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WATER SUPPLY PAPER No. 186

PRELIMINARY REPORT

GROUND-WATER RESOURCES OF THE RURAL MUNICIPALITY OF MONET NO. 257 SASKATCHEWAN

By

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

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GROUND WATER RESOURCES OF THE RURAL MUNICIPALITY OF MONET, NO. 257, 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 Monet, No. 257, covers an area of 428 square miles. It consists of eleven full townships, described as tps. 24, ranges 13 and 14, and tps. 25, 26, and 27, ranges 13, 14, and 15, and part of tp. 24, range 15, W. 3rd mer. Secs. 6, 7, 18, and 19, tp. 24, range 15, are reserved as a bird sanctuary. The centre of the municipality is situated approximately 66 miles south and 52 miles west of the city of Saskatoon. The Eatonia section of the Canadian National railways runs in a general northeast-southwest direction, entering the area in sec. 13, tp. 27, range 13, and leaving it in sec. 7, tp. 26, range 15. On this branch line are located the hamlet of Forgan and the villages of Hughton and Elrose. Provincial highway No. 4 runs in a north-south direction through the western part of the municipality, and highway No. 44 serves the northeastern part of the area.

Most of the southern part of the municipality is quite rough and hilly and is known as the Coteau. The northern half, although slightly rolling in some parts, is fairly level, and at one time was partly covered by a large glacial lake. Undrained depressions are common in the hilly area in the south. Whitebear lake, which in 1935 was little more than a swamp, occurs in the southwestern corner of the municipality. From the north end of this lake a depression trends across the municipality in a general northeasterly direction. Two small, marshy lakes occur in this depression in townships 26 and 27, range 13. In the northwestern corner of the municipality a second valley or depression occurs, extending from near Elrose to the northwestern part of township 27, range 14. The southern part of this valley has a small, intermittent stream that contains water only in the spring, and becomes dry in the early summer months. The maximum elevation in the municipality, 2,600 feet above sea-level, is in sec. 6, tp. 24,

range 13. The minimum elevation, somewhat less than 1,850 feet above sea-level, is in the northeastern part of township 27, range 13. Forgan, Hughton, and Elrose are at elevations of 1,922, 2,011, and 2,055 feet above sea-level, respectively.

The highest parts of the municipality are covered by moraine. A narrow tract bordering the moraine-covered areas, a small area in township 27, range 13, and a large area in the west-central part of the municipality, are mantled by boulder clay or glacial till. Two small areas in township 26, range 14, and township 27, range 13, are covered by glacial outwash sands and gravels. The remainder of the municipality is covered by glacial lake deposits. In a narrow area in townships 26 and 27, range 13, the deposits are sandy, but elsewhere they are formed of clay. The glacial lake deposits and the glacial outwash deposits are underlain by boulder clay. The lake deposits may exceed 40 feet in thickness in some localities, but as a rule they are not thicker than 15 to 25 feet. An abundant supply of water is not obtained in this municipality, but water conditions are better in the southern part than in the northern. Water that is usable for domestic needs is particularly difficult to obtain. Two wells, which are actually springs that have been deepened and cribbed, locally known as "Elrose" and "Hughton" springs, are the chief sources of water for domestic needs in the municipality.

Water-bearing Horizons in the Unconsolidated Deposits

The glacial outwash deposits have not been extensively investigated for water, but an abundant supply should be obtained from these deposits at shallow depth. The "Hughton" spring occurs in the glacial outwash deposits in township 26, range 14, and it yields an abundant supply of usable water. Another spring issues from the outwash deposits in township 27, range 13, and the water from it can also be used for drinking as well as for stock.

A few wells obtain water from the glacial lake sands at shallow depth. The water obtained from the wells sunk in these sands in this municipality, although more highly mineralized than that obtained from similar deposits in other areas, is used for domestic purposes. The glacial lake clay that covers a considerable area in this municipality contains little or no water, but water is obtained from scattered deposits of sand and gravel that occur in the upper part of the underlying boulder clay at or near the contact of the lake clay and boulder clay. Deposits of water-bearing sand and gravel also occur in the lower part of the boulder clay. The scattered, water-bearing deposits that occur at the contact of lake clay and boulder clay show little or no continuity over large areas, and only in the vicinity of depressions and ravines do they appear to be of numerous occurrence. In some townships they are thought to be absent. The supply from wells that tap these deposits is, as a rule, small, and that from many wells is insufficient for local needs. The water is hard and highly mineralized, but it is being used for drinking in many localities, as water of better quality is not available within reasonable hauling distance.

In the moraine and till-covered areas, scattered deposits of sand and gravel that occur in the upper part of the drift, usually within 30 feet of the surface, form the aquifers for a number of shallow wells. They do not form a continuous water-bearing horizon, but they appear to be numerous in the southern part of the municipality. These shallow deposits more or less correspond to the deposits found at the contact of the glacial lake clay and boulder clay in the northern part of the township. The shallow deposits appear to be more numerous near large depressions or flats and along and in ravines and valleys. A few wells dug near sloughs tap water-bearing deposits, but most of the wells of this type obtain their supply by direct seepage from the

impounded surface water. The supply from the shallow wells varies widely, and it is not usually more than sufficient for farm needs. The wells are readily affected by drought conditions. The water contains a large amount of mineral salts in solution, but that from most wells is being used for domestic purposes.

Scattered deposits of sand and gravel that occur in the unweathered, dark clays of the drift, both in the moraine and till-covered areas and in the boulder clay underlying the lake clay, form the aquifers for a number of wells in the municipality. Within small areas these deposits show some continuity, and in these areas wells should obtain water with little difficulty. In most areas, however, the deposits show little or no correlation. They occur at depths of from 30 to 100 feet in the moraine covered area and from 30 to 235 feet in the area covered by glacial till. Only a few dry holes are recorded, however, so the deposits are probably fairly numerous. The supply from the wells included in this group is more dependable than that from the shallow wells, but the yield from many of them is inadequate for farm needs. The water is very hard and highly mineralized. It is suitable for stock, but may not be usable for domestic needs.

As a means of obtaining adequate supplies of water for stock use in those areas where wells do not yield a sufficient supply, the use of dugouts and dams is recommended. In a few localities in the northern half of the municipality, and a number in the southern half, the topography is favourable for the economical construction of small dams. Dugouts should be excavated in natural depressions and should be at least 12 feet deep in order to retain sufficient water for a year's supply. A sufficient supply of water for domestic needs can frequently be obtained from wells sunk near the dugouts or near the water impounded by dams. If the water is properly filtered, and care is taken to see that it is not contaminated by polluted surface water, it should be satisfactory

for household purposes. The water from the wells should be frequently tested for bacteria content.

Water-bearing Horizons in the Bedrock

In the northern part of the municipality, north of the approximate geological boundary shown on the accompanying map, the glacial drift is underlain by the Belly River formation. To the south of the boundary line the drift is underlain by the Bearpaw formation. A small area in townships 24, ranges 13 and 14, attains an elevation of 2,500 feet above sea-level and may possibly be underlain by the Eastend formation.

No definite contact of the drift and bedrock was established from the well logs and no rock outcrops are known to occur. In the highland areas in the southern part of the municipality the bedrock is probably at a considerably higher elevation than in other parts of the area, as the hills are thought to be due only in part to the accumulation of drift. Where the Bearpaw formation occurs in the northern part of the municipality its thickness is probably not great, but in the hilly sections it may attain a thickness of 400 feet or more. A possibility exists that some of the wells obtaining water from the bedrock may be tapping aquifers that occur in the Bearpaw formation, but it is thought that most of the aquifers are located within the Belly River formation. The lenticular form of the water-bearing deposits in the latter formation may give rise to dry holes being drilled in the vicinity of producing wells. It is unusual to find water-bearing horizons of large areal extent in the bedrock in this municipality, and although the sand beds that are water bearing appear to be fairly numerous a few dry holes have been drilled.

Coal was encountered in a well in sec. 6, tp. 25, range 13, at an elevation of more than 1,815 feet above sea-level. The coal would indicate that the Belly River formation was encountered,

but the aquifer is not thought to be of large areal extent. It may, however, be tapped by other wells should they be sunk in the immediate vicinity.

Throughout the remainder of the municipality a number of wells tap bedrock aquifers at depths ranging from 200 to 580 feet, or at elevations of 1,790 to 1,445 feet above sea-level. The shallowest wells in this group may not be drawing all their supplies from aquifers in the bedrock, but from the evidence at hand it seems reasonable to assume that most of them obtain water from it. From the information at hand it has been found impossible to distinguish aquifers in the Bearpaw formation from those in the Belly River, but most of the aquifers are assumed to be located in the latter formation. In one small area outlined by the "A" boundary line the aquifers struck in a few wells appear to form a general water-bearing horizon. In this area the wells obtain water at depths ranging from 375 to 425 feet, or at elevations of 1,535 to 1,505 feet above sea-level. In no other part of the municipality do the aquifers in the bedrock appear to be continuous. Most of the wells that tap aquifers in the bedrock in this municipality yield large, and some very large, supplies of water. Those that yield small or insufficient supplies have usually had part of the supply shut off by fine sand plugging the well casings. The water obtained from the bedrock in this area is very hard and highly mineralized, and with few exceptions its use is limited to stock. The water from a few wells is too highly mineralized to be used even for stock.

GROUND WATER CONDITIONS BY TOWNSHIPS

Township 24, Range 13

The surface of this township is rough and hilly, and with the exception of small parts of sections 31 and 32 is mantled by moraine. This area is part of the Coteau. The minimum elevation of 2,000 feet above sea-level occurs in the northwestern corner, and the maximum of 2,600 feet is attained in section 6. In sections 13, 14, 23, and 24 the elevation reaches 2,500 feet above sea-level. The area is characterized by numerous undrained depressions.

Most of the producing wells in this township obtain water at shallow depths, usually within 25 feet of the surface. They encounter deposits of sand or gravel that occur in the weathered zone of the glacial drift. The wells in the northwestern part of the area yield only small supplies of water that are insufficient for local requirements, but the wells in the other parts of the area yield adequate supplies. These shallow wells are easily affected by drought conditions. The water from all the wells is used for domestic purposes as well as for stock.

It should be possible to obtain small supplies of water at shallow depth from wells sunk near undrained depressions or in ravines. These wells derive their supply by direct seepage from the impounded surface water, and are readily affected by drought conditions.

