CANADA

DEPARTMENT OF MINES

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BUREAU OF ECONOMIC GEOLOGY

GEOLOGICAL SURVEY

PRELIMINARY REPORT

GROUND-WATER RESOURCES OF THE RURAL MUNICIPALITY OF FRANCIS No. 127 SASKATCHEWAN

BY

B. R. MacKay, H. N. Hainstock & G. L. Scott

Water Supply Paper No. 83

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GROUND WATER RESOURCES OF THE RURAL MUNICIPALITY OF FRANCIS, NO. 127, SASKATCHEWAN

INTRODUCTION

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

Publication of Results

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

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

How to Use the Report

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

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

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

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

GLOSSARY OF TERMS USED

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Bearpaw Formation. The Bearpaw consists mostly of incoherent dark grey to dark brownish grey, partly bentonitic shales, weathering light grey, or, in places where much iron is present, buff. Beds of sand occur in places in the lower part of the formation. It forms the uppermost bedrock formation over much of western and southwestern Saskatchewan and has a maximum thickness of 700 feet or somewhat more.

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

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

WATER-BEARING HORIZONS OF THE MUNICIPALITY

The rural municipality of Francis is an area of 432 square miles in southeastern Saskatchewan. It consists of twelve townships, described as tps. 13, 14, 15, and 16, in ranges 13, 14, and 15, W. 2nd mer. The centre of the municipality is 36 miles southeast of the city of Regina. The main line of the Canadian National railways traverses the northern part of the municipality and on it are located the villages of Vibank and Odessa. A branch line of the Canadian Pacific railway extends across the southwestern part of the municipality and on it are located the village of Sedley and the town of Francis.

The southwestern part of this municipality is a flat, treeless plain, and is a portion of the basin of an ancient glacial lake known as Lake Regina. The area is mantled by glacial lake clays. The top soil in this region is a heavy, gumbo clay and is an excellent soil for the production of cereal grains. A small area in townships 14 and 15, range 15, is mantled by glacial lake sands. The elevation of this flat plain is approximately 1,950 to 1,975 feet above sea-level. To the northeast of the old shore line of this glacial lake, a strip of country 1½ to 3½ miles wide is mantled by boulder clay or glacial till. The surface of this area is undulating and has a maximum elevation of 2,050 feet above sea-level. To the northeast of the glacial till-covered area, is a belt of moraine that runs in a northwest-southeast direction. This moraine is approximately 4 miles in width in the southern part and increases to approximately 11 miles in width in the northern part of the municipality. Waskana creek flows in a southeasterly direction through the central part of the moraine-covered area. Its channel is 150 to 200 yards wide, and 50 to 75 feet deep, and is out of proportion to the present small size of the stream. The stream swings sharply to the west a few miles south of the municipality and then flows northwesterly across the old lake basin.

Its valley in the lake basin is much smaller than it is in the moraine-covered area. The ground surface of the moraine is rough and undulating, and is broken by many ravines in the vicinity of Waskana creek. It is heavily wooded in the northern part. The elevation in the southern part of the moraine varies from 2,050 feet to 2,150 feet, and in the northern part from 2,150 feet to slightly over 2,200 feet.

To the northeast of the moraine described above, the municipality is mantled by various glacial deposits. Most of the central part of township 16, range 13, is covered by glacial lake sands and marks the location of a glacial lake, of which the present Strawberry lakes are remnants. Small areas of outwash sands and gravels occur in the vicinity of the village of Odessa and in sections 25 and 26, township 16, range 13. The northeastern half of township 15, and the northern and southern parts of township 16, range 13, are mantled by parts of a moraine and are rough and undulating. The remainder of the municipality that lies to the northeast of the central moraine-covered area is overlain by boulder clay or glacial till.

Water-bearing Horizons in the Unconsolidated Deposits

Except for an area in township 13, ranges 14 and 15, and parts of township 16, range 13, farmers in the municipality do not, as a rule, experience much difficulty in obtaining a sufficient supply of water from wells in the glacial deposits. The water situation in this municipality did not become so critical during the drought of 1930 to 1934 as it did in other municipalities in the southeastern part of Saskatchewan.

The thickness of the glacial drift increases in a south to north direction, roughly corresponding to the rise in surface elevation. In the southern six townships the bedrock Marine Shale series lies at a depth nowhere greater than 200 feet below the surface. In the area outlined by the A-line on Figure 1, in the vicinity of the town of Francis, the Marine Shale was struck at depths of 8 to 30 feet below the surface. The thickness of the glacial drift at the village of Sedley is 100 feet and in parts of township 14, range 13, it is 60 feet. In township 13, Range 13, thick and extensive beds of sand and gravel that occur at depths of less than 25 feet below the surface, provide fairly abundant supplies of water to shallow dug wells. Springs are numerous along ravines and in the valley of Waskana creek. In townships 13 and 14, range 15, moderate quantities of water are not difficult to locate at depths of 40 feet or less below the surface, but in the latter township the water is highly mineralized and unsuitable for drinking. In townships 14, ranges 13 and 14, more abundant supplies of water are obtained in wells that are dug or bored in excess of 50 feet below the surface. In any one of these southern six townships it is inadvisable to drill deeper than 150 to 200 feet from the surface. The boring or drilling method of making a well could be used in townships 14, ranges 13 and 14, but in the other four townships, dug wells will probably yield as abundant a supply of water as can be found.

In the northern six townships the glacial drift is approximately 250 feet to 300 feet thick and it is believed that only one dry hole has encountered the bedrock Marine Shale formation. Thick beds of sand, and in fewer cases gravel, may occur at any depth between 60 feet below the surface and the bedrock. Abundant supplies of water are obtained from wells that tap these beds, and the water is under pressure. Usually, the 200 to 275-foot wells supply water that is under a very high pressure, and which rises to a point 10 to 40 feet below the surface. Shallower drilled wells do not yield water that is under such great pressure. The water is hard and fairly highly mineralized, but it is being used for drinking. The supply of water from wells over 60 feet in depth is not easily affected by prolonged drought periods. Variable quantities of water are obtainable from shallow dug wells in this district, but the supply depends to a large extent on the amount of precipitation. With the possible exception of township 16, range 13, deep drilling operations are advised for farmers who desire a permanent supply of well water in the northern six townships. Usually, the aquifer that is struck in the deep wells, however, is a very fine sand, and many farmers experience a great deal of trouble, in that the sand particles clog the screens and pipes and thus partly or completely shut off the supply.

Thick and extensive beds of sand and gravel underlie the top soil in the areas that are covered by glacial lake sands, but shallow wells in the glacial sand covered area in the western part of the municipality, townships 14 and 15, range 15, derive a better supply of water than do shallow wells in the sand-covered area of township 16, range 13. It is believed that most of the seepage water in this latter area drains off into Strawberry lakes.

A narrow area is shown on Figure 1 in which flowing artesian wells occur. It will be noted that this area lies immediately east of the area where the impervious bedrock Marine Shale is near the surface. Also, to the northeast of the artesian area there is a gradual increase in elevation of approximately 100 feet. The artesian wells in this area are all situated in or near small sloughs or depressions and are dug to depths of 4 to 15 feet below the surface. The source of the water is from the highland to the northeast and this water flows down the slope at the base of the glacial drift until it is obstructed by the rise in the bedrock in the vicinity of Francis. The pressure, caused by the difference in elevation of the well and the intake area, is sufficient to cause the water to flow above the surface. The town of Francis derives an abundant supply of water from one of these flowing-artesian wells. The village of Sedley can only obtain highly mineralized water that is unsuitable for drinking purposes. Water for this village is tanked and sold to the inhabitants by neighbouring farmers. The villages of Odessa and Vibank derive their water supply from drilled wells, and in Odessa numerous shallow wells are obtaining water at depths up to 15 feet in the glacial outwash deposits. At present, Sedley is the only village in this municipality that is in need of a water supply.

The undulating nature of the ground surface in the glacial till and glacial moraine-covered areas offers numerous locations for the excavation of deep dugouts. There are also many locations in the valley of Waskana creek and its tributaries where small dams could be constructed.

Water-bearing Horizons in the Bedrock

Water supplies have not been obtained from the bedrock Marine Shale in this municipality, although numerous dry holes have been dug, bored, and drilled into it in the vicinity of Francis. The Marine Shale is sometimes referred to as "soapstone", and when drilling a well if this "soapstone" is struck it is useless to continue drilling in that particular place. In the northern six townships there is not much likelihood of striking this formation within 250 feet of the surface, but in the southern six townships it may be encountered at any depth between 10 and 200 feet below the surface.

GROUND WATER CONDITIONS BY TOWNSHIPS

Township 13, Range 13

The elevation of the ground surface of the township decreases gradually from 2,150 feet at the northeastern corner to 2,100 feet at the southwestern corner. Waskana creek flows intermittently in a southeasterly direction through sections 34, 27, 26, 23, 14, 13, and 12. The valley through which the creek passes is approximately 50 feet deep and 150 to 200 yards wide, and the banks incline gradually to the plain level. Although Waskana creek flows only in the freshet season, small pools of water exist during the summer months where the water has either been dammed up or where springs discharge small flows of water which remain in depressions in the valley floor.

The undulating nature of the ground surface of the township is broken by many coulees and, therefore, there are numerous favourable locations for the construction of small dams for the conservation of surface run-off. The eastern part of the township is wooded with clumps of poplar.

With the exception of a small area in sections 24, 25, and 36, which is covered by glacial till, the northeastern half of the township is mantled by part of a moraine. The southwestern half is mainly covered by glacial till, a small area in sections 6 and 7 being overlain by glacial lake clays. The surface of the moraine-covered area is more rough and undulating than that of the areas covered by glacial till and glacial lake clays.

The thickness of the glacial deposit varies from 25 feet to approximately 150 feet in this township. The wells range from a depth of 8 feet to a maximum depth of 100 feet. The initial 40 feet of glacial covering consists of yellow, grey, or red clay and thick beds of gravel. Blue clay underlies the lighter coloured clays and gravel and probably extends to the bedrock Marine Shale, but there are beds of sand and gravel lying within the upper part of it, at least.

It was reported that "soapstone", the local term applied to the shale, was struck at a depth of 20 to 30 feet below the surface in the SW.$\frac{1}{4}$, section 17, which places the bedrock at an elevation of 1,975 feet at this point. In the western part of the municipality of Montmartre, which lies to the east of this municipality, the top of the bedrock Marine Shale is at an elevation of 1,850 to 1,900 feet.

The majority of the wells in the township are less than 30 feet in depth. Many large, thick beds of sand or gravel are located within the initial 30 feet of glacial drift and farmers usually possess more than one well since they are easily dug and there is little difficulty, usually, in tapping a water supply. The supply of water from these wells is variable and the drought of 1930 to 1934 affected the supply to a considerable extent. However, the sand beds are generally so thick and extensive and hold so much seepage water that the drought did not bring about a serious shortage of water in this township. About six farmers were forced to tank water for their requirements. Fairly large supplies of water are readily obtained by digging shallow wells in the floors of coulées and Waskana Creek valley. The water is usually hard, but not too highly mineralized to be used for drinking. Springs are of common occurrence in the ravines and they flow continuously during the year.

About eight wells have been dug, bored, or drilled deeper than 30 feet. The supply of water obtained is usually more abundant and dependable than it is from the shallow wells, and the drought did not noticeably reduce the quantity of water obtained. The water is hard and more highly mineralized, as a rule, than the water from the shallow wells, but it is used by the farmers for drinking without any apparent ill effects. A 70-foot, bored well in the NE. $\frac{1}{4}$, section 36, yields water that is under sufficient pressure to rise to a point 20 feet below the surface. The water is too highly mineralized to be used for drinking. The aquifer is a fine, white sand lying beneath a layer of blue clay. Comparatively few dry holes have been dug in the township and no dry holes have been bored or drilled. A few farmers have constructed small dams or have excavated dugouts to collect and store water for stock use in summer.

The general water situation of this township is good. If drilling or boring operations are contemplated, farmers should confine their efforts to the glacial drift. It is inadvisable to penetrate the "soapstone" or Marine Shale.

Township 13, Range 14

The greater part of the township is a flat, treeless plain having an elevation of approximately 2,000 feet. In the northeastern corner the elevation increases to 2,050 feet, and the ground surface becomes slightly undulating. Waskana creek flows in a northwesterly direction through a small, shallow valley in the southwestern part of the township. This creek flows for approximately two weeks during the spring run-off and occasionally during the summer months after a heavy rainfall. Small, tributary coulées occur in the vicinity of the creek.

The slightly undulating ground surface in the northeastern part of the township characterizes an area mantled by glacial till. The remainder of the township, except for a small area of glacial till in sections 5 and 6, is mantled with glacial lake clays. The top soil of this area is a heavy, black loam, free from stones and pebbles. The thickness of the glacial deposit does not exceed 100 feet anywhere in this township, and in the glacial lake bed in the vicinity of the town of Francis, it is only 10 to 15 feet thick. The average elevation of the surface of the bedrock of the Marine Shale series that underlies the glacial deposit is 1,950 feet above sea-level. The Marine Shale is described as being a hard, black "clay", and it is locally referred to as "soapstone" by farmers and well drillers.

The glacial deposit in the lake bed region of the township is composed almost entirely of yellow clay with a top surface covering of heavy, gumbo loam soil. Occasionally there is a small layer of sand between the yellow clay and the bedrock, but over that part of the township comprising sections 4, 5, 6, 7, 8, 9, 10, 15, 16, 17, 18, 19, 20, 21, 22, 27, 28, and 29, this sand layer is almost non-existent. In the glacial till-covered region in the northeast of the township, the glacial deposit is thicker and sand and gravel beds are of more common occurrence within the initial 25 feet of the glacial drift. There are no wells reported in this district deeper than 25 feet, but it is probable that blue clay would be struck at 30 or 40 feet below the surface and would extend to the bedrock. It probably contains layers of sand or gravel.

Two areas are outlined on the accompanying map (Figure 1). The area that is outlined by the "A" boundary line covers the greater part of the western part of the township and within this area it is almost impossible to obtain any large quantity of usable water at any depth. The glacial covering within this zone is not more than 30 feet thick and it is composed almost entirely of yellow clay with very little or no sand. The bedrock Marine Shale series underlies the yellow clay. This series is approximately 900 feet thick, and it contains few water-bearing horizons. The water that has been located in the Marine Shale in places is so highly mineralized that it cannot be used even for stock. There is not a single satisfactory well in this area. The town of Francis has spent over $2,000 on unsuccessful drilling into the Marine Shale, the deepest hole being 450 feet. A 300-foot dry hole was also drilled in the NW.$\frac{1}{4}$, section 16. In this area the only means of obtaining water is by the excavation of dugouts. Due to the flat topography of the ground surface there are very few good locations for dugouts that would catch and retain surface run-off, and consequently sufficient water is not collected during the summer months to last over the winter months. In drought seasons the dugouts will supply water until about the month of December, after which time farmers are forced to haul water for stock use.

The second zone outlined on Figure 1 is an area in which flowing artesian wells occur. In this area a bed or lens of black sand and gravel occurs at depths of 12 to 30 feet below the surface, and it probably lies at the base of the glacial drift and extends into the highland area to the northeast. The greater elevation of the aquifer in the high land than in the low land causes the water to be under pressure. All the flowing artesian wells are located in a slight depression, and the pressure causes the water to barely rise over the top of the casing. The water is fairly hard and contains a little iron that settles out as a brownish precipitate. It is not highly mineralized and may be used for drinking as well as for stock. The water can be used for irrigation without deleterious effects. The best of these flowing artesian wells is located in the SW.$\frac{1}{4}$, section 26. The water flows from this well to the town of Francis in a wooden pipe by the action of gravity. The difference in level between the intake at the well and the hydrants in Francis is 18 feet. Farmers who tap the pipe-line pay $20 a year for the privilege of using the water. The yield from this artesian well was not determined. The supply was not noticeably reduced by the drought of 1930 to 1934. Some of the shallow wells in the glacial till to the northeast of this area of flowing artesian wells probably tap the same aquifer.

Township 13, Range 15

Waskana creek flows intermittently in a northwesterly direction through the northwestern part of the township. The valley through which the creek passes is narrow and not more than 20 feet deep. Long, shallow coulées carry rainfall and spring run-off water to the creek. Springs occur at many places in the coulées and in the valley of the creek.

The southeastern part of the township is mantled with glacial till, and in sections 1, 2, and 11, the upper part of this deposit has been so eroded by streams that the ground surface is quite stony. The remainder of the township is covered by glacial lake clays. The ground surface of the till-covered area is slightly undulating in contrast with the flat ground surface of the clay-covered area. Shallow, undrained, marshy sloughs are common in the southwestern part of the township and the entire township is devoid of any tree growth.

