	Waters 30 head of stock.
1	W.	2	2	34	1	Dug	9	1,793	- 5	1,788	7	1,786	" gravel	" "	46	D. S.	" 100 " " " .
'	NE.	3	"	"	"	Drilled	300	1,830	- 70	1,760	300	1,530	Ravenscrag, fine sand	Soft, salty, soda		D. S.	Constant supply. Kills house plants.
3	NW.	4	"	"	"	Dug	18	1,690	- 13	1,677	12	1,678	Glacial, gravel	Hard, clear		D. S.	Waters 50 head of stock.
4	SW.	3	"	"	"	"		1,805									Dry hole.
5	SW.	10	"	"	"	Drilled	465	1,800	- 45	1,755	465	1,335	Ravenscrag, sandy shale	Soft, salty	46	D. S.	Constant supply. Kills plants.
6	NE	11	"	"	"	"	312	1,778	- 100	1,678	295	1,483	Ravenscrag, coal seam	" "	47	D. S.	Abundant supply.
7	NE.	12	"	"	"	"	310	1,768	- 30	1,738	295	1,473	Ravenscrag, sand	" "		D. S.	Constant supply.
8	SW.	12	"	"	"	Dug	11	1,785	- 5	1,780	5	1,780	Glacial, gravel	Hard, clear	46	D. S.	Waters 90 head of stock.
9	SE.	14	"	"	"	Drilled	460	1,778	+ 4	1,782	440	1,338	Ravenscrag, sandy	Soft, salty	46	D. S.	Constant supply.
10	SE.	15	"	"	"	"	297	1,775	- 60	1,715	285	1,490	Ravenscrag, fine sand	Med. hard, salty		D. S.	Abundant supply.
11	NW.	15	"	"	"	Dug	12	1,775	- 10	1,765	8	1,767	Glacial, sand	Hard, clear		D. S.	Sufficient in years of normal rainfall.
12	SE.	21	"	"	"	"	8	1,775	- 5	1,770	7	1,768	" gravel	" "		D. S.	Abundant supply.
13	SW.	22	"	"	"	"	14	1,802	- 10	1,792	10	1,792	" "	Soft, "	48	D. S.	Waters 100 head of stock.
14	NE.	22	"	"	"	"	12	1,803	- 9	1,794	9	1,794	Glacial, gravel sand	Hard, "	46	D. S.	Poor supply.
15	SE.	23	"	"	"	"	30	1,780	- 6	1,774	8	1,772	" "	" "	45	D. S.	Waters 100 head of 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 MOUNT PLEASANT NO. 2

