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BUREAU OF ECONOMIC GEOLOGY

GEOLOGICAL SURVEY

PRELIMINARY REPORT

GROUND-WATER RESOURCES OF THE RURAL MUNICIPALITY OF EYEBROW No. 193 SASKATCHEWAN

BY

B. R. MacKay & D. C. Maddox

Water Supply Paper No. 22

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GROUND WATER RESOURCES OF THE RURAL MUNICIPALITY OF EYEBROW, NO. 193 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 purposes and the smaller supplies of ground water required for domestic and stock-raising purposes by settlers, villages, and Indian reserves. The drought conditions resulted in repeated crop failures, and in a large number of farms in the acute drought areas of Saskatchewan and Alberta being abandoned. In an effort to relieve the serious situation a number of special studies of the water problem were begun by both Federal and Provincial Governments and allied organizations. The Federal Department of Agriculture undertook among other phases of the drought problem an investigation into the existing supplies of surface water, their conservation by means of dams and dug-outs, and how they could be made more generally available for irrigation. The Geological Survey of the Federal Department of Mines began an extensive study of the underground water conditions of southern Saskatchewan, this water being used principally for domestic and stock-raising purposes. For many years past the water problems in this and other provinces of Canada have engaged the attention of the Geological Survey, and considerable information had already been collected. A number of short reports dealing with the ground water conditions of special areas in Manitoba, Saskatchewan and Alberta have been published by both the Federal and Provincial Geological Surveys, but no systematic study of the ground water resources has been made up to the present.

Field Work

The senior author was in charge of this investigation and was instructed to cover as much of the territory as possible in the season. To effect this it was decided to maintain an

office at Regina and to have a large party consisting of twenty-six units, each to consist of three men who would cover their respective areas and visit every farm. In order that the information gathered by these different party units would be as complete and uniform as possible a questionnaire was prepared on which could be tabulated answers to all the essential questions required for a detailed study of the ground water conditions. An effort was made in the field by each party unit to fill in the questionnaire as completely as possible. In many instances, however, it was found that wells had either been abandoned, or the resident had little or no knowledge of the character of the water-bearing horizon and associated beds. When a party unit had completed the survey of a township the set of questionnaires and a report describing the characteristic features pertaining to the underground water conditions were mailed to the field office. Messrs. D.C. Maddox, F.H. Edmunds, H.H. Beach, H.N. Hainstock, R.D. MacDonald, and D.P. Goodall acted as supervisors in inspecting the work of the field units.

During the field season an area of 80,000 square miles, comprising 2,200 townships, was systematically examined, and records of approximately 60,000 wells were obtained, together with water samples for analyses obtained from 720 representative wells. These are systematically classified so that information pertaining to any well may be readily consulted. These records are supplemented by a set of 24 sectional sheets which cover all of southern Saskatchewan north to include township 32. Each sectional sheet comprises 120 townships. On these are indicated by symbol the location, type, and source of water of each of the 60,000 wells.

Publication of Results

The publication of such a great mass of detailed information is out of the question. This forms the permanent record of the Geological Survey. It is highly desirable, however, that a digest of the essential information pertaining to the ground water conditions of each municipality be furnished in convenient form to the municipality offices, to certain Provincial and Federal departments, and to allied organizations, at which centres it will be possible for any resident of the municipality or other party interested in any particular area to consult these reports. Should anyone find that he requires more detailed data than that contained in the report such additional information as the Geological Survey possesses can be procured on application to the Director, Bureau of Economic Geology, Department of Mines, Ottawa. In making such request the applicant should indicate the exact location of the area by giving the quarter section, township, range and meridian.

The reports have been prepared principally for farm residents, municipal bodies, and well drillers who are either contemplating sinking a well for the first time or considering deepening their well to a lower horizon in order to obtain a more abundant supply of water. In describing the water and geological conditions a certain number of technical terms must of necessity be used, and in case the reader should not be familiar with them their meanings have been defined in the glossary.

How to Use the Report

It is advisable that anyone desiring water information pertaining to a particular section of the municipality read over first the section dealing with the municipality as a whole, as by so doing he will be in a much better position to understand the section of the report dealing with the ground water conditions of

the area in which he is particularly interested. As he reads the text he should keep open before him for constant reference the accompanying map of the municipality on which are two figures, one showing the surface and bedrock geology of the area as they affect the ground water supply, and the other the relief and the location and type of water wells. The land relief is shown by means of lines of equal elevation, termed "contours", which lie generally at vertical intervals of 50 feet. The elevation above sea-level of each fourth line is indicated on the map. The statistical summary that follows the text gives at a glance the main characteristics of the wells in each township of the municipality and of the municipality as a whole as listed under the various sub-headings. This is followed by a section dealing with the analyses and quality of the water derived from the unconsolidated deposits and from bedrock. The table of well records gives the detailed information pertaining to each well. In this are tabulated the altitude of the well, its depth, the height to which the water will rise, and the elevation of the water horizon. The wells are grouped in the table by townships and are numbered from the lower right corner of the township westward and northward, and the location of each well by its quarter section is given. The elevations used were determined by aneroid barometer and were checked frequently by elevations on the published maps or by instrument surveys.

Where the ground surface of an area is comparatively flat an effort has been made to indicate the position of the water-bearing horizon in feet below the surface. In rolling country where there is a considerable difference of elevation within short distances a uniform figure for the depth to the water horizon is not generally possible. It then becomes necessary to indicate the position in terms of the elevation of a water-bearing bed in feet above sea-level.

Should one desire to ascertain at any location at which no well has as yet been sunk, the approximate depth at which a particular water-bearing horizon can be reached it is necessary to know two things--first, the elevation of the land surface, and second, the probable elevation of the water-bearing bed, or aquifer. The elevation of the land surface can be obtained by noting the position of the well site on the map, Figure 2, with respect to the two bounding contour lines of known elevation, and estimating either how far above the lower, or how far below the upper, control elevation line the well site lies. The approximate elevation of the water-bearing horizon at the well site can be obtained by noting on the table of well records the elevation of the horizon in the wells adjacent to the proposed location and from the range of elevations given and the relative positions of the wells shown on the map to select what appears to be its most probable elevation at the new well site. Having determined this elevation the depth that it is necessary to sink in order to tap it is the difference between its elevation and the elevation of the land surface. This method is especially applicable when the water-bearing horizon is in bedrock. In unconsolidated deposits the water horizon either conforms to the rolling land surface or occurs in isolated sand beds at various horizons that do not form a continuous water-bearing bed over a large area. Care should be taken in making any calculations for depth of water-bearing horizons to be sure that the elevations selected for the determinations occur in the same geological horizon, that is they should be either all in glacial drift or in the same bedrock formation.

The table of well records also contains notes on the temperature, quality, and quantity of the water being obtained from the various wells, and from this it is possible to draw reasonable conclusions as to the character and quantity of the water likely to be encountered at the proposed well site.

Glossary of Terms Used

Alluvium. Deposits of earth, silt, sand and gravel, and other transported material laid down by rivers, floods, or other causes upon land that has been submerged beneath the waters of lakes or rivers.

Aquifer. Layers or pockets of water-bearing sand or gravel that occur in unconsolidated deposits or as beds forming part of a bedrock formation.

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 deposits of gravel, sand, silt, and marl that have been laid down by the agency of water and which through a long period of time and the weight of the overlying sediments have become cemented into a solid rock.

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

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

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

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

Flood-plain. A flat section in a river valley that is 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 exerted by the water at any given point. It is due mainly to the weight of the column of water occurring at higher levels in the same aquifer or water-bearing bed.

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

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

Potable. Suitable for drinking.

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.

Water-bearing Horizon. A layer in either unconsolidated deposits or in bedrock formations that is water-bearing; same as aquifer.

Zone of Saturation. An area in which the permeable rocks are saturated with water that will move under ordinary hydrostatic pressure.

Names and Descriptions of Geological Formations, Referred to in These Reports

Wood Mountain Formation. The local name given to a series of gravel and thin sand beds which have a maximum thickness of 50 feet, and which occurs as isolated patches on the higher elevations of Wood mountain. They are the youngest of the consolidated rocks and, where present, rest upon the beds of the Ravenscrag formation.

Cypress Hills Formation. The local name given to a series of conglomerates and sand beds occurring in the southwest corner of Saskatchewan, which rests upon the Ravenscrag or older formations. The thickness of this formation varies from 30 to 125 feet.

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

Whitemud Formation. The local name given to a series of white, grey, and buff coloured clays and sands that varies in thickness from 10 to 75 feet. The base of this formation grades in places into a coarse, limy sand having a maximum thickness of 40 feet.

Eastend Formation. The local 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 eastern escarpment of the Missouri coteau. The The thickness of the formation seldom exceeds 40 feet.

Marine Shale Formation. The general name given to the thick deposit of incoherent, dark grey to dark brownish grey, plastic shales, which weather light grey to buff in places. It forms the uppermost bedrock formation over the greater part of eastern and central Saskatchewan. In the western part of the province it consists of a series of dark shales termed the Bearpaw formation. This is underlain by a series of sands, shales, and coal seams, known as the Belly River formation.

WATER-BEARING HORIZONS OF THE MUNICIPALITY

The rural municipality of Eyebrow occupies nine townships described as townships 19, 20, and 21, ranges 1, 2, and 3, west of the 3rd meridian. The centre of the municipality is located approximately 36 miles northwest of Moose Jaw. The valley of Thunder creek passes in a northeast and then in a northwest direction through the southern part of the municipality. Eyebrow hills are in the north-central part and the Missouri coteau extends into the northwestern part. Drainage in the southern part is to Thunder creek and in the northern part to Qu'Appelle valley, but there are no permanent streams in the municipality. Elevations range from a little less than 1,850 feet above sea-level in a low, flat area of about 2 square miles, apparently an old lake bottom, in the southeast corner of the municipality, to a little over 2,250 feet above sea-level in the "Coteau" region in the southwest corner.

Water-bearing Horizons in the Unconsolidated Deposits

A large part of the municipality is covered by glacial drift, till, or boulder clay which was deposited by the continental ice-sheet during its southward advance over the district. Ground water in the boulder clay is obtained from lenses or layers of sand and gravel which are usually small in extent and erratic in distribution. The morainal type of glacial deposits is thought to have been formed during temporary halts in the melting back of the ice-sheet or at the farthest limit of its advance. Such morainal glacial deposits are found in this municipality in the "Coteau" country in the southwest, and in two detached areas the long axes of which pass in a northwesterly direction through the municipality from a point about a mile north of Lake valley to a point about 3 miles southwest of the northwest corner of the municipality. The morainal deposits are generally similar to that of the boulder clay, but the surface is usually more hilly and the drainage in the belts is less well developed than in the

boulder clay areas; ground water occurrences are like those of the boulder clay. In the southwest quarter of the municipality there are two small areas underlain by sand and gravel that was washed out from the "Coteau"; in these deposits water will probably be found at slight depths. In the southeast there is a considerable area on both sides of the valley of Thunder creek that is underlain by clay that was deposited in lakes formed during the melting of the ice-sheet. In the northeast corner of the municipality there is also a small area of this clay. The lake clay usually contains little sand and is a poor source of ground water, but the lake clay deposits in this municipality are marginal and may contain sandy beds, so that the conditions for ground water are more favourable than in the central parts of a lake basin. The western part of the valley of Thunder creek is underlain by stream deposits of sand, silt, and gravel. From a point about 3 miles west of Eskbank this valley is underlain by boulder clay that has been modified by wave action of a glacial lake, the fine material having been washed away or mixed with silt or fine sand.