The thickness of the glacial deposit probably does not exceed 100 feet anywhere in the township. The bedrock Marine Shale, locally termed "joint clay" or "soapstone", was encountered in the SE.$\frac{1}{4}$, and the SW.$\frac{1}{4}$ of section 14, at depths of 28 feet and 23 feet below the surface, which places the elevation of the bedrock at these points at approximately 1,950 feet above sea-level. The deepest well in the township is only 50 feet. Bedrock was encountered only at the two places mentioned. The initial 50 feet of glacial covering usually consists of heavy black clay, and occasionally yellow or red clay, and beds of sand and gravel. In the glacial till-covered district the first 10 feet of drift below the top soil generally consists of sandy clay, and it is followed by thick beds of sand or gravel. The top soil in the lake basin is a heavy, black clay loam.

With the exception of two wells in section 14, which encountered bedrock near the ground surface, all the wells in the township yielded an adequate supply of water even during the drought of 1930 to 1934. Water is easily obtained by digging to depths of

10 to 50 feet. A 40-foot well in the NE.$\frac{1}{4}$, section 8, will yield at least 25 tanks of water a day, although the water-level is only 3 feet above the base of the well. At least twelve of the thirty-one wells examined yield water that is under a slight pressure sufficient to raise it from 3 to 10 feet above the aquifer. The prolonged drought of 1930 to 1934 only slightly affected water conditions in the township. Unfortunately the water is hard and usually highly mineralized and acts as a laxative on people unaccustomed to its use. In some wells the water is too highly mineralized to be used for drinking and the farmer must tank his household water from a neighbour's well that yields drinkable water. The water imparts no ill effects on stock, however. Springs are fairly numerous along Waskana creek and its tributaries. Soft water from a 20-foot well in the NW.$\frac{1}{4}$, section 26, is hauled and sold to the people of Sedley at the rate of 5 cents a pail. There are very few dugouts in this township since ample supplies of water can be obtained from shallow wells. Boring or drilling in the township to a depth in excess of 100 feet below the surface is not advised. The Marine Shale lies at an approximate elevation of 1,900 to 1,950 feet and rarely yields water that is suitable for farm purposes. The thickness of the shale is about 900 feet.

Township 14, Range 13

Waskana creek flows intermittently in a southeasterly direction through sections 19, 17, 9, 4, and 3. The valley through which the creek flows is approximately 50 to 75 feet deep and the valley floor is 150 to 200 yards wide. The grade of the creek bed is approximately 6 feet to the mile. Sloughs are of common occurrence in this township, but they were dry during the drought of 1930 to 1934. Small clumps of poplar trees occur throughout the township, the stand becoming more dense in the eastern part.

The northeastern part of the township is mantled with glacial till and the ground surface is less undulating than that of the moraine-covered district in the southwestern part of the township. In the vicinity of the valley of Waskana creek the ground surface is quite hilly and rough, and the thickness of the glacial drift is probably very variable. The bedrock Marine Shale, which underlies the glacial drift, was struck in only one place in the township. A bored well in the NE.$\frac{1}{4}$, section 12, encountered "soapstone" or Marine Shale bedrock at a depth of 60 feet below the surface. It was described as having a greyish colour, with small specks of a red material, probably iron, and having a compact, putty-like consistency. Glacial blue clay is often confused with the Marine Shale and this characteristic may be of aid in discriminating between the two materials. The elevation of the surface of the bedrock in this well is 2,100 feet. However, in the SW.$\frac{1}{4}$, section 20, a drilled well 186 feet deep did not encounter any material that would suggest the presence of the shale bedrock, and the base of this well would be at an elevation of 1,825 feet. Other wells in the township did not strike the "soapstone" at depths of 60 to 186 feet, so that there must be a local rise in the bedrock in section 12. In the township immediately to the south, the bedrock Marine Shale was definitely encountered at an elevation of 1,950 feet.

The glacial drift is composed largely of boulder clay. Yellow or red clay, 25 to 35 feet thick, usually occurs beneath the top soil and is underlain by blue clay which extends to the bedrock. Occasionally a small layer of sand separates the yellow or red, oxidized clay from the blue clay. The occurrence of any extensive deposit of sand or gravel in the upper 40 feet of the glacial drift is rare in this township. Consequently there are very few dug wells in comparison with the large number in township 13, range 13, where there is an extensive occurrence of sand and gravel in the upper 40 feet of the drift. Except for a 20-foot well in the SE.$\frac{1}{4}$, section 17, that is dug in Waskana Creek valley, and which yields an abundant supply of usable water, all other wells dug less than 40 feet deep in the township have proved undependable in drought years.

A permanent supply of water will be more assured if a well be bored to depths ranging from 50 to 190 feet below the surface. Within this range there seems to be two distinct water-bearing horizons. The first water-bearing horizon is generally struck at depths of 60 to 90 feet below the surface. The aquifer is generally a fine sand, although a few of the wells reported gravel as the source of the water. The water is hard, and quite highly mineralized, but is being used for drinking as well as for stock. The water is under a slight hydrostatic pressure. The drought of 1930 to 1934 affected the supply to some extent, but 40 head of stock can generally be watered at an individual well. Wells in the SE.$\frac{1}{4}$, section 1, and the NW.$\frac{1}{4}$, section 25, did not encounter this water-bearing horizon.

Farmers, who intend to bore or drill a well, are advised to pass through the first layer of sand unless the flow of water is satisfactory, and continue to the second water-bearing horizon which lies at depths ranging from 140 to 190 feet below the surface. This water-bearing horizon yields an abundant supply of mineralized water that was not depleted by the drought. The hydrostatic pressure is sufficient to raise the water 30 to 50 feet above the aquifer. The water is being used for drinking although it was described as being "alkaline", and it imparts a laxative effect until one has become accustomed to its use. The deeper wells usually yield water containing a considerable amount of iron. In the SW.$\frac{1}{4}$, section 20, a 186-foot drilled well encountered the first water-bearing horizon at a depth of 100 feet below the surface. This horizon was passed through and the well is deriving its supply from the white quicksand that forms the second aquifer. In the SE.$\frac{1}{4}$, section 30, a drilled well encountered water at 143 feet below the surface, but the driller continued to a depth of 240 feet below the surface without striking another aquifer. It is probable that the lower part of this well is in the bedrock Marine Shale. The ground water conditions of this township may be summarized as follows: Permanent supplies of water are very difficult to locate in the upper 50 feet of the glacial drift, due to the scarcity of extensive sand or gravel deposits. Farmers are reasonably assured of a permanent supply of mineralized water at depths ranging from 50 to 190 feet below the surface. It is advised to refrain from drilling deeper than 200 feet below the surface in this township. If the bedrock Marine Shale, or "soapstone" as it is often termed, is struck in drilling, further operations in that particular hole should be discontinued. Springs are of common occurrence in the valley of Waskana creek. The water situation in this township was not critical during the drought of 1930 to 1934.

Township 14, Range 14

Waskana creek, a small intermittent stream, flows across the northeastern part of the township. The valley is 50 to 75 feet deep and 150 to 200 yards wide and is very large in comparison with the size of the present stream. The northeastern corner of the township is mantled by part of a moraine and the ground surface is exceedingly rough and hilly. With the exception of a few sections in the southwestern corner that are mantled by glacial clay the remainder of the township is covered by boulder clay or glacial till. The ground surface of the till-covered area is undulating, whereas that of the glacial clay-covered region is quite flat. Due to the undulating and hilly topography of the greater part of the township, large, deep, undrained depressions or sloughs are of common occurrence and in years of average rainfall they hold large quantities of surface water. The township also contains small ravines or coulées that drain spring run-off water in a southwesterly direction towards Waskana creek. There are a few scattered clumps of poplar trees in the northeastern part of the township and the sloughs are usually fringed with scrub poplar and alders.

The thickness of the glacial drift has not been determined by any well in the township, the deepest well located in the NW.$\frac{1}{4}$, section 28, being 155 feet deep. The bedrock Marine Shale or "soapstone", as it is locally termed, was struck at an elevation of 2,100 feet in the township to the east and at an elevation of 1,850 feet in the village of Sedley to the west of this township. In the township to the south the "soapstone" was struck at an approximate elevation of 1,950 feet. From these figures it would appear that the top of the shale in this township has an approximate elevation of 1,850 to 1,900 feet.

Yellow clay, which is weathered blue clay, usually underlies the top soil to a depth of 10 to 25 feet below the surface. A layer of sand or gravel 2 to 10 feet thick is almost always found beneath the yellow clay and separates it from the blue clay that extends to the bedrock. The blue clay contains, at least, one thick bed of sand or gravel. In a well in the NE.$\frac{1}{4}$, section 20, however, blue clay was encountered 2 feet below the surface. In a well in the SW.$\frac{1}{4}$, section 36, an upper, hard, white clay was reported, and in a well in the NE.$\frac{1}{4}$, section 14, 48 feet of yellow clay and a 4-foot bed of sandy gravel were encountered overlying the blue clay.

The well records show that there are at least two, distinct, general water-bearing horizons in the glacial drift in this township. The uppermost water-bearing horizon consists of a bed of sand or gravel, 2 to 10 feet thick, that in places underlies the yellow clay. Farmers have little difficulty in striking it and most of the wells in the southern half of the township are drawing their supplies from this aquifer. The supply of water obtained is variable, but is usually sufficient for at least 20 head of stock even in drought periods. The prolonged drought of 1930 to 1934 depleted the supply in these wells, but not to such an extent that they became intermittent or even insufficient for the farmer's requirements. The water is hard and contains varying amounts of mineral salts in solution. For instance, an 18-foot well in the NW.$\frac{1}{4}$, section 4, yields water that imparts a laxative effect to stock, whereas a 20-foot well in the SE.$\frac{1}{4}$, section 5, yields water that is being used for all purposes without any apparent ill effects. The water in these shallow wells is not under hydrostatic pressure. Water is almost certain to be encountered at depths of less than 20 feet in the valley of Waskana creek and its tributary coulées.

The second water-bearing horizon is usually tapped by bored or drilled wells at depths of 60 to 110 feet, depending upon the elevation of the ground surface. The elevation of this aquifer is approximately 1,930 to 1,950 feet. In a well drilled in the NW.$\frac{1}{4}$, section 28, the sand was encountered at a depth of 100 feet below the surface and the bed is at least 55 feet thick at this point. Usually the aquifer is only penetrated to a depth of 2 to 3 feet as the water rushes into the well under a pressure sufficient to rise 20 or 30 feet above the aquifer. The supply of water is abundant and many wells have never been pumped dry. The drought of 1930 to 1934 has, however, lowered the water level in a few of these deeper wells, but the supply was always sufficient to meet the farmer's requirements. The water is hard and highly mineralized, but many of the farmers are using it for drinking and they suffer no apparent ill effects after becoming accustomed to its use. The water from a 70-foot well in the SW.$\frac{1}{4}$, section 28, is so highly mineralized, however, that it is unfit for use. The farmer on this land is the only one in the township who has been forced to tank water for stock. An extension of the flowing artesian area outlined in township 13, range 14, occurs in sections 2 and 11 of this township. Springs are of fairly common occurrence in coulées and the valley of Waskana creek.

In general the ground water supply in this township is very good. Very few dry holes have been dug, bored, or drilled in the township. A permanent supply of mineralized water is assured at depths of less than 100 feet below the surface, anywhere in the township.

Township 14, Range 15

The elevation of this township decreases gradually from 2,150 feet in the northeastern corner to 2,050 feet in the valley of Waskana creek which passes through sections 5 and 6. Waskana creek is a very small, intermittent stream; the channel through which it flows is about 20 feet deep and 50 to 100 yards wide. Numerous shallow coulées occur and hold small rivulets of water only in the spring months. A small area in the northeastern corner of the township is mantled by glacial till and the ground surface is slightly undulating. The remainder of the township is covered with glacial lake deposits; glacial lake sands occurring in the north and northeastern parts of the township, and glacial lake clay in the southwestern two-thirds of the township. The ground surface in the glacial lake bed is flat, and the top soil, in the district that is covered by glacial lake clay, is a heavy, black gumbo, whereas that in the area covered by glacial lake sands is lighter and more sandy. An area in the southeastern corner of the township is low lying and marshy. There is very little natural tree growth and the sloughs are shallow, and do not hold large quantities of surface water.

The thickness of the glacial drift has been determined by a well drilled in the village of Sedley. The well is 312 feet deep and the bedrock Marine Shale was struck at a depth of 100 feet. The elevation of the surface of the bedrock at this point is 1,850 feet. The Marine Shale is locally termed "soapstone" and 212 feet of it was penetrated without encountering a water-bearing horizon. The thickness of the Marine Shale series is approximately 900 feet and drillers are advised to refrain from drilling into it in search of water for either drinking or stock use.

The glacial drift consists of yellow, brown, or black boulder clay, thick and extensive beds of sand, and blue clay. The sand beds are struck at depths of less than 40 feet below the surface anywhere in the township. Abundant supplies of water are derived from these sand beds and very few dry holes have been dug in an attempt to locate water. The drought of 1930 to 1934 affected the supply to a slight extent for, although the source of the water in the sand is from surface seepage, the amount of water held by the sand is so large that drought periods affect the supply only slightly. The water in at least nine shallow wells in the township is under a slight hydrostatic pressure. The water from a 6-foot well located in a ravine in the SE.$\frac{1}{4}$, section 4, rises 3 feet above the top of the casing and flows continuously summer and winter. Unfortunately the water from the glacial drift in this township is highly mineralized. The village of Sedley has made many unsuccessful attempts, including the drilling of the 312-foot well, in an effort to secure drinkable water. In 1935 drinking water for the town was hauled from wells in the NW.$\frac{1}{4}$, sec. 26, tp. 13, range 15, and from the NW.$\frac{1}{4}$, sec. 28, tp. 14, range 15. The water was sold at 5 cents a pail. Six farmers are forced to tank water for household purposes as the water from their wells contains a large amount of mineral salts in solution. The remaining farmers of the township use their well water for drinking, although it would produce a harsh, laxative effect on people not accustomed to its use. Three wells located in the NW.$\frac{1}{4}$, section 10, the NE.$\frac{1}{4}$, section 11, and the SE.$\frac{1}{4}$, section 19, yield water that is unfit even for stock use. Many farmers have small dugouts, not because there is a shortage of water from their wells, but because the surface water is more suitable for stock on account of its low mineral salt content. Slough water is also used for stock in seasons of average rainfall.

Drilling in the hope of securing water of good quality is not advised in this township. The Marine Shale series contains very few water-bearing horizons and nearly all the water found is too salty for any farm use. Although abundant quantities of water can readily be found at shallow depths in this township, the water from some wells is so highly mineralized that it is unfit for drinking and even for stock.

Township 15, Range 13

The northeastern half of the township is mantled by part of a moraine and its elevation is approximately 35 to 50 feet higher than the southwestern half of the township that is covered by boulder clay or glacial till. The ground surface is hilly and quite rough in the moraine-covered district, especially in sections 25 and 36. The ground surface of the glacial till-covered area is undulating rather than hilly. A long, narrow ravine winds through the central part of the township and eventually passes into Redfox lake in section 35. A small area of glacial outwash sands and gravels occurs in the vicinity of the village of Odessa in section 30. Redfox lake is a permanent body of water, approximately 240 acres in area. The lake generally contains 4 to 6 feet of water, but its level was lowered by the drought of 1930 to 1934. The undulating nature of the glacial till-covered district and the hilly, rough topography of the moraine-covered district, causes the formation of numerous sloughs. Some of the sloughs cover 50 to 100 acres. Small groves of poplar are scattered throughout the township.

The glacial drift is much thicker in this township than in the southern six townships of the municipality. The deepest producing well located in the NW.$\frac{1}{4}$, section 6, is 245 feet deep. As this well apparently did not tap the Marine Shale the surface of the bedrock is, therefore, probably at a lower elevation than 1,900 feet. A 300-foot dry hole was drilled in the NE.$\frac{1}{4}$, section 36. It stopped at an elevation of 1,894 feet, but no information was obtained as to the material penetrated by the drill. It is believed, however, that the elevation of the bedrock Marine Shale is about 1,850 feet above sea-level.

A cross-section of the upper 150 feet of the glacial drift would probably reveal the following materials in descending order: 2 to 4 feet top soil; 10 to 40 feet yellow clay; a layer of fine sand not more than 3 feet thick, which is present only in places; approximately 100 to 120 feet blue clay; and a thick bed of sand or gravel and blue clay. The well in section 6 penetrated a bed of fine sand of unknown thickness at a depth of 245 feet. The thin layer of sand between the yellow and blue clay is generally absent, and it is very difficult for farmers to secure a reliable supply of water at shallow depths.

