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BUREAU OF ECONOMIC GEOLOGY

GEOLOGICAL SURVEY

PRELIMINARY REPORT

GROUND-WATER RESOURCES OF THE RURAL MUNICIPALITY OF ENTERPRISE No. 172 SASKATCHEWAN

BY

B. R. MacKay, H. H. Beach & R. Johnson

Water Supply Paper No. 148

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WATER SUPPLY PAPER NO. 148

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GROUND WATER RESOURCES OF THE RURAL MUNICIPALITY OF ENTERPRISE, NO. 172 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 fine the approximate depth to a water-bearing horizon, be must learn: (1) the elevation of the site, and (2) the probable elevation of the water-bearing bed. The elevation of the well site is obtained by marking its position on the map, Figure 2, and estimating its elevation with respect to the two contour lines between which it lies and whose elevations are given on the figure. Where contour lines are not shown on the figure, the elevations of adjacent wells as indicated in the Table of Well Records accompanying each report can be used. The approximate elevation of the water-bearing horizon at the well-site can be obtained from the Table of Well Records by noting the elevation of the water-bearing horizon in surrounding wells and by estimating from these known elevations its elevation at the well-site.[1] If the water-bearing horizon is in bedrock the depth to water can be estimated fairly accurately in this way. If the water-bearing horizon is in unconsolidated deposits such as gravel, sand, clay, or glacial debris, however, the estimated elevation is less reliable, because the water-bearing horizon may be inclined, or may be in lenses or in sand beds which may lie at various horizons and may be of small lateral extent. In calculating the depth to water, care should be taken that the water-bearing horizons selected from the Table of Well Records be all in the same geological horizon either in the glacial drift or in the bedrock. From the data in the Table

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

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

GLOSSARY OF TERMS USED

Alkaline. The term "alkaline" has been applied rather loosely to some ground-waters. In the Prairie Provinces, a water is uaually 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 côteau. 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 Enterprise covers an area of approximately 225 square miles in the western part of southern Saskatchewan. It consists of tps. 16, 17 and 18, ranges 28, 29, and 30, W. 3rd mer. It is bounded on the west by the Alberta-Saskatchewan boundary, Fourth meridian, and the western townships, in range 30, are only slightly more than half a mile wide. The Burstall branch of the Canadian Pacific railway crosses the northwestern corner of the municipality and the Fox Valley branch of the same railway extends in a general east-west direction across the central part of the area. The hamlets of Horseham and Richmound are located on this railway within the boundaries of the municipality.

The ground surface of the area rises from elevations of 2,500 to 2,600 feet above sea-level along the southern boundary of the municipality, to form an irregularly hilly rolling upland, some 100 to 200 feet higher in elevation, in the northern part of township 16, and the southern part of township 17, ranges 28, 29 and 30. Northward from this upland the surface elevations drop off gradually to form a rolling plain ranging in elevation between 2,450 and 2,550 feet and extending to the northern boundary of the municipality. The relief is indicated by contours only on the southern third of Figure 2, of the accompanying map, as only these townships have been topographically mapped.

Sloughs formed in undrained depressions constitute the only natural drainage features of the area. These sloughs, excavated dugouts, and a few small dams constructed in coulées, are the only sources of surface water in this municipality. Most of the water used is obtained from wells. Shallow wells adequately furnish household requirements on most farms, but deeper wells, between 40 and 130 feet deep, are in most cases required to ensure

sufficient water for stock requirements. Although the water derived from wells is in most places sufficient for local requirements, the construction of dams and dugouts has been necessary on some farms.

Water-bearing Horizons in the Unconsolidated Deposits

The unconsolidated deposits that cover this municipality consist entirely of glacial drift laid down by the great continental ice-sheet that many thousands of years ago advanced and retreated over the province of Saskatchewan. The ice-sheet deposited an irregular layer of bluish grey, unstratified clay, in which are interspersed stones, boulders, and irregular beds, lenses, and pockets of water-sorted sands and gravels. This material covers the surface of the bedrock throughout the area and is referred to as glacial till or boulder clay. On the uplands in the southern part, and along the northern boundary of the municipality, the retreating ice front apparently paused for a considerable period of time, and here greater accumulations of a more porous phase of the drift were deposited. Such areas are referred to as moraines. The surface of the moraine is characterized by low knolls and gravel ridges, and intervening undrained depressions. Waters formed from the melting ice collected in the lower land to form small lakes, into which fine sediments were washed. The areas occupied by these glacial lakes are marked by thin deposits of lake clay overlying the till. One of these small areas occurs in township 17, range 29, and a larger one in township 18, range 28. The surface distribution of the several types of unconsolidated deposits is shown on Figure 1 of the map accompanying this report.