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
16	NW.	24	2	34	1	Dug	8	1,777	- 4	1,773	7	1,770	Glacial, gravel	Hard, clear	48	D. S.	Waters 50 head of stock
17	NE.	24	"	"	"	"	15	1,775	- 5	1,770	8	1,767	" "	" "	45	D. S.	Abundant supply.
18	SW.	25	"	"	"	"	10	1,775	- 4	1,771	10	1,765	" "	" "		D. S.	Sufficient for local needs.
19	SW.	28	"	"	"	"	15	1,805	- 6	1,799	12	1,793	" clay	" alkaline	46	S.	Goes dry in summer.
20	SW.	28	"	"	"	"	12	1,804	- 8	1,796	8	1,796	" sand	" clear	47	D. S.	Waters 50 head of stock.
21	SE.	33	"	"	"	"	10	1,802	- 4	1,798	9	1,793	" "	" "		D. S.	Haul water during winter.
22	NE.	33	"	"	"	Drilled	308	1,802	- 60	1,742	290	1,512	Gravel below blue clay	" "	47	D. S.	Waters 15 head of stock.
23	NW.	34	"	"	"	"	320	1,810	?		280	1,530	At base of blue clay	" "			
24	SE.	34	"	"	"	Dug	14	1,805	- 7	1,798	10	1,795	Glacial, gravel	Soft, "	48	D. S.	Abundant supply.
1	SE.	2	3	32	1	Dug	12	1,670	- 7	1,663	1	1,669	" "	Hard, "	58	D. S.	Waters 20 head of stock.
2	NW.	2	"	"	"	Drilled	425	1,700	- 90	1,610	423	1,277	Ravenscrag sand in shale	Med. hard, clear	45	D. S.	" 40 " " " . Sand pluge casing.
3	SE.	4	"	"	"	Dug	20	1,692	- 18	1,674	18	1,674	Glacial, sand	Hard, clear	45	S.	" 20 " " " .
4	SW.	4	"	"	"	"	9	1,694	- 7	1,687	7	1,687	" gravel	" "	44	D. S.	Sufficient in years of normal rainfall.
5	SE.	6	"	"	"	"	9	1,680	- 3	1,677	7	1,673	" sand	" "	46	D. S.	Waters 60 head of stock.
6	SE.	6	"	"	"	"	12	1,680	- 3	1,677	3	1,677	" gravel	" "		D. S.	No gravel on south side of creek. Sufficient in years of normal rainfall.
7	SW.	6	"	"	"	"	12	1,703	- 6	1,697	8	1,695	" sand	" "	45	D. S.	Waters 40 head of stock. Uses 2 similar wells.
8	SW.	7	"	"	"	Drilled	272	1,720	+ 4	1,724	260	1,460	Ravenscrag, sand	Soft, "	45	D. S.	Flows 10 gals. a minute.
9	SW.	9	"	"	"	Dug	8	1,708	- 4	1,704	6	1,702	Glacial, gravel	Hard, "	45	D. S.	Waters 75 head of stock.
10	SW.	12	"	"	"	Drilled	289	1,680	+ 2	1,682	285	1,395	Ravenscrag, sandy shale	Soft, salty		D. S.	Flows 2 bbls. a day.
11	NW.	12	"	"	"	"	309	1,700	+ 15	1,715	289	1,411	Ravenscrag, gravel	Hard, clear	45	D. S.	Flows.
12	SW.	13	"	"	"	"	315	1,703	+ 2	1,705	315	1,388	Ravenscrag, sandy shale	" "	46	D. S.	Flows ½" stream.
13	SW.	14	"	"	"	"	400	1,705								N.	Dry hole. Three dry holes drilled to 100'. No water at shallow depth.
14	NW.	14	"	"	"	"	300	1,705	+ 15	1,720	300	1,405	Ravenscrag, sandy shale	Soft, clear		D. S.	Flows.
15	SW.	16	"	"	"	Spring	2	1,687	- 1	1,686	1	1,686	Glacial, sand	Hard, clear		D.	
17	NE.	17	"	"	"	Dug	15	1,726	- 9	1,717	9	1,717	" "	" "	44	S.	Waters 60 head of stock.
18	SW.	18	"	"	"	"	15	1,720	- 6	1,614	6	1,614	" gravel	" "	45	D. S.	" 30 " " " .
19	SW.	19	"	"	"	"	12	1,725	- 3	1,722	10	1,715	" sand	" "		M.	

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.