An area in section 30 is covered with glacial outwash sands and gravels and water-bearing beds occur in these deposits at depths less than 20 feet below the surface. The village of Odessa lies within this area and many of the citizens have dug wells, 15 to 20 feet deep, in the sand, and secure a good supply of water that is not as highly mineralized as the water from deeper wells. With the exception of these wells only six wells in the township that are less than 50 feet deep yield sufficient water to meet the farm requirements.

Most of the wells have been drilled to the second water-bearing horizon that lies at depths of 80 to 160 feet below the surface. Generally, this aquifer is a very fine sand, but in some wells it is gravel. The water usually is under hydrostatic pressure and the abundant supply derived is little affected by drought conditions. Trouble is experienced with the fine sand particles shutting off the supply. The water is hard and mineralized, but is being used for drinking. It often contains iron which stains the water containers a reddish or yellowish colour. The village well of Odessa taps a gravel bed in the second water-bearing horizon at a depth of 145 feet below the surface. An abundant supply of "alkaline" water is obtained and is being used for drinking and household purposes by the inhabitants.

The third water-bearing horizon, consisting of quicksand, was tapped by a 245-foot well in the NW.$\frac{1}{4}$, section 6. It is deriving a very limited supply because the pipes are readily plugged with sand. The water from this well is hard and acts as a laxative upon those unaccustomed to its use, and it contains iron.

Farmers in this township who desire a permanent supply of water are advised to drill. The best water-bearing horizon will probably be found between 80 and 150 feet below the surface. Drilling operations should not exceed a depth of 300 feet since the Marine Shale that underlies the glacial drift does not contain water-bearing horizons.

Township 15, Range 14

The northeastern and southwestern corners of the township are mantled with a deposit of glacial till, whereas the remainder of the township is covered by moraine, the surface of which is undulating and is quite rough and hilly in the vicinity of Waskana creek. This creek traverses the township in a northwest to southeast direction and flows through the area mantled by moraine. In section 2, Waskana valley is approximately 50 feet deep, but it gradually becomes shallower in sections 19, 20, and 30. Water flows in the creek during the freshet season only. Small supplies of water occur along the channel at places where farmers have built small dams to conserve the water during the summer months for stock purposes. Small sloughs that hold surface run-off water are numerous in wet seasons. Clumps of poplar trees occur throughout the township and are more numerous in the northern and eastern sections.

The thickness of the glacial drift is believed to be approximately 300 feet, but no wells in the township have been drilled deep enough to confirm this estimate. Wells drilled to a depth of 230 feet have not encountered the bedrock Marine Shale that underlies the glacial drift. The surface of the bedrock is believed to lie at an approximate elevation of 1,850 to 1,900 feet. Except in coulées and Waskana Creek valley, the occurrence of a thick sand or gravel deposit within 30 feet of the surface is of infrequent occurrence. Consequently there are very few shallow dug wells in the township. Shallow wells dug in the floors of ravines yield abundant supplies of water in wet years and although affected by the drought of 1930 to 1934, their supply did not become intermittent. Shallow wells dug on the plain, or near slough basins, did not give a satisfactory supply during the drought.

The majority of the wells in the township have been drilled to depths of 100 to 230 feet below the surface. Abundant quantities of water are obtained from thick beds of sand or gravel that are encountered in the wells. The water is under a slight pressure and there was no noticeable depletion of the supply during the drought of 1930 to 1934. The water is hard, highly mineralized, and in many cases contains iron. It is used for drinking, although it cannot be termed good drinking water. These wells are excellent sources of water for stock, due to the constant and abundant supply, and the water is not too highly mineralized to be harmful. The main difficulty with many of those wells is that they become plugged by sand. The aquifer is either a very fine sand or gravel, and if the well has been drilled to a fine sand bed, the particles eventually clog the screens and render the well useless.

The logs obtained of the above-mentioned wells show considerable variation in the character, sequence, and thickness of the materials that compose the glacial drift. A 205-foot well drilled in the SE.$\frac{1}{4}$, section 4, penetrated the following materials in descending order: 10 feet yellow clay, 3 feet fine white sand, 188 feet blue clay, 4 feet fine white sand, and blue clay. This well was rendered useless by sand particles plugging the screens. A 168-foot well drilled in the SE.$\frac{1}{4}$, section 24, penetrated 20 feet yellow clay, 120 feet blue clay, 20 feet yellow clay, and 8 feet quicksand. This well was also gradually being plugged with sand. A 133-foot well in the NW.$\frac{1}{4}$, section 6, penetrated 2 feet black, sandy loam, 7 feet yellow clay with small sand layers, 70 feet gravel (dry), 50 feet blue clay, 4 feet gravel. Very few dry holes have been drilled to depths of 100 to 230 feet below the surface, and should other wells be drilled in this township a permanent supply of water will probably be obtained at about these depths. Farmers are advised, however, not to drill into the "soapstone" or bedrock Marine Shale series.

Township 15, Range 15

The northeastern corner of the township is mantled by part of a moraine. The headwaters of Waskana creek are in section 35, and the creek flows intermittently in a southeasterly direction through sections 36 and 25. The ground surface in the moraine-covered area is very rough and hilly, and it is broken by many ravines and gullies in the vicinity of the creek. The northwestern, central, and southeastern parts of the township are covered by glacial till and the southwestern corner is mantled by glacial lake sands. The ground surface in the areas that are mantled by glacial till and lake sands is undulating. The only occurrence of surface water in the township is that found in Waskana creek and its tributaries, and in small sloughs. Small clumps of poplar are sparsely scattered throughout the township.

The thickness of the glacial drift throughout the township is not definitely known, but a 300-foot well in the village of Sedley, in township 14, range 15, immediately to the south, encountered the bedrock at an approximate depth of 100 feet. The average character of the glacial drift is fairly well shown by a well located in the NW.$\frac{1}{4}$, section 28, the materials penetrated in descending order being 25 feet yellow clay, 10 feet blue clay, 4 feet white sand containing water, 47 feet blue clay, and 7 feet gravel. In the area that is covered by glacial lake sand the sandy loam top soil is underlain by sand which passed downward into a gravel bed having an average thickness of 18 feet.

Except in the area that is mantled by glacial lake sands, and in the floors of coulées and Waskana Creek valley, abundant supplies of water are very difficult to locate by shallow digging methods.

Most of the wells in this township have been dug or bored to depths of less than 80 feet. As a rule these wells do not produce a constant or abundant supply of water. Prolonged drought periods have a great effect on the supply and even seasonal differences in rainfall will cause a fluctuation in the available water supply. The water is hard and not too highly mineralized to prevent its use for drinking. Water is readily found in the glacial lake sands in the southwestern part of the township, and one 12-foot well in the NW.$\frac{1}{4}$, section 4, yields an abundant supply of soft water that was not decreased by the drought of 1930 to 1934.

Neighbouring farmers have taken as many as six tanks a day from this well without lowering the water level. In the NW.$\frac{1}{4}$, section 25, in the floor of Waskana Creek valley, there is a 6-foot deep, flowing artesian well that yields an abundant supply of soft, slightly "alkaline" water. This well was dug in 1925 and it has flowed continuously ever since.

All the drilling operations in the northeastern half of the township have been successful, although the supply in some of the wells has been depleted by sand plugging the screens. It is believed that abundant quantities of mineralized water can be located at depths ranging from 100 and 250 feet from the surface anywhere in the glacial moraine and glacial till-covered areas, and that the water is under pressure.

In the southwestern part of the township, the Marine Shale will probably be struck between depths of 100 and 150 feet. Farmers are advised to refrain from drilling into this shale or "soapstone", as it is usually termed. Only in a few places has usable water been found in the shale.

Township 16, Range 13

The central part of the township is an old glacial lake basin, in which occur a series of undrained depressions called Strawberry lakes. The largest lake is in sections 14, 15, 16, 22, and 23 and covers an area of approximately 1,500 acres, whereas the smallest lake is only a few acres in extent. As precipitation was small during 1930 to 1934, the level of the lakes was lowered. Springs occur on the north side of the largest lake and this suggests that the lakes may be spring fed in part at least. The lakes are from 4 to 10 feet deep. The upper 10 to 20 feet of the glacial drift in the vicinity of the lakes is composed almost entirely of sand. The extreme northern and southern parts of the township are mantled by part of a moraine. Separating the area of moraine in the south from the glacial lake sands is a strip of glacial till. The ground surface in these areas is extremely undulating and contains many small sloughs. The northeastern quarter of the township is thickly wooded.

In the boulder clay and moraine-covered areas, the upper 10 to 35 feet of the glacial drift usually consists of yellow clay, which is underlain by a layer of sand or gravel 1 to 4 feet thick. Occasionally, 10 to 20 feet of blue clay underlies the yellow clay and it is underlain by the layer of sand or gravel. Usually the blue clay is struck at approximately 40 feet from the surface and extends to a depth of at least 200 feet.

Practically every well in the glacial till and moraine-covered areas is less than 30 feet deep and the water is derived from pockets of sand or gravel that usually lie beneath the yellow clay. A permanent supply of water is difficult to find, and usually the wells do not water over 20 head of stock. The quantity of water obtained depends largely on rainfall seepage and consequently the drought of 1930 to 1934 caused a water shortage for many farmers. At least 10 farmers in this township were forced to tank water during the drought.

In the area that is covered by glacial lake sands, beds of sand and gravel, 10 to 20 feet thick, underlie the top soil. Large quantities of water are not obtained from wells dug into this sand, possibly because the water that seeps down into the sand from the surface is drained off into the lower lying basins containing Strawberry lakes.

In section 10, a hole was drilled to a depth of 200 feet without striking a water-bearing sand or gravel aquifer. The only producing drilled well is 160 feet deep, and is located in the NE.$\frac{1}{4}$, section 32. It is thought to be deriving most of its supply from an aquifer that lies 80 feet below the surface. The quantity of water obtained is not abundant, especially in winter when the level of the water table lowers. If the aquifer were at the base of the well the water would probably be under a strong pressure and the supply would be abundant. Numerous dry holes have been dug and bored to a maximum depth of 100 feet below the surface, and apparently no extensive water-bearing horizons occur between depths of 40 and 100 feet. Sufficient data are not at hand to state the possibilities of locating water-bearing sand or gravel aquifers between 100 and 200 feet below the surface.

Farmers who intend digging a well are advised to test with an auger to a maximum depth of 40 feet below the surface before digging is commenced. In this manner a sand or gravel pocket that will yield a good supply of water may be tapped with a minimum amount of expense and effort. Drilling to depths in excess of 100 to 150 feet may possibly locate a water-bearing horizon in the drift, but sufficient data are not available to determine this question.

Township 16, Range 14

With the exception of a small area near the northeastern corner that is mantled by glacial lake sands, and a strip along the eastern border that is covered by boulder clay or till, this township is underlain by part of a large moraine. The ground surface over most of the township is undulating and it becomes rougher towards the north. The uneven topography causes the formation of numerous sloughs, and small ravines. There is a gradual rise in elevation from 2,160 feet in the east to approximately 2,210 feet at the western part of the township. No permanent bodies of water and no well-defined stream channels occur in the township. The surface is wooded with poplar and the stand is more dense in the central and northern sections.

The glacial drift is at least 300 feet thick and is composed mainly of blue boulder clay. In many places the blue clay is immediately below the top soil without any overlying yellow clay that usually forms the upper 10 to 20 feet of the drift. Layers of sand may occur at various depths in the blue clay.

Permanent supplies of water are difficult to locate at shallow depths, since sand or gravel deposits are not of common or extensive occurrence, especially in the southern 4 miles of the township. In some places a bed of sand and gravel, 10 to 15 feet thick, underlies the top soil and a well that taps such a deposit will yield an abundant supply of slightly mineralized water. Five wells, 8 to 20 feet in depth, located in sections 32, 33, and 34, have tapped thick beds of sand and gravel that extend to the surface. Seasonal or even prolonged drought periods have not a marked effect on the quantity of water yielded, and the water level does not fluctuate as it does in wells where the aquifer is of small extent.

The majority of the wells in the township have been bored or drilled to depths exceeding 40 feet. There appears to be three general levels in the drift at which water is located; namely, 60 to 80 feet below the surface, 100 to 140 feet below the surface, and 200 to 300 feet below the surface. These three water-bearing horizons, however, are not continuous throughout the township, and holes have been drilled to a depth of 370 feet without locating any of these three water-bearing horizons.

Bored wells have usually tapped the aquifer at the 60 to 80-foot level and the water obtained is hard, and highly mineralized. The aquifer is usually a very fine, white sand and farmers and well drillers experience difficulty with this sand washing in before the casing can be installed. The water is under a slight hydrostatic pressure, and although the supply is good,dry years have an effect on the quantity of water obtained. Many dry holes, 60 to 80 feet deep, have been bored without locating this horizon. The water from these wells is seldom used for drinking.

Four wells in the township have been drilled to the coarse sand or gravel aquifer located at depths of 100 to 140 feet below the surface. They are in the SW.$\frac{1}{4}$, section 2, SE.$\frac{1}{4}$, section 6, SE.$\frac{1}{4}$, section 10, and the NE.$\frac{1}{4}$, section 18. The water in these wells is not as highly mineralized as the water from the 60- to 80-foot wells. It is described by farmers as being hard, slightly "alkaline", and containing iron. It is being used for drinking as well as for stock. The hydrostatic pressure raises the water only 20 to 50 feet above the aquifer, but the supply is abundant and not easily depleted by drought periods. No trouble is experienced with sand plugging the screens in these wells.

The third water-bearing horizon is located at depths ranging from 200 to 300 feet below the surface. The water rises under great pressure to a point 10 to 30 feet below the surface. The supply is abundant and although the water is hard and highly mineralized it can be used for drinking. The aquifer is quicksand and almost all the wells that have tapped this aquifer have been, or are being, rendered useless by the fine sand particles clogging the pipes. Wells that have been drilled to this aquifer are located in the NE.$\frac{1}{4}$, section 4, SW.$\frac{1}{4}$, section 16, NW.$\frac{1}{4}$, section 19, SE.$\frac{1}{4}$, section 20, and the NW.$\frac{1}{4}$, section 31. The wells in section 4 and section 19 are completely plugged with sand and cannot be used.

A dry hole, 310 feet deep, was drilled in the NW.$\frac{1}{4}$, section 9, and dry holes, 280 feet and 370 feet deep, were drilled in the SE.$\frac{1}{4}$, section 16. Boring and drilling operations are fairly certain to meet with success at most places in this township, but the thick beds of fine sand that form the aquifers at the 60- to 80-foot level and at the 200- to 300-foot level, although usually yielding abundant supplies of water, may partly or totally plug the well casings and shut off the supply. The best wells are those that tap the gravel aquifer at depths of 100 to 140 feet. The water from this horizon is not highly mineralized, and is abundant in quantity.

Township 16, Range 15

The headwaters of Manybone creek are located in section 8 of this township. This intermittent creek trends in a north-westerly direction through sections 8 and 18 to drain into Waskana creek. The eastern half of the township is mantled by moraine, whereas the western part is occupied by glacial till. The ground surface is rolling and in the southern and southwestern parts is broken by small gullies. Sloughs are numerous and extensive tree growths are limited to the six northern sections.

The glacial drift is estimated to be 250 to 300 feet thick, and it overlies the bedrock of the Marine Shale series. The deepest drilled hole in the township is 225 feet and is located in the SE.$\frac{1}{4}$, section 23. The top soil is generally underlain by 15 to 30 feet of yellow clay, which is followed by blue clay that extends to the bedrock. The upper 75 to 100 feet of the blue clay contains beds of sand or gravel. In the southern 2 miles of the township, thick beds of sand or gravel are of common occurrence in the upper 30 feet of the glacial drift, and in many places extend from the blue clay to the surface without a capping of yellow clay. In sections 1 to 12 inclusive, therefore, there are many shallow wells, 5 to 25 feet in depth, that yield abundant supplies of mineralized water. A 12-foot well in the NW.$\frac{1}{4}$, section 2, and a 5-foot well in a ravine in the SW. $\frac{1}{4}$, section 7, have never been bailed or pumped dry. Farmers in this district often dig more than one shallow well, one well being used for the house, another near the barn for stock use, and perhaps another in the pasture for watering stock in winter . The supply of water in some of these wells was affected by the drought of 1930 to 1934, but, in general, there has been no water shortage as the sand beds are extensive and hold much water.

In the northern 4 miles of the township, sand and gravel deposits in the upper part of the drift are scarce, and water at shallow depths is difficult to locate. The majority of the wells in this district, therefore, have been bored or drilled to depths of 80 to 150 feet, and abundant supplies of mineralized water are almost certain to be obtained within this range. An 87-foot well in the NE.$\frac{1}{4}$, section 19, yields an abundant supply of water and the water level cannot be lowered by continuous pumping. Variable amounts of dissolved mineral salts are contained in the water, but seldom render them unfit for drinking. The variable quality of water that is, apparently, derived from the same aquifer is shown by the wells in the village of Vibank. At present a 126-foot well is furnishing the village supply and the water is hard and slightly "alkaline", but is satisfactory for all purposes. A 106-foot well bored in the same village was filled in because the water was too highly mineralized to be suitable for domestic purposes. The water in these bored and drilled wells is suitable for stock, and drought affects the supply very slightly or not at all. The hydrostatic pressure raises the water to a point 40 to 60 feet below the surface.