The distribution of the water-bearing sand and gravel in the unconsolidated deposits is so irregular that no well-defined water horizon that extends over a large part of the municipality exists. Ground water horizons of small extent are described under the townships in which they occur. The thickness of the drift is known only in a few wells. In township 19, range 2, the thickness at well 15 is reported as 115 feet, at well 25 as 159 feet, and at well 31 as 55 feet. In township 20, range 2, the drift is reported as 300 feet thick, a little south of Eskbank. Of these four wells only the first mentioned obtained water at the base of the drift. As the Bearpaw shale is exposed in the Eyebrow hills and in the valley of Thunder creek just west of the municipality, it is probable that the thickness of the drift decreases in these directions.

Water-bearing Horizons in the Bedrock

The Bearpaw marine shale bedrock underlies the glacial deposits over the whole municipality, but does not outcrop. The shale contains very little ground water, but there are beds of sand in the lower part of the formation that are water bearing and it is thought that the deep, soft water wells obtain their water from these sands. It is not possible to set the limits of these sands, but it is unlikely that they extend far south of the south boundary of township 19, nor far east of the east boundary of range 2. The depth to the deep, soft water sand in this municipality varies from about 360 to a little over 500 feet. The area of flowing artesian wells indicated on the map is controlled by the elevation of the surface. In 1931 the level of water in the deep, soft water wells in the vicinity of Mawer was 1,990 feet above sea-level. The deep, soft water is used for all purposes except irrigation. The Bruvold well, township 20, range 3, well No. 38, had a flow of 47 gallons a minute in 1931. The initial flow of the Canadian National Railways well at Mawer was very large, but it is not now used by the railway. The temperature of the deep, soft water usually ranges from 42 to 48 degrees.

The Belly River formation underlies the Bearpaw formation. The J. Aske well (township 19, range 3, well 16), the S.J. Campbell well, (township 19, range 1, well 23), and the W.E. Falkner well (township 21, range 1, well 31) are thought to obtain water from sands in the Belly River formation. Water from the Belly River sands is usually more highly mineralized, more salty, and less generally useful than water from the Bearpaw sands, and the depth to the water sand is usually more than that to the Bearpaw sands.

GROUND WATER CONDITIONS BY TOWNSHIPS

Township 19, Range 1

The valley of Thunder creek passes through the northwest part of the township and for about the last 2 miles is represented

by a low, flat area apparently marking a dry bed of a Recent lake. The southern two-thirds of the township is underlain by glacial lake deposits, chiefly clay with layers and lenses of sand. The northern third is underlain chiefly by boulder clay. The Bearpaw formation underlies the glacial deposits over the entire township.

In the southern two-thirds ground water occurs in sands in the glacial lake deposits at depths of generally less than 20 feet. In this part the supply of water is usually not sufficient for all purposes and several wells are dry or nearly dry in drought periods. The water in this part is hard, except the water from five wells in or near the valley of Thunder creek, where the water is alkaline but can be used for stock. No well-defined aquifer of considerable extent exists. Well No. 2 is 365 feet deep but did not apparently reach bedrock, a little water was obtained in gravel but it was poor in quality and the well is not in use.

In the northern third the depth of most of the wells ranges from 10 feet to 37 feet. Well No. 29 in the drift is 170 feet deep, and well 23 in the bedrock is 1,140 feet deep. No well-defined water horizons in the boulder clay exist. The water is hard, except in well No. 22 where soft water occurs and in well 23 where the water is rather salty, but is used for stock and can be used in small quantities by humans. There are no wells with "alkaline" water. Well No. 29 obtained water in sand at a depth of 170 feet; the water is usable for drinking but is slightly laxative. The water level is 135 feet below the surface or about 1,876 feet above sea-level. This well does not correspond in elevation of depth of well or of water level with well No. 2.

The soft water sand horizon that supplies the wells in Mawer district and elsewhere in the municipality does not apparently extend into this township. Well No. 2 is much deeper than the wells in Mawer district, and probably obtains its water from the Belly River formation which underlies the Bearpaw in this township. The

base of well No. 2 is 857 feet above sea-level, the base of the deep, soft water wells in Mawer district is about 1,575 feet to 1,600 feet above sea-level.

Township 19, Range 2

The valley of Thunder creek passes through the northeast part of the township, ground level rising towards the southwest to the edge of the Missouri coteau. Glacial lake deposits, including lake clays and the boulder clay modified by water action, occupy nearly half the township; about one square mile in the southeast corner is underlain by dune sand. The remainder of the township is underlain by glacial drift or boulder clay. Depth to water ranges from 9 feet to 90 feet. In the valley of Thunder creek, and in the dune sand area in the southeast, water will probably be found in sand or silt within a few feet of the surface. A bed of sand or gravel containing ground water appears to extend in a northwesterly direction from well No. 1 to well No. 31, the elevation of the bed being about 1,950 feet above sea-level. Depth to water varies with elevation of the surface from 18 feet to 65 feet. West of this area there is another ground water horizon about 1,980 feet above sea-level from which a number of wells obtain water. Another ground water horizon about 2,010 feet above sea-level occurs in sections 9 and 16. These ground water sands and gravels are usually overlain by a considerable thickness of clay. Bedrock is reported at a depth of 115 feet in well No. 15, at 159 feet in well 25, and at 55 feet in well 31. Bedrock in all these wells is considerably lower than 1,950 feet above sea-level, and it seems probable that the sands and gravels at elevations of about 1,950 feet and 1,980 feet above sea-level were formed during the melting away of an earlier ice-sheet. The soft water producing sand in the Bearpaw formation is not thought to underlie this township and wells drilled into the bedrock would probably obtain rather salty water from sands in the Belly River formation which underlies the Bearpaw

formation. The J. Aske well, township 19, range 3, well No. 16, obtained water at about 1,353 feet above sea-level and the T.J. Campbell well, township 19, range 1, well No. 23, obtained it at about 857 feet above sea-level.

The supply of water in most of the wells is sufficient for domestic purposes, but in a considerable proportion it is not sufficient for all purposes. The water is hard, except in three wells in which it is "alkaline." Dry holes to 112 feet deep are reported in the vicinity of well No. 6, and to 80 feet deep in the vicinity of well No. 7.

Township 19, Range 3

Thunder creek occupies a valley in which the sides slope gently and which passes in an easterly and northerly direction through the northern half of the township. The southwest corner is occupied by the Missouri coteau and elevations rise to over 2,250 feet above sea-level, although the slope upward is gradual. In the southeast there is a depression that is occupied by an irregularly shaped lake which has an elevation of 1,965 feet above sea-level. In the northwest corner elevations are over 2,000 feet above sea-level and a little north of the southeast corner elevations are over 2,100 feet above sea-level. Except for a small area in the southwest drainage is into Thunder creek, the valley of which is floored with alluvial deposits of sand, gravel, and silt.

That part of the township north of Thunder creek, except for sections 30, 31, and the western half of 32, is underlain by outwash sands from the coteau, but no wells are reported in this area. South of Thunder creek glacial drift of the knob and depression type, designated terminal moraine, occupies most of the country, but towards the north and west the glacial drift is in the form of boulder clay. In the valley of Thunder creek ground water will probably be found at slight depths in the alluvial sands and gravels. No wells have been dug in the area north of Thunder creek,

which is underlain by outwash sands, but should they be water will probably be found here also at slight depth. In the remainder of the township ground water appears to occur only in lenses or layers of sand in the glacial drift. The depth of the wells varies widely. North of Thunder creek, south of Thunder creek on the edge of the valley, and in the low area around the lake in the southeastern part the wells are 20 feet deep or less. Elsewhere the depth of the wells in the glacial deposits ranges from 25 feet to 114 feet. South of Thunder creek there is a bed of gravel and sand at an elevation of about 1,975 feet above sea-level which apparently supplies seven of the wells in that part; this bed was probably formed during the melting away of an earlier ice-sheet.

The water of most of the wells in the glacial deposits is hard, but in four wells in the southern third of the township the water is "alkaline," and in well 18, which is a seepage well near a slough, the water is soft. The supply of water is in many cases not sufficient for local needs.

The Bearpaw shale underlies the glacial deposits, and outcrops of the shale occur in the valley of Thunder creek just west of the township boundary. The sand that supplies the soft water to the deep wells in Mawer district probably does not extend far south into this township. The only bedrock well in the township is well No. 16 which obtained rather highly mineralized salty water from a bed of sand which is thought to be in the Belly River formation. The elevation of this sand is about 1,350 feet above sea-level.

Township 20, Range 1

In this township the ground level is generally flat or gently rolling. The slope is southwesterly towards the valley of Thunder creek from an elevation of a little over 2,050 feet above sea-level at a point north and west of Brownlee to about 1,975 feet above sea-level in the southwest corner of the township. Drainage is towards the south, but there are no permanent streams. An

irregularly shaped area of glacial deposits of the knob and depression or terminal moraine type, averaging about a mile in width, lies north and west from the southeast corner of the township to the western boundary of section 19. The rest of the township is underlain by glacial drift as boulder clay. Ground water occurs in lenses and discontinuous layers in the glacial clays. In the southern two-thirds hard water is usually obtained at depths of 25 feet or less. Ground water conditions seem to be generally more favourable in the boulder clay area than in the terminal moraine area. A bed of sand from which large quantities of soft water may be obtained, by the use of sand-points, lies in the vicinity of well No. 5 and supplies water to well No. 6 in the next township west. This sandy area seems to be of small extent, as other wells in the vicinity did not obtain water from it. The deepest well in the township is No. 27, which obtained water in coarse gravel at 352 feet, about 1,700 feet above sea-level, and passed through beds of quicksand at depths of 125 feet and 150 feet. The water was hard and "alkaline" and only rose 30 feet in the well. The coarse gravel was apparently deposited in a preglacial valley. The thickness of the glacial deposits is not known, but in the vicinity of Brownlee it is over 350 feet. The supply of water from the wells is generally not sufficient for all purposes and many of the residents use dugouts or sloughs to supplement the water supply; at a few farms water is hauled. Dry holes in the morainal area are reported up to 85 feet in well No.7, and 10 feet in well No. 15, and near well 25 dry holes up to 100 feet deep were put down.

The Bearpaw shale underlies the glacial drift. It is not known whether the sand that supplies soft water to the deep wells in Mawer district is present in this township, as no deep wells have been drilled, but conditions in adjacent townships seem to indicate that the sand does not extend so far east.

Township 20, Range 2

In this township the general slope of the surface is from the northeast, where elevations of about 2,025 above sea-level occur, to the southwest, where in the valley of Thunder creek elevations of a little less than 1,900 feet above sea-level occur. The valley of Thunder creek passes through the southwestern part, the creek bed being about 100 feet below prairie level on the south and about 50 feet below prairie level on the north. The country north of Thunder Creek valley is of the rolling type. Drainage is southward to Thunder creek. There are no permanent lakes or streams in the township.

The valley of Thunder creek is floored with alluvial deposits of sand, silt, and gravel in which water will probably be found near the surface. South of Thunder Creek valley there is an area of glacial outwash sands in which water will be found at shallow depths. North of Thunder Creek valley there is a belt, about one mile wide, underlain by boulder clay that has been washed by the waves of a glacial lake. There are no wells in this part. The remainder of the township is underlain by glacial drift as boulder clay, except for a small area of about $2\frac{1}{2}$ square miles in the northeast which is underlain by the knob and depression or terminal moraine type of glacial deposit. Ground water in these areas will be found in isolated pockets or lenses of sand and gravel.