It is improbable that continuous water-bearing horizons will be encountered in the glacial drift. Two wells in section 22 encounter pockets of water-bearing sand and gravel at depths of 35 and 65 feet, or at elevations of 2,345 and 2,335 feet above sea-level. The 65-foot well yields an abundant supply of hard, mineralized water, and the 35-foot well yields a supply that is adequate for farm needs. The water from both wells is used for domestic purposes and for stock. The drift was not

investigated at depths greater than 65 feet, but it is probable that other water-bearing deposits could be encountered without difficulty.

Township 24, Range 14

This township is also included in the area known as the Coteau. The northwestern and the southeastern parts of the township are decidedly hilly and rolling and are mantled by moraine. A narrow area separating the two areas of moraine is covered by boulder clay or glacial till. The elevation rises from 2,000 and 2,050 feet in the till-covered area to 2,550 feet in the southeastern corner, and to 2,350 feet in the northwestern corner. A few, small, intermittent creeks flow in a southeasterly and northwesterly direction from the moraine into the boulder clay-covered area.

A poor supply of ground water is obtained in the eastern half of this township, and the residents depend to a large extent on surface water collected in dugouts or impounded by dams. Wells sunk near the depressions or ravines should obtain small supplies of water in years of normal rainfall. In the western half of the township a number of wells obtain water at depths of 13 to 235 feet. Most of the shallow wells, less than 30 feet deep, are dug beside sloughs, close to water impounded by dams, or in or near ravines. They do not yield large supplies of water, but with one exception the water obtained from them is usable for domestic purposes. Two wells in section 16 and one in section 20 are sunk to depths of 100, 80, and 100 feet, respectively. The wells in section 16 may have tapped a common aquifer, but the well in section 20 appears to tap a local pocket of sand. No water-bearing horizons of large areal extent are thought to exist in this township, and several dry holes may be dug before a producing well is located. The quality of the water from the drift varies greatly, as does the supply. The yield from the wells in section 16 is inadequate

for farm needs, but the water is used for all farm purposes, whereas the supply from the well in section 20 is sufficient, but the water is too highly mineralized for domestic use.

A well in section 5, drilled 235 feet deep, taps a fine sand aquifer at an elevation of 1,855 feet above sea-level. The areal extent of this aquifer is unknown. At present the well is not used as the fine sand plugs the well casings and shuts off the supply. When first drilled the supply was sufficient for farm needs, and the water was usable for drinking and for stock.

Township 24, Range 15

The northeastern part of the township is covered by moraine. It is hilly and the elevation reaches 2,400 feet above sea-level in sections 35 and 36. The elevation decreases to 2,000 feet above sea-level in the till-covered, narrow belt that extends northwesterly from the southeastern corner, and to less than 1,900 feet in the southwestern part of the township that is largely covered by glacial lake clay, in which area is situated Whitebear lake. At one time Whitebear lake no doubt retained a permanent supply of water and covered a larger area than now shown, but in 1935 it was only a marsh, and the southern part an "alkali" flat. Sections 6, 7, 18, and 19 have been reserved as a bird sanctuary. The surface of the northeastern corner of the township is covered by moraine and the southwestern half is mantled by glacial lake clay. The lake clay is seldom more than 30 feet in thickness and is underlain by boulder clay.

Water no doubt exists in the gravelly moraine deposits that occur in the highland areas in the northeastern part of the township, but no wells have been dug in this area. The areal extent of some of the gravel deposits may be fairly large, as they have been observed at various localities. A few wells are sunk near Whitebear lake, in coulées and near undrained depressions,

and yield small supplies of water. The water from these shallow wells is used for drinking, but that from the wells near the lake may be highly mineralized. The supply from these wells is readily affected by drought conditions.

Two wells, located in sections 20 and 32, tap aquifers in the boulder clay at depths of 96 and 105 feet, respectively. Each well is thought to tap an individual deposit of water-bearing sand or gravel, and the deposits in this part of the drift are assumed to be of scattered occurrence. The water from these wells is hard, highly mineralized, and was not being used at the time the area was visited. In parts of this township the topography is especially favourable for the construction of small dams, whereas in other parts dugouts could be excavated. The surface water conserved by these means is quite suitable for stock. Domestic supplies can be obtained by sinking shallow wells near the dams or dugouts.

Township 25, Range 13

The southeastern part of this township is rolling and hilly, and attains an elevation of 2,350 feet above sea-level. The northwestern half of the township lies at an approximate elevation of 1,950 feet above sea-level, and is locally known as the "lake flat". Sloughs or marshes occur in sections 21 and 27, but they contain water only in spring and early summer months. A broad shallow depression extends from the central to the northeastern part of the township. The area locally known as the "lake flat" is covered by glacial lake clay. An area approximately one mile wide and paralleling the lake clay-covered area on the southeast is mantled by glacial till or boulder clay. The highland area in the southeastern part is covered by moraine.

Shallow wells are uncommon in this township, but a few are located in either the glacial till or moraine-covered area.

The glacial lake clay is thought to contain little or no water. The deposits that form the aquifers for the shallow wells do not appear to be continuous, and several dry holes may be sunk before a producing deposit is tapped. It is, therefore, advisable to locate water by means of a small test auger before digging wells. One shallow well in section 14 does not yield a sufficient supply for farm needs, but others yield a large supply. The supply varies from moderately soft to hard, is not usually highly mineralized, and is used for domestic purposes as well as stock. Springs are found in the hilly, moraine-covered area in the southeastern corner, and also along the coulee that extends from the southeastern corner. The water from the springs is used mainly for stock.

Most of the wells in this township, both in the glacial till and moraine-covered areas and in the area mantled by lake clay, derive water from scattered deposits of sand and gravel that occur in the unweathered, blue boulder clay at depths of 40 to 110 feet. Over small areas the water-bearing deposits appear to be numerous and fairly continuous, but the yield from the wells and the quality of the water vary widely, and some of the wells do not yield a sufficient supply for local requirements. The water from two wells contains such a concentration of mineral salts in solution that its use is limited to stock. The water from most of the wells contains a considerable amount of iron in solution. Little trouble should be experienced in obtaining water from this part of the glacial drift.

A 140-foot well in section 6 taps an aquifer at an elevation of 1,815 feet above sea-level. It was reported that coal was struck in this well and it appears that the Belly River formation is encountered. If such is the case, the Bearpaw formation that immediately underlies the glacial drift in this area is very thin. The areal extent of the aquifer is unknown. The supply from the well is abundant, and the hydrostatic pressure is sufficient to raise the

water 50 feet above the aquifer. The water was reported as soft, and it has been found suitable for drinking as well as for stock.

Township 25, Range 14

The southwestern part of this township is very rolling and hilly, and the elevation rises to more than 2,400 feet above sea-level in parts of sections 5, 6, 7, 8, and 18. The northeastern part of the area is a comparatively level plain, and the elevation ranges from 1,900 to 2,000 feet above sea-level. The hilly area is covered by moraine, whereas most of the plain is mantled by glacial lake clay. A narrow belt bordering the moraine-covered area on the northeast and a small area in the northwestern corner are covered by glacial till or boulder clay.

Shallow wells, usually less than 20 feet deep, are not uncommon in coulées and near sloughs. Some of these wells tap deposits of sand and gravel, but others are dug in boulder clay and derive their water by direct seepage from the impounded surface water. The deposits of sand and gravel are scattered, and in no area do they appear to form continuous water-bearing horizons. They are fairly numerous in both the moraine and till-covered areas. The glacial lake clay does not yield water, but some water is obtained from deposits of sand and gravel that occur at the contact of the lake clay and the underlying boulder clay. These deposits, however, are neither continuous nor numerous, and it may be necessary to dig a number of dry holes before a producing pocket is tapped. It is advisable to locate water by means of a test auger before going to the expense of digging a well. The supply from the shallow wells is fairly abundant, especially from those that tap sand or gravel deposits. The water is quite highly mineralized, but in a number of instances it is used for drinking.

Springs are known to occur in sections 2, 4, 9, 17, and 34. They yield hard, highly mineralized water that is quite

suitable for stock. Reservoirs dug near these springs to collect the overflow water would considerably increase the amount of water available for use.

A few wells in this township obtain water from sand and gravel deposits that occur at depths of 40 to 70 feet in the blue boulder clay. The water-bearing deposits show little or no continuity, even over short distances, and they are not thought to be numerous in any of the areas investigated. The supply from two wells that tap deposits of sand and gravel in the blue boulder clay is inadequate for local requirements. The water is hard and highly mineralized, and many residents find it necessary to haul water for domestic use. One well located in section 11 yields an abundant supply of water that can be used for drinking and the water is sold for domestic use.

Township 25, Range 15

The southeastern part of this township is rolling and hilly, and the elevation, in sections 1 and 12, attains 2,400 feet above sea-level. A narrow valley extends from Whitebear lake in a northeasterly direction to the northeastern corner of the township. This valley is very steep-sided in the southern part of the area, but becomes quite shallow to the northeast. It is at an elevation of approximately 1,900 feet above sea-level. To the northwest of the valley the elevation rises, attaining 2,100 feet in section 29. This area and a narrow area to the southeast of the valley are mantled by boulder clay or glacial till. The floor of the valley is covered by glacial lake clay. Moraine mantles the highland area in the southeastern corner of the township.

Most of the wells in this township obtain water at shallow depth. Some of these tap water-bearing deposits of gravel, some depend more or less directly on seepage, and others are springs that have been deepened and cribbed. The gravel deposits are found

mainly in small ravines, and in some places they outcrop at the surface. In such areas no great difficulty should be experienced in obtaining at least small supplies of water. The deposits, however, are not continuous over large areas. A well site should be prospected for water-bearing deposits by means of a small auger before a well is sunk in order to eliminate the possibility of digging a dry hole. The supply from the shallow wells varies considerably, depending to a large extent upon the size of the aquifer encountered and upon the amount of annual precipitation. The shallow well in section 26, locally known as "Elrose spring", is actually a spring that has been deepened and cribbed, and it yields an abundant supply of water that is used by many of the residents in this area. Other shallow wells, however, yield supplies that are not sufficient for local needs. A number of other springs occur in this township, and some of them yield large supplies of water. The spring in section 8 yields an abundant supply of medium hard water that is used for stock. It is not recorded if the water is unsuitable for drinking. The supply from a spring in section 14 is sufficient for more than 200 head of stock, but it is not known if the water is usable for drinking. If these springs were cleaned out and cribbed they would probably yield larger supplies of water. The available supply can also be increased by conserving the overflow in reservoirs.