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R. 7526

WELL RECORDS—Rural Municipality of MOUNT PLEASANT NO.2

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
20	SE.	20	3	32	1	Dug	15	1,725	- 9	1,716	9	1,716	Glacial,sand	Hard,clear	44	D. S.	Waters 100 head of stock.
21	SW.	20	"	"	"	"	18	1,710	- 5	1,705	5	1,705	Sandy clay	" "		D, S.	Poor supply. Intermittent.
22	NW.	21	"	"	"	"	12	1,720	- 4	1,716	4	1,716	Glacial,gravel	" "	45	S.	Abundant supply.
23	SE	22	"	"	"	"	9	1,680	- 2	1,678	2	1,678	" "	" "	45	D.	Sufficient for domestic use.
24	SE.	22	"	"	"	"	10	1,697	- 5	1,692	6	1,691	" "	" "		D. S.	A good supply.
25	NW.	23	"	"	"	Spring		1,700	0	1,700				" "	45	D.	
26	SW.	24	"	"	"	Dug	12	1,705	- 7	1,698	8	1,697	Glacial,sand	" "	46	D.	Haul water for stock.
27	NW.	24	"	"	"	Drilled	310	1,705	+ 2	1,707	308	1,397	Gravel at base of blue clay?	" "	45	D. S.	Flows ½" stream.
28	NE.	25	"	"	"	"	450	1,705									Dry hole. 2 drilled wells to 400', no water. Uses dugout for stock.
29	SW.	28	"	"	"	Dug	8	1,720	- 6	1,714	6	1,714	Glacial,gravel	" "	47	D. S.	Abundant water.
30	SW.	30	"	"	"	"	12	1,735	- 6	1,729	6	1,729	" sand	" "		D. S.	Sufficient for local needs.
31	NE.	30	"	"	"	"	8	1,730	- 5	1,725	5	1,725	" gravel	" "	48	S.	Poor supply in dry years.
32	SW.	31	"	"	"	"	10	1,740	- 4	1,736	5	1,735	" "	" "		S.	Waters 50 head of stock. Sandpoint used in house.
33	SE.	31	"	"	"	"	15	1,738	- 10	1,728	10	1,728	" sand	" "	45	D. S.	Sufficient in years of normal rainfall.
34	NE.	32	"	"	"	Bored	66	1,740	- 63	1,677	10	1,730	" "	" "		D.	Shallow wells poor. House supply only.
35	SW.	36	"	"	"	Drilled	400	1,710	- 40	1,670	350	1,360	Ravenscrag shale, sandy layers?	Soft, salty	45	S.	Flowed for 6 years. Abundant supply.
36	NW.	36	"	"	"	"	260	1,725	- 10	1,715	260	1,465	Sand at base of blue clay.	Hard, "	44	S.	Small supply.
37	SW.	36	"	"	"	Dug	12	1,709	- 9	1,700	9	1,700	Glacial sand	" clear	46	D.	Sufficient for house use only.
1	NE.	1	3	33	1	Dug	9	1,720	- 6	1,714	5	1,715	Glacial gravel	Hard,clear	44	S.	Cannot be pumped dry.
2	SW.	4	"	"	"	Drilled	306	1,760	- 7	1,753	306	1,454	Ravenscrag gravel?	" "	42	D. S.	Abundant supply.
3	SE.	4	"	"	"	"	300	1,760	- 40	1,720	300	1,460	Ravenscrag, gravel	" "	42	D. S.	Waters 100 head of stock.
4	SW.	6	"	"	"	"	296	1,785	- 50	1,735	286	1,499	Ravenscrag,sand	" "	42	D. S. I.	Waters 50 head of stock. No water at shallow depth.
5	SE.	6	"	"	"	"	300	1,780	- 45	1,735	300	1,480	" "	" iron, clear	42	D. S.	Waters 50 head of stock.
6	NE.	7	"	"	"	"	338	1,780	- 110	1,670	338	1,442	" "	Hard,alkaline		D. S,	Pumps dry in 1 hour, refills in 2 hours.
7	SE.	9	"	"	"	"	313	1,760	- 33	1,727	313	1,447	Ravenscrag, coal seam	Hard,clear	43	D. S. I.	Cannot be pumped dry.
8	SW.	13	"	"	"	"	275	1,740									Flows
9	SE.	14	"	"	"	Dug	12	1,745	- 4	1,741	4	1,741	Glacial,sand	Hard,clear	44	S.	Pumps dry refills quickly.