Depths to water in the township ranges from 9 feet to 260 feet. In the northern half most of the wells are 30 feet deep or less, but two wells in the northwest corner and one in the southwest are over 60 feet deep. The deepest well is No. 9, 278 feet deep, in which hard water was obtained in gravel at a depth of 260 feet or at 1,720 feet above sea-level. The supply was large and the water was used for all purposes. Wells Nos.26,30, and 31 on the highway at the north of the township obtained soft water, but the last two seem to be seepage wells. Soft water was found at well 19, and at well No. 6, which is in an area of deep sand, in

which a large supply of water is obtained by the use of a sand-point. There are no well-defined ground water horizons in the glacial deposits, although a number of wells in the northern third of the township obtain water from an horizon about 1,995 feet above sea-level. Well No. 20 passed through 85 feet of clay and obtained no water. The supply of water in many of the wells is not sufficient, and ground water conditions are not very good. The thickness of the glacial deposits is not known; they are at least 278 feet thick in well No. 9.

The Bearpaw shale underlies the glacial deposits. How far into the township the sand bed that supplies soft water to the deep wells a little west of Darmody extends is not known, but it is unlikely that it reaches to the eastern boundary. Salty and rather highly mineralized water could probably be obtained from sands in the Belly River formation at about 850 feet to 950 feet above sea-level.

Township 20, Range 3

The surface of this township is generally of the rolling type of topography. Elevations range from a little over 2,000 feet above sea-level in the southwest to about 1,925 feet in the northeast corner, where the valley of Thunder creek passes just beyond the township boundary. Drainage of a small area in the northern part of the township is to Ridge creek and Qu'Appelle valley; drainage in the southern part is to Thunder Creek valley. About 2 square miles in the southern part is underlain by outwash sands in which water is generally found at slight depths. The knob and depression or terminal moraine type of glacial deposit underlies about half the township, and the glacial drift, till, or boulder clay type underlies the remainder. In both these latter types of glacial deposits ground water will be found in irregular pockets or beds of sand and gravel in the clay.

In the northern row of townships wells in the glacial deposits are 21 feet to 90 feet deep. In the rest of the township,

with the exception of wells Nos. 15, 21, and 25, which are between 40 feet and 50 feet deep, the wells are 25 feet deep or less. There are few well-defined water horizons, but a bed of sand and gravel at an elevation of about 1,945 feet above sea-level apparently supplies water to a number of the wells. It is apparently this bed that comes to the surface in the vicinity of well No. 9; the bed seems to be rather widespread and may be an interglacial outwash deposit. Ground water in the glacial deposits is hard, except in well No. 9 where it is soft and in well No. 8 where it is "alkaline". The supply of water derived from the shallow wells in the south half of the township is generally insufficient for all purposes. In the northern half the supply appears to be more satisfactory, but several wells in this part give only small supplies. A sandstone bed in the Bearpaw shale formation supplies soft water, which can be used for all purposes except irrigation, to a number of wells in the township. The depth to this sand within the township ranges from 400 feet to 508 feet and the elevation of the sand ranges from 1,475 feet to 1,636 feet above sea-level. Many of the wells flow; the maximum elevation of water level in the flowing wells is not known, but in a well just north of the township boundary this elevation is known to be 1,990 feet above sea-level and in well No. 7 in the southwest corner of the township the elevation of water level is 2,024 feet above sea-level. It seems probable that the sand bed underlies the whole township, although no deep wells have been drilled in the southeast part.

Township 21, Range 1

The general slope of the surface is towards the northeast. The country is generally rolling. Drainage is towards the north and northeast to Qu'Appelle river. The valleys of some of the tributaries to Qu'Appelle river penetrate the township for a short distance on the north. Elevations range from about 1,925 feet above sea-level in the northeast corner to about 2,075 feet

above sea-level near Eyebrow. An area of about 6 square miles in the northeast is underlain by glacial lake clays; the remainder of the township is underlain by glacial drift as till or boulder clay. Water in the glacial lake clays is usually obtained from sandy layers at depths of 28 feet to 50 feet. In the vicinity of well No. 41, thirteen dry holes up to 100 feet were put down. Well No.27 is close to the edge of the glacial lake clays; it passed through a series of beds of sand and clay and obtained water at a depth of 22 feet, about 1,928 feet above sea-level. Well No. 41 was drilled to a depth of 306 feet after thirteen dry holes up to 100 feet deep had been put down on the quarter section. The water in the drilled well was hard and slightly salty but was used for all purposes, although the supply was rather small. Well No. 11 passed through a bed of sand from 210 feet to 250 feet in depth (1,740 feet to 1,780 feet above sea-level). The supply was large enough for the requirements of two farms. The sand bed, as it is probably a lens in the clay, does not seem to extend north as far as well No. 41. The water of the wells in the south half of the township is hard and is generally usable for all purposes, but the supply is generally small and conditions for obtaining greater supplies of ground water do not appear to be very favourable. Most of the wells are 25 feet deep or less, but three of the wells are deeper, ranging from 51 feet to 260 feet deep.

In that part of the north half of the township underlain by glacial drift as boulder clay, most of the wells are deeper than those in the south part, depths ranging from 18 feet to 90 feet. No well-defined water horizons occur in the glacial deposits and ground water conditions are not very good. Dry holes to 90 feet deep were put down in the vicinity of well No. 19. Five dry holes were put down in the vicinity of well 25 to 75 feet deep, and in several of the wells the water supply is small. The water in most of the wells is hard, but in two wells a little over a mile east of Eyebrow the

water is "alkaline". The thickness of the glacial deposits is not known but in the eastern part it appears to be great, as wells Nos. 11 and 41, 306 feet and 260 feet deep, respectively, did not pass through it. The Bearpaw shale underlies the glacial deposits in this township. Well No. 31 is the only one that was drilled to bedrock. The water in this well was salty, rather "alkaline," and not fit for human use. The water sand is thought to be in the Belly River formation. It is reported that water was found in this well in very fine sand at 540 feet depth, or 1,544 feet above sea-level. This sand may be the one that supplies soft water to the wells in Mawer district. The supply of water derived from this sand was apparently too small to be of use, probably on account of the sand being too fine to be a good water producer.

Township 21, Range 2

Over most of the township the surface is rolling. The general slope is southwesterly. Elevations range from a little over 2,150 feet above sea-level in Eyebrow hills to a little less than 2,000 feet above sea-level in the southwestern corner. Direction of surface water run-off is westward or southwestward to the valley of Ridge creek and Qu'Appelle valley, but there are no streams or lakes in the township. In the south-central part there is a narrow depression a little over a mile long which may accommodate some of the run-off in the spring. With the exception of an irregularly shaped area of a little over one square mile on and near the western boundary, which is underlain by the knob and depression or terminal moraine type of glacial deposit, the whole township is underlain by glacial drift of the till or boulder clay type. Ground water in the glacial deposits will be found in lenses, pockets, or layers of sand and gravel which will probably be small in extent. The depth of the wells in the glacial deposits ranges from 8 feet to 90 feet, and no zoning by depth to ground water is possible. No widespread ground water producing sands or gravels appear to exist,

although there are a number of wells in the northern two-thirds of the township that have obtained water from a sand about 1,950 feet above sea-level. The water in most of the wells is hard, but may usually be used for all purposes. The water in wells 24 and 29 is less hard than that in most of the wells. Well 25 is a shallow seepage well in which the water is soft. In only one well, No. 26, is the water too "alkaline" for domestic use. The supply of water from wells is not always sufficient during dry seasons; and ground water conditions are not very favourable.

The Bearpaw formation underlies the glacial deposits. The only well in this township that was drilled to bedrock is No.2. This well is 500 feet deep; base of well about 1,535 feet above sea-level, water level about 2,016 feet above sea-level. Elevations of water level and water sand correspond generally with those of the deep, soft water wells near Mawer, but the water is too salty for human use. Salty water is often found in wells near the margin of a deep, soft water area and it seems probable that deep, soft water that may be drunk by humans would only be found in the western part of the township, although there is no information on which a definite boundary can be drawn. The fact that in well No. 31, township 21, range 1, the sand at the deep, soft water horizon was too fine to provide much water seems to show that the sand from which the water is obtained is petering out eastward.

Township 21, Range 3

The surface of most of the township is flat or gently rolling. The valley of Ridge creek passes in a northwesterly direction through the northern half of the township. Elevations range from a little less than 1,950 feet above sea-level in the valley of Ridge creek to a little over 2,000 feet above sea-level in two small summits located in the southeast, and the northwest part of the township, respectively. Drainage is northwestward into the valley of Ridge creek which is an intermittent stream.

There are several small, dry lake beds in the centre and south. An irregularly shaped area of about 5½ square miles in the central and eastern part is underlain by the knob and depression or terminal moraine type of glacial deposits. The rest of the township is underlain by glacial drift in the form of till or boulder clay. Ground water occurrences will be probably confined to small, discontinuous bodies and pockets of sand and gravel which occur in the glacial drift or the morainal deposits. Many wells in this township have obtained water from an horizon about 1,950 to 1,955 feet above sea-level, but the details of the horizon could not be obtained. Depth of wells in the glacial deposits ranges from 16 feet to possibly 333 feet. Well No. 34, 333 feet deep, is a flowing well but the water is very hard, contains much less mineral matter than the average deep, soft water, and the water is thought to come from a bed of sand in the glacial drift.

A number of wells obtain soft water, which can be used for all purposes except irrigation, from sand beds at or near the base of the Bearpaw formation. The elevation of water level in well No. 5 at the south boundary of the township was 1,990 feet above sea-level. Many of the wells are flowing, but the owner of well No. 28 reported a fall in water level of 40 feet between 1931 and 1935 and the well no longer flows. The elevation of water level in this well in 1935 was 1,956 feet above sea-level. A very large flow of water was obtained from the Canadian National Railways well at Mawer station.

STATISTICAL SUMMARY OF WELL INFORMATION IN RURAL MUNICIPALITY OF EYEBROW, NO.193, SASKATCHEWAN

West of 3rd mer.	Township / Range	19 / 1	19 / 2	19 / 3	20 / 1	20 / 2	20 / 3	21 / 1	21 / 2	21 / 3	Total No. in Municipality
Total No. of Wells in Township		36	56	27	38	40	45	69	57	55	423
No. of wells in bedrock		0	2	1	0	1	9	3	2	14	32
No. of wells in glacial drift		36	54	26	38	39	36	65	55	41	390
No. of wells in alluvium		0	0	0	0	0	0	1	0	0	1
Permanency of Water Supply											
No. with permanent supply		24	29	14	27	34	40	48	56	55	327
No. with intermittent supply		12	14	13	4	5	4	5	1	0	58
No. dry holes		0	13	0	7	1	1	16	0	0	38
Types of Wells											
No. of flowing artesian wells		0	0	0	0	0	9	0	0	12	21
No. of non-flowing artesian wells		20	20	13	20	22	16	29	47	32	219
No. of non-artesian wells		16	23	14	11	17	19	24	10	11	145
Quality of Water											
No. with hard water		34	41	25	24	33	33	52	53	38	333
No. with soft water		2	2	2	7	6	12	1	4	17	53
No. with salty water		0	0	1	0	0	0	2	1	0	4
No. with "alkaline" water		7	11	7	4	7	7	9	11	7	70
Depths of Wells											
No. from 0 to 50 feet deep		35	40	21	34	34	32	48	34	38	316
No. from 51 to 100 feet deep		0	9	4	4	5	4	17	21	3	67
No. from 101 to 150 feet deep		0	6	1	0	0	0	0	1	0	8
No. from 151 to 200 feet deep		1	1	0	0	0	0	0	0	0	2
No. from 201 to 500 feet deep		0	0	0	0	1	8	3	1	14	27
No. from 501 to 1,000 feet deep		0	0	1	0	0	1	1	0	0	3
No. over 1,000 feet deep		1	0	0	0	0	0	0	0	0	1
How the Water is used											
No. usable for domestic purposes		29	30	23	26	32	37	35	40	37	289
No. not usable for domestic purposes		7	13	4	5	7	7	18	17	18	96
No. usable for stock		35	42	27	28	36	43	45	51	52	359
No. not usable for stock		1	1	0	3	3	1	8	6	3	26
Sufficiency of Water Supply											
No. sufficient for domestic needs		32	43	27	31	39	42	47	57	55	373
No. insufficient for domestic needs		4	0	0	0	0	2	6	0	0	12
No. sufficient for stock needs		14	24	15	13	20	27	30	42	44	229
No. insufficient for stock needs		22	19	12	18	19	17	23	15	11	159

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 and unless the figure is very high it does not imply that the water is too alkaline for irrigation purposes. The analyses are given in parts per million--that is, in parts by weight of the constituents in 1,000,000 parts by volume 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 practically all rocks, but in larger amounts from limestone, dolomite, and gypsum. The calcium and magnesium salts impart hardness to water. The magnesium salts are laxative, especially magnesium sulphate (Epsom Salts, $MgSO_4$), and they are more detrimental to health than the lime or calcium salts. The calcium salts have no laxative or other deleterious effects. The scale found on the inside of steam boilers and teakettles 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, and waters that contain a large amount of them cannot be used for irrigation.