Only two recorded wells derive water from the unweathered blue boulder clay. They are located in sections 20 and 21 and are 82 and 40 feet deep, respectively. Two holes were sunk to depths of 70 feet in section 10 and encountered a fine sand aquifer at that depth, but they are now filled. No correlation in the occurrence of these different aquifers has been established and the sand and gravel deposits are thought to be of scattered occurrence; so that a number of dry holes may be dug before a water-bearing deposit is tapped. The supply from both the producing

wells is sufficient for farm needs, and the well in section 20 yields an abundant supply, which is usable for domestic needs and for stock. The water from the well in section 21 is very highly mineralized and is only used for stock.

Should large supplies of water for stock be required, surface water can be impounded by dams or collected in dugouts.

Township 26, Range 13

The difference in elevation in this township is less than 100 feet, and the surface throughout is nearly level. The surface slopes from the southeastern and northwestern corners towards a wide, swampy depression that extends from section 18 to section 34. This township is covered by glacial lake deposits. Glacial lake sands mantle a narrow area along the eastern side of the ravine and the remainder of the area is covered by lake clay. The thickness of the lake deposits is not definitely known, but in some sections in the north they are assumed to be less than 10 feet thick, whereas in localities in the south they may attain a thickness of more than 30 feet. Glacial till or boulder clay underlies the lake deposits.

The glacial lake clay is not thought to be water-bearing, but discontinuous deposits of water-bearing sand and gravel occur at the contact of the lake clay and the underlying boulder clay. The lake sands may contain water at shallow depth and water may also be obtained from deposits of gravel that occur at their contact with the boulder clay. The shallow wells in this township obtain water mainly from the gravel deposits that occur at the base of the lake clay and sands. Most of these wells are located along the depressions or swampy area and the water-bearing deposits appear to be fairly numerous in this area, but elsewhere the deposits are of scattered distribution. The deposits should be located by means of a test auger before sinking a well. A few shallow wells are dug

beside sloughs and obtain their supply by seepage from the impounded surface waters. In years of normal rainfall the supply from such wells is as a rule sufficient for domestic purposes and a few head of stock, but during periods of drought they frequently become dry. A few springs have been deepened and cribbed and they yield an abundant supply of water. The water from two of the shallow wells in this township is so highly mineralized that it is used only for stock, but that from the others is usable for domestic purposes.

With one exception the remaining wells in this township obtain their water from sand and gravel deposits that occur in the blue boulder clay that underlies the lake deposits. The wells range in depth from 40 to 120 feet. The three wells located in sections 4 and 6 may tap a common aquifer, but over the remainder of the township each well seems to be drawing from a scattered pocket of sand or gravel. The deposits are known to be scattered in section 23, where a dry hole to a depth of 60 feet was dug within a short distance of a producing well. Three of the wells included in this group yield a supply that is inadequate for local requirements, and the water from two wells is recorded as unfit for drinking. The water from the well in section 23 was analysed and pronounced unfit for drinking and stock use, but it is being used for the latter purpose. The 120-foot well in section 31 is used by the hamlet of Forgan, and although the water is quite highly mineralized no ill effects were reported from its continued use.

A well located in the NW.$\frac{1}{4}$, section 30, was drilled to a depth of 340 feet, and taps an aquifer of fine sand at an elevation of 1,560 feet above sea-level. In this area the Bearpaw formation which immediately underlies the drift is thought to be very thin, and it is probable that this well has passed through it into the Belly River formation. The areal extent of the aquifer is unknown, and the quality of the water obtained from the well would hardly justify the expense of drilling such a deep well. The water

has a soda taste, acts as a laxative, and is unpalatable. It is used for stock, but is unsuitable for irrigation. The supply is abundant and the hydrostatic pressure raises the water 140 feet above the top of the aquifer.

Township 26, Range 14

The west-central part of this township is mantled by glacial till, and moraine occurs in sections 4, 5, and 6. Glacial outwash sands and gravels mantle the surface in parts of sections 10, 11, 13, 14, 23, and 24, and the remainder of the township is covered by glacial lake clay. In the eastern third of the township the soil is gravelly; in the central third it is a heavy, clay loam; and in the western third it is a sandy loam. The elevation rises from 1,850 feet above sea-level at the eastern border to more than 2,000 feet in the western part of the area. The ground surface is comparatively level.

The supply of water obtained in this township is poor. The chief source of drinking water is a well in section 13. This well is locally known as "Hughton spring", and is actually a spring that has been deepened and cribbed.

It is located on the bank of a shallow ravine and the aquifer is formed by deposits of glacial outwash sand and gravel. The supply from the well is abundant and most of the residents in the area obtain water for domestic purposes from it. No other shallow wells are recorded, but it seems probable that the gravel that occurs in parts of this township should yield some water. Wells sunk near sloughs should also yield some water, but during continued periods of drought the supply from such wells becomes appreciably depleted and the wells may become dry.

Most of the wells in this township obtain water from sand and gravel deposits that occur in the lower part of the boulder clay, possibly near the base of the glacial drift. With the

exception of two wells sunk to depths of 70 and 50 feet, respectively, located in sections 14 and 24, the other wells range in depth from 135 to 200 feet. The deposits are thought to be of scattered occurrence and do not form continuous water-bearing horizons. It is possible that part of the supply in some of the wells is being derived from the underlying bedrock.

The supply of water from most of these deeper wells is sufficient for stock needs, but the well in section 16 yields an inadequate supply. The water from two wells located in sections 14 and 32 is used for drinking, but the water from the others is too highly mineralized for domestic purposes.

Three wells located in sections 17, 18, and 29, drilled to depths of 300, 325, and 426 feet, respectively, are thought to have tapped aquifers in a bedrock formation. The first two may be drawing water from the Bearpaw formation, which immediately underlies the glacial drift, but the last-mentioned well no doubt obtains its supply from the Belly River formation. The well in section 29 has been plugged by sand and the supply of water is shut off. The wells in sections 17 and 18 may tap a common aquifer, but it is more probable that they tap individual deposits. The supply from the wells in sections 17 and 18 is sufficient, but the water is highly mineralized and is suitable only for stock. It is questionable if the quality of water obtained at depth warrants the expense of drilling deep wells.

Dams could be constructed in some sections of the township to conserve run-off water. Dugouts can also be used to collect and store surface water for stock use. Shallow wells sunk near the impounded water should yield sufficient water for domestic purposes. The water from dugouts and dams, and from wells sunk beside them, should be, as a rule, superior in quality to that obtained from deep wells.

Township 26, Range 15

The surface of this township is relatively level, and the difference in relief is approximately 100 feet, the lowest area being along a small valley that extends from section 9 to section 33. A small, intermittent stream flows from section 30 to section 33 in a small valley that joins the valley previously mentioned. The village of Elrose is at an elevation of 2,055 feet above sea-level. Boulder clay or glacial till mantles all of the township with the exception of an area along the northern boundary that is covered by glacial lake clay. The lake clay is underlain by boulder clay, and is thought to be less than 25 feet thick in this township.

A few shallow wells are dug near the ravines in this township and obtain sufficient water for farm needs. In other parts of the township it is improbable that water will be obtained at shallow depth, as deposits of gravel and sand do not appear to be present except along the ravines. A well in section 30 is actually a spring that has been dug out and cribbed. The spring in section 33 could also be deepened and cribbed, as this usually increases the yield. If the overflow water from springs is retained in a reservoir or dugout, the quantity available for use will be greatly increased. Although the water from the shallow wells is used for drinking in some instances, it is nevertheless rather highly mineralized, and it sometimes has a laxative effect on those not accustomed to its use.

Wells tapping the sand and gravel deposits that occur in the lower part of the drift range in depth from 66 to 176 feet, and only one is less than 140 feet deep. It is 66 feet deep and is located in section 32, but the aquifer that it taps is not thought to be of large areal extent. The deeper drift wells, located in sections 6, 10, 12, and 16, may in some instances be drawing from a common aquifer, as the elevation of the aquifers

ranges only from 1,837 to 1,854 feet above sea-level. Other wells sunk in this area should obtain water at this approximate elevation. The supply from the wells in sections 6 and 10 is inadequate for farm needs, mainly because the fine sand that forms the aquifers plugs the well casings. The water from all the wells is very hard and highly mineralized, and with one exception its use is restricted to stock.

Wells located in sections 4, 7, 9, 34, and 36 derive water from aquifers at depths of 580, 410, 500, 395, and 387 feet, respectively, or at elevations of 1,445, 1,610, 1,540, 1,580, and 1,603 feet above sea-level. The Bearpaw formation that underlies the drift is thought to be very thin in this area, and it seems probable that the wells mentioned above have tapped aquifers in the Belly River formation. The wells in sections 34 and 36 may tap a common aquifer, but the other wells appear to tap water-bearing deposits of local areal extent, and a 565-foot dry hole was drilled in section 9. Drilling into the Belly River formation is not particularly recommended, as it is questionable if the quality of water obtained warrants the expense of drilling. The water from most wells cannot be used for drinking, and that from two wells in sections 4 and 7 is even too highly mineralized to be used for stock. The water from the well located in section 36 is used for domestic purposes as well as for stock, and no ill effects are recorded from its continued use. The supplies from the wells sunk into the bedrock are large, and the hydrostatic pressure is sufficient to raise the water at least 200 feet above the aquifer.

Most of the water for domestic needs in this area is hauled from "Elrose spring", located in sec. 26, tp. 25, range 15, directly south. Surface water for stock use can be impounded by dams in some parts of the township, or collected in dugouts in other parts. Shallow wells sunk beside the impounded waters should yield a sufficient supply for domestic needs, and the water should be of better quality than that obtained from most wells in the area.

Township 27, Range 13

The difference in topographic relief in this township amounts to less than 100 feet, and the ground surface is relatively level. A wide depression extends from sections 2 and 3 to section 11, where it widens out and forms a marshy lake that extends into section 14. A small, intermittent stream flows in a narrow valley from section 13 to section 25. Most of the surface of this township is covered by glacial lake clay. In the northeastern corner a small area is covered by glacial outwash sands and gravels, and the Canadian National Railways has constructed a spur line into the area to obtain gravel for ballast. In the southeastern corner small areas are mantled by glacial lake sand and glacial till or boulder clay. The glacial lake sands, lake clay, and glacial outwash deposits are underlain by glacial till. The lake deposits do not exceed 35 feet in thickness.

Glacial outwash sands and gravels usually contain an abundant accumulation of ground water, and although the deposits in this township have not been fully investigated, they will no doubt contain a considerable amount of water. The municipality has deepened and cribbed a spring in section 36, which yields an abundant supply of water that is used by many of the residents in this area.