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 MOUNT PLEASANT NO. 2

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
10	NE.	16	3	33	1	Dug	16	1,760	- 5	1,755	7	1,753	Glacial, sand	Hard, clear	46	D. S.	Waters 20 head of stock.
11	SE.	16	"	"	"	"	10	1,745	- 7	1,738	7	1,738	" gravel	" "	45	D. S. I.	" 10 " " " .
12	NE.	18	"	"	"	"	14	1,770	- 7	1,763	7	1,763	" sand	" "	50	D. S.	Haul water in dry years.
13	NW.	20	"	"	"	"	12	1,745	- 9	1,736	9	1,736	" "	" "	44	S.	Not sufficient. Dry in dry years.
14	SE.	20	"	"	"	"	6	1,750	- 2	1,748	3	1,747	" gravel	" "	44	D.	100 gals. a day.
15	NE.	21	"	"	"	"	15	1,765	- 7	1,758	7	1,758	" sand	" "	43	D. S.	Sufficient in years of normal rainfall.
16	NW.	22	"	"	"	Drilled	320	1,765	- 40	1,725	315	1,450	Ravenscrag, sand	Soft, salty, soda	44	S.	Abundant supply.
17	SE.	22	"	"	"	Dug	14	1,765	- 12	1,752	8	1,757	Glacial, sand	Hard, clear	42	D. S.	Haul water in dry years.
18	SW.	24	"	"	"	"	17	1,740	- 5	1,735	5	1,735	" "	" "	43	D. S.	Waters over 50 head of stock.
19	SW.	25	"	"	"	"	12	1,740	- 8	1,732	8	1,732	" "	" "	43	S.	" " 20 " " " .
20	NE.	25	"	"	"	"	45	1,740	- 25	1,715	32	1,708	" "	" alkaline	44	S.	Sufficient for stock.
-	SW.	26	"	"	"	Drilled	315	1,755	- 45	1,710	314	1,441	Bedrock	Soft, soda	44	D. S.	Constant supply.
22	SE.	27	"	"	"	Dug	22	1,760	- 3	1,757	21	1,739	Glacial gravel	Hard, clear	44	D. S.	Waters 12 head of stock. Shallow wells poor.
23	SE.	28	"	"	"	"	10	1,770	- 36	1,764	6	1,764	" sand	" "	53	S. I.	Waters 100 head of stock.
24	NW.	30	"	"	"	"	20	1,750	- 4	1,746	11	1,739	" "	" "		D. S.	" 20 " " " .
25	NW.	31	"	"	"	"	20	1,770	- 7	1,763	7	1,763	" gravel	" "	44	D. S.	Can be pumped steady.
26	NE.	31	"	"	"	"	18	1,785	- 14	1,771	8	1,777	" sand	" "		D. S.	Waters 15 head of stock.
27	NW.	32	"	"	"	"	20	1,790	- 17	1,773	17	1,773	" "	" "	44	D. S.	Dry in autumn and winter.
28	NE.	32	"	"	"	Drilled	376	1,790	- 30	1,760	365	1,425	Ravenscrag shale	Soft			
29	SW.	33	"	"	"	Dug	16	1,775	- 7	1,768	8	1,767	Glacial sand	Hard, clear	43	D. S.	Waters 20 head of stock. Dry holes dug close by.
30	SE.	33	"	"	"	"	14	1,770	- 8	1,762	8	1,762	" "	alkaline	47	D. S.	Waters 20 head of stock.
31	NW.	34	"	"	"	Drilled	345	1,775	- 30	1,745	345	1,430	Ravenscrag shale	Soft, soda	44	S.	Sufficient when casings are cleared of sand.
32	SE.	34	"	"	"	"	262	1,760	- 14	1,746	260	1,500	Above bedrock?	Soft, salty		D. S. I.	Constant supply.
33	SE.	35	"	"	"	Dug	8	1,745	- 4	1,741	4	1,741	Glacial gravel	Hard, clear	43	D. S.	Pocket of gravel, fair supply.
34	SW.	36	"	"	"	"	8	1,743	- 5	1,738	5	1,738	" "	Soft, "	44	D. S.	Waters 25 head of stock. Dry holes numerous.
35	SE.	36	"	"	"	"	10	1,750	- 7	1,743	10	1,740	" "	Hard "		D. S.	Waters 50 head of stock.
1	NE.	2	3	34	1	Drilled	305	1,800	- 65	1,735	275	1,525	Ravenscrag sand	Soft, "	44	D. S.	Waters 150 head of stock. No supply from shallow wells.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of 10 MOUNT PLEASANT NO. 2