Sulphates

Sulphates (SO_4) are one of the common constituents of natural water. The sulphate salts most commonly found are sodium sulphate (Glauber's Salt, Na_2SO_4), magnesium sulphate (Epsom

Salts, $MgSO_4$) and calcium sulphate ($CaSO_4$). Waters that contain these sulphate salts are called "sulphated waters". When the water contains large quantities of the sulphate of sodium ("White Alkali") it is injurious to vegetation and cannot be used for irrigation. According to Thresh and Beale, London, the continued use of water that contains 1,200 parts or more per million of magnesium sulphate and 500 parts or more per million of sodium sulphate causes diarrhoea and scour among stock, and one half this quantity makes the water unfit for domestic use.

Chlorides

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

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 out 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 had 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 to the bicarbonates of calcium and magnesium, 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. The following table from "The Examination of Water and Water Supplies" by Thresh and Beale, London, 1925 , can be used for determining the relative hardness of a water.

Total Hardness	Character
Less than 50 parts per million.	Very soft
50 - 100 " " "	Moderately soft
100 - 150 " " "	Slightly hard
150 - 200 " " "	Moderately hard
200 - 300 " " "	Hard
Over 300 " " "	Excessively hard

Many of the Saskatchewan water samples analysed by the Geological Survey 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.

The term "alkaline" has been applied rather loosely to some ground waters. Its original meaning was a chemical one and it implied that the substance in question would neutralize acids. The carbonates of calcium, magnesium, and sodium are the only compounds found in ground water that would make it alkaline chemically. A later application of the term "alkaline" was to soils that contain sufficient "black alkali" or "white alkali" to make them unfit for vegetation. In the Prairie Provinces a water is usually considered to be alkaline when it contains so much dissolved solids that it is not very suitable for human consumption; except that 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".

Analyses of Water Samples from the Municipality of Eyebrow, No. 193, Saskatchewan

LOCATION					Depth of Well, Ft.	Total dis'vd Solids	Cl.	HARDNESS			CONSTITUENTS AS ANALYSED					CONSTITUENTS AS CALCULATED IN ASSUMED COMBINATIONS								Source of Water
Qtr.	Sec.	Tp.	Rge.	Mer.				Total	Perm.	Temp.	Alkalinity	CaO	MgO	SO_4	Na_2O	Solids	$CaCO_3$	$CaSO_4$	$MgCO_3$	$MgSO_4$	Na_2CO_3	Na_2SO_4	NaCl		
NW.	6	20	3	3	400	1,820	193				510														x 2
SW.	26	20	3	3	457	1,626															(2)	(1)	(3)		x 2
SW.	32	21	1	3	90	297											(3)	(1)		(2)					x11
NE.	10	21	2	3	45	2,029											(4)	(1)		(2)		(3)			x 1
NE.	16	21	2	3	70	1,189											(3)	(1)		(2)		(4)			x 1
SW.	5	21	3	3	392	1,560		45	40	5											498	789	163		x 2

Water samples indicated thus, x 1, are from glacial drift or other unconsolidated deposits.
Water samples indicated thus, x 2, are from bedrock, Bearpaw formation.
Analyses are reported in parts per million; where numbers (1), (2), (3), and (4) are used instead of parts per million, they represent the relative amounts in which the four main constituents are present in the water.
Hardness is the soap hardness expressed as calcium carbonate ($CaCO_3$).
Analyses Nos. 2, 3, 4, and 5, by Provincial Analyst, Regina; Analysis No. 6, by Andrés and Cruickshank, Regina.
For interpretation of this table read the section on Analyses and Quality of Water.

Water from the Unconsolidated Deposits

The composition of ground water from the unconsolidated deposits varies widely even within short distances, and it is only possible to make generalizations as to its composition. Water from the glacial boulder clay, the morainal deposits, and the lake clays is usually harder and contains more mineral matter than water from sandy deposits such as dune sands or sandy outwash deposits. The rapidity of circulation of the ground water also seems to influence the amount of total dissolved solids in the water. The table of analyses shows that water from the third well on the list, although it is in an area underlain by boulder clay, contains only 297 parts per million of total dissolved solids. The well is located close to the head of the valley of a creek that runs into Qu'Appelle valley, and ground water circulation may be more rapid than in flat, poorly drained areas.

The usual composition of hard water in the glacial deposits is fairly well shown by the fourth and fifth analyses in the table. Calcium sulphate ($CaSO_4$), and magnesium sulphate ($MgSO_4$), are the chief salts, both of which give permanent hardness to the water. Calcium sulphate is tasteless and has no laxative effect. Sodium sulphate or Glauber's Salts (Na_2SO_4) is usually present, but in less quantities than calcium sulphate or magnesium sulphate. Sodium sulphate is less laxative than magnesium sulphate, and unless it is present in large proportions it does not affect the taste of the water noticeably. Calcium carbonate ($CaCO_3$) makes the water hard, but it is tasteless and has no laxative effect. Sodium chloride or common salt (NaCl) is often present in solution in water from the glacial deposits, but is usually in such small quantities that it does not affect the taste or use of the water. Calcium chloride ($CaCl_2$) makes water permanently hard, but it is usually also present in amounts too small to affect the taste or use of the water. Sodium carbonate occasionally is found in solution in the ground water

from the glacial deposits. Sodium carbonate gives a flat, soda taste to water and water containing it blackens tea or coffee. Sodium carbonate unless present in considerable amounts has little harmful effect.

Few ground waters from the glacial deposits contain enough "alkali" to make them unfit for irrigation, and the calcium sulphate that they contain tends to counteract the effects of the "alkali", but in this municipality the supply of water from most of the wells in the glacial deposits is too small for irrigation purposes. Well No. 5, township 20, range 1, and well No. 6, township 20, range 2, obtain water from sand-points in a thick deposit of sand. The supply of water is large and the water is described as "soft", but no analysis is available. The occurrence of water seems similar to that in the dune sand areas of some of the forest reserves where large amounts of comparatively soft water may be pumped from sand-points. Most of the wells that yield "alkali" water are located in the southern 2 miles of this municipality, but a few occur farther north.

Water from the Bedrock

In this municipality there are two general types of water derived from the bedrock; the water from the sands at or near the base of the Bearpaw formation which is soft, except in one well, and is used for all purposes except irrigation; and the water from sands in the Belly River formation, which contain more dissolved solids than water from the Bearpaw, is generally rather salty, and is not fit for human use. This municipality is in the eastern part of the Darmody-Riverhurst artesian area and many of the deep wells in township 20, range 3, and township 21, range 3, have fairly large flows. The water contains sodium sulphate, sodium carbonate, and sodium chloride, relative abundance in the order given. In the Canadian National Railways well at Mawer the proportion of the three salts is about 5 : 3 : 1. The water is not good for irrigation,

as it contains so large a proportion of sodium salts, about half of which is "black alkali", and as it contains practically no calcium sulphate. It is used for drinking by humans and although it is slightly laxative, due to the sodium sulphate it contains, it is only in large quantities that the laxative effect is noticeable. For stock living on dry feed during the winter the laxative effect is an advantage. The flat soda taste of the water is not noticeable when the water is cold; the temperature at the wells is generally 42 to 48 degrees. At well No. 3, township 21, range 3, the water is salty; this condition seems to show that this well is at or close to the margin of the artesian area.

No analysis of water from wells in the Belly River formation is available. The water is described as soft and salty, and it seems probable that the water contains more total dissolved solids and a much larger proportion of sodium chloride than the water from the Bearpaw formation. It is probably less well adapted for irrigation than the water from the Bearpaw formation.

WELL RECORDS—RURAL MUNICIPALITY OF EYE BROW, NO. 193, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
1	SW.	1	19	1	3	Dug	16	1,900	- 12	1,888	16	1,884	Glacial sand	Hard	44		
2	NE.	2	"	"	"	Drilled	365	1,910	-182	1,728	365	1,545	" drift			N	Small amount;poor quality water; well abandoned.
3	SW.	4	"	"	"	Dug	25	1,900	- 20	1,880	25	1,875	" sand	"	42	D, S,	Sufficient supply.
4	NE.	5	"	"	"	"	18	1,875	- 8	1,867	18	1,857	" quick-sand	" slightly alkaline	43	D	Stock watered from neighbor's well.
5	SE.	6	"	"	"	"	16	1,945	- 12	1,933	16	1,929	Glacial drift	" ,hard	42	S	Insufficient supply; another 12' well for house
6	SE.	7	"	"	"	"	17	1,905	- 13	1,892	-17	1,888	" "	Hard	44		
7	SE.	8	"	"	"	"	12	1,860	- 8	1,852	12	1,848	" quicksand	" ,alkaline	42	S	Sufficient for stock; laxative.
8	NE.	10	"	"	"	"	16	1,900	- 6	1,894	16	1,884	" clay	Hard,alkaline	43	S	Dugout also used.
9	NW.	13	"	"	"	"	17	1,975	- 11	1,964	17	1,958	" "	Hard	43	D, S	Supply sufficient.
10	SW.	14	"	"	"	"	14	1,925	- 6	1,919	14	1,911	" "	"	43	D, S	" depending on slough.
11	NE.	16	"	"	"	"	14	1,940	- 8	1,932	14	1,926	" "	"	44	S	" " " " .
12	SE.	18	"	"	"	"		1,890						" alkaline	43	S	
13	NE.	18	"	"	"	"	14	1,860	- 9	1,851	14	1,846	" quicksand	" , little iron	43	D, S	" sufficient.
14	NE.	20	"	"	"	"	18	1,950	- 6	1,944	18	1,932	" clay	Hard	42	D, S	Another 16' seepage well; supply sufficient.
15	NW.	21	"	"	"	"	17	1,950	- 5	1,945	17	1,933	" "	"	43	D, S	" well used for stock; " " .
16	SW.	23	"	"	"	"	14	1,960	- 8	1,952	14	1,946	" drift	"		D, S	Supply sufficient except in dry seasons.
17	SW.	27	"	"	"	"	25	1,980	- 10	1,970	25	1,955	" clay	",slightly alkaline	42	D, S	" " .
18	NE.	28	"	"	"	"	37	1,975	- 33	1,942	37	1,938	" gravelly sand	Hard	42	D, S	" insufficient.
19	SE.	28	"	"	"	"	30	1,985	- 25	1,960	30	1,955	" clay	"	43	D, S	" sufficient.
20	SW.	29	"	"	"	"	26	1,945	- 18	1,927	26	1,919	" sandy clay	"	43		
21	NE.	30	"	"	"	"	24	1,955	- 18	1,937	24	1,931	" quicksand	Fairly hard	43	D, S	" " .
22	NW.	30	"	"	"	"	21	1,955	- 18	1,937	21	1,934	" "	Soft	42	D, S	Another 30' well in house; supply insufficient.
23	NW.	31	"	"	"	Drilled	1,140	1,997			1,140	857	Sandstone probably Belly River formation	Salty		S	Large supply.
24	SE.	33	"	"	"	Dug	20	1,985	- 15	1,970	20	1,965	Glacial clay	Hard	42	D, S	Another 30' well also used; supply small.
25	SW.	34	"	"	"	"	16	1,995	- 14	1,981	16	1,979	" quicksand	"	42	D, S	Supply sufficient.
26	NE.	34	"	"	"	"	30	2,006	- 10	1,996	30	1,976	" "	"	43	D, S	" not sufficient except in wet years.
27	SE.	35	"	"	"	"	21	2,005	- 10	1,995	21	1,984	" drift		43		Farm deserted.