A few shallow wells obtain water in the eastern part of the township from sand and gravel deposits that occur in the boulder clay, and at or near the contact of the lake clay and boulder clay. These water-bearing deposits are fairly numerous along the depression and intermittent creek, but they do not appear to form a continuous aquifer. The supply from these wells is small, and the water from many of them is so highly mineralized that it has been found unsuitable for drinking.

In this township the sand and gravel deposits in the blue clay form aquifers for a few wells, but the lower part of the

drift does not contain much water. The depths of the producing wells range from 40 to 120 feet. Wells located in sections 10, 22, and 27 may tap a common aquifer. The supply from the wells that tap water-bearing deposits in the lower part of the drift is more constant than that from shallower wells, and with the exception of the well in the NE.$\frac{1}{4}$, section 22, the supply is sufficient for stock needs. The water, however, is very hard and highly mineralized, and with one exception it cannot be used for drinking.

A well located in section 18, drilled to a depth of 178 feet, obtains water from a sand aquifer at an elevation of 1,747 feet above sea-level. The aquifer for this well may be located in the bedrock, but it is more probable that it is located within the glacial drift. The areal extent of the water-bearing sand is not thought to be large. The supply from the well is small and the water is so highly mineralized that it is suitable only for stock.

At least eight wells tap aquifers in the Belly River formation in the western part of the township. These wells range from 303 to 425 feet deep, and the aquifers are tapped at elevations ranging from 1,500 to 1,587 feet above sea-level. In the area outlined by the "A" boundary line the water-bearing deposits are fairly continuous, and a general water-bearing horizon appears present in this area at an elevation of from 1,505 to 1,535 feet, the slope being towards the northwest. These wells yield an abundant supply of water, and in the outlined area the hydrostatic pressure raises the water to an average elevation of 1,877 feet above sea-level. The water from the wells is very hard and highly mineralized, and is usually unsatisfactory for domestic purposes, although that from two wells is being used for that purpose.

Township 27, Range 14

This township is mantled by glacial lake clay and the ground surface is fairly level. A large, marshy depression occurs in the northwestern corner at an elevation of less than 1,900 feet above sea-level. Part of this area was under cultivation in 1935. The lake clay is thought to exceed 40 feet in thickness in some sections, and it is underlain by glacial till. The difference in surface elevation amounts to less than 100 feet.

No wells obtain water at depths of less than 50 feet in this township. The lake clay does not contain water-bearing horizons, and the wells have probably been dug through the lake deposits and tap water-bearing deposits in the underlying boulder clay. The producing wells are from 50 to 100 feet deep, and the deposits of water-bearing sand and gravel that they tap are not numerous or continuous in any area. It was necessary to sink wells to greater depths in various parts of the township before sufficient water was encountered. The supply from the 50- to 100-foot wells varies considerably, and many of the wells do not yield adequate supplies for local needs. The water is hard, highly mineralized, and as a rule is not used for domestic purposes.

Four wells, located in sections 6, 12, 19, and 22, are drilled to depths of 200, 245, 165, and 225 feet, respectively, and tap aquifers at elevations of 1,790, 1,695, 1,735, and 1,725 feet above sea-level. The wells in sections 12 and 22 may be drawing from a common aquifer, but no correlation appears to exist between the aquifers encountered in the other wells. It is not definitely known if the aquifers that these wells tap are located in the bedrock or if they are within the glacial drift, but it appears that some of the water is obtained from the upper part of the Belly River formation. The supply from three of the wells is more than adequate for local needs, but that from the well in section 6 is insufficient for stock requirements. The water is

hard, highly mineralized, recorded as "alkaline", and its use is limited to stock.

A number of other wells in this township derive water from aquifers thought to be located wholly within the Belly River formation. They range from 325 to 550 feet in depth, and the aquifers are tapped at elevations of 1,645 to 1,400 feet above sea-level. The wells in sections 13 and 24, within the area outlined by the "A" boundary, appear to tap a common aquifer, but no correlation can be noted in the aquifers of the other wells. Deposits of water-bearing sands appear to be fairly numerous in the Belly River formation in this township, and there should not be undue difficulty encountered in tapping them by drilled wells. The supplies from the bedrock wells are usually large, and the water is in many cases under considerable hydrostatic pressure. The supply from the well in section 24, however, is inadequate for local needs, as the flow has been partly shut off by sand plugging the casings. This was also the case in two wells in section 20. The quality of the water from these wells was not sufficiently good to warrant the expense involved in cleaning them out and they are not used. The water from the other wells is very hard and highly mineralized, but that from the wells in sections 16, 28, and 36 is used for drinking as well as for stock.

Should deep wells fail to yield adequate supplies of water for farm needs, dugouts can be used to collect and conserve surface water. These artificial reservoirs should be located in depressions, and in order to retain water throughout the year should be at least 12 feet deep. Water for domestic purposes is scarce in this township. Shallow wells dug beside dams, dugouts, or sloughs should derive sufficient usable water for domestic needs.

Township 27, Range 15

The surface of this township is gently rolling, and the difference in relief amounts to slightly more than 100 feet. The general slope is from the southwestern corner towards the valley of an intermittent creek in the southeastern corner, and towards a fairly large depression in the northeastern corner. The valley of the intermittent creek is fairly narrow, but the banks are quite steep. Glacial till or boulder clay occurs at the surface in the southwestern corner, but elsewhere in the township it is covered by approximately 35 feet of glacial lake clay.

A number of wells in this township obtain water from deposits of sand and gravel that are located at or near the contact of the lake clay and the underlying boulder clay, or wholly within the boulder clay. The deposits appear fairly numerous in the low areas in the southeastern half of the municipality, but they do not appear to be continuous. In the northwestern part of the area they are sparsely distributed. The supply from shallow wells varies greatly within narrow limits, but with two exceptions the wells yield sufficient water for local needs. The water is hard and that from some of the wells is quite highly mineralized, but as a rule it is being used for drinking. The wells are readily affected by drought conditions.

The other wells in the township derive water from scattered deposits of sand and gravel that occur in the blue boulder clay at depths ranging from 40 to 150 feet, and usually at depths of 50 to 80 feet. In a small area that includes parts of sections 17, 18, 19, 20, and 30 the deposits appear to be fairly extensive at depths ranging from 40 to 63 feet, but over the remainder of the township there is little or no evidence of continuity in their occurrence. No dry holes were recorded, and

it is possible that the deposits are numerous and that no great difficulty should be encountered in obtaining water. The supply from wells included in this group varies considerably; that from those located in sections 20, 32, 33, and 34 is insufficient for farm needs. The water is very hard, and that from some of the wells contains a considerable amount of mineral salts in solution, and is used only for stock.

In a few areas the topography is suitable for the construction of small dams to impound surface water in the spring months for stock use. In most areas, however, dugouts will be found the most economical, and where the water supply is inadequate for stock requirements this means of collecting and storing surface water is recommended. They should be located in natural depressions and should be at least 12 feet deep. Shallow wells sunk near the water impounded by dams or collected in dugouts should derive sufficient water for domestic needs. If the water from these wells is not contaminated by sewage it should be satisfactory for drinking and other domestic needs.

STATISTICAL SUMMARY OF WELL INFORMATION IN RURAL MUNICIPALITY OF MONET, NO. 257, SASKATCHEWAN

Township	24	24	24	25	25	25	26	26	26	27	27	27	Total No. in Municipality
West of 3rd mer. Range	13	14	15	13	14	15	13	14	15	13	14	15	
Total No. of Wells in Township	7	10	7	27	23	16	20	12	19	25	22	26	214
No. of wells in bedrock	0	0	0	1	0	0	1	3	5	8	14	0	32
No. of wells in glacial drift	7	10	7	26	23	16	19	9	14	17	8	26	182
No. of wells in alluvium	0	0	0	0	0	0	0	0	0	0	0	0	0
Permanency of Water Supply													
No. with permanent supply	7	6	6	27	22	16	17	12	17	25	22	26	203
No. with intermittent supply	0	4	1	0	1	0	2	0	1	0	0	0	9
No. dry holes	0	0	0	0	0	0	1	0	1	0	0	0	2
Types of Wells													
No. of flowing artesian wells	0	0	0	1	1	1	0	0	0	1	0	0	4
No. of non-flowing artesian wells	1	2	1	9	3	3	5	5	8	10	15	11	73
No. of non-artesian wells	6	8	6	17	19	12	14	7	10	14	7	15	135
Quality of Water													
No. with hard water	6	10	7	24	21	16	18	12	18	23	22	25	202
No. with soft water	1	0	0	3	2	0	1	0	0	2	0	1	10
No. with salty water	0	0	0	0	0	0	0	1	0	0	0	0	1
No. with "alkaline" water	2	1	1	13	6	3	6	8	8	5	15	22	90
Depths of Wells													
No. from 0 to 50 feet deep	6	6	5	12	19	15	12	2	7	13	1	15	113
No. from 51 to 100 feet deep	1	3	1	11	3	1	6	2	1	2	7	10	48
No. from 101 to 150 feet deep	0	0	1	4	1	0	1	2	1	1	0	1	12
No. from 151 to 200 feet deep	0	0	0	0	0	0	0	4	4	1	2	0	11
No. from 201 to 500 feet deep	0	1	0	0	0	0	1	2	4	8	11	0	27
No. from 501 to 1,000 feet deep	0	0	0	0	0	0	0	0	2	0	1	0	3
No. over 1,000 feet deep	0	0	0	0	0	0	0	0	0	0	0	0	0
How the Water is Used													
No. usable for domestic purposes	7	8	4	25	19	12	14	3	9	10	7	16	134
No. not usable for domestic purposes	0	2	3	2	4	4	5	9	9	15	15	10	78
No. usable for stock	7	9	6	27	23	14	19	12	17	24	22	26	206
No. not usable for stock	0	1	1	0	0	2	0	0	1	1	0	0	6
Sufficiency of Water Supply													
No. sufficient for domestic needs	7	10	6	27	19	14	17	11	16	25	22	26	200
No. insufficient for domestic needs	0	0	1	0	4	2	2	1	2	0	0	0	12
No. sufficient for stock needs	4	5	6	23	16	11	13	10	14	10	20	18	150
No. insufficient for stock needs	3	5	1	4	7	5	6	2	4	15	2	8	60

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 represents the amount of mineral salts that can be removed by boiling. Temporary hardness is due mainly to the bicarbonates of calcium and magnesium and iron, and permanent hardness to the sulphates and chlorides of calcium and magnesium. The permanent hardness

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

Analyses of Water Samples from the Municipality of Monet, No. 257, Saskatchewan.