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	SE.	3	3	34	1	Drilled	280	1,800	-100	1,700	260	1,540	Sand and gravel above	Hard, clear	43	D. S.	Pump steady.
3	NW.	3	"	"	"	"	270	1,820	-100	1,720	270	1,550	Sand above bed rock	" "	43	D. S. I.	Waters 45 head of stock. No supply from shallow wells.
4	NE.	10	"	"	"	"	300	1,815	- 80	1,735	300	1,515	Sand above Ravenscrag	" "	42	D. S.	Abundant supply.
5	SE.	11	"	"	"	"	297	1,805	- 60	1,745	297	1,508	Ravenscrag gravel	" "	44	D. S. I.	Waters 45 head of stock. No supply from shallow wells.
6	NW.	12	"	"	"	"	400	1,803	- 60	1,743	400	1,403	Ravenscrag sand	Soft, "	44	D. S.	Sufficient for local needs. No supply from shallow wells.
7	SW.	13	"	"	"	"	513	1,807			513	1,294	" "	" cloudy	44	D. S.	Pumps steadily. No supply from shallow wells. Also water turns milky before a storm.
8	SW.	14	"	"	"	"	465	1,802	- 55	1,747	465	1,337	" sand shale	Hard, clear	44	D. S.	No supply from shallow wells.
9	SE.	15	"	"	"	"	360	1,825	- 60	1,765	360	1,465	Sandy shale in bedrock.	" "		D. S. I.	Waters at 285 feet in sand. No supply from shallow wells.
10	SE.	21	"	"	"	"	410	1,830	- 60	1,770	410	1,420	Bedrock?	Soft, clear		D. S. I.	Waters 50 head of stock. No supply from shallow wells.
11	NE.	22	"	"	"	"	290	1,815			290	1,525	Ravenscrag coal	Soft, brown	44	D. S.	Pumps steadily. Kills plants. No supply from shallow wells.
12	SE.	23	"	"	"	"	285	1,800	- 40	1,760	284	1,516	" "	" clear	43	D. S. I.	Pumps steadily. No supply from shallow wells.
13	SW.	23	"	"	"	"	292	1,820	- 50	1,770	288	1,532	" "	" cloudy	45	D. S. I.	Waters 35 head of stock. No supply from shallow wells.
14	NE.	24	"	"	"	Dug	15	1,795	- 9	1,786	10	1,785	Glacial, gravel	Hard, clear	44	D. S. I.	Waters 50 head of stock. 12 dry holes dug.
15	SE.	25	"	"	"	Drilled	324	1,790	- 9	1,799	324	1,466	Ravenscrag gravel	" soda, clear	42	D. S.	Flowed for 1 year. Water 4' from top now.
16	SW.	26	"	"	"	"	300	1,820	- 80	1,740	300	1,520	Ravenscrag coal	Soft, brown	44	D. S.	Water 40 head of stock. No supply from shallow wells.
17	NE.	26	"	"	"	Dug	16	1,812	- 8	1,804	12	1,800	Glacial gravel	Hard, clear	42	D. S.	Waters 20 head of stock.
18	SW.	27	"	"	"	Drilled	270	1,820	- 30	1,790	264	1,554	Rabenscrag coal	Soft, clear	44	D. S. I.	2 to 3 pails a day. Plugged with sand. No supply from shallow wells.
19	SE.	28	"	"	"	"	294	1,830	- 70	1,760	290	1,540	Ravenscrag coal	" cloudy	43	D. S.	Waters 50 head of stock. No supply from shallow wells.
20	SE.	34	"	"	"	Dug	25	1,820	- 4	1,816	12	1,808	Glacial, gravel	Hard, clear	43	D. S. I.	Sufficient supply. Hauled water for 8 years previous.
21	NW.	34	"	"	"	Drilled	350	1,820	- 50	1,770	350	1,470	Ravenscrag gravel	" sulphur	42	D. S.	Pumps steadily. No supply from shallow wells.
22	NW.	36	"	"	"	Dug	12	1,802	- 8	1,794	8	1,794	Glacial sand	" clear	43	D. S.	Waters 20 head of stock.

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(#) Sample taken for analysis.