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

WELL RECORDS—RURAL MUNICIPALITY OF EYE BROW , NO. 193, SASKATCHEWAN

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (−) Surface	Elev.	Depth	Elev.	Geological Horizon				
28	SE.	36	19	1	3	Dug	10	2,006	- 5	2,001	10	1,996	Glacial quick-sand	Hard	42	S	Three other shallow wells on farm.
29	NW.	36	"	"	"	Drilled	170	2,011	-135	1,876	170	1,841	Glacial sand	"		D, S	Supply sufficient.
1	NW.	1	19	2	2	Dug	18	1,960	- 17	1,943	18	1,942	" "	"	42	D, S	Water from neighboring farm also used.
2	SW.	2	"	"	"	"	25	1,995	- 14	1,981	25	1,970	" "	", alkaline	42	S	Another 23' well used for house.
3	SE.	4	"	"	"	"	30	2,000	- 15	1,985	30	1,970	" "	"		D	" 29' " " " stock; sufficient.
4	NE.	5	"	"	"	Bored	40	2,020	- 30	1,990	40	1,980	" clay	", slightly alkaline	43	D, S	Supply usually insufficient for stock.
5	SE.	6	"	"	"	Dug	21	2,060	- 15	2,045	21	2,039	" "		44		Farm deserted.
6	NE.	7	"	"	"	Bored	40	2,045	- 20	2,025	40	2,005	" "	"		D, S	Supply sufficient; 4 dry holes on farm.
7	NW.	8	"	"	"	"	86	2,040			86	1,954	" "	" , iron	42	D, S	" " ; 2 " " dug out also used.
8	NE.	9	"	"	"	Dug	18	2,025	- 12	2,013	18	2,007	" "	", slightly alkaline		D, S	" " .
9	SW.	9	"	"	"	Bored	90	2,030	- 70	1,960	90	1,940	" "	", slightly alkaline		D, S	" " .
10	NW.	10	"	"	"	"	90	2,010	- 25	1,985	90	1,920	" "	" "	42	S	" " ; another 14' house well.
11	NE.	11	"	"	"	Dug	12	2,000	- 9	1,991	12	1,988	" "	", slightly alkaline	43	D, S	" " .
12	SW.	13	"	"	"	"	40	1,965	- 36	1,929	40	1,925	" quicksand	"	42	D, S	Another 35' well for stock.
13	SE.	14	"	"	"	"	18	1,968	- 13	1,955	18	1,950	" sandy clay	"	42	D, S	Supply sufficient.
14	NW.	14	"	"	"	"	18	1,970	- 16	1,954	18	1,952	" quicksand	"	43	D, S	Small supply in well; dugout used for stock.
15	NW.	14	"	"	"	"	18	1,975	- 16	1,959	18	1,957	" clay	"	43	D, S	" " ;another 115' well on farm.
16	SW.	16	"	"	"	"	33	2,040	- 23	2,017	33	2,007	" sand	"	43	D, S	Supply sufficient.
17	NE.	16	"	"	"	Bored	16	2,016	- 8	2,008	16	2,000	" drift	Fairly hard	42	D	Stock watered from spring and 3 other wells.
18	SE.	17	"	"	"	Dug	25	2,012	- 20	1,992	25	1,987	" clay	Hard	42	D, S	Supply sufficient.
19	NE.	18	"	"	"	"	27	2,012	- 25	1,987	27	1,985	" sand	"		D, S	Water not sufficient.
20	SE.	19	"	"	"	Bored	49	2,030			49	1,981	" clay	"		D, S	Supply sufficient.
21	NE.	19	"	"	"	Dug	38	2,020	- 35	1,985	38	1,982	" "	", alkaline		S	Another 110' house well.
22	SW.	20	"	"	"	"	16	2,025	- 10	2,015	16	2,009	" "	"		D, S	Supply sufficient.
23	NE.	21	"	"	"	"	28	2,012	- 24	1,988	28	1,984	" drift	"	42	S	" insufficient; another well for stock.
24	NE.	22	"	"	"	"	19	1,975	- 17	1,958	19	1,956	" sand	"	41	D	Two other wells used for stock, 10' and 30'.
25	SW.	23	"	"	"	"	24	1,975	- 22	1,953	24	1,951	" clay	"	43	D, S	Another similar well; also a 160' dry hole; supply insufficient.

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(#) Sample taken for analysis.

WELL RECORDS—RURAL MUNICIPALITY OF EYE BROW, NO. 193, 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
26	NE.	27	19	2	3	Dug	9	1,900	- 7	1,993	9	1,991	Glacial clay	Hard	43	D, S	Supply sufficient.
27	NW.	28	"	"	"	Bored	65	2,016	- 35	1,981	65	1,951	" sand,gravel	"	43	D, S	" " .
28	SE.	28	"	"	"	Dug	24	2,010	- 21	1,989	24	1,986	" gravel	"	43	D, S	" insufficient for stock.
29	SE.	30	"	"	"	"	26	2,004	- 16	1,988	26	1,978	" clay	",alkaline		S	Drinking water hauled.
30	NE.	32	"	"	"	"	40	1,981	- 33	1,948	40	1,941	" sand,gravel	"		D, S	Supply insufficient for stock.
31	NW.	32	"	"	"	Bored	28	1,980	- 23	1,957	28	1,952	" sandy clay, sand	Fairly soft	41	D, S	" " ; 12 dry holes up to 55'.
32	SE.	32	"	"	"	"	84	2,000	- 40	1,960	84	1,916	Glacial gravel	Hard	43	N	Farm deserted.
1	SE.	2	19	3	3	Dug	12	1,980	- 11	1,969	12	1,968	" sand	"	42	D, S	Supply sufficient.
2	NE.	2	"	"	"	"	20	2,090	- 5	2,085	20	2,070	" " , gravel	"	43	D, S	" " ; dugout and other wells for stock.
3	SW.	4	"	"	"	"	28	2,000	- 24	1,976	28	1,972	" gravelly clay	"	42	D, S	Supply insufficient.
4	SW.	5	"	"	"	"	40	2,200	- 20	2,180	40	2,160	" "	",alkaline	43	S	" " .
5	SE.	6	"	"	"	Bored	40	2,200	- 20	2,180	40	2,160	" gravel	" "	42	D, S	Only drinkable for humans when used with lemon.
6	NW.	10	"	"	"	"	90	2,050	- 60	1,990	90	1,960	" "		42	S	Another 25' house well; laxative.
7	NE.	10	"	"	"	"	114	2,050	-100	1,950	114	1,936	" clay	" "	42	S	" 60' " " .
8	NW.	12	"	"	"	Dug	25	2,055	- 15	2,040	25	2,030	" "	"	42	D, S	Supply sufficient.
9	SE.	12	"	"	"	"	50	2,080	-31	2,049	50	2,030	" "	"	43	D, S	" " except in dry season.
10	SE.	16	"	"	"	Bored	80	2,040			80	1,960	" quicksand	" , iron	43	D, S	" " .
11	NE.	18	"	"	"	Dug	9	1,995	- 7	1,988	9	1,986	" gravel	"	43	D, S	" " .
12	NW.	22	"	"	"	"	11	1,990	- 9	1,981	11	1,979	" "	",slightly alkaline	44	D, S	" " .
13	SE.	22	"	"	"	"	40	2,000	- 20	1,980	40	1,960	" clay	",slightly alkaline	42	D, S	" " .
14	NE.	22	"	"	"	"	38	1,975	- 26	1,949	38	1,937	" quicksand	"	43	D, S	Another 8' well; supply not always sufficient.
15	NE.	24	"	"	"	"	24	2,005	- 14	1,991	24	1,981	" sand	"		D, S	Supply insufficient in winter.
16	SE.	25	"	"	"	Drilled	640	1,993	- 14	1,979	640	1,353	Belly River?sand	Salty	43	S	Used for washing and cooking.
17	SE.	25	"	"	"	Dug	60	1,970	- 20	1,950	60	1,910	Glacial clay	Hard,slightly alkaline	43	D	Small supply.
18	NW.	30	"	"	"	"	13	1,990	- 11	1,979	13	1,977	" sand	Soft		D, S	Supply sufficient? apparently; seepage well.
19	NW.	31	"	"	"	"	15	2,025	- 10	2,015	15	2,010	" clay	Hard	42		
20	NE.	36	"	"	"	"	20	1,910	- 17	1,893	20	1,890	" sand	"		D, S	Supply sufficient.

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(#) Sample taken for analysis.