The lake clay is generally too fine grained and compact to yield ground water, but it is probably less than 10 feet thick in most places, and supplies of water in these areas are found in

the underlying glacial till. Irregularly scattered pockets of water-bearing sand and gravel occur interspersed in the upper 30 to 40 feet of the moraine and glacial till. These pockets are as a rule more numerous and more productive in the moraine-covered areas than in the till. Shallow wells tapping these pockets generally yield adequate supplies of water for household use, and in many places one or more shallow wells will yield a sufficient water supply for stock. The use of test augers in locating water-bearing pockets in the boulder clay is strongly recommended as there is rarely any indication on the surface of their presence at depth. The water from shallow wells varies from soft to hard and "alkaline", but is generally suitable for household use. Shallow wells sunk in depressions, where evaporation causes the concentration of mineral salts in the surface water, usually yield a more "alkaline" water than do wells situated near the bases of slopes.

More extensive beds of sand and gravel occur at greater depths in the glacial drift, and from them adequate supplies of water for stock are generally obtainable. Throughout this municipality these porous beds have been encountered at depths of between 40 and 130 feet. In some places they may extend continuously over areas of a few square miles, but as a rule they appear to be of local occurrence. However, only a few dry holes of any appreciable depth are reported, indicating that water may be obtained at most localities within a depth of 130 feet. In some places fine sands or sandy clays that yield only small seepages are encountered. The water obtained is as a rule, hard, highly mineralized, and iron bearing. In some of the waters the iron is in sufficient concentration to give the water a distinct yellowish colour; in many waters the mineral salts in solution render them unfit for drinking or for other domestic purposes. Many residents have shallow wells to provide household supplies. Prospecting, at

depths of 30 feet or less, seems advisable in order to obtain water for domestic purposes.

The thickness of the glacial drift in this municipality is not definitely known. A 225-foot well in sec. 31, tp. 18, range 29, penetrated a sand bed, at its base, that may lie at the contact between the glacial drift and the underlying Bearpaw shale bedrock. The log of a 335-foot well in the village of Burstall, in the municipality adjoining on the north, indicates the thickness of the glacial drift to be approximately 200 feet. Similar thicknesses of drift may be found in the northern part of this municipality, but in the uplands at the south, where the surface is 200 to 300 feet higher the thickness may be greater. The 225-foot well in sec. 31, tp. 18, range 29, yields a fairly large supply of hard, highly mineralized water, and although similar supplies may be obtained from sands or gravels at the contact in other parts of the municipality, this horizon cannot be considered a certain source of supply.

Water-bearing Horizons in the Bedrock

The Bearpaw bedrock formation is thought to underlie the glacial drift over the greater part of the municipality, and it in turn is underlain by the Belly River formation. Within the area lying south of the geological boundary line drawn in the southwest corner of Figure 1 of the accompanying map, the Bearpaw formation was removed by erosion prior to the deposition of the glacial drift, and the Belly River formation immediately underlies the drift. The boundary separating the two formations as outlined on the geological map must be regarded as approximate since no outcrops occur in the area, and no wells have been sunk into either of the formations. Its position has been assumed as a result of studies of outcrops and findings in wells in areas to the west, and the boundaries thus determined have been projected

into this area. The Bearpaw formation is probably less than 150 feet thick in all parts of this area.

The Bearpaw formation in this region is composed largely of compact marine shales which can be expected to yield little or no water. Localized, water-bearing sand beds may occur at various horizons in the shales, but the possibilities of obtaining water from them do not warrant the drilling of deep test holes. Any water so obtained would probably be too highly mineralized to be used for household purposes. The Belly River formation is composed mostly of sandy beds which might prove to be water bearing. However, even at places where the elevation of the surface is low it would probably be necessary to drill wells to depths of more than 300 feet before sandy beds would be reached. In adjoining areas to the north and northeast, fairly large supplies of water have been obtained from this formation at depths of 300 to 500 feet, but since the lateral variation in the porosity of the beds can only be determined by drilling, no definite assurance can be given that supplies will be obtained here within the same range of depths. One or more deep holes drilled in the municipality would be a worth-while undertaking to test this lower horizon. Should individual residents, however, find that test holes, sunk to depths not exceeding 130 feet, fail to yield sufficient water for stock, they are strongly advised to excavate dugouts or build small dams in coulées for the storage of surface water rather than to go to the expense of sinking deep wells to an horizon the productivity of which is problematical.

GROUND WATER CONDITIONS BY TOWNSHIPS

Township 16, Range 28

Most of this township consists of an irregularly rolling area of moraine. A small area of till plain borders the moraine along the southern boundary of the township. Both the moraine and the till plain are composed largely of boulder clay.