STATISTICAL SUMMARY OF WELL INFORMATION IN RURAL MUNICIPALITY OF FRANCIS, NO. 127, SASKATCHEWAN

West of 2nd meridian — Township / Range	13 / 13	13 / 14	13 / 15	14 / 13	14 / 14	14 / 15	15 / 13	15 / 14	15 / 15	16 / 13	16 / 14	16 / 15	Total No. in municipality
Total No. of Wells in Township	69	115	61	85	46	44	65	75	66	72	96	81	875
No. of wells in bedrock	1	65	20	2	0	1	1	0	0	0	0	0	90
No. of wells in glacial drift	68	50	41	83	46	43	64	75	66	72	96	81	785
No. of wells in alluvium	0	0	0	0	0	0	0	0	0	0	0	0	0
Permanency of Water Supply													
No. with permanent supply	41	27	37	49	45	39	49	53	43	46	64	65	558
No. with intermittent supply	3	2	0	6	1	3	3	4	3	2	5	3	35
No. dry holes	25	86	24	30	0	2	13	18	20	24	27	13	282
Types of Wells													
No. of flowing artesian wells	0	5	0	0	0	1	0	0	1	0	0	0	7
No. of non-flowing artesian wells	1	0	15	16	12	8	16	22	8	4	16	15	133
No. of non-artesian wells	43	24	22	39	34	33	36	35	37	44	53	53	453
Quality of Water													
No. with hard water	34	27	34	50	42	37	48	41	35	42	52	58	500
No. with soft water	10	2	3	5	4	5	4	16	11	6	17	10	93
No. with salty water	1	0	0	0	1	3	0	0	0	2	0	0	7
No. with "alkaline" water	11	9	17	19	19	31	22	20	25	12	33	25	233
Depths of Wells													
No. from 0 to 50 feet deep	64	92	61	56	31	42	39	35	44	60	66	45	635
No. from 51 to 100 feet deep	5	20	0	19	13	1	8	14	12	10	18	18	138
No. from 101 to 150 feet deep	0	0	0	7	1	0	10	14	7	0	4	14	57
No. from 151 to 200 feet deep	0	0	0	3	1	0	6	7	3	2	1	4	27
No. from 201 to 500 feet deep	0	3	0	0	0	1	2	5	0	0	7	0	18
No. from 501 to 1,000 feet deep	0	0	0	0	0	0	0	0	0	0	0	0	0
No. over 1,000 feet deep	0	0	0	0	0	0	0	0	0	0	0	0	0
How the Water is Used													
No. usable for domestic purposes	37	26	33	53	40	32	48	49	42	37	57	56	510
No. not usable for domestic purposes	7	3	4	2	6	10	4	8	4	11	12	12	83
No. usable for stock	42	28	35	55	43	36	51	56	43	45	66	63	563
No. not usable for stock	2	1	2	0	3	6	1	1	3	3	3	5	30
Sufficiency of Water Supply													
No. sufficient for domestic needs	40	27	37	49	44	37	49	52	43	45	63	65	551
No. insufficient for domestic needs	4	2	0	6	2	5	3	5	3	3	6	3	42
No. sufficient for stock needs	30	22	34	43	41	30	34	44	36	21	51	53	439
No. insufficient for stock needs	14	7	3	12	5	12	18	13	10	27	18	15	154

ANALYSES AND QUALITY OF WATER

General Statement

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

Total Dissolved Mineral Solids

The term "total dissolved mineral solids" as here used refers to the residue remaining when a sample of water is evaporated to dryness. It is generally considered that waters that have less than 1,000 parts per million of dissolved solids are suitable for ordinary uses, but in the Prairie Provinces this figure is often exceeded. Nearly all waters that contain more than 1,000 parts per million of total solids have a taste due to the dissolved mineral matter. Residents accustomed to the waters may use those that have much more than 1,000 parts per million of dissolved solids without any marked inconvenience, although most persons not used to highly mineralized water would find such waters highly objectionable.

Mineral Substances Present

Calcium and Magnesium

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

Sodium

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

Sulphates

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

Chlorides

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

Iron

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

Hardness

Calcium and magnesium salts impart hardness to water. Hardness of water is commonly recognized by its soap-destroying powers as shown by the difficulty of obtaining lather with soap. The total hardness of a water is the hardness of the water in its original state. Total hardness is divided into "permanent hardness" and "temporary hardness". Permanent hardness is the hardness of the water remaining after the sample has been boiled and it represents the amount of mineral salts that cannot be removed by boiling. Temporary hardness is the difference between the total hardness and the permanent hardness and represents the amount of mineral salts that can be removed by boiling. Temporary hardness is due mainly to the bicarbonates of calcium and magnesium and iron, and permanent harness to the sulphates and chlorides of calcium and magnesium. The permanent hardness can be partly eliminated by adding simple chemical softeners such as ammonia or sodium carbonate, or many prepared softeners. Water that contains a large amount of sodium carbonate and small amounts of calcium and magnesium salts is soft, but if the calcium and magnesium salts are present in large amounts the water is hard. Water that has a total hardness of 300 parts per million or more is usually classed as excessively hard. Many of the Saskatchewan water samples have a total hardness greatly in excess of 300 parts per million; when the total hardness exceeded 3,000 parts per million no exact hardness determination was made. Also no determination for temporary hardness was made on waters having a total hardness less than 50 parts per million. As the determinations of the soap hardness in some cases were made after the samples had been stored for some time, the temporary hardness of some of the waters as they come from the wells probably is higher than that given in the table of analyses.

Analyses of Water Samples from the Municipality of Francis, No. 127, Saskatchewan

LOCATION						Depth of Well, Ft.	Total dis'vd solids	HARDNESS			CONSTITUENTS AS ANALYSED						CONSTITUENTS AS CALCULATED IN ASSUMED COMBINATIONS									Source of Water
No.	Qtr.	Sec.	Tp.	Rge.	Mer.			Total	Perm.	Temp.	Cl.	Alkalinity	CaO	MgO	SO_4	Na_2O	Solids	$CaCO_3$	$CaSO_4$	$MgCO_3$	$MgSO_4$	Na_2CO_3	Na_2SO_4	NaCl	$CaCl_2$	
1	NW.	12	13	13	2	34	280	230	150	80	10	185	40	50	06	45	280	72		96	12		83	17		xl
2	SW.	2	13	14	2	44	3,760	400	375	25	102	275	50	97	2,255	1,510	3,740	90		157	66		3,259	168		xl
3	SW.	26	13	14	2	17	526	Faint trace of Nitrates and Organic Matter									526	(3)	(1)		(2)		(4)		(5)	xl
4	NW.	33	13	14	2	28	4,260	2,200	2,200		328	275	580	338	2,202	713	3,836	275	1,035		1,007		978	541		xl
5	NW.	33	13	15	2	30	2,060	900	850	50	103	585	150	184	931	603	2,051	269		265	170		1,177	170		xl
6	SW.	14	14	13	2	67	2,480	1,700	1,700		33	100	360	360	1,607	174	2,298	100	739		1,073		332	54		xl
7	SW.	15	14	14	2	40	3,826		Colon Bacilli Present								3,826	(3)	(1)		(2)				(4)	xl
8	SE.	13	15	14	2	135	760	425	425		35	135	40	119	422	182	763	72		52	235		346	58		xl
9	SW.	14	15	14	2	127	1,940	1,500	1,500		20	495	280	259	959	234	1,804	495	7		772		497	33		xl
10	SE.	21	15	14	2	230	1,600	1,200	1,100	100	16	135	160	234	996	203	1,496	135	204		697		454	26		xl
11	SW.	22	15	15	2	95	4,320	2,800	2,800		136	95	450	540	2,657	560	3,906	95	965		1,609		1,014	223		xl
12	SE.	30	16	13	2	16	434		Bacteria and a slight Trace of Organic Matter Present								434	(1)		(2)					(3)	xl
13	SW.	33	16	15	2	165	1,870		Bacteria Count 400 per c.c.								1,870	(4)	(1)		(2)		(3)		(5)	xl

Water samples indicated thus, xl, are from glacial drift.

Analyses are reported in parts per million; where numbers (1), (2), (3), (4), and (5) are used instead of parts per million, they represent the relative amounts in which the five main constituents are present in the water.

Hardness is the soap hardness expressed as calcium carbonate ($CaCO_3$).

Analyses Nos. 3, 7, 12, and 13, by Provincial Analyst, Regina.

For interpretation of this table read the section on Analyses and Quality of Water.

Water from the Unconsolidated Deposits

Thirteen samples of water from the glacial deposits of the municipality of Francis were analysed and the results are listed in the accompanying table. The total dissolved solid content of these waters varies from 280 parts per million in sample 1, to 4,320 parts per million in sample 11. There is no relationship between the depth at which the water is obtained and the amount of total dissolved solids contained in the water. For example, sample 1 with a total dissolved solid content of 280 parts per million was taken from a 34-foot well, whereas sample 4, with a total dissolved solid content of 4,260 parts per million, was taken from a 28-foot well. This is also shown by samples 8 and 9. These samples were taken from wells that are only 2 miles apart and 135 feet and 127 feet deep, respectively. It is quite probable that they tap the same aquifer, yet sample 9 has a total dissolved solid content two and a half times as great as that of sample 8, although the component salts that constitute the total dissolved solid content are almost identical. The majority of the samples contain relatively large amounts of magnesium sulphate (Epsom salts) and sodium sulphate (Glauber's salt). The presence of these salts in large amounts is very undesirable in drinking water because of their laxative producing properties. The waters shown by samples 2, 4, 7, and 11 should not be used for drinking since they contain a large amount of total dissolved solids, the greater percentage of which is composed of $MgSO_4$ and Na_2SO_4. Samples 9 and 10 also contain a fairly high proportion of Epsom salts and Glauber's salt and may be undesirable as drinking waters. Colon bacilli were reported as present in the water of sample 7. This water may have been contaminated by surface waters containing sewage, and would be unfit for human use as it might cause typhoid fever or dysentery.

Water from the Bedrock

No producing wells tap an aquifer in the bedrock of the Marine Shale series underlying the glacial drift in this municipality, and it is very doubtful if water-bearing horizons which would yield usable water occur in the shale. Water that has been obtained in places from the Marine Shale series in south-western Saskatchewan contains an excessive amount of dissolved mineral salts in solution, principally magnesium sulphate, sodium sulphate, and common salt, and this prohibits its use for any farm purpose.

WELL RECORDS—Rural Municipality of FRANCIS NO.127, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
1	NW.	3	13	13	2	Dug	16	2,050					Glacial drift				Dry hole, Tanks water the year round.
2	NE.	5	"	"	"	Dug	34	2,008	- 30	1,978	30	1,978	Glacial sand	Hard, iron, "alkaline"		D, S	Sufficient for 60 head stock; spring sufficient for 100 head stock; also.
3	SE.	6	"	"	"	Dug	21	1,983					Glacial drift	Hard, "alkaline"		D	Intermittent supply. One other well will water 15 head stock.
4	SE.	7	"	"	"	Dug	30	2,005	- 26	1,979	30	1,975	Glacial fine sand	Hard, iron, "alkaline"		S	Insufficient supply in dry years.
5	SE.	9	"	"	"	Dug	16	2,019	- 12	2,007	12	2,007	Glacial fine sand	Hard, iron		S	Well has never been pumped dry.
6	SW.	9	"	"	"	Dug	16	2,017	- 12	2,005			Glacial sand	Hard		D, S	Abundant supply; can obtain water readily near buildings.
7	NW.	12	"	"	"	Bored	34	2,056	- 33	2,023	33	2,023	Glacial fine sand	Hard		D, S	Abundant supply; water easily found on this farm. #
8	NE.	14	"	"	"	Dug	19	2,030	- 15	2,015			Glacial sand and gravel	Soft		D, S	Sufficient supply for 60 head stock.
9	SW.	15	"	"	"	Dug	14	2,033	- 11	2,022			Glacial sand	Hard, "alkaline"		D, S	Sufficient water for 20 head stock.
10	SE.	17	"	"	"	Dug	11	2,003	- 8	1,995	4	1,999	Glacial gravel	Hard		D, S	Sufficient for 25 head stock; strikes "soapstone" at 30 feet in SW. ¼, section 17.
11	NE.	20	"	"	"	Dug	14	2,058	- 4	2,054			Glacial sand and gravel	Hard, iron		D, S	Sufficient for 25 head stock; uses a dugout for stock in summer.
12	SE.	21	"	"	"	Spring		2,046	+ 1	2,047	0	2,046	Glacial gravel	Soft, iron		D, S	Spring flows winter and summer.
13	NW.	21	"	"	"	Dug	12	2,056	- 4	2,052			Glacial sand and gravel	Soft, clear		D, S	Sufficient for 30 head stock; has a flowing spring in the pasture.
14	NW.	22	"	"	"	Dug	20	2,052					Glacial drift	Hard, "alkaline"		D	Intermittent supply; tanks for 10 head stock when dugout goes dry.
15	NW.	23	"	"	"	Drilled	83	2,087	- 60	2,027	60	2,027	Glacial sand and gravel	Hard, iron, "alkaline"		D, S	Abundant supply for 30 head stock; owns a dam on Waskana creek.
16	SE.	25	"	"	"	Dug	18	2,120			0	2,120	Glacial sand	Hard		D, S	Sufficient for 25 head stock; owns a 100-foot well on NE. ¼, section 25, good supply.
17	SW.	28	"	"	"	Dug	30	2,060					Glacial drift				Dry hole. Hauls water from section 29.
18	SE.	29	"	"	"	Dug	8	2,050	- 3	2,047	6	2,044	Glacial fine sand	Hard		D, S	Abundant supply.
19	SW.	29	"	"	"	Dug	12	2,058	- 7	2,051			Glacial sand	Soft		D	Intermittent supply; uses springs when dugout and wells fail.
20	SW.	31	"	"	"	Dug	52	2,037	- 48	1,989	49	1,988	Glacial fine sand	Soft		D, S	Well has never been pumped dry.
21	NW.	33	"	"	"	Dug	48	2,084	- 46	2,038			Glacial fine sand	Soft, iron		D, S	Abundant supply.
22	SE.	34	"	"	"	Bored	44	2,093	- 28	2,065			Glacial fine sand	Soft		D	Farmer has sufficient water; owns a dam on Waskana creek.
23	NW.	34	"	"	"	Dug	17	2,056	- 7	2,049			Glacial sand	Hard, salty		S	Sufficient for 60 head stock; seepage from a creek.
24	NE.	36	"	"	"	Bored	70	2,140	- 20	2,120			Glacial fine sand	Hard, "alkaline"		S	Waters at least 20 head stock. No water above 70 feet on this land.
1	SE.	1	13	14	2	Dug	12	1,990	- 2	1,988			Glacial sand	Soft		S	Direct seepage from a dugout; several dry holes to 100 feet.
2	SW.	2	"	"	"	Dug	44	1,970	- 25	1,945			Glacial drift	Hard, iron, "alkaline"		D, S	Sufficient for at least 25 head stock. #
3	SW.	3	"	"	"	Dug	30	1,962	0	1,962			Glacial drift	Hard, "alkaline"		D, S	Supplies at least 10 tanks a day.