WELL RECORDS—RURAL MUNICIPALITY OF EYE BROW, NO. 193, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
1	SW.	1	20	1	3	Dug	21	2,005	- 14	1,991	21	1,984	Glacial clay			D, S	
2	SE.	2	"	"	"	"	21	2,015	- 11	2,004	21	1,994	" "	Rather soft	43	D, S	One other well; supply sufficient.
3	NE.	4	"	"	"	"	20	2,000	- 15	1,985	20	1,980	" drift	Hard	43	D, S	Sufficient for 14 head.
4	NE.	6	"	"	"	"	19	2,000	- 13	1,987	19	1,981	" clay	Soft	43	D, S	" " 40 " stock;another 30' well only for stock.
5	SW.	7	"	"	"	"	42	2,005	- 30	1,975	42	1,963	" quicksand	"	42	D, S	Sand-point used; very large supply.
6	NE.	8	"	"	"	Bored	26	1,990	- 12	1,978	26	1,964	" sandy clay	Hard		D, S	One other 12' well for stock; for 50 head stock.
7	NW.	10	"	"	"	"	85	2,005			85	1,920	" stony "				Dry hole; another 12' well dependent on slough; supply insufficient
8	NW.	10	"	"	"	Dug	21	2,010	- 13	1,997	21	1,989	" clay	"	43	D, S	" sufficient for at least 1 cow; dugout also used.
9	SE.	12	"	"	"	"	13	2,025	- 7	2,018	13	2,012	" sandy clay	"	42	D	Dugout used for 6 head stock; insufficient.
10	SW.	12	"	"	"	"	19	2,025	- 13	2,012	19	2,006	" " "	"	42	D	
11	NE.	12	"	"	"	"	25	2,025	- 22	2,003	25	2,000	" clay	",slightly alkaline	42	D	Another 16' well for 14 head stock.
12	NE.	14	"	"	"	"	26	2,030	- 15	2,015	26	2,004	" quicksand	"	43	D, S	Sufficient for 20 head stock; dugout also used.
13	NW.	14	"	"	"	"	20	2,025	- 8	2,017	20	2,005	" sandy clay	"	42	D, S	" " 26 " " ; " " "
14	NW.	15	"	"	"	Bored	24	2,025	- 16	2,009	24	2,001	" clay	" ,iron	42	D, S	Supply insufficient; " " "
15	SW.	16	"	"	"	Dug	10	2,010			10	2,000				N	Dry hole.
16	NE.	16	"	"	"	"	12	2,010	- 9	2,001	12	1,998	" quicksand	"	43	D, S	Supply barely sufficient.
17	NW.	17	"	"	"	"	28	2,010	- 25	1,985	28	1,982	" "	"		D, S	Sufficient for 15 head stock.
18	NE.	18	"	"	"	"	22	2,000	- 14	1,986	22	1,978	" drift	"	44		Farm deserted.
19	SE.	19	"	"	"	"	21	2,020	- 18	2,002	21	1,999	" clay	"	43	D	Another 12' well for 23 head stock; supply sufficient.
20	SE.	22	"	"	"	"	20	2,020	- 10	2,010	20	2,000	" black clay	Fairly hard	43	D, S	" with dugout for 8 head stock.
21	SW.	22	"	"	"	"	21	2,030	- 14	2,016	21	2,001	" quicksand	Hard		D	Another well for stock; supply sufficient for 5 head stock.
22	SW.	24	"	"	"	"	28	2,045	- 14	2,031	28	2,017	" clay	"	43	D, S	With 2 dugouts, sufficient for 22 head stock.
23	NE.	24	"	"	"	"	17	2,035	- 11	2,024	17	2,018	" quicksand	Fairly soft		D	Dugout sufficient for 9 head stock.
24	SE.	30	"	"	"	"	15	2,040-	- 5	2,035	15	2,025	" clay	Hard	43	S	" for stock; supply insufficient.
25	SE.	34	"	"	"	Bored	60	2,055			60	1,995	" "			N	Dry hole; other dry holes up to 100'.
26	NE.	35	"	"	"	Dug	20	2,060	- 14	2,046	20	2,040	" sand	"	43	D, S	Dugout for 20 head in summer; supply insufficient.
27	SW.	36	"	"	"	Drilled	352	2,050	-322	1,728	352	1,698	" "	",alkaline			

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(#) Sample taken for analysis.

WELL RECORDS—RURAL MUNICIPALITY OF EYE BROW, NO. 193, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
1	NE.	1	20	2	3	Dug	20	1,990	- 12	1,978	20	1,970	Glacial clay	Hard, cloudy		D, S	Well used by shcool in village of Eskbank.
2	NE.	3	"	"	"	"	18	1,955	- 12	1,943	18	1,937	" "	"	44		Farm deserted.
3	SW.	4	"	"	"	"	16	1,960	- 14	1,946	16	1,944	" "	"	42	D, S	Supply sufficient.
4	NW.	6	"	"	"	"	12	1,955	- 10	1,945	12	1,943	" drift	", alkaline	43	S	Water hauled for house; supply insufficient.
5	NE.	9	"	"	"	Bored	32	1,960	- 13	1,947	32	1,928	" "	" "	43	S	Farm deserted.
6	NE.	12	"	"	"	Dug	33	2,005			33	1,972	" quicksand	Fairly soft	42	D, S	Another 14' well for stock; sufficient for 14-20 head stock.
7	SE.	14	"	"	"	"	26	1,995	- 17	1,978	26	1,969	" sandy clay	Hard	43	D, S	Only sufficient for 6 head stock.
8	NW.	14	"	"	"	"	15	2,005	- 9	1,996	15	1,990	" " "	"		D, S	
9	SE.	15	"	"	"	Drilled	278	1,980	- 18	1,962	260	1,720	" gravel	"		D, S	Large supply.
10	SE.	16	"	"	"	Bored	69	1,980	- 63	1,917	69	1,911	" blue clay	", slightly alkaline	43	D, S	C.N.R. dam used for stock.
11	SW.	16	"	"	"	"	30	1,960	- 15	1,945	30	1,930	" drift		43		Farm deserted.
12	NW.	18	"	"	"	Dug	18	1,955	- 8	1,947	18	1,937	" blue clay	"	43	D, S	Supply insufficient; water hauled for stock.
13	NW.	19	"	"	"	"	16	1,980			16	1,964				S	" " ; another 80' well with very alkaline water.
14	SW.	20	"	"	"	"	11	1,970	- 7	1,963	11	1,959	" clay	"	44	D, S	Seepage well; supply probably insufficient.
15	NW.	22	"	"	"	Bored	37	2,000	- 22	1,978	37	1,963	" drift		43	N	
16	SE.	22	"	"	"	"	32	2,000	- 18	1,982	32	1,968	" black quicksand	"	44		Farm deserted.
17	SE.	24	"	"	"	"	62	1,995	- 36	1,959	62	1,933	" drift	"		D, S	
18	NW.	25	"	"	"	Dug	13	2,010	- 12	1,998	13	1,997	" "	"			" " .
19	SE.	27	"	"	"	"	12	2,015	- 9	2,006	12	2,003	" sand	Soft		D, S	Another 12' well; supply sufficient.
20	NW.	27	"	"	"	"	23	2,005	- 15	1,990	23	1,982	" clay	Hard	42	S	Dry hole 85' deep, water for house hauled.
21	SE.	28	"	"	"	"	18	2,002	- 14	1,988	18	1,984	" "	"	43	D, S	Another 24' well; sufficient for 17 head stock.
22	NW.	28	"	"	"	"	20	2,010	- 18	1,992	20	1,990	" "	"	43	S	" 30' house well; supply insufficient for stock.
23	NW.	29	"	"	"	Bored	75	1,990	- 49	1,941	75	1,915	" "	"	42	D, S	Supply sufficient.
24	NW.	30	"	"	"	Dug	11	1,980	- 7	1,973	11	1,969	" drift	", cloudy	43	S	Seepage well.
25	NE.	31	"	"	"	Bored	60	2,010			60	1,950	" sand	", iron		D, S	Supply sufficient for 23 head stock.
26	NE.	32	"	"	"	Dug	20	1,990	- 15	1,975	20	1,970	" drift	Soft	43	D	Stock watered elsewhere; supply insufficient.
27	SE.	32	"	"	"	"	31	2,000	- 21	1,979	31	1,969	" gravel	Hard	43	D, S	Sufficient for 20 head stock.
28	SW.	33	"	"	"	Bored	41	2,005	- 21	1,984	41	1,964	" "	"	43	N	

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(#) Sample taken for analysis.

WELL RECORDS—RURAL MUNICIPALITY OF EYE BROW, NO. 193, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
29	SE.	34	20	2	3	Dug	30	2,020	- 24	1,996	30	1,990	Glacial gravel	Hard, slightly alkaline	43	S	Another 20' well for house and stock. Sufficient for 28 head stock.
30	NE.	34	"	"	"	"	11	2,005	- 5	2,000	11	1,994	" drift	Soft	44	S	" " 14 " " ; another 14' well for house.
31	NE.	36	"	"	"	"	9	2,005	- 7	1,998	9	1,996	" sand	"	43	D, S	
1	SE.	1	20	3	3	Dug	10	1,945			10	1,935	" drift	Hard		N	Well dry July 1935.
2	SE.	2	"	"	"	Bored	25	1,950	- 22	1,928	25	1,925	" "	"	38	D, S	Another 30' well; supply insufficient.
3	NE.	2	"	"	"	Dug	11	1,966	- 10	1,956	11	1,955	" quicksand	"	43	D, S	Sufficient for 15 head stock.
4	SW.	2	"	"	"	Bored	13	1,930	- 12	1,918	13	1,917	" drift		44		Farm deserted.
5	SE.	3	"	"	"	Dug	11	1,940	- 7	1,933	11	1,929	" gravel	"	42	D, S	Another 20' well; supply insufficient.
6	NW.	5	"	"	"	"	10	1,990	- 9	1,981	10	1,980	" drift	"	43		Farm deserted.
7	NW.	6	"	"	"	Drilled	400	2,024	- 2	2,022	400	1,624	Bearpaw? sand	Soft	45		Supply sufficient.
8	SW.	12	"	"	"	Bored	20	1,970	- 9	1,961	20	1,950	Glacial clay	Hard, alkaline	43	S	" " for 100 head stock; water for house is hauled.
9	SE.	13	"	"	"	Dug	7	1,950			6	1,944	" sand, gravel	Rather soft.	48	D, S	Another well 7' deep not used; sufficient.
10	SE.	15	"	"	"	"	7	1,952	- 6	1,946	7	1,945	" drift	Hard			Farm deserted.
11	NE.	15	"	"	"	"	9	1,952	- 5	1,947	9	1,943	" "	"	44		" "
12	NW.	15	"	"	"	"	18	1,962	- 15	1,947	18	1,944	" clay, sand	", slightly alkaline		D, S	Sufficient for 15 head stock.
13	SE.	16	"	"	"	"	10	1,963	- 8	1,955	10	1,953	" "	"	43	S	Seepage well; another 17' well for house; supply insufficient.
14	NW.	16	"	"	"	"	50	1,968	- 12	1,956	50	1,918	" drift	", slightly alkaline	42	S	" sufficient for 8 head stock; water hauled for house.
15	NE.	17	"	"	"	"	16	1,968	- 12	1,956	16	1,952	" sand, gravel	"	42	D, S	Sufficient for 14 head stock.
16	NW.	17	"	"	"	"	12	1,978	- 11	1,967	12	1,966					Farm deserted.
17	NE.	18	"	"	"	Drilled	425	1,989	+ 10	1,999	425	1,564	Bearpaw? sandstone	Soft	48	D, S	Flows 3 gallons a minute.
18	SE.	18	"	"	"	Dug	14	1,995	- 10	1,985	14	1,981	Glacial drift				Seepage well; farm deserted.
19	SW.	20	"	"	"	Bored	14	1,992	- 3	1,989	14	1,978	" "	Hard	43	D, S	Supply sufficient.
20	NE.	20	"	"	"	Dug	22	1,982	- 19	1,963	22	1,960	" "	"			
21	NW.	20	"	"	"	"	34	1,990	- 33	1,957	41	1,949	" sand	"	43	D, S	Sufficient for 30 head stock.
22	SW.	21	"	"	"	Drilled	438	1,984	+ 8	1,992	438	1,546	Bearpaw sandstone	Soft		D, s	Flows 2½ gallons a minute.
23	NE.	22	"	"	"	"	508	1,971	- 10	1,981	508	1,463	" sandstone	"	48	D, S	" 1½ " " " .
24	NE.	23	"	"	"	Bored	25	1,960	- 21	1,939	25	1,935	Glacial sand	Hard, slightly alkaline	43	D, S	Sufficient for 8 head stock.

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(#) Sample taken for analysis.