Many residents obtain adequate supplies of water for farm requirements from one or more shallow wells tapping localized pockets of sand and gravel that occur in the upper 35 feet of the boulder clay, or from wells sunk near sloughs, the supplies in the latter being derived directly by seepage through the clay. The water obtained at these depths is generally soft or only moderately hard, and is suitable for domestic use. In a few places, where wells have been sunk in depressions, more highly mineralized waters are obtained, but the concentration of dissolved mineral salts present is rarely such as to render the water unsuitable for drinking. Where shallow wells fail to yield adequate supplies for stock, wells sunk to greater depths will in most places prove more productive, but due to the scattered occurrence of the porous beds a large supply cannot always be assured.

Wells sunk to depths of 40 to 110 feet in this township have as a rule, penetrated water-bearing beds of sand or gravel that appear to be local in character, although in some places they may extend continuously over areas of a few square miles. In most places the supplies obtained are adequate for local stock requirements, but where fine sands or thin beds of gravel are encountered only small supplies are obtained. The waters from the deeper wells in the glacial drift are hard and highly mineralized, and in some places the high concentration of iron salts may give the water a yellowish colour. These waters are suitable for stock, but water of

better quality for household use can usually be obtained from shallow wells.

No definite information was obtained regarding the possibility of getting water by deep drilling in this township. For a general discussion of the possible water-bearing beds in the lower part of the glacial drift and in the Bearpaw and Belly River formations the reader is referred to that part of this report dealing with the municipality as a whole.

Where wells not exceeding 120 feet in depth fail to yield sufficient water, conservation of surface supplies by means of dugouts or small dams seems preferable to deep drilling.

Township 16, Range 29

The southern part of this area is a nearly level to gently rolling land surface formed by glacial till. The surface rises and becomes more irregular toward the north, to form an upland area of hilly moraine.

Sloughs, dugouts, and dams provide some water for stock in this area, but wells supply most of the water being used.

Water is being obtained at depths of 40 feet or less, in both the till and moraine-covered areas, from localized pockets of sand or gravel interspersed in the boulder clay. Many of the shallow wells have been sunk near sloughs and derive their supplies by seepage through the clay. Many residents find one shallow well inadequate for farm requirements and use two or more wells. The water varies from soft to hard and is highly mineralized, but it is rarely unfit for drinking.

On many farms wells have been sunk to depths of 40 and 80 feet in the glacial drift and have penetrated water-bearing sands or gravels. In some places these beds may extend continuously over areas of 3 or 4 square miles, but as a rule they appear to be of local extent. On the NW. $\frac{1}{4}$, section 32, two wells, bored to

depths of 86 and 101 feet, yield moderately large supplies of hard, undrinkable water. The aquifer is evidently confined to a small area, as other wells sunk to depths as great as 110 feet found no water. From most of the deeper wells, however, the supplies obtained are adequate for local stock requirements. The water is generally hard and highly mineralized, and in many places is unfit for domestic use. In some places iron imparts a yellowish colour to the water. Careful prospecting at shallow depths is advisable where supplies are required for domestic use.

No deep wells have been drilled within a considerable distance of this township, and hence no definite information can be given on the possibilities of obtaining water at greater depths in the glacial drift or in the underlying Bearpaw and Belly River formations. A general discussion of these possibilities is given in the part of this report dealing with the municipality as a whole. The Belly River formation is considered to immediately underlie the glacial drift within the area lying south of the geological boundary line, as indicated on Figure 1 of the accompanying map, except in the small upland area in sections 7 and 18, where the Belly River beds may be capped by Bearpaw shales. It is possible that water will be found at shallower depths in the bedrock in this area than throughout the moraine-covered areas of higher elevation.

Township 16, Range 30

This township covers an area of only slightly more than 3 square miles, being less than half a mile wide adjacent to the Alberta-Saskatchewan boundary, the Fourth meridian. Till covers the greater part of the area, and merges into moraine in the northern parts. All residents of the area have been able to obtain at least small supplies of drinkable water from sand and gravel pockets in the glacial drift. Further prospecting at depths not exceeding 100 feet should ensure adequate supplies for watering stock in all parts of the area.

No wells have been sunk through the drift into the underlying bedrock.

Township 17, Range 28

This township is a gently rolling plain covered by glacial drift in the form of a till plain, except in small, moraine-covered areas in the east-central and south-central parts. The land slopes to the north from the morainic hills along the southern boundary.