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 FRANCIS NO.127, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
4	NW.	4	13	14	2	Dug		1,980					Glacial drift				Dry holes; owns a dugout but also tanks from Francis.
5	NE.	5	"	"	"	Dug	12	1,968					Glacial drift	Soft		D, S	Intermittent supply; uses a dugout and tanks water in 1934.
6	NW.	7	"	"	"	Dug	20	1,955	- 16	1,939			Glacial drift	Hard		D	Sufficient for the house only; tanked water in 1934.
7	SE.	10	"	"	"	Bored	63	1,980					Bedrock Marine Shale				Dry hole; uses a dugout and tanks water.
8	NW.	10	"	"	"	Drilled	400	1,980									Dry hole; uses a dugout and tank water when it becomes dry.
9	NE.	11	"	"	"	Dug	30	1,982	+ 1	1,983	26	1,956	Glacial gravel	Hard		D,mS	Very abundant supply; drilled dry holes in "soapstone" to 100 feet.
10	NE.	13	"	"	"	Dug	19	2,002					Glacial drift	Hard,iron		D, S	Sufficient for 15 head stock; one other similar well.
11	SW.	14	"	"	"	Dug	12	1,978	+ 2	1,980	10	1,968	Glacial fine black sand	Hard		D, S	Very abundant supply; there is another artesian well on the NW. ¼, section 14.
12	SW.	16	"	"	"	Dug	16	2,000					Glacial drift	Hard,very "alkaline"		N	Water is too mineralized for use; uses a dugout and tanks water.
13	NW.	16	"	"	"	Drilled	300	2,000					Bedrock Marine Shale				Practically a dry hole; a little water at 60 feet from the surface.
14	SW.	17	"	"	"	Dug	30	2,000					Bedrock Marine Shale				Dry hole; uses a dam and a dugout and tanks water.
15	SW.	18	"	"	"	Bored	32	1,963	- 12	1,951			Glacial sand	Hard		D, S	Sufficient for 15 head stock; uses a dugout and tanks from Francis.
16	SE.	19	"	"	"	Dug	30	1,970					Glacial drift				Dry hole; uses a dugout and tanks from Francis
17	NW.	19	"	"	"	Bored	100	1,970					Bedrock Marine Shale				Dry hole; uses a dugout and tanks water for 15 head stock in dry years.
18	SE.	20	"	"	"	Dug	20-30	1,980					Bedrock Marine Shale				Dry hole; uses dugout, reservoirs, and tanks water from Francis.
19	SW.	20	"	"	"	Dug	30	1,980					Bedrock Marine Shale				Dry holes; uses dugout in wet years and tanks water in winters and dry years.
20	NW.	21	"	"	"	Drilled	450	1,974					Bedrock Marine Shale				Dry hole; Town of Francis. Pipe line from section 26, supplies the town.
21	SW.	25	"	"	"	Dug	20	2,011	- 15	1,996			Glacial sand and gravel	Hard		D, S	Barely sufficient for 15 head stock.
22	NW.	25	"	"	"	Dug	22	2,017	- 20	1,997	20	1,997	Glacial gravel	Hard,iron		D, S	Good supply for 15 head stock.
23	SE.	26	"	"	"	Bored	20	2,005	- 10	1,995			Glacial gravel	Hard		D, S	Well has never been pumped dry.
24	SW.	26	"	"	"	Dug	17	2,000	+ 1	2,001			Glacial gravel	Hard		D, S, I	Abundant supply; water is piped from this well to the town of Francis. #
25	SW.	28	"	"	"	Dug	30	2,000					Bedrock Marine Shale				Dry hole; buys water from pipe line running to Francis.
26	NW.	28	"	"	"	Bored	100	2,000					Bedrock Marine Shale				Dry hole; tanks water from the flowing spring 1 mile east.
27	NW.	30	"	"	"	Dug		1,984					Glacial sand	Hard		D, S	Good supply for 20 head stock.
28	NW.	32	"	"	"	Dug	28	1,986	- 17	1,969			Glacial drift	Hard		D, S	Sufficient for 20 head stock.
29	NE.	32	"	"	"	Dug	30	1,979					Glacial drift	Hard,iron, "alkaline"		D, S	Sufficient for 25 head stock.
30	NW.	33	"	"	"	Dug	28	1,988	- 16	1,972			Glacial gravel	Hard,"alkaline"		D, S	Sufficient for 25 head stock. #

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

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

WELL RECORDS—Rural Municipality of FRANCIS NO.127, 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
31	NE.	34	13	14	2	Spring		1,990	0	1,990			Glacial drift	Hard		S	Flows winter and summer.
32	SE.	35	"	"	"	Dug	20	2,010					Glacial drift	Hard,"alkaline"			Sufficient for 15 head stock at least.
33	NE.	35	"	"	"	Bored	21	2,012	- 13	1,999			Glacial sand	Hard,iron, "alkaline"		D, S	Well has never been pumped dry; also uses a spring in pasture.
34	SE.	36	"	"	"	Dug	12	2,018	- 7	2,011			Glacial drift	Hard,iron, "alkaline"		D, S	Sufficient for 15 head stock.
1	NE.	2	13	15	2	Dug	24	2,000	- 20	1,980	20	1,980	Glacial coarse sand	Hard		D, S	Abundant supply.
2	NE.	3	"	"	"	Dug	10	1,980	0	1,980			Glacial gravel	Hard		D, S	Abundant supply; also uses a spring fed slough.
3	SW.	4	"	"	"	Dug	35	1,950	- 32	1,918	32	1,918	Glacial gravel	Hard,iron, "alkaline"		S	Poor supply and water has a laxative effect on horses.
4	NE.	4	"	"	"	Dug	19	1,975	- 12	1,963	12	1,963	Glacial sand	Hard,iron		D, S	Sufficient for 25 head stock at least.
5	NE.	5	"	"	"	Dug	15	1,950	- 10	1,940	10	1,940	Glacial sand	Hard,"alkaline"		D, S	Abundant supply; also uses springs in a coulee.
6	NW.	7	"	"	"	Dug	30	1,950					Glacial gravel	Hard		D, S	Sufficient for at least 20 head stock.
7	NE.	8	"	"	"	Dug	40	1,965	- 36	1,929	36	1,929	Glacial sand and gravel	Hard,iron		D, S	Supplies 25 tanks a day.
8	SE.	14	"	"	"	Dug	22	1,985	- 12	1,973	18	1,967	Glacial sand	Hard		D, S	Sufficient supply; 10 dry holes dug to bedrock Marine Shale.
9	SW.	14	"	"	"	Dug	23	1,960	- 10	1,950	0	1,960	Glacial sand	Soft		D, S	Intermittent supply; 10 dry holes dug to bedrock Marine Shale.
10	NW.	15	"	"	"	Bored	40	1,970	- 34	1,936	34	1,936	Glacial sand	Hard,iron		D, S	Sufficient for at least 10 head stock.
11	NE.	15	"	"	"	Dug	35	1,975	- 15	1,960			Glacial gravel	Hard		D, S	Sufficient supply.
12	SE.	16	"	"	"	Dug	40	1,970	- 30	1,940	38	1,932	Glacial sand	Hard		D, S	Abundant supply.
13	SE.	17	"	"	"	Dug	46	1,965	- 42	1,923			Glacial sand and gravel	Soft,		D, S, I	Abundant supply.
14	NW.	18	"	"	"	Bored	22	1,960	- 12	1,948	22	1,938	Glacial fine sand	Hard,iron, "alkaline"		D, S	Well has never been pumped dry.
15	SE.	19	"	"	"	Dug	25	1,970	- 22	1,948	22	1,948	Glacial gravel	Hard,"alkaline"		D, S	Abundant supply.
16	NW.	21	"	"	"	Dug	15	1,975	- 12	1,963	12	1,963	Glacial sand and gravel	Hard,iron		D, S	Ten tanks a day have been drawn from this well.
17	NE.	21	"	"	"	Dug	18	1,980	- 10	1,970	18	1,962	Glacial sand	Hard		D, S	Abundant supply for 25 head stock.
18	NW.	23	"	"	"	Bored	40	1,965	- 20	1,945	40	1,925	Glacial sand	Hard,"alkaline"		S	Sufficient supply, but water has a laxative effect on man.
19	SW.	23	"	"	"	Dug	24	1,965	- 20	1,945	20	1,945	Glacial gravel	Hard		D, S	Abundant supply.
20	NE.	24	"	"	"	Dug	16	1,950	- 3	1,947	16	1,934	Glacial sand and gravel	Hard,iron		D, S	Well has never been pumped dry.
21	NE.	25	"	"	"	Dug	50	1,970	- 20	1,950			Glacial sand and gravel	Hard,iron, "alkaline"		D, S	Abundant supply.
22	SE.	26	"	"	"	Dug	22	1,960	- 19	1,941	17	1,943	Glacial gravel	Hard,"alkaline"		D, S	Well can be pumped dry but it refilles in ½ hour; also owns a dugout.
23	NW.	26	"	"	"	Dug	20	1,950	- 10	1,940	19	1,931	Glacial gravel	Soft		D, S	Abundant supply; water is hauled from this well to town of Sedley.

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 FRANCIS NO.127, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
24	SE.	27	13	15	2	Dug	30	1,965	- 10	1,955	26	1,939	Glacial gravel	Hard,"alkaline"		D, S	Abundant supply.
25	NE.	30	"	"	"	Dug	19	1,960	- 9	1,951			Glacial sand	Hard,"alkaline"		D, S	Abundant supply.
26	NE.	31	"	"	"	Bored	48	1,970	- 40	1,930	40	1,930	Glacial sand and gravel	Hard,iron, "alkaline"		D, S	Good supply.
27	NW.	32	"	"	"	Dug	15	1,945	- 12	1,933	12	1,933	Glacial sand	Hard,"alkaline"		D, S	Sufficient for 30 head stock; also uses a spring for stock.
28	NW.	33	"	"	"	Dug	30	1,955	- 20	1,935	30	1,925	Glacial sand	Hard,iron, "alkaline"		D, S	Abundant supply for 50 head stock. #
29	NW.	34	"	"	"	Bored	38	1,950					Glacial gravel	Hard,iron, "alkaline"		D, S	Sufficient for 20 head stock.
30	SW.	35	"	"	"	Dug	35	1,960	- 20	1,940	35	1,925	Glacial sand and gravel	Hard,iron, "alkaline"		D, S	Abundant supply.
31	NE.	36	"	"	"	Bored	30	1,975	- 20	1,955	30	1,945	Glacial gravel	Hard,iron		D, S	Abundant supply.
1	SE.	1	14	13	2	Dug & Bored	70	2,134	- 4	2,130			Glacial drift	Hard		D, S	Intermittent supply; also owns a dam and a dugout. Dry holes.
2	SW.	3	"	"	"	Dug	24	2,061	- 14	2,047			Glacial fine sand	Hard,"alkaline"		D, S	Insufficient for 20 head stock; uses the creek for stock and also tanks.
3	SW.	5	"	"	"	Bored & Dug	45	2,061	- 43	2,018			Glacial drift	Hard,iron, "alkaline"		D, S	Small supply; dry holes to 20 feet.
4	SE.	6	"	"	"	Drilled	145	2,070	- 70	2,000	140	1,930	Glacial sand				
5	NW.	7	"	"	"	Bored	50	2,041					Glacial sand	Hard		D, S	Sufficient for 50 head stock.
6	SW.	8	"	"	"	Bored	50	2,087	- 38	2,049			Glacial sand	Hard		D, S	Sufficient for 30 head stock.
7	NW.	8	"	"	"	Bored	50	2,104	- 38	2,066	39	2,065	Glacial fine sand	Hard,iron, "alkaline"		D, S	Insufficient supply in winter.
8	SE.	9	"	"	"	Dug	7	2,058	- 5	2,053	5	2,053	Glacial gravel	Hard		D, S	Abundant supply for 35 head stock; also owns 5 springs.
9	SE.	11	"	"	"	Bored	50	2,154	- 10	2,144			Glacial fine sand	Hard,"alkaline"		D, S	Abundant supply for 25 head stock.
10	NW.	11	"	"	"	Bored	112	2,152	- 92	2,060	112	2,040	Glacial fine sand	Hard,"alkaline"		D, S	Abundant supply for 30 head stock.
11	NE.	12	"	"	"	Bored	66	2,162	- 34	2,128	66	2,096	Glacial gravel	Hard,"alkaline"		D, S	Barely sufficient for 30 head stock; dry holes to bedrock Marine Shale 60 feet deep.
12	SW.	14	"	"	"	Dug	67	2,159	- 63	2,096	66	2,093	Glacial fine sand	Hard,"alkaline"		S	Sufficient for 20 head stock; dry holes dug to 58 feet. #
13	NW.	14	"	"	"	Drilled	137	2,173	- 87	2,086			Glacial sand	Hard,iron, "alkaline"		D, S	Abundant supply.
14	NE.	15	"	"	"	Drilled	153	2,168	-113	2,055			Glacial gravel	Hard,"alkaline"		D, S	Abundant supply; owns a dugout.
15	SE.	17	"	"	"	Bored	20	2,054	- 10	2,044			Glacial sand	Soft,iron		D, S	Good supply for 40 head stock; several springs in Washana creek bed.
16	SW.	18	"	"	"	Bored	45	2,104	- 31	2,073	41	2,063	Glacial fine sand	Hard,iron		D, S	Sufficient supply for 40 head stock.
17	SW.	20	"	"	"	Drilled	186	2,126	- 70	2,056	100	2,026	Glacial fine sand	Hard,iron		D, S	Sufficient for 60 head stock; trouble with sand plugging.
18	NW.	21	"	"	"	Drilled	112	2,151	- 40	2,111			Glacial fine sand	Hard,iron, "alkaline"		D, S	Abundant supply for 50 head stock.
19	SE.	22	"	"	"	Drilled	80	2,163	- 71	2,092			Glacial gravel	Hard,"alkaline"		D, S	Well has never been pumped dry.