WELL RECORDS—RURAL MUNICIPALITY OF EYE BROW, NO. 193, 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
25	SE.	25	20	3	3	Borod	41	1,980	- 26	1,954	41	1,939	Glacial clay	Hard,iron, alkaline		S	Another 14' well for house; supply insufficient
26	NW.	25	"	"	"	Dug	18	1,970	- 13	1,957	18	1,952	" drift	Hard			Farm deserted.
27	SW.	26	"	"	"	Drilled	457	1,970	+ 20	1,990	457	1,513	Bearpaw? sand-stone	Soft		D, S	Flows 36 gallons a minute.
28	SE.	28	"	"	"			1,976	-100	1,876							
29	SW.	28	"	"	"	"	437	1,977	- 12	1,989	437	1,530	" ?sand-stone	. "	48	D, S	" 16 " " " .
30	SW.	30	"	"	"	Dug	19	2,000	- 13	1,987	19	1,981	Glacial drift	Hard	43	D, S	Not sufficient in dry years.
31	NE.	30	"	"	"	Drilled	435	1,985	+ 10	1,995	435	1,550	Bearpaw?sand-stone	Soft	47	D, S	Flows 1½ gallons a minute.
32	NE.	30	"	"	"	Dug	16	1,990	- 10	1,980	16	1,974	Glacial clay	Hard	43	D, S	
33	SW.	31	"	"	"	Bored	58	1,990	- 19	1,971	58	1,932	" drift	"	44		
34	SW.	33	"	"	"	"	71	1,973	- 30	1,943	71	1,902	" clay	",slightly alkaline,iron	41	D, S,	Supply sufficient
35	SE.	33	"	"	"	Drilled	440	1,975	+ 20	1,995	440	1,535	Bearpaw?sand-stone	Soft		D, S	Flows 4½ gallons a minute.
36	NW.	33	"	"	"	Bored	90	1,978	- 50	1,928	90	1,888	Glacial clay	Hard,iron		D, S	Supply sufficient.
37	SW.	34	"	"	"	"	58	1,975	- 13	1,962	58	1,917	" drift	" "	43	S	" insufficient for house.
38	SW.	35	"	"	"	Drilled	457	1,970	- 20	1,990	457	1,513	Bearpaw?sand-stone	Soft	49	D, S	Flows 47 gallons a minute.
39	SW.	35	"	"	"	Bored	49	1,965	- 5	1,960	49	1,916					
40	SE.	36	"	"	"	Dug	21	1,980	- 17	1,963	21	1,959	Glacial clay	Hard,slightly alkaline	41	D, S	Sufficient for only 10 head stock.
1	SE.	1	21	1	3	"	13	2,025	- 4	2,021	13	2,012	" "	Hard,clear	44	D	Dugout used for stock.
2	SW.	2	"	"	"	"	14	2,040	- 5	2,035	14	2,026	" "	" "	43	D	" " " " .
3	NE.	4	"	"	"	"	15	2,050	- 4	2,046	15	2,035	" "	Fairly soft	44	D, S	Supply varies seasonally.
4	SW.	4	"	"	"	"	17	2,050	- 5	2,045	17	2,033	" "	Hard,clear	42	D, S	Only sufficient for house in winter; another 60' well; water unusable.
5	SE.	6	"	"	"	Bored	16	2,033	- 10	2,023	16	2,017	" sand	" "	43	D	Largely seepage; another well used for stock.
6	NW.	6	"	"	"	Dug	14	2,043	- 13	2,032	14	2,031	" clay	" "	43	D	Water occasionally hauled for stock; another well for stock.
7	NW.	7	"	"	"	"	15	2,052	- 14	2,038	15	2,037	" "	"	44		Farm deserted.
8	NW.	8	"	"	"	"	22	2,052	- 18	2,034	22	2,030	" "	" "	43		" " .
9	SE.	9	"	"	"	"	20	2,045	- 16	2,029	20	2,025	" gravel	",slightly alkaline	42	D	Dugout used for stock. Nine dry holes to 40' deep.
10	NW.	10	"	"	"	"	15	2,005	- 10	1,995	15	1,990	" "	"	43	N	Well caved in. Dugout for stock. Water hauled for house.
11	NE.	12	"	"	"	Drilled	260	2,000			210	1,790	Quicksand	" ,iron	40	D, S	Waters 50 head stock and adjacent farm.

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(#) Sample taken for analysis.

WELL RECORDS—RURAL MUNICIPALITY OF EYE BROW, NO. 193, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
12	SW.	14	21	1	3	Bored	51	1,995	- 27	1,968	51	1,944	Glacial sand clay		43	N	Small supply from an 8' well, and from dugout.
13	NW.	14	"	"	"	Dug	11	1,995	- 7	1,988	11	1,984	Glacial " , clay				New well; not in use on July 23, 1935.
14	NW.	15	"	"	"	"	21	2,023	- 10	2,013	21	2,002	Glacial gravel			S	House deserted; water used for stock on another farm.
15	NE.	16	"	"	"	"	20	2,015	- 12	2,003	20	1,995	" sandy clay	Hard, clear	43	D	Stock use water of well No. 14.
16	SE.	16	"	"	"	Bored	20	2,025			20	2,005	" sand	" "	42	D	Dugout and another well for stock.
17	NW.	17	"	"	"	Dug	23	2,075	- 11	2,064	23	2,052	" clay	" , salty		S	Stock dislike water; another seepage well 18' deep; very small supply. Supply sufficient.
18	SW.	18	"	"	"	Bored	72	2,068	- 50	2,018	72	1,996	" "	" , clear	42	D, S	Two other 12' and 16' wells on farm.
19	NW.	18	"	"	"	Dug	22	2,068	- 18	2,050	22	2,046	" drift	" "	43	S	Sufficient for 3 head stock; water for domestic use is hauled.
20	NW.	19	"	"	"	Bored	58	2,072	- 28	2,044	58	2,014	" gravel, clay	", iron, clear		S	Sufficient for stock; two 90' dry holes.
21	NW.	20	"	"	"	"	83	2,060	- 23	2,037	83	1,977	" clay	", alkaline	43	S	Water hardly fit for stock; another 12' well has very small supply.
22	SE.	20	"	"	"	"	39	2,062	- 24	2,038	39	2,023	" "	", clear	43	D, S	Dugout also used; supply insufficient in dry seasons. Water often hauled.
23	NW.	21	"	"	"	"	57	2,038	- 37	2,001	57	1,981	" "	", iron	43	D	Another 15' well for stock.
24	SW.	22	"	"	"	Dug	37	2,005	- 25	1,980	37	1,968	" "	"	43	D	Dugout for 7 head stock.
25	NW.	22	"	"	"	"	21	2,005	- 18	1,987	21	1,984	" quicksand	" "	43	S	Sufficient for 7 head stock; another well for house 21' deep; small supply.
26	NE.	22	"	"	"	Bored	75	2,005								N	Dry holes; 5 others 12' to 75' deep on farm.
27	SW.	24	"	"	"	Dug	18	1,965	- 4	1,961	18	1,947	" sandy clay				Seepage well, side of slough.
28	NE.	24	"	"	"	"	32	1,950	- 26	1,924	22	1,928	" sand	Hard, clear	43	D, S	Sufficient for 10 head stock; another 260' well is caved in.
29	SW.	27	"	"	"	"	50	2,000	- 20	1,980	50	1,950	" clay	" "	42	D, S	Very large supply.
30	SE.	29	"	"	"	"	21	2,030	- 13	2,017	21	2,009	" "	" "			Farm deserted
31	SE.	30	"	"	"	Bored	77	2,078	- 33	2,045	77	2,001	" "	", alkaline	42	S	More than enough for stock.
32	SW.	30	"	"	"	Drilled	690	2,090	200	1,890	690	1,400	Belly River? sandstone	Salty, alkaline		N	Well now caved in. Fresh water at 200' and 360' in quicksand.
33	SW.	30	"	"	"	Bored	75	2,085	65	2,020	75	2,010	Glacial sand	Hard, clear	41	D, S	Not enough for stock.
34	SW.	31	"	"	"	"	60	2,085	30	2,055	60	2,025	" sandy clay	" "	43	D, S	Supply sufficient.
35	SW.	32	"	"	"	"	90	2,055	50	2,005	90	1,965	" drift	" "			
36	NE.	33	"	"	"	Dug	4	1,950	3	1,947	4	1,946	" sandy clay				Farm deserted.
37	SW.	34	"	"	"	Bored		1,970									No further information.
38	NW.	34	"	"	"	"	50	1,950	40	1,910	50	1,900	" drift	Hard, clear	43	D, S	Sufficient for 12 head stock.

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(#) Sample taken for analysis.

WELL RECORDS—RURAL MUNICIPALITY OF EYE BROW, NO. 193, 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
39	SW.	35	21	1	3	Bored	48	1,965	26	1,939	48	1,917	Glacial gravel		41	N	Farm not occupied.
40 n	NE.	35	"	"	"	"	36	1,925	- 24	1,901	36	1,889	" "	Hard, slightly alkaline	42	D, S	Sufficient for 20 head stock.
41	SW.	36	"	"	"	Dug	28	1,935	- 24	1,911	28	1,907	" drift	Hard, iron	42	D, S	" " 25 " " .
42	SE.	36	"	"	"	Drilled	306	1,930			306	1,624	" "	" , rather salty	41	D, S	Barely sufficient; 13 dry holes up to 100' on farms.
1	SE.	1	21	2	3	Bored	27	2,032	- 14	2,018	27	2,005	" clay	"	44		Farm deserted.
2	NW.	1	"	"	"	Dug	26	2,050	- 11	2,039	26	2,024	" "	"	43		" " .
3	SE.	2	"	"	"	Drilled	500	2,035	- 19	2,016	500	1,535	Bearpaw? sandstone	Salty	41	S	Another 16' well for house.
4	SW.	2	"	"	"	Dug	20	2,035	- 18	2,017	20	2,015	Glacial drift	Hard	43	D, S	Supply sufficient.
5	NE.	3	"	"	"	"	16	2,020	- 13	2,007	16	2,004	" sand	"		D, S	" intermittent; well goes dry occasionally.
6	SE.	4	"	"	"	Bored	65	2,010	- 59	1,951	65	1,945	" clay	"	43	S	Another well for house.
7	SE.	5	"	"	"	"	16	1,990	- 10	1,980	16	1,974	" "	"	42		Farm deserted.
8	NW.	5	"	"	"	"	38	1,970	- 12	1,958	38	1,932	" "	"	43		" " .
9	SW.	6	"	"	"	"	48	1,985	- 41	1,944	48	1,937	" "	", slightly alkaline	43	D, S	Supply sufficient.
10	NW.	6	"	"	"	"	102	2,005	- 60	1,945	102	1,903					
11	NE.	7	"	"	"	"	90	1,985	- 30	1,955	90	1,895	" "	" , slightly alkaline.	41	D, S	Sufficient for 60 head stock.
12	SW.	8	"	"	"	"		1,985									
13	SW.	9	"	"	"	"	80	2,000	- 45	1,955	45	1,955	" "	"	41	S	Another 80' well has similar water; domestic supply hauled.
14	SW.	10	"	"	"	Dug	16	2,012	- 12	2,000	16	1,996	" "	"	42	S	Another 30' well for house.
15	NE.	10	"	"	"	Bored	45	2,010	- 30	1,980	45	1,965	" "	"	43	D, S	Supplies neighbour in drought.
16	NE.	11	"	"	"	Dug	14	2,025	- 11	2,014	14	2,011	" sand	"	41	S	Sufficient for 10 head stock.
17	SW.	12	"	"	"	"	13	2,040	- 10	2,030	13	2,027	Gravel and quicksand	" slightly	43	D, S	Another 13' well not in use; sufficient for 8 head stock
18	NE.	12	"	"	"	"	27	2,048	- 16	2,032	27	2,021	Glacial clay	"			Supply sufficient.
19	NE.	13	"	"	"	"	19	2,068	- 14	2,054	19	2,049	" "	"	43	D	Farm deserted.
20	SW.	14	"	"	"	"	55	2,045	- 30	2,015	55	1,995	" "	"			Another well near slough for house.
21	NE.	14	"	"	"	Bored	55	2,050	- 30	2,020	55	1,995	" sand	"	43	D, S	Sufficient for 18 head.
22	SW.	16	"	"	"	"	60	2,005	- 45	1,960	60	1,945	" "	"	42	D, S	Another 62' well; large supply of poor quality water; sufficient for 12 head stock.