Scattered pockets of water-bearing sand and gravel occur interspersed through the upper 40 feet of the glacial drift. Shallow wells tapping such pockets will yield adequate supplies of water for domestic use, and in a few places residents obtain sufficient water for stock by sinking one or more such wells. Several test holes may be necessary before a productive pocket is encountered at these depths, and test augers can be used to advantage in carrying out this prospecting. The water from shallow wells varies in character from soft to hard and "alkaline", but it generally satisfactory for domestic use.

Most of the water used in the township is obtained from beds of sand and gravel that occur in the glacial drift at depths of 40 to 100 feet. In some places these porous beds may extend continuously over areas of a few square miles, but most of them appear to be of local occurrence. The 80-foot well bored on the SW. $\frac{1}{4}$, section 6, was the only dry hole of any appreciable depth reported in the area, indicating that the water-bearing beds are seldom absent within 100 feet of the surface. With few exceptions, the wells yield adequate supplies of water for local stock requirements. The water is hard, and usually highly charged with dissolved sulphate salts, and in many places is unfit for domestic purposes. Iron is commonly present in sufficient quantities to give the water a yellowish colour. Although these deeper wells are in many places

necessary to ensure adequate water supplies for stock, shallow wells offer the best prospect of obtaining water of good quality for household use.

Where wells 120 feet or less in depth fail to yield sufficient water for stock, conservation of surface supplies by means of small dams and dugouts is considered advisable rather than deep drilling.

Water might be obtained in the lower part of the glacial drift or in the underlying Bearpaw and Belly River formations, but due to the absence of any deep drilled holes within a considerable distance of this area, no definite information can be given regarding the occurrence of water in the bedrock. A general discussion of the possibilities of obtaining water from these formations is given in the part of this report dealing with the municipality as a whole.

Township 17, Range 29

The surface of this township is a plain that becomes more rolling in the southern and northwestern parts. The general slope of the land is from south to north, with elevations ranging from 2,650 feet above sea-level at points along the southern border to 2,500 feet in the northern sections. Glacial till covers the greater part of the area, becoming more irregularly rolling to form areas of moraine in section 3 and 4, in the north-central parts, and in a narrow, elongated area extending in a northwesterly direction from the central part of the township. A thin deposit of glacial lake clay covers the till in the northern part of section 25. No wells have been sunk into the lake clay. It is probable that it is too compact to yield water, but water is to be expected in sand and gravel pockets in the underlying till.

The glacial drift, in both the till and moraine-covered areas, is composed largely of clay which will seldom yield water except in proximity to surface accumulations of water in sloughs.

However, scattered pockets of sand and gravel occur interspersed in the upper 40 feet of the clay, which when tapped by wells in most cases yield sufficient water for household use. In some places one or more of these wells will yield sufficient water for all local farm requirements. The water varies from soft to hard and "alkaline", but is generally usable for drinking.

Most of the water used in the area is obtained from wells, between 40 and 120 feet deep, tapping beds of sand and gravel in the glacial drift. These beds appear to occur mainly as irregularly interspersed beds in the boulder clay, but no wells sunk to depths of 100 feet have failed to obtain water, and most of them yield adequate supplies for stock. However, in a few places, fine sands or thin, porous beds occur that yield only small supplies. The water is generally hard, contains large quantities of sulphate salts in solution, and is unsatisfactory for domestic use. In a few places it is unfit for drinking. It is better to depend upon shallow seepage wells for water for domestic purposes.

Should wells 120 feet or less in depth fail to yield sufficient water for stock, conservation of surface water by means of dugouts or by small dams appears to be preferable to deep drilling.

Water might be obtained by deep drilling into the lower part of the glacial drift or the underlying Bearpaw or Belly River formations, but as no deep wells have been drilled within a considerable distance of this area, no definite data pertaining to the quality or quantity of water to be expected are available.

Township 17, Range 30

This township is an area of only slightly more than 3 square miles. It is half a mile wide and lies adjacent on the east to the Fourth meridian, the boundary between Alberta and Saskatchewan. The area is a till plain except in section 25, where it grades into a more irregularly rolling area of moraine. All water supplies of the area are obtained from sand and gravel pockets

interspersed through the glacial drift. Wells on sections 12, 13, and 36 are shallow, but on sections 1 and 24 it was found necessary to sink wells to depths of 80 and 60 feet before even small quantities of water were found. Careful prospecting of the drift at depths not exceeding 100 feet should provide adequate water supplies in most parts of the area.