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WELL RECORDS—Rural Municipality of FRANCIS NO.127, 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
20	SW.	22	14	13	2	Bored	84	2,155	- 80	2,075			Glacial sand and gravel	Hard, "alkaline"		D, S	Abundant supply.
21	SW.	24	"	"	"	Dug	62	2,169	- 42	2,127			Glacial fine sand	Hard, iron, "alkaline"		D, S	Insufficient supply in drought years; dry holes to 100 feet. Tanks water.
22	NW.	25	"	"	"	Bored	80	2,170					Glacial drift				Dry hole; uses a dugout and tanks water.
23	NE.	26	"	"	"	Bored	80	2,161	- 76	2,085			Glacial gravel	Hard, iron, "alkaline"		D, S	Barely sufficient for 40 head stock.
24	NE.	27	"	"	"	Drilled	150	2,158					Glacial drift	Hard, iron		D, S	Sufficient for at least 50 head stock.
25	SE.	30	"	"	"	Drilled	143	2,160	-125	2,035	143	2,017	Glacial sand	Hard, iron		D, S	Sufficient for at least 60 head stock.
26	SW.	31	"	"	"	Drilled	100	2,160	- 80	2,080			Glacial drift	Hard, iron, "alkaline"		D, S	Sufficient for at least 30 head stock.
27	NW.	31	"	"	"	Drilled	132	2,163	- 92	2,071			Glacial gravel	Hard, iron, "alkaline"		D, S	Sufficient for at least 40 head stock.
28	SE.	32	"	"	"	Dug	32	2,165	- 24	2,141	30	2,135	Glacial fine sand	Soft		D, S	Intermittent supply; many dry holes to 40 feet. Uses dugout and tanks water.
29	SW.	33	"	"	"	Drilled3	180	2,163					Glacial drift	Hard, iron		D, S	Yields 1½ barrels of water at a time; also uses a dugout.
30	SE.	34	"	"	"	Dug	20	2,155					Glacial drift	Soft		D, S	Intermittent supply; uses dugout and sloughs for stock and tanks water.
31	SE.	35	"	"	"	Bored	96	2,162	- 70	2,092			Glacial fine sand	Hard, iron, "alkaline"		D, S	Slow seepage; tanks water in dry years. Barely sufficient for 20 head stock.
32	SW.	36	"	"	"	Bored	80	2,159	- 40	2,119			Glacial drift	Hard, iron		D, S	Abundant supply.
33	NE.	36	"	"	"		47?	2,178					Glacial drift	Hard, iron, "alkaline"		D, S	Sufficient for about 20 head stock.
1	SE.	1	14	14	2	Dug	9	2,033	- 6	2,027			Glacial gravel	Hard, iron, "alkaline"		D, S	Sufficient for 30 head stock; also uses a spring for stock in a coulee.
2	NW.	4	"	"	"	Dug	18	1,989	- 11	1,978			Glacial gravel	Hard, very "alkaline"		S	Water has laxative effect on stock; sufficient for 15 head stock.
3	SE.	5	"	"	"	Dug	20	1,991	- 15	1,976	20	1,971	Glacial gravel	Hard		D, S	Sufficient for 25 head stock.
4	SE.	8	"	"	"	Dug							Glacial sand	Hard		D, S	Well has not been pumped dry.
5	SW.	9	"	"	"	Dug	18	1,989	- 11	1,978			Glacial sand	Hard, iron, "alkaline"		S	Sufficient for 30 head stock.
6	NE.	9	"	"	"	Dug	25	2,016	- 20	1,996	22	1,994	Glacial gravel	Hard, "alkaline"		D, S	Sufficient for 40 head stock.
7	SW.	10	"	"	"	Dug	14	2,004					Glacial sand	Hard, iron, "alkaline"		D, S	Sufficient for 20 head stock.
8	SE.	11	"	"	"	Dug	30	2,048	- 16	2,032	27	2,021	Glacial sand	Hard		D, S	Abundant supply; owns a spring in pasture but it is seldom used.
9	SW.	12	"	"	"	Dug	20	2,056	- 18	2,038	20	2,036	Glacial fine sand	Hard, iron, "alkaline"		D, S	Good supply for 40 head stock.
10	NW.	12	"	"	"	Dug	40	2,067					Glacial sand	Hard		D, S	Waters at least 50 head stock.
11	NE.	14	"	"	"	Bored	64	2,091	- 44	2,047	63	2,028	Glacial coarse sand	Hard, iron		D, S	Abundant supply.
12	SW.	15	"	"	"	Bored	40	2,040	- 20	2,020			Glacial drift	Hard, iron, salty, "alkaline"		D, S	Sufficient for 20 head stock. #
13	NW.	16	"	"	"	Bored	60	2,016	- 20	1,996	40	1,976	Glacial drift	Hard, "alkaline"		D, S	Good supply for 50 head stock.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of FRANCIS NO.127, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
14	SE.	17	14	14	2	Dug	9	2,004	- 5	1,999	5	1,999	Glacial sand and gravel	Hard		S	Good supply for 50 head stock.
15	SW.	19	"	"	"	Dug	16	2,002	- 12	1,990	0	2,002	Glacial gravel	Hard		D, S	Good supply for 40 head stock; fast seepage.
16	SW.	20	"	"	"	Dug	24	2,020	- 16	2,004	24	1,996	Glacial fine sand	Very hard		D, S	Well has never been pumped dry.
17	NE.	20	"	"	"	Bored	63	2,041	- 20	2,021	63	1,978	Glacial sand	Hard,"alkaline"		D, S	Good supply for 25 head stock.
18	NE.	22	"	"	"	Drilled	65	2,084	- 45	2,039			Glacial drift	Hard,iron, "alkaline"		D, S	Abundant supply.
19	SW.	23	"	"	"	Drilled	55	2,061	- 35	2,026			Glacial drift	Hard,iron, "alkaline"		D, S	Good supply; rather slow seepage.
20	NW.	24	"	"	"	Bored	64	2,114	- 62	2,052	61	2,053	Glacial fine sand	Soft		D, S	Sufficient for at least 15 head stock.
21	NE.	24	"	"	"	Dug	15	2,072	- 5	2,067	14	2,058	Glacial coarse sand	Hard,iron		D, S	Sufficient for at least 30 head stock.
22	SW.	25	"	"	"	Dug	14	2,097	- 11	2,086	14	2,083	Glacial sand	Soft		D, S	Sufficient for 50 head stock.
23	SW.	27	"	"	"	Drilled	70	2,080					Glacial gravel	Hard		D, S	Good supply.
24	SW.	28	"	"	"	Drilled	70	2,050					Glacial drift	Hard,very "alkaline"		N	Water is too mineralized for farm use; tanks water in winters and dry years.
25	NW.	28	"	"	"	Drilled	155	2,079	-100	1,979	100	1,979	Glacial fine sand	Hard,iron		D, S	Sufficient for at least 20 head stock.
26	NE.	28	"	"	"	Bored	63	2,087	- 38	2,049	61	2,026	Glacial coarse sand	Hard,iron, "alkaline"		D, S	Sufficient for at least 25 head stodk.
27	NW.	33	"	"	"	Drilled	110	2,121					Glacial drift	Hard,iron, "alkaline"		D, S	Abundant supply.
28	NW.	34	"	"	"	Dug	20	2,078	- 12	2,066	20	2,058	Glacial fine sand	Soft,"alkaline"		D, S	Water level in the well varies with creek level.
29	NE.	34	"	"	"	Dug	20	2,081			20	2,061	Glacial sand	Soft,"alkaline"		D, S	Water lever in the well varies with dreek level.
30	NW.	35	"	"	"	Drilled	90	2,124	- 78	2,046			Glacial drift	Hard		D, S	Sufficient for at least 50 head stock.
31	SW.	36	"	"	"	Drilled	95	2,147	- 70	2,077			Glacial gravel	Hard,"alkaline"		D, S	Abundant supply.
1	SE.	1	14	15	2	Drilled	50	1,975	- 15	1,960			Glacial sand	Hard,iron, "alkaline"		D, S	Sufficient for at least 25 head stock.
2	SW.	3	"	"	"	Dug	32	1,970	- 29	1,941	29	1,941	Glacial sand	Hard,"alkaline"		D, S	Well pumps dry and refills in ½ hour; also uses a dugout fed by a spring.
3	SE.	4	"	"	"	Dug	6	1,960	- 3	1,963	6	1,954	Glacial sand	Very hard, iron,salty, sulphur,"alkaline"		D, S	Flows continually summer and winter.
4	NE.	6	"	"	"	Dug	18	1,935	- 14	1,921	14	1,921	Glacial sand	Hard,"alkaline"		D, S	Sufficient for 40 head stock.
5	SE.	9	"	"	"	Dug	15	1,965	- 6	1,959	15	1,950	Glacial fine sand	Hard,iron, salty,"alkaline"		D, S	Sufficient for 30 head stock at least.
6	NW.	10	"	"	"	Dug	15	1,975	- 13	1,962	15	1,960	Glacial fine sand	Hard,very "alkaline"		N	Water is too highly mineralized and the well was abandoned; tanks water.
7	NE.	11	"	"	"	Dug	35	1,975	- 28	1,947	10	1,965	Glacial fine sand	Hard,very "alkaline"		N	Water unfit for farm use; uses a spring for all purposes.
8	NW.	13	"	"	"	Dug	18	1,980	- 11	1,969	18	1,962	Glacial sand	Hard,"alkaline"		D, S	Good supply for 15 head stock.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of FRANCIS NO.127, 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
9	NE.	16	14	15	2	Dug	26	1,970	- 21	1,949	22	1,948	Glacial fine sand	Hard,"alkaline"		D, S	Sufficient for 30 head stock.
10	SE.	17	"	"	"	Dug	35	1,960	- 27	1,933	27	1,933	Glacial sand	Hard,"alkaline"		S	Village of Sedley well. No drinking water; buy it from farmers for 5 cents a pail.
11	SE.	17	"	"	"	Drilled	312	1,957					Bedrock Marine Shale				Dry hole; village of Sedley.
12	NE.	17	"	"	"	Bored	36	1,957	- 31	1,926	33	1,924	Glacial gravel	Hard,"alkaline"		D	Good supply.
13	SE.	19	"	"	"	Bored	50	1,935	- 16	1,919	24	1,911	Glacial fine sand	Hard,iron, salty,sulphur "alkaline"		N	Water condemned by analyst. Hauls water a distance of 4 miles.
14	NE.	22	"	"	"	Bored	24	1,980	- 16	1,964	24	1,956	Glacial sand	Hard,iron, "alkaline"		D, S	Insufficient for 40 head stock in winter; also uses a spring.
15	NW.	22	"	"	"	Dug	16	1,970	- 12	1,958	12	1,958	Glacial sand and gravel	Hard,iron, sulphur		D	Sufficient for house use; owns a dam and springs.
16	SW.	23	"	"	"	Dug	24	1,975	- 14	1,961	23	1,952	Glacial sand	Hard,"alkaline"		D, S	Sufficient for 60 head stock.
17	SW.	24	"	"	"	Bored	15	1,980	- 10	1,970	10	1,970	Glacial sand	Hard,"alkaline"		S	Sufficient for 25 head stock.
18	SE.	25	"	"	"	Dug	28	2,020	- 18	2,002	28	1,992	Glacial sand	Soft		D, S, I	Good supply for 30 head stock.
19	NW.	26	"	"	"	Dug	20	1,975	- 15	1,960	15	1,960	Glacial sand	Hard,"alkaline"		D, S	This well supplies the village of Sedley with drinking water.
20	NE.	28	"	"	"	Dug	20	1,975	- 16	1,959	16	1,959	Glacial sand	Soft		D, S	Pumps dry but refills. Sufficient for 30 head stock.
21	SE.	30	"	"	"	Dug	15	1,950	- 8	1,942			Glacial drift	Hard,very "alkaline"		S	Sufficient for 10 head stock.; tanks drinking water a distance of 3 miles.
22	NW.	31	"	"	"	Dug	25	1,975	- 18	1,957	18	1,957	Glacial sand	Hard,"alkaline"		D, S	Sufficient supply; dugout is also used.
23	NE.	32	"	"	"	Dug	18	1,980	- 8	1,972	18	1,962	Glacial fine sand	Hard,"alkaline"		D	Sufficient supply and a similar well is used for stock.
24	NW.	33	"	"	"	Dug	18	1,980	- 14	1,966	14	1,966	Glacial fine sand	Hard,"alkaline"		D, S	Sufficient for 40 head stock.
25	SW.	34	"	"	"	Dug	20	1,985	- 15	1,970	15	1,970	Glacial fine sand	Hard		D, S	Sufficient for 50 head stock.
26	NE.	34	"	"	"	Dug	30	2,000	- 16	1,984	18	1,982	Glacial gravel	Soft		D, S, I	Sufficient for 50 head stock.
27	NE.	35	"	"	"	Dug	50	2,025	- 30	1,995			Glacial sand	Hard,"alkaline"		D, S	Abundant supply.
28	SE.	35	"	"	"	Dug	12	2,000	- 10	1,990	10	1,990	Glacial sand	Soft		D, S	Intermittent supply; well is dry in winter.
29	SW.	36	"	"	"	Dug	40	2,010	- 25	1,985	40	1,970	Glacial fine sand	Hard,"alkaline"		D, S	Sufficient for at least 30 head stock.
30	NE.	36	"	"	"	Dug	22	2,050	- 4	2,046	18	2,032	Glacial sandy clay	Hard		D, S	Intermittent supply.
1	SE.	2	15	13	2	Bored	84	2,154	- 44	2,1 0			Glacial drift	Hard,"alkaline"		D, S	Good supply for 15 head stock.
2	NW.	3	"	"	"	Drilled	127	2,162	-111	2,051			Glacial sand	Hard,"alkaline"		D, S	Good supply for 30 head stock.
3	NE.	4	"	"	"	Drilled	142	2,163	- 85	2,078	135	2,028	Glacial fine sand	Soft,iron		D, S	Well has never been pumped dry.
4	NW.	6	"	"	"	Drilled	245	2,152	-145	2,007			Glacial fine sand	Hard,iron, "alkaline"		D, S	Barely sufficient for 22 head stock.
5	SE.	8	"	"	"	Drilled	160	2,180	- 85	2,095			Glacial gravel	Hard,"alkaline"		S	Sufficient for 45 head stock; slow seepage.

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 FRANCIS NO.127. SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
6	NW.	9	15	13	2	Drilled	100	2,175	- 90	2,085			Glacial gravel	Hard,iron, "alkaline"		D, S	Sufficient for 30 head stock.
7	SE.	11	"	"	"	Bored	75	2,158	- 69	2,089			Glacial drift	Hard,"alkaline"		D, S	Poor supply; stock are driven to a neighbours well.
8	NE.	11	"	"	"	Dug	20	2,157					Glacial drift	Hard,iron		D, S	Sufficient for 20 head stock.
9	SW.	12	"	"	"	Dug & Bored	50	2,158	- 35	2,123			Glacial sand	Hard		D, S	Sufficient for 40 head stock.
10	NW.	13	"	"	"	Drilled	80	2,138	- 10	2,128			Glacial drift	Hard,iron		D, S	Sufficient for 40 head stock at least.
11	NE.	14	"	"	"	Dug	32	2,145	- 16	2,129			Glacial gravel	Hard		D, S	Insufficient for 25 head stock in winter, tank water.
12	SW.	15	"	"	"	Drilled	115	2,156	- 35	2,121			Glacial drift	Hard,iron		D, S	Good supply for 25 head stock.
13	NW.	16	"	"	"	Drilled	130	2,165					Glacial drift	Hard,iron, "alkaline"		D, S	Good supply.
14	NW.	19	"	"	"	Drilled	107	2,166					Glacial gravel	Hard,"alkaline"		D, S	Sufficient for 35 head stock.
15	NE.	19	"	"	"	Dug	9	2,153	- 6	2,147	4	2,149	Glacial sand	Hard		D, S	Insufficient supply; bored well 200 feet deep caved in before being cribbed.
16	NW.	20	"	"	"	Drilled	152	2,151	- 78	2,073	149	2,002	Glacial gravel	Hard,iron, "alkaline"		D, S	Sufficient for only 10 head stock because of sand plugging; dry holes.
17	NE.	20	"	"	"	Dug	14	2,166	- 7	2,159			Glacial sand	Hard		D, S	Sufficient for 20 head stock; uses 2 dugouts for stock also.
18	SE.	21	"	"	"	Drilled	165	2,138	- 62	2,076	165	1,973	Glacial gravel	Hard,iron		D, S	Well has never been pumped dry.
19	NW.	21	"	"	"	Drilled	130	2,166	- 80	2,086	126	2,040	Glacial gravel	Hard,"alkaline"		D, S	Abundant supply; also owns a 110-foot drilled well on the SW. ¼,section 16.
20	NW.	22	"	"	"	Bored	52	2,156	- 30	2,126	52	2,104	Glacial gravel	Hard,iron, "alkaline"		D, S	Will water 200 head stock.
21	NW.	23	"	"	"	Dug	28	2,142	- 26	2,116			Glacial sand	Hard,"alkaline"		D, S	Sufficient for house use only; uses slough in summer and melts snow in winter.
22	NW.	24	"	"	"	Drilled	128	2,154	- 68	2,086			Glacial gravel	Hard,iron, "alkaline"		D, S	Sufficient for at least 40 head stock.
23	SW.	25	"	"	"	Drilled	129	2,157	- 33	2,124			Glacial gravel	Hard		D, S	Sufficient for at least 30 head stock.
24	SE.	28	"	"	"	Dug	40	2,139	- 25	2,114			Glacial sand	Hard,iron, "alkaline"		D, S	Sufficient for at least 20 head stock.
25	NE.	29	"	"	"	Dug	19	2,155					Glacial fine sand	Soft		D	Intermittent supply; uses dugout for stock in summer.
26	SW.	30	"	"	"	Drilled	145	2,156	- 55	2,101			Glacial gravel	Hard,iron, "alkaline"		D, S	Village of Odessa well; abundant supply.
27	NW.	30	"	"	"	Drilled	50	2,154					Glacial sand	Hard,"alkaline"		D	Used for the house only; 2 shallow wells supply 20 head stock.
28	SE.	31	"	"	"	Bored	24	2,156	- 20	2,136			Glacial drift	Hard,iron, "alkaline"		D	Intermittent supply; waters stock at a 28-foot well in the pasture.
29	SW.	32	"	"	"	Dug	28	2,151	- 17	2,134			Glacial sand	Hard		D	Sufficient for house use only; uses a 10-foot well ½ mile east for stock.
30	NW.	32	"	"	"	Dug	48	2,155	- 33	2,122	35	2,120	Glacial sand	Hard,"alkaline"		D, S	Very slow seepage; poor supply.
31	NE.	32	"	"	"	Bored	27	2,155	- 23	2,132			Glacial drift	Hard		D	Sufficient for house use only; tanks water for 17 head stock.
32	NE.	36	"	"	"	Dug	36	2,194	- 34	2,160			Glacial sand	Hard		D, S	Sufficient for 60 head stock.