LOCATION						Depth of Well, ft.	Total dis'vd solids	HARDNESS			CONSTITUENTS AS ANALYSED						CONSTITUENTS AS CALCULATED IN ASSUMED COMBINATIONS									Source of Water
No.	Qtr.	Sec.	Tp.	Rge.	Mer.			Total	Perm.	Temp.	Cl.	Alkalinity	CaO	MgO	SO_4	Na_2O	Solids	$CaCO_3$	$CaSO_4$	$MgCO_3$	$MgSO_4$	Na_2CO_3	Na_2SO_4	NaCl	$CaCl_2$	
1		8	25	13	3	50	1,540											(4)	(1)		(2)		(3)		(5)	*1
2	SE.	32	25	13	3	70	1,463												(2)		(3)	(4)	(1)	(5)		*1
3	SW.	34	25	13	3	112	2,920												(2)		(3)	(4)	(1)	(5)		*1
4		24	25	14	3	102	2,674												(2)		(4)	(3)	(1)	(5)		*1
5	NW.	23	20	13	3	52	2,694												(2)		(3)	(4)	(1)	(5)		*1
6	SE.	9	20	15	3	10	531											(3)	(1)		(2)				(4)	*1 ?

Water samples indicated thus, *1, are from glacial drift or other unconsolidated deposits.
Analyses are reported in parts per million; where numbers (1), (2), (3), (4), and (5) are used instead of parts per million, they represent the relative amounts in which the five main constituents are present in the water.
Hardness is the soap hardness expressed as calcium carbonate ($CaCO_3$).
Analyses Nos. 1, 2, 3, 4, 5, and 6 by Provincial Analyst, Regina.
For interpretation of this table read the section on Analyses and Quality of Water.

Water from the Unconsolidated Deposits

No samples of water from the unconsolidated deposits in the municipality of Monet were collected by the field party, but a number of samples were analysed by the Provincial Analyst and the results are listed in the accompanying table.

No wells have been dug in the deposits of glacial outwash, but the water that issues from two springs in these sands and gravels is being used for all domestic needs as well as for stock. The water is hard and is not very highly mineralized. Two wells derive water from the lake sands, and the water in both cases is being used for all farm purposes. The water from the extensive sand and gravel deposits in this area should be usable for all farm needs.

The water from the upper part of the moraine and glacial till is hard and quite highly mineralized. The water from the shallow wells in the southern part of the township is of better quality than that from wells in the northern part. Sample 6 is from a well that taps a sand pocket in the boulder clay at a depth of 16 feet. This water is not highly mineralized and is usable for all general farm purposes. The water is usually much more highly mineralized, however, and much of it may not be suitable for drinking. Shallow wells dug near sloughs or artificial reservoirs yield water that is not highly mineralized, and which if not contaminated by sewage is usable for domestic needs.

The water from the lower part of the drift is in most places harder and more highly mineralized than that obtained from the upper part. The first five samples listed are from this part of the drift. The total dissolved solid content varies from 1,463 to 2,694 parts per million. Sodium sulphate and calcium sulphate are the most abundant mineral salts present, with magnesium sulphate being third. Four of these samples contain sodium carbonate (black alkali). Samples 1 and 2 can be used for drinking, but samples

3, 4, and 5 may act as a laxative. A number of wells throughout the municipality yield more highly mineralized water than that shown by the analysed samples. The water from a considerable number cannot be used for drinking as it acts as a strong laxative, and that from a few is even too highly mineralized for stock. Magnesium sulphate (Epsom salts) and sodium sulphate (Glauber's salt) are probably highly concentrated in the water from such wells.

Water from the Bedrock

No samples of water from the bedrock in this municipality were analysed. The water from the bedrock formations in this area is quite highly mineralized, and that from aquifers at depth is very hard. The predominant mineral salts in solution are probably magnesium sulphate, calcium sulphate, and sodium sulphate. The water obtained from a well in sec. 6, tp. 25, range 13, is recorded as soft, and contains a large amount of sodium salts. This well, and a few in township 27, range 14, are used for domestic purposes, but the others are only used for stock. The waters are not suitable for irrigation. It is doubtful if the water from the bedrock in this area will be suitable for drinking, but it should be satisfactory for stock.

WELL RECORDS—Rural Municipality of MONET, NO. 257, SASKATCHEWAN.

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
1	SE.	10	24	13	3	Dug	16	2,380	− 12	2,368	12	2,368	Glacial gravel	Hard		D, S	Oversufficient for 35 head stock.
2	NE.	22	"	"	"	Bored	65	2,400	− 45	2,355	65	2,335	Glacial white sand	Hard, iron, "alkaline"	48	D, S	Abundant supply.
3	SE.	22	"	"	"	Dug	35	2,375	− 30	2,345	30	2,345	Glacial sand	Moderately hard, iron, "alkaline"	49	D, S	Sufficient for 25 head stock.
4	NW.	22	"	"	"	Dug	16	2,350	− 12	2,338	12	2,338	Glacial gravel	Hard	48	D, S	Oversufficient for 35 head stock.
5	NE.	31	"	"	"	Bored	26	2,000	− 22	1,978	22	1,978	Glacial sand	Hard	48	D, S	Insufficient supply.
6	SW.	32	"	"	"	Dug	18	2,100	− 12	2,088	18	2,082	Glacial sand	Soft	48	D, S	Insufficient; used to water 150 head stock.
7	NE.	32	"	"	"	Dug	18	2,000	− 17	1,983	17	1,983	Glacial gravel	Hard	48	D, S	Insufficient supply.
1	NE.	5	24	14	3	Drilled	235	2,090	−200	1,890	235	1,855	Glacial fine sand	Medium hard	42	D, S	Sufficient supply until quicksand filled in.
2	SE.	9	"	"	"	Dug	25	2,100	− 0	2,100			Glacial drift	Hard, cloudy, odorous	46	S	Insufficient, intermittent supply.
3	SW.	10	"	"	"	Dug	48	2,105	− 18	2,087	18	2,087	Glacial sand	Very hard, iron	44	D, S	Insufficient, intermittent supply.
4	SW.	16	"	"	"	Dug	30	2,050	− 10	2,040	10	2,040	Glacial drift	Moderately hard	45	D, S	Intermittent supply.
5	NW.	16	"	"	"	Bored	80	2,060	− 73	1,987	73	1,987	Glacial gravel	Hard	43	D, S	Intermittent supply.
6	SE.	16	"	"	"	Dug	100	2,075	− 98	1,977	100	1,975	Glacial fine sand	Hard, "alkaline"	44	D, S	Insufficient supply.
7	SW.	20	"	"	"	Bored	100	2,135	− 85	2,050	100	2,035	Glacial fine sand	Hard, iron	45	S	Sufficient supply.
8	NW.	28	"	"	"	Dug	13	2,115	− 10	2,105	10	2,105	Glacial sand	Moderately hard	47	D, S	Insufficient supply.
9	NE.	30	"	"	"	Dug	14	2,200	− 10	2,190	10	2,190	Glacial sand	Moderately hard	48	D, S	Sufficient supply.
10	SE.	30	"	"	"	Dug	14	2,190	− 12	2,178	12	2,178	Glacial sand	Moderately hard	48	D, S	Insufficient supply.
1	SW.	2	24	15	3	Dug	15	2,030	− 9	2,021	9	2,021	Glacial drift	Moderately hard	50	D, S	Sufficient supply.
2	NE.	10	"	"	"	Dug	10	1,975	− 0	1,975			Glacial drift	Very hard, "alkaline"	42	D	Insufficient supply; intermittent.
3	NE.	20	"	"	"	Bored	96	2,018	− 91	1,927	91	1,927	Glacial drift	Very hard, odorous Mineralized	42	N	Unsuitable for use.
4	centre	21	"	"	"	Spring		2,000									
5	NE.	31	"	"	"	Dug	12	1,900	− 9	1,891	9	1,891	Glacial gravel	Medium hard	42	S	Sufficient supply.
6	NE.	32	"	"	"	Bored	105	2,100	− 10	2,090	105	1,995	Glacial drift	Very hard, odorous, iron	42	S	Sufficient supply; not used at present.
7	NW.	34	"	"	"	Dug	20	2,220	− 13	2,207	13	2,207	Glacial drift	Hard	43	D, S	Sufficient for local needs.
1	SE.	1	25	13	3	Spring		2,300					Glacial drift	Soft		S	Sufficient for 125 head stock.
2	E.½	5	"	"	"	Dug	12	2,000	− 9	1,991	9	1,991	Glacial gravel	Hard, sulphur	48	D, S	Sufficient for 200 head stock.
3	W.½	5	"	"	"	Bored	24	1,980	− 18	1,962	18	1,962	Glacial sand	Hard	48	D, S	Sufficient 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 MONET, NO. 257, SASKATCHEWAN.