Township 18, Range 28

The southern half of this township is a gently rolling plain covered by glacial till. Toward the north the till plain grades into moraine, forming a more irregularly rolling topography over the northern half of the area. Thin layers of glacial lake clay cover the boulder clay in the central part of the township, and in the eastern part of section 13. The clay is thin and is probably too compact to form a reservoir for ground water accumulation. In these areas it would be necessary to extend wells down into the underlying till. Both the till and moraine are composed largely of boulder clay. Localized pockets of sand and gravel occur interspersed in the upper 40 feet of the boulder clay, from which ground water can be expected. Shallow wells sunk near sloughs that occur in undrained depressions in the moraine form sources of water on many farms. Shallow wells tapping the gravel or sand pockets yield sufficient water for household use, and in many places, particularly in the moraine-covered area in the northern half of the township, residents obtain adequate supplies of water for stock by sinking one or more shallow wells. The water varies in quality from place to place, from soft to hard and "alkaline", but is usually suitable for drinking.

Most residents of the area have found it necessary to sink wells to beds of sand and gravel in the glacial drift, at depths between 40 and 130 feet, in order to ensure a sufficient supply for stock. These sands and gravels are not expected to form continuous

beds over large areas, but they are almost certain to be encountered at any location within 130 feet of the surface. The supplies obtained from these wells are in most places adequate for local stock requirements. The water is almost invariably hard and highly mineralized, and in many places iron imparts a yellowish colour to the water. A 95-foot test hole in the SW. ¼, section 30, is the only dry hole of appreciable depth reported in the township. Prospecting at shallow depths can be expected to yield water of better quality for domestic use, but the yield from the aquifers encountered is usually small and deeper wells are necessary to furnish adequate stock requirements. If water is not found at depths of 130 feet or less, there remains the possibility that water might be obtained by deep drilling, into the lower part of the glacial drift or the underlying Bearpaw and Belly River formations. In the absence of any deep wells in the region, however, no definite information can be given regarding the quantity or quality of water to be expected, or the depth to the uppermost productive beds. Conservation of surface water for stock use by excavating dugouts or constructing small dams appears to be preferable to deep drilling.

Township 18, Range 29

The northern third of the area, and a belt extending southward through sections 17, 8, and 5, are covered by irregularly rolling moraine. The southwestern and southeastern parts of the area are covered by glacial till on which the surface is relatively flatter.

The glacial till and moraine deposits are composed mainly of boulder clay. The clay, itself, will seldom yield water except where shallow wells are located near sloughs, from which water may be derived by seepage. Localized pockets of sand and gravel from which water can be obtained occur interspersed in the upper 40 feet of the boulder clay. Several test holes may be necessary to locate a productive pocket at shallow depths, as there is generally no

surface indication of their occurrence. Most shallow wells yield sufficient water for domestic requirements, and in a few places adequate supplies for stock are being obtained by using two or more shallow wells. The water varies from soft to hard and highly mineralized, but can generally be used for drinking.

More extensive beds of sand and gravel occur at greater depths in the glacial drift, from which most residents of the area obtain their water supplies. Wells, between 40 and 108 feet deep, that tap these sands and gravels are in most places yielding adequate supplies of water for stock. Occasionally fine sands or thin, porous beds are encountered from which very little water can be obtained. These sands and gravels may in some places extend continuously over areas of a few square miles, but for the most part they appear to occur in localized beds. The water obtained at depths of 40 feet or more in the glacial drift is generally hard, highly mineralized, and unsatisfactory for domestic use. The smaller supplies obtainable at shallow depths must be depended upon for drinking.

No definite information can be given of the possibilities of obtaining water by deep drilling in this area. A 225-foot well, located in section 31, is yielding a fairly large supply of hard, highly mineralized, undrinkable water from a sand bed at an approximate elevation of 2,260 feet above sea-level. The water is being used for stock. The aquifer is considered to be at or near the contact of the glacial drift and the underlying Bearpaw formation. Water-bearing sands may occur at the contact in other parts of the area at depths of less than 250 feet, or water might be obtained at greater depths from sand beds in the underlying Bearpaw and Belly River formations. In places, where wells not exceeding 130 feet in depth fail to yield sufficient water, the conservation of surface supplies by means of dugouts or small dams would undoubtedly prove more economical than the drilling of deep wells.

Township 18, Range 30

This township covers an area of only slightly more than 3 square miles immediately adjoining the Fourth meridian. The area, a strip half a mile wide, is covered entirely by glacial drift composed of till over the southern and central parts, but grading into moraine in the northern parts. Only three wells were recorded as having been sunk in the area, but all these wells have reached water-bearing sand beds in the boulder clay at depths not exceeding 65 feet. Little difficulty should be experienced in obtaining an adequate water supply at depths not exceeding 100 feet, but, as in other parts of the municipality, it is probable that water from the deeper wells will be more highly mineralized than water from the shallower sources.