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

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

WELL RECORDS—Rural Municipality of FRANCIS NO.127, 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				
33	NE.	36	15	13	2	Drilled	300	2,194					Bedrock Marine Shale				Dry hole.
1	SE.	1	15	14	2	Drilled	131	2,150	-100	2,050			Glacial fine white sand	Hard, iron, "alkaline"		D, S	Sufficient for 25 head stock; troubled with sand plugging.
2	SW.	1	"	"	"	Drilled	104	2,150	- 88	2,062	73	2,077	Glacial fine sand	Hard, iron		D, S	Abundant supply.
3	NW.	2	"	"	"	Dug	22	2,062	- 19	2,043	0	2,062	Glacial sand	Soft		D, S	Sufficient for 40 head stock; a 200-foot well plugged with sand.
4	SW.	3	"	"	"	Dug	18	2,130	- 4	2,126			Glacial sand	Soft		D, S, I	Always sufficient water.
5	SE.	4	"	"	"	Dug	14	2,130	0	2,130			Glacial sand	Soft		D, S	Intermittent supply; a 205-foot well gave a very poor supply. Tanks water in winter.
6	SW.	4	"	"	"	Drilled	140	2,121	- 55	2,066	136	1,985	Glacial black sand	Hard, iron		D, S	Will water at least 100 head stock.
7	SE.	5	"	"	"	Drilled	165	2,110	-100	2,010	100	2,010	Glacial sand and gravel	Hard, iron, "alkaline"		S	Abundant supply for 20 head stock.
8	SW.	6	"	"	"	Bored	84	2,066	- 64	2,002			Glacial drift	Hard, iron		D, S	Always sufficient water.
9	NW.	6	"	"	"	Drilled	133	2,096	- 73	2,023	133	1,963	Glacial gravel	Hard, iron		D, S	Sufficient for at least 35 head stock.
10	SW.	9	"	"	"	Drilled	95	2,166	- 78	2,088	95	2,071	Glacial gravel	Hard, iron		D, S	Sufficient for at least 30 head stock; a 230 foot well became plugged with sand.
11	SE.	10	"	"	"	Dug	20	2,150	- 18	2,132	18	2,132	Glacial gravel	Hard		D, S	Sufficient for at least 10 head stock.
12	NW.	10	"	"	"	Drilled	80	2,165	- 60	2,105			Glacial sand	Hard, "alkaline"		D, S	Sufficient for at least 25 head stock.
13	SW.	12	"	"	"	Drilled	150	2,145	- 90	2,055	149	1,996	Glacial gravel	Hard		D, S	Sufficient for 30 head stock.
14	NW.	12	"	"	"	Drilled	165	2,150			135	2,015	Glacial sand	Hard, iron		D, S	Abundant supply.
15	NE.	12	"	"	"	Drilled	240	2,150					Glacial fine grey sand	Hard, iron, "alkaline"		D, S	Well not in use at present; farm is not occupied.
16	SW.	14	"	"	"	Drilled	127	2,129	- 37	2,092	127	2,002	Glacial gravel	Hard, iron, "alkaline"		D, S	Abundant supply. #
17	SW.	15	"	"	"	Dug	60	2,155	- 20	2,135			Glacial drift	Hard		D	Seepage water from a dam.
18	SW.	16	"	"	"	Dug	28	2,151	0	2,151			Glacial drift	Soft, "alkaline"		S	Intermittent supply; a 9-foot well in the creek bed was used for stock in dry years.
19	SE.	13	"	"	"	Drilled	135	2,150	-100	2,050			Glacial gravel	Hard, iron, "alkaline"		D, S	Abundant supply. #
20	NE.	17	"	"	"	Dug	24	2,117	- 14	2,103			Glacial sand	Soft		D, S	Sufficient for 30 head stock.
21	SW.	18	"	"	"	Drilled	108	2,178	- 92	2,086	108	2,070	Glacial gravel	Hard, iron		D, S	Well has never been pumped dry.
22	NW.	18	"	"	"	Drilled	180	2,172	-164	2,008			Glacial sand and gravel	Hard, "alkaline"		D, S	Abundant supply
23	SE.	18	"	"	"	Dug	16	2,145	- 6	2,139			Glacial sand sand	Hard		D, S	Insufficient supply.
24	SE.	21	"	"	"	Drilled	230	2,176	- 90	2,086			Glacial fine sand	Hard, iron, "alkaline"		D, S	Abundant supply. #
25	NE.	21	"	"	"	Drilled	117	2,180	- 91	2,089	117	2,063	Glacial gravel	Hard, iron		D, S	Abundant supply.
26	NE.	22	"	"	"	Drilled	135	2,138	-105	2,033			Glacial fine sand	Hard, iron, "alkaline"		D, S	Abundant supply.

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

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

WELL RECORDS—Rural Municipality of FRANCIS NO.127, 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	HEIGHT TO WHICH WATER WILL RISE: Elev.	PRINCIPAL WATER-BEARING BED: Depth	PRINCIPAL WATER-BEARING BED: Elev.	PRINCIPAL WATER-BEARING BED: Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
27	SW.	24	15	14	2	Drilled	150	2,140	-130	2,010			Glacial gravel	Hard,iron		D, S	Abundant supply.
28	SE.	24	"	"	"	Drilled	160	2,158	- 90	2,068	160	1,998	Glacial fine sand	Hard,iron, "alkaline"		D, S	Waters only 10 head stock; supply poor because of sand plugging.
29	NE.	24	"	"	"	Drilled	110	2,157					Glacial drift	Hard		D, S	Well has never been pumped dry.
30	NE.	25	"	"	"	Dug	8	2,130	- 5	2,125	5	2,125	Glacial gravel	Soft		D, S	Abundant supply for 40 head stock.
31	NE.	28	"	"	"	Drilled	120	2,165	-110	2,055			Glacial gravel	Hard,iron, "alkaline"		D, S	Always sufficient water.
32	SW.	30	"	"	"	Dug	24	2,113	- 20	2,093	16	2,097	Glacial fine sand	Soft,"alkaline"		S	Sufficient for at least 80 head stock.
33	SW.	31	"	"	"	Drilled	100+	2,165	- 60	2,105			Glacial drift	Hard,iron, "alkaline"		D, S	Abundant supply.
34	NW.	31	"	"	"	Dug	16	2,160	- 8	2,152	15	2,145	Glacial sand and gravel	Soft		D, S	Good supply for 30 head stock.
35	SW.	32	"	"	"	Drilled	64	2,183	- 51	2,132			Glacial drift	Hard		D, S	Sufficient for at least 50 head stock; fast seepage.
36	NW.	32	"	"	"	Dug	17	2,170	- 14	2,156	15	2,155	Glacial fine sand	Soft,iron, "alkaline"		D, S	Insufficient for 20 head stock in winter; dry holes 27 to 50 feet deep.
37	NE.	33	"	"	"	Dug	15	2,156	- 10	2,146	12	2,144	Glacial sand	Soft		S	Intermittent supply in 1934.
38	SW.	34	"	"	"	Dug	10	2,157	- 6	2,151	8	2,149	Glacial gravel	Soft		D, S	Sufficient for 10 head stock.
39	NE.	34	"	"	"	Dug	12	2,152	- 3	2,149	9	2,143	Glacial sand	Soft		D, S	Sufficient for 25 head stock.
40	SW.	35	"	"	"	Dug	7	2,136	- 4	2,132	4	2,132	Glacial gravel	Hard,iron		D, S	Sufficient for 20 head stock.
41	SW.	36	"	"	"	Drilled	160	2,136	-130	2,006			Glacial sand	Hard,iron, "alkaline"		D, S	Abundant supply.
42	NW.	36	"	"	"	Dug	16	2,134	- 8	2,126			Glacial gravel	Soft		D, S	Intermittent supply in 1932 and 1934; one other shallow well used also.
43	NE.	36	"	"	"	Drilled	130	2,133	-100	2,033	130	2,003	Glacial gravel	Hard		D, S	Well has never been pumped dry.
1	SE.	1	15	15	2	Drilled	70	2,043	- 54	1,989			Glacial drift	Hard,iron, "alkaline"		D, S	Very poor supply; owns a dam and a dugout.
2	SE.	2	"	"	"	Bored	60	2,036	- 45	1,991			Glacial drift	Hard,iron, "alkaline"		D, S	Sufficient for 50 head stock; screen plugging with sand.
3	NW.	4	"	"	"	Dug	12	1,981	- 9	1,972	9	1,972	Glacial gravel	Soft		D, S	Abundant supply.
4	NE.	5	"	"	"	Dug	16	1,986	- 12	1,974	15	1,971	Glacial gravel	Soft		D, S	Insufficient supply.
5	SE.	7	"	"	"	Dug	8	1,988	- 6	1,982			Glacial fine sand	Hard,"alkaline"		D, S	Fast seepage; sufficient for 20 head stock at least.
6	SW.	8	"	"	"	Dug	18	1,993	- 13	1,980			Glacial drift	Hard,"alkaline"		D, S	Sufficient for 25 head stock.
7	NE.	8	"	"	"	Dug	16	2,000	- 13	1,987	8	1,992	Glacial gravel	Soft		D, S	Good supply for 45 head stock.
8	NE.	9	"	"	"	Dug	16	2,022	- 11	2,011			Glacial fine sand	Hard,"alkaline"		D, S	Good supply for 40 head stock.
9	SE.	10	"	"	"	Bored	44	2,007	- 38	1,969	38	1,969	Glacial fine sand	Hard,iron, "alkaline"		D, S	Barely sufficient for 40 head stock.
10	NE.	10	"	"	"	Dug	16	2,064	0	2,064			Glacial drift	Soft,"alkaline"		D, S	Intermittent supply; dry holes to 100 feet deep. Hauls water in winter and dry years.

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 FRANCIS NO.127, 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
11	SE.	12	15	15	2	Drilled	130	2,091	- 80	2,011			Glacial drift	Hard,"alkaline"		D, S	Abundant supply.
12	SE.	13	"	"	"	Dug	24	2,137	- 6	2,131	10	2,127	Glacial sand	Soft		D, S	Seepage from a dugout; dry in winters. Tanks water.
13	SW.	13	"	"	"	Bored	96	2,120					Glacial drift				Dry hole; uses a dugout and tanks water.
14	SE.	14	"	"	"	Drilled	145	2,121	-130	1,991			Glacial sand	Hard,iron, "alkaline"		D, S	Good supply, but troubled with sand plugging.
15	SE.	16	"	"	"	Dug	14	2,015	- 11	2,004	12	2,003	Glacial fine sand	Soft		D, S	Sufficient for 35 head stock.
16	NE.	16	"	"	"	Dug	70	2,055					Glacial drift				Dry hole; tanks water from the SE. ¼,section 16.
17	SE.	17	"	"	"	Dug	15	2,018	- 13	2,005	12	2,006	Glacial gravel	Hard,iron		D, S	Decreases in winter; good supply because of fast seepage.
18	NW.	17	"	"	"	Dug	14	1,993	- 6	1,987			Glacial gravel	Soft		D, S	Sufficient for 25 head stock.
19	NW.	19	"	"	"	Dug	20	2,044	- 5	2,039			Glacial sand	Hard		D, S	Sufficient for 10 head stock at least.
20	SE.	21	"	"	"	Dug	38	1,990					Glacial fine sand	Hard,very "alkaline"		N	Water is too "alkaline" for use; uses a dam and a spring for stock.
21	SW.	22	"	"	"	Bored	95	2,092	- 25	2,067	25	2,067	Glacial sand	Hard,iron, "alkaline"		S	Sufficient for 25 head stock. #
22	NE.	22	"	"	"	Bored	80	2,138	- 65	2,073			Glacial drift	Hard,"alkaline"		D, S	
23	SW.	24	"	"	"	Drilled	165	2,141	-147	1,994	165	1,976	Glacial gravel	Hard,iron		D, S	Well has never been pumped dry.
24	NW.	24	"	"	"	Drilled	175	2,142	-157	1,985			Glacial sand	Hard,"alkaline"		D, S	Abundant supply.
25	SW.	25	"	"	"	Dug	12	2,146	- 2	2,144			Glacial sand	Very hard, iron,"alkaline"		D, S	Water level varies with creek level.
26	NW.	25	"	"	"	Dug	6	2,106	+ 1	2,107	5	2,101	Glacial sand	Soft,"alkaline"		D, S	Well flows continuously winter and summer.
27	NE.	27	"	"	"	Drilled	110	2,145	- 50	2,095			Glacial fine sand	Hard,iron, "alkaline"		D, S	Abundant supply for 50 head stock.
28	NW.	28	"	"	"	Drilled	93	2,136	- 39	2,097	86	2,050	Glacial gravel	Hard,"alkaline"		D, S	Abundant supply for 35 head stock.
29	SW.	31	"	"	"	Bored	60	2,089	- 58	2,031	58	2,031	Glacial gravel	Hard,iron, "alkaline"		D, S	Sufficient for 25 head stock; fast seepage.
30	SW.	32	"	"	"	Drilled	125	2,129	- 25	2,104			Glacial fine sand	Hard		D, S	Well has been rendered useless by sand plugging the pipes; tanks water.
31	SE.	33	"	"	"	Drilled	73	2,150					Glacial drift	Hard,iron		D, S	Sufficient for at least 25 head stock.
32	SE.	35	"	"	"	Dug	45	2,147	- 38	2,109			Glacial sand	Very hard, iron,"alkaline"		D, S	Abundant supply for 25 head stock.
33	SW.	35	"	"	"	Dug	16	2,142	- 11	2,131	7	2,135	Glacial sand	Hard,"alkaline"		D, S	Intermittent supply; an 8 foot well is also used for stock.
34	NW.	35	"	"	"	Drilled	100	2,151	- 50	2,101			Glacial fine sand	Hard,iron, "alkaline"		D, S	Sufficient for at least 35 head stock.
35	NE.	36	"	"	"	Dug	17	2,164	- 6	2,158	10	2,154	Glacial sand and gravel	Soft		D, S	Sufficient for 30 head stock.
36	NE.	36	"	"	"	Drilled	158	2,164	- 78	2,086			Glacial gravel			D, S	Well not in use at present since the windmill is broken.

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 FRANCIS NO.127, 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				
1	SW.	1	16	13	2	Dug	24	2,166	- 15	2,151			Glacial sand	Hard		D, S	Good supply for 35 head stock.
2	SE.	2	"	"	"	Dug & Bored	25	2,180	- 10	2,170			Glacial drift	Hard, salty		D, S	Barely sufficient water.
3	SE.	2	"	"	"	Bored	30	2,173	- 2	2,171			Glacial sand	Hard		D, S	Abundant supply.
4	SE.	3	"	"	"	Bored	50?	2,168					Glacial drift	Hard, iron, "alkaline"		D, S	Good supply.
5	SE.	4	"	"	"	Dug	30	2,153	- 22	2,131			Glacial drift	Hard, iron, "alkaline"		D, S	Will water 5 head stock only in winter; hauls 2 tanks of water a week.
6	NE.	4	"	"	"	Dug	20	2,159	- 4	2,155			Glacial sand	Soft		S	Insufficient supply; also owns a 30-foot well that is also used for stock.
7	SW.	5	"	"	"	Bored	34	2,150	- 26	2,124	30	2,120	Glacial gravel	Hard, "alkaline"		S	Sufficient for 40 head stock.
8	SW.	7	"	"	"	Dug	25	2,175	- 24	2,151			Glacial fine sand	Hard, "alkaline"		S	Waters only 8 head stock in summer; laxative effect on some animals.
9	NW.	7	"	"	"	Bored	40	2,175	- 34	2,141			Glacial sand	Soft		D	Sufficient for house use only; tanks water for stock from a lake.
10	NW.	8	"	"	"	Bored	34	2,150			30	2,120	Glacial gravel	Hard		D, S	Sufficient supply of water; 2 dry holes bored 60 feet deep.
11	SW.	9	"	"	"	Bored	36	2,150	- 20	2,130	20	2,130	Glacial sand	Hard, iron		D, S	Sufficient for 25 head stock only; dry holes 60 feet deep, tanks water.
12	NW.	10	"	"	"	Dug	12	2,157	- 8	2,149	6	2,151	Glacial sand	Hard		D, S	Well is readily bailed dry; tanks water summer and winter.
13	NE.	10	"	"	"	Bored	30	2,151	- 15	2,136			Glacial sand	Hard, "alkaline"		S	Poor supply and insufficient; tanks water.
14	NW.	11	"	"	"	Dug & Sand-point	28	2,144					Glacial sand	Hard		D, S	Sufficient for at least 30 head stock.
15	SE.	12	"	"	"	Dug	24	2,174	- 21	2,153			Glacial sand	Soft		D, S	Sufficient for at least 30 head stock.
16	SE.	14	"	"	"	Dug	12	2,165	- 9	2,156			Glacial fine sand	Hard		D, S	Sufficient for at least 30 head stock.
17	NW.	16	"	"	"	Bored	12	2,151	0	2,151			Glacial fine sand	Soft		D, S	Intermittent supply; dry holes 65 feet deep. Stock are watered at Strawberry lake.
18	NE.	22	"	"	"	Dug	4	2,149	0	2,149	0	2,149	Glacial fine white sand	Hard, iron, "alkaline"		D	Well situated near a lake.
19	SW.	24	"	"	"	Dug	12	2,160	- 6	2,154			Glacial sand	Soft		D, S	Waters 650 sheep.
20	NE.	26	"	"	"	Bored	36	2,150	- 24	2,126			Glacial drift	Hard, iron		D	Poor supply; waters stock at a spring ¾ mile east.
21	NW.	27	"	"	"	Dug	20	2,155	- 14	2,141	15	2,140	Glacial gravel	Hard		D, S	Sufficient for 40 head stock.
22	NE.	28	"	"	"	Dug	40	2,150					Glacial drift				Dry hole; tanks water from the lake.
23	SE.	30	"	"	"	Dug	16	2,160	- 13	2,147	13	2,147	Glacial fine sand	Hard		D	Sufficient for house use; 10-foot well supplies 40 head stock. #
24	SW.	31	"	"	"	Borod	26	2,165	- 10	2,155	24	2,141	Glacial gravel	Hard, "alkaline"		D, S	Will water 80 head stock.
25	SE.	32	"	"	"	Dug	36	2,165	- 11	2,154	36	2,129	Glacial gravel	Hard, "alkaline"		D	Sufficient for house use; stock are watered at a lake.
26	NE.	32	"	"	"	Drilled	160	2,170	- 80	2,090			Glacial drift	Hard, iron, "alkaline"		S	Good supply, but the pipes do not extend to a sufficient depth.