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
4	N.½	6	25	13	3	Bored	140	1,955	- 90	1,865	140	1,815	Belly River	Soft	46	D, S	Sufficient for 200 head stock.
5	SW.	8	"	"	"		50	1,975	- 45	1,930	45	1,930	Glacial drift	Hard			#
6	SW.	12	"	"	"	Spring		2,200					Glacial drift	Hard			Sufficient for 25 head stock.
7	NE.	14	"	"	"	Dug	20	2,075	- 16	2,059	16	2,059	Glacial sand	Soft	49	D, S	Insufficient; waters 9 head stock.
8	SW.	18	"	"	"	Bored	45	1,960	- 25	1,935	45	1,915	Glacial drift	Hard, iron, "alkaline"	46	D, S	Sufficient for 10 head stock; yields 16 barrels a day.
9	SW.	20	"	"	"	Bored	40	1,950	- 30	1,920	40	1,910	Glacial sand	Hard, iron, "alkaline"	48	D, S	Oversufficient; waters 5 head stock.
10	NE.	20	"	"	"	Dug	80	1,950	- 72	1,878	80	1,870	Glacial white sand	Hard, slightly "alkaline"	49	D, S	Sufficient for 25 head stock.
11	NW.	21	"	"	"	Bored	100	1,960	- 80	1,880	100	1,860	Glacial sand	Hard, iron, "alkaline"	49	D, S	Oversufficient; waters 100 head stock.
12	SW.	22	"	"	"	Dug	110	1,950	-105	1,845	105	1,845	Glacial sand	Hard, iron	49	D, S	Insufficient; yields 3 barrels a day.
13	NE.	22	"	"	"	Dug	45	1,950	- 41	1,909	41	1,909	Glacial gravel	Hard, iron, red sediment	48	D, S	Sufficient; waters 40 head stock.
14	NW.	22	"	"	"	Dug	70	1,950	- 68	1,882	68	1,882	Glacial sand	Hard, iron	49	D, S	Insufficient; yields 5 barrels a day.
15	NE.	23	"	"	"	Bored	30	2,000	- 24	1,976	30	1,970	Glacial sand	Hard, slightly "alkaline"	48	D, S	Oversufficient supply; ample for 25 head stock.
16	SW.	24	"	"	"	Bored	24	2,040	- 18	2,022	18	2,022	Glacial sand	Hard, "alkaline"	46	D, S	Oversufficient; yields 40 barrels a day.
17	SW.	25	"	"	"	Dug	13	1,990	- 11	1,979	11	1,979	Glacial fine sand	Hard, iron, "alkaline"	48	D, S	Sufficient; waters 6 head stock.
18	NE.	26	"	"	"	Bored	75	1,950	- 55	1,895	75	1,875	Glacial sand	Hard	49	D, S	Oversufficient; waters 25 head stock.
19	SW.	26	"	"	"	Bored	60	1,950	- 50	1,900	50	1,900	Glacial drift	Hard, "alkaline"	48	D, S	Insufficient for more than 10 head stock.
20	NE.	28	"	"	"	Dug	115	1,960	-110	1,850	110	1,850	Glacial sand	Hard, iron, "alkaline"	48	S	Waters 20 head stock; hauls drinking water.
21	NW.	28	"	"	"	Bored	75	1,950	- 72	1,878	72	1,878	Glacial sand	Hard, iron, red sediment	48	D, S	Sufficient; waters 25 head stock.
22	NE.	30	"	"	"	Dug	60	1,965	- 55	1,910	55	1,910	Glacial gravel	Hard, slightly "alkaline"	48	D, S	Oversufficient; yields 30 barrels a day.
23	SE.	32	"	"	"	Dug	70	1,942	- 62	1,880	70	1,872	Glacial white sand	Hard, "alkaline"	48	D, S	Sufficient for 25 head stock; #.
24	SW.	34	"	"	"	Dug	112	1,955	-108	1,847	108	1,847	Glacial sand	Hard, iron, "alkaline"	48	S	Sufficient for 15 head stock; not suitable for drinking; #.
25	NW.	34	"	"	"	Dug	100	1,955	- 90	1,865	100	1,855	Glacial sand	Hard, iron, red sediment	49	D, S	Yields 100 barrels a day.
26	SW.	36	"	"	"	Bored	60	1,950	- 52	1,898	52	1,898	Glacial sand	Hard, iron, red sediment	48	D, S	Waters 16 head stock.
27	NE.	36	"	"	"	Bored	80	1,950	- 40	1,910	80	1,870	Glacial sand	Hard, iron, "alkaline"	48	D, S	Abundant supply; laxative.
1	NW.	2	25	14	3	Dug	18	1,990	- 12	1,978	12	1,978	Glacial gravel	Soft	46	D, S	Sufficient supply; many springs, plentiful supply.
2	NW.	4	"	"	"	Spring		2,175					Glacial sand				Sufficient for 100 head stock.
3	SW.	5	"	"	"	Dug	14	2,200	- 10	2,190	10	2,190	Glacial sand	Hard, iron, "alkaline"	48	D, S	Sufficient for 15 head stock.
4	SW.	9	"	"	"	Spring		2,175					Glacial sand				Sufficient for 100 head stock.

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

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

WELL RECORDS—Rural Municipality of MONET, NO. 141, SASKATCHEWAN.

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
5	SE.	10	25	14	3	Dug	5	2,050	− 0	2,050			Glacial sand	Medium hard, iron		S, D	Oversufficient; ample for 150 head stock.
6	NE.	11	"	"	"	Bored	55	1,935	− 27	1,908	55	1,880	Glacial gravel	Iron, (trace), soda	46	D, S	Sufficient supply.
7	SW.	14	"	"	"	Bored	30	1,970	− 22	1,948	22	1,948	Glacial sand	Medium hard, slightly "alkaline"	48	D, S	Oversufficient for 20 head stock.
8	NE.	16	"	"	"	Dug	60	1,990	− 58	1,932	58	1,932	Glacial drift	Hard, very "alkaline"	48	S	Poor supply.
9	NE.	17	"	"	"	Springs		2,200					Glacial drift				Five springs; which stop flowing in summer.
10	NE.	20	"	"	"	Dug	16	2,000	− 13	1,987	13	1,987	Glacial drift	Hard, iron, "alkaline"	48	D, S	Sufficient for 10 head stock.
11	NW.	22	"	"	"	Dug	8	1,950	− 4	1,946	4	1,946	Glacial gravel	Medium hard	48	D, S	Oversufficient for 150 head stock.
12	NE.	23	"	"	"	Dug	70	1,905	− 40	1,865	70	1,835	Glacial drift	Hard, "alkaline"	46	D, S	Sufficient for 30 head stock.
13	NW.	24	"	"	"	Bored	50	1,940	− 48	1,892	48	1,892	Glacial fine sand	Hard, iron, "alkaline"	46	D, S	Insufficient; yields 2 barrels a day; also 102-foot well; #.
14	NE.	30	"	"	"	Dug	14	1,925	− 8	1,917	8	1,917	Glacial fine gravel	Hard, iron	48	D, S	Sufficient for 25 head stock.
15	S.½	34	"	"	"	Spring		1,900					Glacial drift				Sufficient for 100 head stock.
16	NE.	35	"	"	"	Bored	40	1,960	− 30	1,930	40	1,920	Glacial sand	Soft	48	D, S	Limited supply; waters 18 head stock.
17	NW.	36	"	"	"	Dug	6	1,945	− 3	1,942	3	1,942	Glacial sand and gravel	Hard	46	D, S	Sufficient; yields 10 barrels a day.
1	NW.	2	25	15	3	Bored	20	2,360	− 14	2,346	14	2,346	Glacial gravel	Hard		D, S	Insufficient for more than 4 head stock.
2	SW.	4	"	"	"	Dug	14	2,140	− 13	2,127	13	2,127	Glacial sand and gravel	Hard, iron	48	D, S	Insufficient; yields 1 barrel a day.
3	E.½	8	"	"	"	Spring		2,000					Glacial sand	Hard			Large yields.
4	SE.	10	"	"	"	Bored	20	2,225	− 14	2,211	20	2,205	Glacial gravel	Hard	48	D, S	Insufficient for more than 4 head stock; two wells; was good supply, but caved in.
5	NW.	10	"	"	"	Bored	20	2,200	− 6	2,194	20	2,180	Glacial gravel	Hard	48	D, S	Sufficient for 20 barrels a day; waters 50 head stock.
6	NE.	12	"	"	"	Dug	22	2,400	− 0	2,400			Glacial sand	Hard, "alkaline"	48	S	Yields 6 barrels a day; laxative.
7		14	"	"	"	Spring							Glacial sand				Sufficient for 200 head to 300 head stock.
8	NE.	16	"	"	"	Dug	18	2,000	− 12	1,988	12	1,988	Glacial gravel	Hard	47	D, S	Sufficient for 30 head stock.
9	SE.	17	"	"	"	Dug	35	1,940	− 27	1,913	27	1,913	Glacial drift	Hard, slightly "alkaline"	48	D, S	Abundant supply.
10	SE.	20	"	"	"	Bored	82	2,010	− 41	1,969	82	1,928	Glacial drift	Hard, iron, Sulphur	48	D, S	Abundant supply.
11	SE.	21	"	"	"	Dug	40	1,915	− 30	1,885	40	1,875	Glacial gravel	Hard, iron		S	Sufficient; waters 15 head stock; unfit for humans.
12	SE.	22	"	"	"	Bored	30	1,960	− 20	1,940	20	1,940	Glacial drift	Hard, iron	48	D, S	Sufficient for 10 head stock.
13	W.½	26	"	"	"	Dug	10	1,950	− 0	1,950	10	1,940	Glacial drift	Medium hard		D, S, M	Yields 60 barrels daily, supplies community of Elrose.