STATISTICAL SUMMARY OF WELL INFORMATION IN RURAL MUNICIPALITY OF ENTERPRISE, NO. 172, SASKATCHEWAN

West of 3rd mer. Township / Range	16 / 28	16 / 29	16 / 30	17 / 28	17 / 29	17 / 30	18 / 28	18 / 29	18 / 30	Total No. in Municipality
Total No. of Wells in Township	82	75	8	49	51	6	54	31	6	362
No. of wells in bedrock	0	0	0	0	0	0	0	0	0	0
No. of wells in glacial drift	82	75	8	49	51	6	54	31	6	362
No. of wells in alluvium	0	0	0	0	0	0	0	0	0	0
Permanency of Water Supply										
No. with permanent supply	61	59	5	45	49	6	52	28	6	311
No. with intermittent supply	12	10	3	3	0	0	1	0	0	29
No. dry holes	9	6	0	1	2	0	1	3	0	22
Types of Wells										
No. of flowing artesian wells	0	0	0	1	0	0	0	0	0	1
No. of non-flowing artesian wells	6	1	0	26	19	1	22	18	2	95
No. of non-artesian wells	67	68	8	21	30	5	31	10	4	244
Quality of Water										
No. with hard water	48	53	5	44	48	4	40	24	6	272
No. with soft water	25	16	3	4	1	2	13	4	0	68
No. with salty water	0	4	0	0	0	0	0	0	0	4
No. with "alkaline" water	24	28	2	25	20	1	25	11	0	136
Depths of Wells										
No. from 0 to 50 feet deep	57	44	8	23	20	4	28	8	5	197
No. from 51 to 100 feet deep	24	29	0	26	30	2	21	18	1	151
No. from 101 to 150 feet deep	1	2	0	0	1	0	5	4	0	13
No. from 151 to 200 feet deep	0	0	0	0	0	0	0	0	0	0
No. from 201 to 500 feet deep	0	0	0	0	0	0	0	1	0	1
No. from 501 to 1,000 feet deep	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
How the Water is Used										
No. usable for domestic purposes	63	62	8	37	47	6	45	26	3	297
No. not usable for domestic purposes	10	7	0	11	2	0	8	2	3	43
No. usable for stock	66	65	8	48	49	6	51	27	3	323
No. not usable for stock	7	4	0	0	0	0	2	1	3	17
Sufficiency of Water Supply										
No. sufficient for domestic needs	43	65	4	40	44	5	46	25	5	277
No. insufficient for domestic needs	30	4	4	8	5	1	7	3	1	63
No. sufficient for stock needs	36	54	4	34	41	4	39	21	5	238
No. insufficient for stock needs	37	15	4	14	8	2	14	7	1	102

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. Resident

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

Mineral Substances Present

Calcium and Magnesium

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

Sodium

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

Sulphates

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

Chlorides

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

Iron

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

Hardness

Calcium and magnesium salts impart hardness to water. Hardness of water is commonly recognized by its soap-destroying powers as shown by the difficulty of obtaining lather with soap. The total hardness of a water is the hardness of the water in its original state. Total hardness is divided into "permanent hardness" and "temporary hardness". Permanent hardness is the hardness of the water remaining after the sample has been boiled and it represents the amount of mineral salts that cannot be removed by boiling. Temporary hardness is the difference between the total hardness and the permanent hardness and represents the amount of mineral salts that ban be removed by boiling. Temporary hardness is due mainly to the bicarbonates of calcium and magnesium and iron, and permanent hardness to the sulphates and chlorides of calcium and magnesium. The permanent hardness

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

Analyses of Water Samples from the Municipality of Enterprise, No. 172, 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.	Alka-linity	CaO	MgO	SO_4	Na_2O	Solids	$CaCO_3$	$CaSO_4$	$MgCO_3$	$MgSO_4$	Na_2CO_3	Na_2SO_4	NaCl	
1	NW.	22	17	28	3	32	1,360	850	750	100	26	155	40	173	607	200	1,007	72		70	417		405	43	* 1
2	NW.	23	17	28	3	85	1,275											(3)	(1)		(2)		(4)	(5)	* 1
3	NW.	34	17	29	3	120	2,620	2,100	2,000	100	43	325	50	411	1,595	580	2,544	89		198	941		1,245	71	* 1

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

Analysis No. 2 by Provincial Analyst, Regina.
For interpretation of this table read the section on Analyses and Quality of Water.

Water from the Unconsolidated Deposits

The results of analyses of three samples of water from the unconsolidated glacial deposits in this municipality are given in the foregoing table. The following generalizations are based on these analyses and those of waters from similar deposits in adjoining municipalities on observations at the well sites, and on reports of residents using the waters.