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

WELL RECORDS—Rural Municipality of FRANCIS NO.127, 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
27	NE.	33	16	13	2	Dug	30	2,150	- 18	2,132	19	2,131	Glacial fine sand	Hard,"alka-line"		S	Insufficient for 30 head stock in winter; tanks water in winter from a lake.
28	SE.	34	"	"	"	Bored	45	2,143					Glacial drift	Hard,iron, "alkaline"		D	Very poor supply; uses a dugout and sloughs.
29	SW.	35	"	"	"	Bored	70	2,140	- 50	2,090			Glacial drift	Hard,iron		D, S	Waters at least 30 head stock.
30	NW.	36	"	"	"	Dug	15	2,141	- 8	2,133			Glacial sand	Hard		D, S	Sufficient for 15 head stock.
1	SW.	2	16	14	2	Drilled	128	2,173	-104	2,069			Glacial gravel	Hard		D, S	Abundant supply for 35 head stock.
2	SE.	3	"	"	"	Drilled	65	2,180					Glacial drift				Dry hole; tanks water for stock and domestic use.
3	NE.	4	"	"	"	Drilled	278	2,190	- 80	2,110			Glacial fine sand	Hard,"alka-line"		D, S	Abundant supply but troubled with sand plugging the pipes.
4	SE.	5	"	"	"	Dug	12	2,178	- 7	2,171			Glacial sand	Very hard, "alkaline"		D, S	Insufficient for 15 head stock; uses one other 10-foot well and tanks water.
5	NE.	5	"	"	"	Drilled	70	2,198	- 30	2,168			Glacial drift	Hard,iron, "alkaline"		S	Very slow seepage, although it is dependable; waters 20 head stock.
6	SE.	6	"	"	"	Drilled	145	2,187	- 70	2,117			Glacial gravel	Hard,iron, "alkaline"		D, S	Abundant supply.
7	NW.	6	"	"	"	Dug	8	2,176	- 4	2,172	7	2,169	Glacial gravel	Soft		D, S	Good supply for 10 head stock.
8	NE.	6	"	"	"	Bored	40	2,194	- 35	2,159	39	2,155	Glacial sand	Hard,"alka-line"		D, S	Sufficient for 30 head stock.
9	NW.	8	"	"	"	Bored	60	2,208	- 40	2,168			Glacial white gravel	Hard,iron, "alkaline"		D, S	Sufficient for about 30 head stock; well can be pumped dry.
10	NW.	9	"	"	"	Drilled	310	2,200					Glacial drift				Dry hole; tanks water for stock and domestic use.
11	SE.	10	"	"	"	Drilled	120	2,188	-100	2,088			Glacial sand	Hard,iron, "alkaline"		D, S	Good supply for 20 head stock.
12	NE.	10	"	"	"	Dug	42	2,190					Glacial drift				Dry hole; tanks water for stock and domestic use.
13	SW.	14	"	"	"	Bored	46	2,184	- 40	2,144	44	2,140	Glacial fine sand	Hard,"alka-line"		D, S	Intermittent supply; uses a dugout and tanks in winter and dry years.
14	SE.	15	"	"	"	Bored	65	2,190					Glacial drift				Dry hole; uses dugout and tanks water for stock and domestic use.
15	SW.	16	"	"	"	Drilled	261	2,203	- 30	2,173			Glacial sand	Hard,iron		D, S	Abundant supply for 25 head stock.
16	SE.	16	"	"	"	Drilled	370	2,195					Glacial drift				Dry hole.
17	NW.	16	"	"	"	Bored	60	2,200	- 20	2,180	60	2,140	Glacial drift	Hard,iron, "alkaline"		D, S	Sufficient for 30 head stock at least.
18	SW.	17	"	"	"	Drilled	60	2,207	- 15	2,192	60	2,147	Glacial gravel	Hard,iron, "alkaline"		D, S	Sufficient for 65 head stock at least.
19	SE.	18	"	"	"	Dug	50	2,214	- 45	2,169	40	2,173	Glacial gravel	Hard,"alka-line"		D,	Insufficient for stock use; a 90-foot bored well is plugged with sand.
20	SW.	18	"	"	"	Bored	40	2,200	- 30	2,170			Glacial drift	Hard,"alka-line"		D, S	Sufficient supply.
21	NE.	18	"	"	"	Drilled	135	2,219	-112	2,107			Glacial black sand	Hard,iron, "alkaline"		D, S	Sufficient supply.
22	NW.	19	"	"	"	Bored	65	2,209	- 29	2,180	65	2,144	Glacial gravel	Hard,iron, "alkaline"		D, S	Sufficient for at least 20 head stock; a 290-foot drilled well is plugged.
23	SE.	20	"	"	"	Drilled	251	2,206	- 38	2,168			Glacial fine sand	Hard,iron, "alkaline"		D, S	Abundant supply.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of FRANCIS NO.127, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
24	NE.	20	16	14	2	Dug	16	2,201	- 12	2,189			Glacial drift	Soft		D	Will water 15 head stock only.
25	SE.	22	"	"	"	Bored	42	2,172	- 20	2,152	41	2,131	Glacial gravel	Hard,"alka-line"		D, S	Sufficient for at least 40 head stock.
26	NE.	22	"	"	"	Bored	40	2,170	- 16	2,154			Glacial sand	Hard,"alka-line"		D, S	Sufficient for at least 30 head stock.
27	SW.	23	"	"	"	Bored	45	2,169	- 25	2,144	44	2,125	Glacial gravel	Hard,"alka-line"		D, S	Sufficient for at least 30 head stock.
28	SE.	24	"	"	"	Dug	25	2,160	- 10	2,150			Glacial drift	Hard,"alka-line"		D, S	Sufficient for at least 15 head stock.
29	NW.	24	"	"	"	Dug	20	2,162	- 5	2,157	19	2,143	Glacial gravel	Hard,"alka-line"		D, S	Sufficient for 22 head stock.
30	NW.	25	"	"	"	Dug	13	2,166	- 11	2,155	12	2,154	Glacial sand	Soft		D, S	Good supply for house; a 14-foot well is used for stock usually.
31	SW.	26	"	"	"	Dug	38	2,174	- 18	2,156			Glacial sand	Hard,"alka-line"		S	Sufficient for at least 15 head stock; bad laxative effect on man.
32	NE.	28	"	"	"	Dug	12	2,193	- 9	2,184	10	2,183	Glacial sand	Soft		D	Sufficient for 25 head stock.
33	NW.	30	"	"	"	Drilled	96	2,202	- 20	2,182			Glacial drift	Hard,iron, "alkaline"		D, S	Abundant supply; neighbours tanked from it in drought years.
34	NE.	30	"	"	"	Drilled	86	2,207	- 35	2,172			Glacial gravel	Hard,iron, "alkaline"		S	Good supply.
35	SW.	31	"	"	"	Bored	60	2,211	- 45	2,166	22	2,189	Glacial sand	Hard,"alka-line"		S	Insufficient supply, slow seepage. Drives stock ½ mile to water in winter.
36	NW.	31	"	"	"	Drilled	190	2,197	- 30	2,167			Glacial fine sand	Hard,"alka-line"		D, S	Sufficient for 20 head stock; well is gradually filling in with sand.
37	SW.	32	"	"	"	Dug	14	2,196	- 8	2,188	0	2,196	Glacial gravel	Hard,"alka-line"		S	Sufficient for 30 head stock.
38	NW.	32	"	"	"	Dug	20	2,203	- 5	2,198			Glacial sand	Soft		D	Sufficient for 25 head stock.
39	SE.	33	"	"	"	Bored	65	2,200	- 50	2,150	62	2,138	Glacial fine sand	Hard,"alka-line"		S	Sufficient for 25 head stock; some horses refuse this water.
40	SW.	33	"	"	"	Dug	12	2,204	- 8	2,196	10	2,194	Glacial red gravel	Soft		D, S	Sufficient for 45 head stock.
41	NW.	33	"	"	"	Dug	12	2,193	- 4	2,189			Glacial fine sand	Hard,iron		D, S	Sufficient for 50 head stock.
42	NE.	33	"	"	"	Bored	50	2,195	- 48	2,147			Glacial drift	Hard,"alka-line"		D	Poor supply; tanks water for stock. Dry holes 18 to 25 feet deep.
43	SE.	34	"	"	"	Dug	8	2,188	- 4	2,184	0	2,188	Glacial fine blue sand	Hard,odour, oily skum		S	Intermittent supply; tanks water in dry years.
44	NW.	36	"	"	"	Dug	16	2,166	- 5	2,161			Glacial gravel	Hard,"alka-line"		S	Intermittent supply; tanks water in dry years.
45	NE.	36	"	"	"	Dug	32	2,163	- 20	2,143	30	2,133	Glacial gravel	Hard,"alka-line"		D, S	Sufficient for 60 head stock.
1	SE.	1	16	15	2	Dug	9	2,172	- 5	2,167	2	2,170	Glacial sand	Soft,"alka-line"		D, S	Sufficient for 20 head stock at least.
2	SE.	2	"	"	"	Dug	12	2,154	- 9	2,145	0	2,154	Glacial sand	Soft		D, S	Good supply for 10 head stock.
3	NW.	2	"	"	"	Dug	12	2,166	- 4	2,162	0	2,166	Glacial fine sand	Soft		D, S	Well has never pumped dry.
4	SW.	3	"	"	"	Dug	20	2,146	- 18	2,128			Glacial drift	Hard		D, S	Barely sufficient for 15 head stock.
5	NW.	4	"	"	"	Dug	20	2,148	- 16	2,132			Glacial sand	Hard,iron		D	Sufficient for house use only; 2 wells in pasture supply the stock.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of FRANCIS NO. 127, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
6	SW.	4	16	15	2	Dug	20	2,150	- 12	2,138			Glacial gravel	Hard		D, S	
7	SW.	5	"	"	"	Dug	17	2,157	- 12	2,145			Glacial sand	Soft,"alkaline"		D, S	Insufficient for 15 head stock in winter.
8	NW.	6	"	"	"	Dug	16	2,150	- 8	2,142	14	2,136	Glacial gravel	Hard,"alkaline"		D, S	Sufficient for 25 head stock.
9	NE.	6	"	"	"	Dug	23	2,151	- 18	2,133			Glacial fine sand	Soft		D, S	Well waters 10 head stock only in wet years.
10	SW.	7	"	"	"	Dug	5	2,144	- 2	2,142	0	2,144	Glacial gravel	Hard		S	Abundnat supply, but it freezes in winter.
11	SE.	8	"	"	"	Dug	20	2,150	- 15	2,135			Glacial sand	Hard		D, S	Sufficient supply; farm uses a dugout also.
12	NW.	9	"	"	"	Dug	10	2,132	- 6	2,126	0	2,132	Glacial sand and gravel	Hard		S	Sufficient for 25 head stock.
13	SW.	10	"	"	"	Bored	80	2,162	- 30	2,132			Glacial gravel	Soft		D, S	Good supply.
14	SW.	10	"	"	"	Dug	9	2,164	- 6	2,158			Glacial sand	Hard,"alkaline"		D	Sufficient for house use; 2 other wells supply stock water.
15	NW.	10	"	"	"	Drilled	106	2,176	- 70	2,106			Glacial gravel	Hard		D, S	Good supply for 25 head stock.
16	NW.	11	"	"	"	Dug	25	2,181	- 12	2,169			Glacial drift	Hard		D, S	Sufficient for 15 head stock.
17	SW.	12	"	"	"	Drilled	184	2,184	- 65	2,119	184	2,000	Glacial gravel	Hard,iron, "alkaline"		S	Abundant supply for 40 head stock.
18	NW.	12	"	"	"	Bored	126	2,197	- 60	2,137	124	2,073	Glacial gravel	Hard,"alkaline"		D, S	Village well of Vibank; good supply and water is satisfactory according to analyst.
19	NE.	12	"	"	"	Dug	40	2,000					Glacial drift				Dry hole; tanks water from a neighbours well.
20	SE.	14	"	"	"	Drilled	83	2,195	- 60	2,135			Glacial sand	Hard,"alkaline"		D, S	Sufficient supply.
21	NW.	14	"	"	"	Drilled	102	2,198	- 60	2,138			Glacial gravel	Hard,"alkaline"		D, S	Waters at least 30 head stock.
22	NW.	16	"	"	"	Dug	18	2,188	- 5	2,183			Glacial drift	Soft		D, S	Poor supply; seepage water from a dugout. Tanks water for stock in winter.
23	SE.	17	"	"	"	Dug	35	2,152	- 25	2,127	15	2,137	Glacial fine sand	Hard		D, S	Good supply for 10 head stock.
24	SE.	18	"	"	"	Dug	7	2,145	- 4	2,141	0	2,145	Glacial sand and gravel	Soft		D, S	Fast seepage; good supply for 35 head stock.
25	NE.	18	"	"	"	Bored	54	2,154	- 32	2,122			Glacial sand	Hard,"alkaline"		D, S	Insufficient for 15 head stock in winter.
26	NE.	19	"	"	"	Bored	87	2,171	- 60	2,111	87	2,084	Glacial drift	Hard,"alkaline"		D, S	Water level has never been lowered.
27	SE.	20	"	"	"	Dug	13	2,178	0	2,178			Glacial drift	Soft		D, S	Seepage water from a dugout; tanks water in dry years and winters.
28	SW.	20	"	"	"	Dug	42	2,160					Glacial drift				Dry hole; tanks water from the SE. ¼, section 18.
29	NE.	20	"	"	"	Bored	85	2,183	- 60	2,123	63	2,120	Glacial fine sand	Hard,iron, "alkaline"		D, S	Very poor supply on account of sand plugging the pipe.
30	SW.	22	"	"	"	Bored	106	2,191	- 71	2,120	104	2,087	Glacial gravel	Hard,iron, "alkaline"		D, S	Intermittent supply; uses a dugout.
31	SE.	23	"	"	"	Drilled	225	2,195					Glacial drift				Dry hole; tanks water winter and summer 3 miles.
32	SE.	24	"	"	"	Drilled	80	2,200	- 60	2,140			Glacial gravel	Hard,"alkaline"		D, S	Abundant supply.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of FRANCIS NO.127, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
33	NW.	24	16	15	2	Drilled	86	2,215	- 30	2,185			Glacial gravel	Hard, iron		D, S	Sufficient for 40 head stock; probably plugging with sand.
34	NE.	24	"	"	"	Drilled	77	2,200	- 35	2,165			Glacial gravel	Hard, iron, "alkaline"		D, S	Good supply for 20 head stock.
35	NE.	26	"	"	"	Dug	50	2,200	- 32	2,168	50	2,150	Glacial gravel	Hard, "alkaline"		D, S	Well has never been pumped dry.
36	SE.	28	"	"	"	Drilled	94	2,203	- 64	2,139			Glacial gravel	Hard, iron, "alkaline"		D, S	Abundnat supply fpr 25 head stock.
37	SW.	28	"	"	"	Drilled	106	2,194	- 71	2,123			Glacial gravel	Hard, iron		D, S	Abundnat supply for 25 head stock.
38	NE.	28	"	"	"	Drilled	108	2,200	- 68	2,132			Glacial gravel	Hard, "alkaline"		D, S	Abundnat supply for 30 head stock.
39	NW.	30	"	"	"	Bored	130	2,181	- 30	2,151			Glacial drift	Hard, iron, "alkaline"		D, S	Abundant supply for 25 head stock.
40	NE.	30	"	"	"	Drilled	151	2,185	- 70	2,115	150	2,035	Glacial gravel	Hard, iron,		S	Sufficient for at least 60 head stock; too much iron for house use.
41	SE.	33	"	"	"		130	2,214					Glacial drift			D, S	Dry hole; tanks water for stock and domestic use.
42	SW.	33	"	"	"	Drilled	165	2,204					Glacial drift	Hard, iron "alkaline"		D, S	Well has never been pumped dry. #
43	SW.	34	"	"	"	Drilled	Not over 100	2,212	- 50	2,162			Glacial drift	Hard, iron, "alkaline"		D, S	Good supply for 15 head stock.
44	NW.	34	"	"	"	Test	30	2,215					Glacial drift				Dry hole; uses dugout and tanks 2½ miles for stock and house.
45	NE.	34	"	"	"	Dug Drilled	89	2,216	- 83	2,133			Glacial sand	Hard, "alkaline"		D, S	Well delivers one tank only at a single pumping.
46	SE.	36	"	"	"	Dug	64	2,208	- 60	2,148			Glacial gravel	Hard, iron, "alkaline"		D, S	Sufficient for 40 head stock; fast seepage.
47	NW.	36	"	"	"	Drilled	150	2,218	- 50	2,168			Glacial fine sand	Hard, odour		S	Sufficient for at least 50 head stock.
48	NE	36	"	"	"	Drilled	80	2,223	- 65	2,158			Glacial gravel	Hard, "alkaline"		D, S	Good supply for 30 head stock.

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(#) Sample taken for analysis.