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 MONET, NO. 257, 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
14	NE.	36	25	15	3	Dug	26	1,930	- 22	1,908	22	1,908	Glacial sand and gravel	Hard, slightly "alkaline"	48	D, S	Sufficient for 20 head stock.
1	SE.	1	26	13	3	Dug	12	1,940	- 0	1,940			Glacial gravel	Medium hard	44	D, S	Sufficient for 20 head stock.
2	NE.	4	"	"	"	Dug	75	1,920	- 67	1,853	75	1,845	Glacial fine sand	Hard, iron	46	D, S	Sufficient; yields 25 barrels a day.
3	SW.	4	"	"	"	Dug	65	1,935	- 60	1,875	60	1,875	Glacial fine sand	Hard, iron, red sediment	47	D, S	Insufficient; yields 5 to 6 barrels daily.
4	SE.	6	"	"	"	Dug	50	1,910	- 42	1,868	42	1,868	Glacial fine sand	Hard, "alkaline"	48	D, S	Sufficient for 20 head stock.
5	NE.	18	"	"	"	Bored	30	1,850	- 20	1,830	20	1,830	Glacial fine sand and gravel	Hard, "alkaline"	48	S	Sufficient for local needs.
6	NW.	19	"	"	"	Dug	8	1,875	- 0	1,875			Glacial drift	Hard, cloudy, very "alkaline"		S	Spring-fed well; too "alkaline" for drinking.
7	SE.	20	"	"	"	Dug	8	1,855	- 4	1,851	4	1,851	Glacial gravel	Soft		D, S	Sufficient for 50 head stock.
8	NW.	22	"	"	"	Dug	18	1,875	- 13	1,862	13	1,862	Glacial sand	Hard	46	D	Sufficient; yields 2 barrels daily; spring-fed.
9	S.½	22	"	"	"	Dug	32	1,900	- 15	1,885	32	1,868	Glacial drift	Hard, iron, red sediment	47	D, S	Oversufficient; waters 10 to 12 head stock.
10	NW.	23	"	"	"	Bored	52	1,905	- 49	1,856	49	1,856	Glacial sand	Hard, iron	41	S	Insufficient; #; yields 4 barrels daily; also 60-foot dry hole; hauls drinking water.
11	NW.	24	"	"	"	Bored	60	1,900	- 58	1,842	58	1,842	Glacial fine sand	Hard		D	Sufficient supply.
112	N.½	27	"	"	"	Dug	30	1,850	- 20	1,830	20	1,830	Glacial sand	Hard, "alkaline"	48	D, S	Sufficient for 15 head stock.
13	NW.	30	"	"	"	Drilled	340	1,900	-200	1,700	340	1,560	Belly River	Hard, iron, soda	46	S	Sufficient for 50 head stock; hauls drinking water.
14	SE.	30	"	"	"	Bored	40	1,860	- 15	1,845	40	1,820	Glacial gravel	Hard, very, "alkaline"	48	S	Oversufficient; waters 25 head stock; too "alkaline" for house use.
15	SW.	30	"	"	"	Dug	14	1,895	- 10	1,885	10	1,885	Glacial sand	Hard, iron, red sediment	48	D, S	Intermittent supply.
16	NE.	31	"	"	"	Bored	120	1,900	- 40	1,860	120	1,780	Glacial gravel	Hard, iron, "alkaline"	48	D, S, M	Sufficient for hamlet of Forgan.
17	NE.	32	"	"	"	Bored	60	1,900	- 55	1,845	55	1,845	Glacial sand and gravel	Hard, iron, "alkaline"	48	D, S	Insufficient; waters 4 horses.
18	N.½	34	"	"	"	Dug	15	1,850	- 0	1,850			Glacial drift	Hard, iron, "alkaline"	48	D, S	Intermittent supply.
19	NW.	35	"	"	"	Dug	18	1,870	- 13	1,857	13	1,857	Glacial gravel	Medium hard	47	D, S	Sufficient; yields 15 barrels daily.
1	SW.	13	26	14	3	Dug	8	1,875	- 0	1,875			Glacial sand and gravel	Medium hard	47	D, S	Abundant supply; spring-fed; supplies drinking water to whole district.
2	SW.	14	"	"	"	Dug	70	1,895	- 56	1,839	70	1,825	Glacial sand and gravel	Hard, iron, "alkaline"	45	D, S	Sufficient for 10 head stock.
3	NW.	16	"	"	"	Bored	168	2,005	-138	1,862			Glacial gravel	Hard, iron, red sediment	44	S	Insufficient; yields 4 barrels daily; laxative.
4	SE.	17	"	"	"	Drilled	300	2,005	-250	1,755	300	1,705	Belly River(?)	Hard, iron, "alkaline"	42	S	Sufficient for 50 head stock.
5	NW.	18	"	"	"	Drilled	325	2,010	-200	1,810	325	1,685	Belly River(?)	Hard, iron	41	S	Yields 50 barrels daily; bad taste.

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 MONET, NO. 257, SASKATCHEWAN.

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
6	NE.	20	26	14	3	Drilled	200	2,011	-190	1,821	190	1,821	Glacial sand	Very hard, iron, very "alkaline"		S	Sufficient supply.
7	NE.	22	"	"	"	Dug	180	1,965	-100	1,865	180	1,785	Glacial drift(?)	Hard, iron, "alkaline"	43	S	Sufficient for 65 head stock; disagreeable taste.
8	NE.	24	"	"	"	Bored	50	1,900	- 0	1,900			Glacial drift	Very hard, "alkaline", salty	46	S	Waters 20 head stock; laxative.
9	NW.	26	"	"	"	Drilled		1,950					Glacial sand	Hard, iron, "alkaline"	44	S	Waters 8 head stock; too hard for drinking.
•10	NW.	29	"	"	"	Drilled	426	2,000			426	1,574	Belly River	Hard, iron, "alkaline"		D, S	Sufficient supply until it became plugged.
11	NW.	32	"	"	"	Drilled	195	1,995	-190	1,805	190	1,805	Glacial sand	Hard, iron, slightly "alkaline"		D, S	
12	N.½	34	"	"	"	Bored	135	1,965	-125	1,840	125	1,840	Glacial drift	Hard, iron, red sediment	43	S	Waters 10 head stock; laxative; too hard for drinking.
•1	NW.	4	25	14	3	Drilled	580	2,025	-150	1,875	580	1,445	Belly River	Hard, iron, "alkaline"	46	46	Yields 3 barrels daily.
2	SW.	6	"	"	"	Drilled	140	2,035	-130	1,905	130	1,905	Glacial drift	Hard, iron	46	D, S	Intermittent supply.
•3	NE.	7	"	"	"	Drilled	410	2,020	- 1	2,019	410	1,610	Belly River	Hard, iron, "alkaline"		N	Not used owing to bad taste.
•4	SE.	9	"	"	"	Drilled	500	2,040	-300	1,740	500	1,540	Belly River	Hard, iron, slightly "alkaline"	46	S	Sufficient; yields 20 to 30 barrels daily; also 565-foot dry hole and 10-foot well; #.
5	NW.	10	"	"	"	Drilled	176	2,030			176	1,854	Glacial sand	Hard, iron		S	Insufficient; laxative; fills with quicksand.
6	NE.	12	"	"	"	Bored	173	2,020	-157	1,863	173	1,847	Glacial drift	Hard, iron, "alkaline"	48	S	Yields 10 barrels daily; sufficient.
7	SW.	12	"	"	"	Bored	173	2,010	-143	1,867	173	1,837	Glacial drift	Hard, iron, "alkaline"	46	S	Waters 50 head stock; laxative.
8	SE.	16	"	"	"	Bored	175	2,010	-165	1,845	165	1,845	Glacial sand	Hard, iron, "alkaline"	44	S	Insufficient; waters 10 head stock; laxative.
9	SW.	16	"	"	"	Dug	16	2,010	- 6	2,004	6	2,004	Glacial drift	Hard	48	D, S	Oversufficient; yields 20 barrels daily.
10	NW.	19	"	"	"	Dug	14	2,005	- 10	1,995	10	1,995	Glacial sand and gravel	Hard, soda, "alkaline"	48	D, S	Sufficient for 25 head stock; laxative.
11	SW.	21	"	"	"	Dug	16	2,000	- 12	1,988	12	1,988	Glacial drift	Hard, iron	46	D, S	Yields 6 barrels a day.
12	SE.	30	"	"	"	Dug	14	2,010	- 9	2,001	9	2,001	Glacial sand and gravel	Moderately hard	48	D, S	Oversufficient; waters 25 head stock.
13	W.½	30	"	"	"	Dug	14	2,000	- 9	1,991	9	1,991	Glacial sand and gravel	Moderately hard	48	D, S	Oversufficient; waters 25 head stock; spring-fed.
14	SW.	32	"	"	"	Dug	66	2,010	- 56	1,954	66	1,944	Glacial drift	Hard, "alkaline"	48	S	Oversufficient; waters 40 head stock.
15	N.½	33	"	"	"	Spring		1,950					Glacial quicksand				Sufficient for 30 head stock.
•16	NE.	34	"	"	"	Drilled	395	1,975	-100	1,875	395	1,580	Belly River	Hard, iron, red sediment	42	S	Sufficient for 60 head stock; laxative.
•17	NW.	36	"	"	"	Drilled	387	1,990	- 80	1,910	387	1,603	Belly River	Hard, iron	43	D, S	Yields 50 barrels daily.
1	E.½	1	27	13	3	Bored	60	1,880					Glacial drift	Hard, iron, slightly "alkaline"	48	D, S	Sufficient; waters 8 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 MONET, NO. 257, SASKATCHEWAN.

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
2	SE,	4	27	13	3	Dug	14	1,900	- 9	1,891	9	1,891	Glacial gravel	Soft	47	D	Sufficient; yields 2 barrels daily.
3	SW,	6	"	"	"	Bored	85	1,910	- 70	1,840	85	1,825	Glacial sand	Hard, iron, "alkaline"		N	Sufficient for 12 head stock; but not used at present.
4	SE,	8	"	"	"	Drilled	390	1,925	- 35	1,890	390	1,535	Belly River	Hard, iron, red sediment	45	S	Oversufficient for 15 head stock.
5	NE,	10	"	"	"	Bored	50	1,900	- 40	1,860	50	1,850	Glacial fine sand	Hard, iron	47	S	Sufficient for 15 head stock.
6	SE,	10	"	"	"	Bored	22	1,860	- 10	1,850	10	1,850	Glacial fine sand	Hard, iron, red sediment	46	S	Insufficient supply.
7	NW,	13	"	"	"	Dug	18	1,860	- 14	1,846	14	1,846	Glacial drift	Hard, iron, "alkaline"	47	S	Insufficient supply.
8	NE,	15	"	"	"	Dug	12	1,900	- 8	1,892	8	1,892	Glacial fine sand	Soft	46	D, S	Insufficient supply.
9	SE,	16	"	"	"	Bored	25	1,910	- 22	1,888	22	1,888	Glacial fine sand	Hard, iron	46	D	Sufficient supply.
10	SW,	18	"	"	"	Drilled	178	1,925	-175	1,750	178	1,747	Glacial sand	Hard, iron, red sediment	45	S	Insufficient supply.
11	SE,	20	"	"	"	Drilled	303	1,890	-150	1,740	303	1,587	Belly River	Hard, iron	46	S	Oversufficient supply.
12	NW,	20	"	"	"	Drilled	375	1,910	- 40	1,870	375	1,535	Belly River	Hard, iron, "alkaline"	45	D, S	Oversufficient; ample for 75 head stock.
13	NW,	21	"	"	"	Drilled	385	1,900	- 20	1,880	385	1,515	Belly River	Hard, iron	44	S	Abundant supply; not suitable for human consumption.
14	NE.	22	"	"	"	Bored	50	1,880	- 42	1,838	42	1,838	Glacial drift	Hard, iron	44	S	Insufficient; yields 4 barrels daily; 15-foot well, good water.
15	NW,	22	"	"	"	Dug	45	1,890	- 37	1,853	37	1,853	Glacial fine sand	Hard, iron	45	S	Sufficient; waters 6 head stock.
16	NE.	23	"	"	"	Dug	35	1,925	- 30	1,895	30	1,895	Glacial drift	Hard, iron	48	D, S	Insufficient.
17	SW.	24	"	"	"	Dug	26	1,930	- 22	1,908	22	1,908	Glacial drift	Hard, iron, "alkaline"	48	D, S	Insufficient; yields 3 barrels daily.
18	SW.	27	"	"	"	Bored	40	1,885	- 33	1,852	33	1,852	Glacial fine sand	Hard, iron, red sediment	45	S	Sufficient; waters 30 head stock.
19	NW.	28	"	"	"	Drilled	386	1,905	- 30	1,875	386	1,519	Belly River	Hard, iron	45	S	Oversufficient supply.
20	NE.	30	"	"	"	Drilled	420	1,920	-100	1,820	420	1,500	Belly River	Hard, iron	45	S	Yields 75 barrels daily; not suitable for human consumption.
21	SW,	30	"	"	"	Bored	120	1,925					Glacial drift	Hard, iron, red sediment	46	S	Sufficient; yields 6 barrels daily.
22	NE.	32	"	"	"	Drilled	425	1,930	- 60	1,870	425	1,505	Belly River	Hard, iron	45	D, S	Yields 60 barrels daily.
23	SE.	33	"	"	"	Drilled	325	1,900	- 75	1,825	325	1,575	Belly River	Hard, iron	45	D, S	Abundant supply.
24	SW,	36	"	"	"	Dug	8	1,850			8	1,842	Glacial gravel	Hard		D, S, M	Abundant supply; flows at surface; supplies community of Wiseton.
1	SE.	1	27	14	3	Bored	100	1,930	- 80	1,850	80	1,850	Glacial gravel and sand	Hard, "alkaline"	46	S	Sufficient; waters 20 head stock.
2	SE.	2	"	"	"	Drilled	550	1,950	- 50	1,900	550	1,400	Belly River	Hard, iron, "alkaline"	46	S	Ample supply; not suitable for human use.
3	SE.	6	"	"	"	Drilled	200	1,990			200	1,790	Belly River(?)	Hard, iron	46	S	Insufficient; waters 6 head stock; laxative.
4	SE.	8	"	"	"	Drilled	330	1,975	- 90	1,885	330	1,645	Belly River	Hard, "alkaline"	46	S	Ample for 40 head stock.