The boulder clay is regarded as being the main source of the sulphate salts that cause the permanent hardness of the waters and impart the laxative acting properties. Consequently, water obtained from sands and gravels, overlain by only a few feet of boulder clay, are, in many places, soft or only moderately hard, contain less than 1,000 parts per million of total dissolved solids, and have a total hardness of less than 400 parts per million. Most water obtained at greater depths contains increasing quantities of mineral salts. Considerable variation occurs in the character of the boulder clay within short distances, and, consequently, wells sunk to similar depths only a short distance away may yield waters differing greatly in mineral salt content.

Analyses 1, 2, and 3 bear out these generalizations. Analysis No. 1 is of water from a 32-foot well in the NW. $\frac{1}{4}$, sec. 22, tp. 17, range 28. This water has a total dissolved solid content of 1,360 parts per million and a total hardness of 850 parts per million. The predominant mineral salts are magnesium sulphate ($MgSO_4$, Epsom salts) and sodium sulphate (Na_2SO_4, Glauber's salt), both of which have laxative effects. The mineral salt content of this water is not excessive, however, and it is used for drinking with no reported ill effects, but would probably prove to be laxative to persons unaccustomed to the use of highly mineralized waters. The concentration of mineral salts is relatively high for water from a well of this depth, but the well is located near an

"alkali" slough and the boulder clay in this vicinity is probably highly charged with sulphate salts, concentrated as a result of surface evaporation. Analysis No. 2 is of water from an 85-foot well in the NW. $\frac{1}{4}$, section 23, in the same township. This water has a total hardness of 1,275 parts per million, made up of the following mineral salts in order of their decreasing abundance: calcium sulphate ($CaSO_4$), magnesium sulphate ($MgSO_4$), calcium carbonate ($CaCO_3$), sodium sulphate (Na_2SO_4), and sodium chloride ($NaCl$). This water is of similar quality to the water from the 32-foot well in section 22, but has a lower concentration of sodium sulphate. The most objectionable feature of this water is the presence of a high concentration of iron which causes a brownish precipitate to form when the water is exposed to the air. Analysis No. 3 is of water from a 120-foot well in the NW. $\frac{1}{4}$, sec. 34, tp. 17, range 29. This water has a very high total solid content of 2,620 parts per million, and a total hardness of 2,100 parts per million. Magnesium and sodium sulphates are present in large quantities, and would probably have a laxative effect on persons drinking the water. Highly mineralized waters of this type are common at depths of 40 feet or more in the glacial drift.

Water from the Bedrock

No water is being obtained from the Bearpaw or Belly River formations in this municipality, and hence only generalizations can be made regarding the quality of water likely to be obtained. Water found near the top of the bedrock as a rule is similar to that obtained from the lower part of the glacial drift. At greater depths in the shales of the Bearpaw formation, sodium salts generally are in excess, having replaced the magnesium and calcium salts, and the water is, therefore, much softer. Although sodium sulphate (Na_2SO_4) is not as powerful a laxative as magnesium sulphate, such water may prove objectionable for domestic use. Sodium carbonate (Na_2CO_3), or soda, may also be present. This salt

tends to give water a flat taste and may prove harmful if used for watering plants. Sodium chloride (NaCl), or common salt, gives the water a salty taste, and is a common constituent in waters from the compact shales of the Bearpaw formation. Supplies that have been derived from the shales in other areas are not usually drinkable, and may be too highly mineralized to be used for watering stock. Water from the Belly River formation is not expected to be as highly mineralized as water from the Bearpaw, and due to the absence of calcium and magnesium may be quite soft, but it is questionable if it would be satisfactory for domestic use other than for laundry purposes.

WELL RECORDS—Rural Municipality of ENTERPRISE, NO. 172, SASKATCHEWAN.