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WELL RECORDS—RURAL MUNICIPALITY OF EYE BROW, NO. 193, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
23	NE.	16	21	2	3	Bored	70	2,020	- 48	1,972	70	1,950	Glacial clay	Hard	42	D, S	Another 65' well used for stock.
24	NW.	16	"	"	"	"	60	2,005	- 20	1,985	60	1,945	" "	Soft	43	D, S	Supply sufficient.
25	SE.	18	"	"	"	Dug	8	1,975	- 3	1,972	8	1,967	" gravel and quicksand	"	50	D, S	Another well has very alkaline water; sufficient for 12 head stock.
26	SE.	19	"	"	"	"	25	1,985	- 20	1,965	25	1,960	Glacial clay	Hard, very alkaline	43	S	Large supply; laxative.
27	NE.	19	"	"	"	Bored	60	2,005			60	1,945	" "	Hard, slightly alkaline	42	D, S	
28	NW.	19	"	"	"	"	45	2,000	- 6	1,994	45	1,955	" "				Farm deserted.
29	SE.	20	"	"	"	"	90	2,005	- 52	1,953	90	1,915	" sand	Fairly soft	41	D, S	Sufficient for 21 head stock.
30	NE.	21	"	"	"	Dug	58	2,042	- 50	1,992	58	1,984	" clay	Hard	43		
31	NW.	22	"	"	"	"	63	2,040	- 51	1,989	63	1,977	" sand	"	42	D, S	" " at least 8 head stock.
32	SE.	23	"	"	"	"	38	2,060	- 27	2,033	38	2,022	" "	Slightly hard	43	D, S	" supply.
33	SE.	25	"	"	"	"	40	2,085	- 36	2,049	40	2,045	" " and gravel	Hard	42	D, S	" for at least 35 head stock.
34	SW.	25	"	"	"	"	35	2,080	- 31	2,049	35	2,045	Glacial sand	"	41	D, S	" " " " 15 " " .
35	SW.	26	"	"	"	Bored	98	2,049	- 58	1,981	98	1,951	" clay	"	43	D, S	" " a 25 head stock.
36	NE.	26	"	"	"	"	69	2,088	- 42	2,046	69	2,019	" " , gravel	"	42	S	No house on ¼ section; supply of water was large in July 1935.
37	SE.	27	"	"	"	"	69	2,045	- 21	2,024	69	1,976	" quicksand	", slightly alkaline	42	D, S	Sufficient for 45 head stock.
38	SW.	27	"	"	"	Dug, Drilled	75	2,025	- 60	1,965	75	1,950	" sand	"	42	D, S	" supply.
39	NE.	28	"	"	"	Bored	78	2,045	- 68	1,977	78	1,967	" "	"	42	D, S	Another 244' well also used in dry seasons.
40	NE.	30	"	"	"	Dug		1,990					" drift	", slightly alkaline	43	D, S	Barely sufficient for 12 head stock.
41	SW.	31	"	"	"	"	38	1,985	- 34	1,951	38	1,947	" sand	"	42	D, S	Sufficient for 50 head stock.
42	NE.	32	"	"	"	Bored	41	2,000	- 37	1,963	41	1,959	" sandy clay	"	41	D, S	" supply.
43	NE.	33	"	"	"	Dug	70	2,044	- 60	1,984	70	1,974	" sand	" slightly	43	D, S	
44	NW.	33	"	"	"	"	50	2,010	- 47	1,963	50	1,960	" clay	"	45		Farm deserted.
45	SE.	34	"	"	"	"	40	2,040	- 38	2,002	40	2,000	" sand	"	41	D, S	Sufficient for 17 head stock except in dry year
46	NW.	34	"	"	"	"	40	2,040	- 30	2,010	40	2,000	" "	"	41	D, S	" " 12 " " .
47	NW.	36	"	"	"	"	20	2,095	- 2	2,093	20	2,075	" clay	"	41	D, S	" " 20 " " ; another 13' well used for stock only.
48	NW.	36	"	"	"	"	40	2,088	- 33	2,055	40	2,048	" "	"	42	D, S	Sufficient for 14 head stock.

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WELL RECORDS—RURAL MUNICIPALITY OF EYE BROW, NO. 193, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
1	SW.	2	21	3	3	Bored	40	1,970	- 20	1,950	40	1,930	Glacial clay	Hard	43	D, S	Supply sufficient.
2	NW.	2	"	"	"	"	24	1,970	- 19	1,951	24	1,946	" "	"	42		Farm deserted.
3	SE.	3	"	"	"	#	60	1,970	- 15	1,955	60	1,910	" "	"	43	D, S	Sufficient for 12 head stock.
4	SE.	4	"	"	"	"	36	1,990	- 18	1,972	36	1,954	" quicksand			N	
5	SE.	4	"	"	"	Drilled	423	1,990	+ 8	1,998	423	1,567	Bearpaw? sand-stone	Soft	44	D, S	2 gallons a minute.
6	NW.	4	"	"	"	"	412	1,976	+ 16	1,992	412	1,564	"	"		D, S	4 " " " .
7	SW.	5	"	"	"	"	403	1,978	+ 7	1,985	403	1,575	"	"	46	D, S	1½ " " " .
8	SW.	5	"	"	"	"	392	1,968			392	1,576	"	"		D, S	Said to have flowed 40' above ground when drilled.
9	NE.	6	"	"	"	Dug	14	1,970	- 12	1,958	14	1,956	Glacial clay	Hard	42		Farm deserted.
10	SE.	7	"	"	"	Drilled	444	1,967	+ 5	1,972	444	1,523	Bearpaw? sand-stone	Soft		D, S	Flows 2/3 gallon a minute.
11	SW.	8	"	"	"	"	435	1,971	+ 6	1,977	435	1,536	Bearpaw? sand-stone	"	47	D, S	" 1 " " " .
12	SE.	8	"	"	"	"	450	1,976	+ 5	1,981	450	1,526	" sand-stone	"	47	D, S	" 1/2 " " " .
13	SE.	9	"	"	"	Bored	27	1,956	- 23	1,933	27	1,929	Glacial clay	Hard	42	D, S	Sufficient for 8 head stock.
14	NW.	10	"	"	"	"	38	1,965	- 8	1,957	38	1,927	" "	"	42	S	Another 36' well for house; supply sufficient.
15	SE.	10	"	"	"	"	35	1,980	- 17	1,963	35	1,945	" "	"	42	D, S	" 35' "; sufficient for 40 head stock.
16	SW.	12	"	"	"	Dug	31	1,970	- 13	1,957	31	1,939	" "	"	42	D, S	" well for washing; " " 9 " " .
17	NW.	12	"	"	"	"	14	1,960	- 12	1,948	14	1,946	" "	"	44		Farm deserted.
18	SE.	13	"	"	"	Bored	46	1,975	- 16	1,959	46	1,929	" drift	"	42		" " .
19	SE.	14	"	"	"	Dug	13	1,960	- 8	1,952	13	1,947	" sand	" slightly alkaline	44	D, S	Another 14' well for stock.
20	SE.	16	"	"	"	"	28	1,955	- 19	1,936	28	1,927	" clay	Hard, sulphur taste	43	D, S	Sufficient for 10 head stock.
21	NE.	16	"	"	"	Bored	60	1,950	- 30	1,920	60	1,890	" "	Hard, alkaline	42		Farm deserted.
22	SW.	17	"	"	"	Drilled	444	1,972	+ 3	1,975	444	1,528	Bearpaw? sand-stone	Soft		D, S	Flows 1/3 gallon a minute.
23	NW.	17	"	"	"	Dug	34	1,962	- 30	1,932	34	1,928	Glacial drift	Hard		S	Water for house hauled; 4 dugouts also used for stock.
24	SE.	18	"	"	"	Bored	40	1,960	- 13	1,947	40	1,920	" clay	"			Farm deserted.
25	NW.	18	"	"	"	Drilled	418	1,966	+ 6	1,972	418	1,548	Bearpaw sand-stone	Soft		D, S	Flows 1 gallon a minute.
26	NW.	19	"	"	"	Bored	20	1,965	- 15	1,950	20	1,945	Glacial clay	Hard	44	N	Water hauled.
27	SW.	20	"	"	"	"	24	1,970	- 12	1,958	24	1,946	" drift	"	43		Farm deserted.

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

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

WELL RECORDS—RURAL MUNICIPALITY OF EYE BROW, NO. 193, 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
28	NW.	20	21	3	3	Drilled	495	1,986	- 30	1,956	495	1,491	Bearpaw? sandstone	Soft		D, S	Water level delined 40' 1931 tc 1935.
29	SE.	20	"	"	"	"	480	1,969	+ 3	1,972	480	1,489	" sandstone	"		D, S	" flows ¼ gallon a minute.
30	NW.	21	"	"	"	Dug	30	1,960	- 21	1,939	30	1,930	Glacial clay	Hard	41	D, S	Sufficient for 30 head stock.
31	SW.	22	"	"	"	"	23	1,960	- 8	1,952	23	1,937	" "	"	43	D, S	
32	NW.	22	"	"	"	"	16	1,955	- 13	1,942	16	1,939	" "	"	43		Farm deserted.
33	SW.	24	"	"	"	Bored	40	1,960	- 20	1,940	40	1,920	" "	",alkaline	42	S,	Sufficient for 50 head stock. Another 20' well for house.
34	NW.	24	"	"	"	Drilled	333	1,968			333	1,635	Probably glacial sand drift	"		D, S	
35	NE.	24	"	"	"	Bored	20	1,970	- 16	1,954	20	1,950	" "	Soft	43	D	Small supply.
36	SE.	25	"	"	"	Dug	36	1,985	- 21	1,964	36	1,949	" "	Hard,iron	42	D, S	Water for cooking hauled.
37	NE.	26	"	"	"	Bored	75	1,978	- 12	1,966	75	1,903	" clay	"	42		Farm deserted.
38	SW.	26	"	"	"	"	23	1,960	- 19	1,941	23	1,937	" "	"	41	D, S	Sufficient for 8 head stock except in dry years.
39	SE.	27	"	"	"	"	23	1,960	- 18	1,942	23	1,937	" "	"	42	S	Sufficient for 10 head stock.
40	NW.	27	"	"	"	"	21	1,960	- 13	1,947	21	1,939	" "	"	44		Farm deserted.
41	NE.	28	"	"	"	"	20	1,955	- 14	1,941	20	1,935	" "	"	44		" " .
42	NE.	29	"	"	"	"	40	1,950	- 15	1,935	40	1,910	" "	"	42	D, S	Sufficient for 30 head stock.
43	NW.	32	"	"	"	Drilled	418	1,925	+ 8	1,933	418	1,507	Bearpaw? sandstone	Soft	48	D, S	Flow 1.2 gallons a minute.
44	NW.	34	"	"	"	"	360	1,975	- 3	1,972	360	1,615	" sandstone	"		D, S	Supply sufficient.
45	SE.	35	"	"	"	Bored	20	1,960	- 14	1,946	20	1,940	Glacial clay	Hard	42	D, S	Water hauled in dry years.
46	NE.	35	"	"	"	"	44	1,965	- 20	1,945	44	1,921	" "	"	43		Another well has very alkaline water. Farm deserted.
47	NE.	36	"	"	"	"	40	2,000	- 30	1,970	40	1,960	" drift	Rather soft, slightly alkaline	41	D, S	Sufficient for 20 head stock; another well 24' deep.

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

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