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

WELL RECORDS—Rural Municipality of MONET, NO. 257, SASKATCHEWAN.

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
5	SE.	10	27	14	3	Drilled	500	1,960	-100	1,860	500	1,460	Belly River	Hard, iron, "alkaline"		S	Ample for 40 barrels a day.
6	SE.	12	"	"	"	Drilled	245	1,940	-100	1,840	245	1,695	Belly River	Hard, iron, "alkaline"	47	S	Ample for 20 head stock.
7	SE.	13	"	"	"	Drilled	400	1,930	- 40	1,890	400	1,530	Belly River	Hard, iron, "alkaline"	45	S	Oversufficient; ample for 100 head stock.
8	W.½	16	"	"	"	Drilled	450	1,955	- 80	1,875	450	1,505	Belly River	Hard, iron, slightly "alkaline"	41	D, S	Ample supply.
9	SW.	18	"	"	"	Bored	80	1,950						Glacial sand	48	S	Sufficient for 3 head stock.
10	NE.	18	"	"	"	Bored	100	1,945	- 96	1,849	96	1,849	Glacial drift	Hard, iron, "alkaline"	44	S	Insufficient; yields 5 barrels daily.
11	E.½	19	"	"	"	Bored	75	1,960	- 65	1,895	65	1,895	Glacial sand	Hard, iron, "alkaline"	46	S	Sufficient; waters 25 head stock; laxative.
12	W.½	19	"	"	"	Drilled	165	1,900	- 35	1,865	165	1,735	Belly River(?)	Hard, iron	46	S	Abundant supply; yields 50 barrels daily; too hard for drinking.
13	NE.	20	"	"	"	Drilled	350	1,940	-335	1,605	335	1,605	Belly River	Hard, iron, "alkaline"	48	D, S	Yields ½ barrel at a time.
14	N.½	20	"	"	"	Drilled	325	1,945	-200	1,745	325	1,620	Belly River	Hard, iron, "alkaline"	44	D, S	Poor supply; well needs attention.
15	SE.	22	"	"	"	Drilled	225	1,950	-125	1,825	225	1,725	Belly River(?)	Hard, iron, "alkaline"	47	S	Oversufficient for 25 head stock; laxative,
16	SE.	24	"	"	"	Drilled	390	1,925	- 50	1,875	390	1,535	Belly River	Hard, "alkaline"	46	S	Insufficient supply; dugout also used.
17	NW.	28	"	"	"	Drilled	300	1,920	- 260	1,660	300	1,500	Belly River	Hard, iron, slightly "alkaline"	47	D, S	Oversufficient for 20 head stock.
18	SE.	30	"	"	"	Bored	80	1,915	- 40	1,875	80	1,835	Glacial sand	Hard, iron	46	D, S	Sufficient for 40 head stock.
19	SW.	31	"	"	"	Bored	50	1,900	- 10	1,890	50	1,850	Glacial drift	Hard, iron, "alkaline"	46	S	Sufficient for 100 head stock; laxative.
20	SE.	32	"	"	"	Bored	60	1,910	- 54	1,856	54	1,856	Glacial drift	Hard, iron, red sediment	48	S	Sufficient; yields 6 barrels daily; unfit for human use.
21	SE.	34	"	"	"	Dug	76	1,920	- 66	1,854	66	1,854	Glacial drift	Hard, iron	46	D, S	Insufficient supply.
22	NW.	36	"	"	"	Drilled	425	1,920	- 60	1,860	425	1,495	Belly River	Hard, iron	46	D, S	Abundant supply; 70 barrels daily.
1	SW.	2	27	15	3	Dug	150	1,965	-100	1,865	150	1,815	Glacial drift	Hard, iron, "alkaline"	48	S	Yields 30 barrels.
2	SW.	4	"	"	"	Dug	23	1,980	- 20	1,960	20	1,960	Glacial sand	Soft		D, S	Sufficient supply.
3	SE.	6	"	"	"	Bored	80	2,010	- 50	1,960	80	1,930	Glacial sand	Hard, iron, "alkaline"	48	S	Sufficient; waters 8 head stock; laxative.
4	NW.	7	"	"	"	Bored	32	2,000	- 28	1,972	28	1,972	Glacial fine sand	Moderately hard		D, S	Insufficient supply.
5	NW.	7	"	"	"	Dug	40	2,000	- 36	1,964	36	1,964	Glacial drift	Hard, "alkaline"		S	Limited supply; laxative.
6	NE.	8	"	"	"	Bored	28	1,935	- 10	1,925	28	1,907	Glacial sand	Hard, iron, slightly "alkaline"	48	D, S	Oversufficient; waters 15 head stock.
7	NW.	10	"	"	"	Dug	20	1,940	- 12	1,928	12	1,928	Glacial drift	Hard, "alkaline"		S	Insufficient; waters 10 head stock; laxative; unsuitable for drinking.

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

WELL RECORDS—Rural Municipality of MONET, NO. 257, 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
8	NW.	12	27	15	3	Bored	50	1,925	- 35	1,890	35	1,890	Glacial sand	Hard, iron, odorous, slightly "alkaline"	48	D, S	Sufficient; yields 14 barrels a day.
9	NW.	14	"	"	"	Dug	10	1,900	- 6	1,894	6	1,894	Glacial sand	Hard, "alkaline"	47	D, S	Waters 18 head stock; yields 15 barrels daily; laxative.
10	NW.	16	"	"	"	Dug	32	1,975	- 30	1,945	30	1,945	Glacial gravel	Hard, slightly "alkaline"	38	D, S	Sufficient for 70 head stock.
11	SW.	17	"	"	"	Dug	50	1,995	- 39	1,956	50	1,945	Glacial fine sand	Hard, iron, "alkaline"	48	D, S	Abundant supply; waters 10 head stock.
12	NW.	18	"	"	"	Bored	52	2,000	- 45	1,955	45	1,955	Glacial drift	Hard, "alkaline"		D, S	Sufficient; yields 5 barrels daily; laxative.
13	SW.	19	"	"	"	Bored	63	2,000	- 51	1,949	51	1,949	Glacial drift	Very hard, very "alkaline"	48	S	Sufficient; yields 3 barrels daily; laxative.
14	NW.	20	"	"	"	Bored	57	2,000	- 55	1,945	57	1,943	Glacial sand	Hard, iron	46	D, S	Limited; yields 2 barrels daily.
15	SE.	21	"	"	"	Dug	30	1,960	- 28	1,932	28	1,932	Glacial sand	Hard, black sediment	48	S	Insufficient; yields 3 barrels a day.
16	NW.	22	"	"	"	Dug	28	1,960	- 26	1,934	26	1,934	Glacial gravel	Hard, iron, "alkaline"	49	D, S	Sufficient; waters 7 head stock.
17	SW.	26	"	"	"	Dug	32	1,950	- 22	1,928	32	1,918	Glacial coarse gravel	Very hard, "alkaline", iron	48	D, S	Abundant supply; waters 5 head stock.
18	SE.	27	"	"	"	Bored	30	1,945	- 8	1,937	30	1,917	Glacial sand	Iron, hard, "alkaline"		S	Oversufficient; yields 16 barrels daily; not suitable for human consumption.
19	NE.	28	"	"	"	Dug	50	1,960	- 40	1,920	40	1,920	Glacial drift	Very hard, very "alkaline"	49	S	Waters 12 head stock; sufficient supply; very laxative.
20	N.½	30	"	"	"	Dug	60	1,975	- 50	1,920	60	1,915	Glacial sand	Hard, iron, "alkaline"	47	D, S	Sufficient; waters 8 head stock.
21	SE.	30	"	"	"	Bored	40	1,980	- 34	1,946	34	1,946	Glacial fine sand	Hard, "alkaline"	48	D, S	Sufficient; waters 10 head stock.
22	SE.	32	"	"	"	Bored	60	1,950	- 15	1,935	60	1,890	Glacial drift	Hard, iron, "alkaline"	46	D, S	Waters 26 head stock; sufficient.
23	NE.	32	"	"	"	Bored	80	1,950	- 65	1,885	80	1,870	Glacial drift	Hard, iron, "alkaline"	45	S	Insufficient; yields 2 barrels a day.
24	SE.	33	"	"	"	Bored	60	1,955	- 60	1,895	80	1,875	Glacial drift	Hard, "alkaline"	49	D, S	Insufficient; yields 4 barrels daily.
25	N.½	34	"	"	"	Bored	60	1,965	- 50	1,915	60	1,905	Glacial drift	Hard, iron, "alkaline"	47	D, S	Insufficient; supplies 8 barrels daily.
26	SW.	36	"	"	"	Bored	91	1,930	- 61	1,869	61	1,869	Glacial gravel	Hard, "alkaline"	49	S	Supplies 12 barrels daily; laxative.

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(#) Sample taken for analysis.