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
1	SW.	2	16	28	3	Dug	11	2,526	− 4	2,522	4	2,522	Glacial sand and gravel	Soft, "alkaline"	48	D, S	Sufficient supply.
2	NE.	2	"	"	"								Glacial drift	Hard		N	Well filledin.
3	SE.	2	"	"	"								Glacial drift	Hard		N	Well filled in.
4	SW.	2	"	"	"	Bored	44	2,554	− 40	2,514	40	2,514	Glacial drift	Hard, "alkaline"	44	D, S, I	Sufficient supply.
5	SE.	3	"	"	"	Bored	46	2,542	− 10	2,532	10	2,532	Glacial drift	Hard, "alkaline"	42	D, S, I	Sufficient supply.
6	SW.	3	"	"	"	Bored	109	2,613	− 97	2,516	97	2,516	Glacial drift	Hard, "alkaline"	44	N	
7	NW.	3	"	"	"	Bored	90	2,586	− 60	2,526	90	2,496	Glacial drift	Hard	42	S	Sufficient supply.
8	SW.	5	"	"	"	Bored	40	2,538	− 20	2,518	20	2,518	Glacial drift	Hard, "alkaline"	46	D, S	Sufficient supply.
9	NW.	5	"	"	"	Bored	32	2,555	− 24	2,531	24	2,531	Glacial drift	Hard, "alkaline"	44	S	Sufficient supply.
10	NW.	5	"	"	"	Dug	23	2,545	− 20	2,525	20	2,525	Glacial drift	Hard, "alkaline"	45	N	Insufficient supply.
11	SE.	6	"	"	"	Dug	23	2,492	− 4	2,488	23	2,469	Glacial quicksand	Hard	46	S	Sufficient supply.
12	NE.	6	"	"	"	Bored	60	2,524	− 56	2,468	56	2,468	Glacial black sand	Soft, iron, "alkaline", coloured	44	D, S	Insufficient supply.
13	NW.	6	"	"	"	Dug	14	2,502	− 10	2,492	10	2,492	Glacial gravel	Soft	44	S	Sufficient supply.
14	SE.	7	"	"	"	Dug	18	2,540	− 10	2,530	10	2,530	Glacial gravel	Soft	47	S	Insufficient supply.
15	NW.	9	"	"	"	Dug	40	2,586	− 25	2,561	20	2,566	Glacial drift	Soft, sulphur	48	D, S	Sufficient supply.
16	NW.	9	"	"	"	Bored	36	2,586	− 11	2,575	20	2,566	Glacial drift	Soft	48	D, S	Sufficient supply.
17	SW.	10	"	"	"	Bored	72	2,616	− 54	2,562	40	2,576	Glacial drift	Hard, "alkaline"	44	D, S	Insufficient supply.
18	NW.	10	"	"	"	Bored	40	2,583	− 26	2,557	26	2,557	Glacial drift	Hard, iron, "alkaline", cloudy	44	S	Insufficient supply.
19	SW.	12	"	"	"	Bored	63	2,581	− 43	2,537	43	2,537	Glacial drift	Hard, iron, "alkaline"	46	D, S	Sufficient supply.
20	NE.	12	"	"	"	Bored	15	2,633	− 10	2,623	10	2,623	Glacial drift	Hard, "alkaline"	50		Insufficient supply.
21	SE.	13	"	"	"	Bored	100	2,600	− 70	2,530	100	2,500	Glacial sand	Hard, iron, "alkaline", cloudy	41	S	Sufficient supply.
22	SE.	13	"	"	"	Dug	14	2,600	− 4	2,596	4	2,596	Glacial gravel	Hard, iron, yellow colour	44	D, S	Sufficient supply.

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

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

WELL RECORDS—Rural Municipality of ENTERPRISE, NO. 172, SASKATCHEWAN.

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
23	SE.	14	16	28	3	Dug	26	2,562	− 22	2,540	22	2,540	Glacial drift	Hard, iron, "alkaline", cloudy, lime	48	D, S	Insufficient supply; #.
24	SE.	14	"	"	"	Dug	19	2,575	− 10	2,565	10	2,565	Glacial drift	Soft	48	D, S	Sufficient supply.
25	SE.	15	"	"	"	Dug	22	2,607	− 4	2,593	4	2,593	Glacial sand	Soft	48	D, S	Sufficient supply; 6 dry holes 16 feet deep.
26	SE.	15	"	"	"	Bored	58	2,611	− 40	2,571	40	2,571	Glacial sand	Hard, "alkaline"		D, S	Intermittent supply.
27	SW.	15	"	"	"	Bored	76	2,642	− 41	2,601	41	2,601	Glacial sand	Hard, iron, greasy yellow	44	D, S	Sufficient supply; #. Dry hole 22 feet deep.
28	NE.	15	"	"	"	Dug	42	2,595	− 14	2,581	14	2,581	Glacial drift	Hard	43	D, S	Insufficient supply.
29	NW.	15	"	"	"	Dug	24	2,612	− 14	2,598	14	2,598	Glacial gravel	Soft		S	Sufficient supply.
30		16	"	"	"		86										Two dry holes 86 feet deep in glacial drift.
31	SE.	16	"	"	"	Bored	86	2,650	− 78	2,572	78	2,572	Glacial drift	Hard		S	Insufficient supply.
32	SW.	16	"	"	"	Bored	55	2,641	− 43	2,598	43	2,598	Glacial sand	Hard, "alkaline"	46	D, S	Just sufficient supply.
33	SW.	16	"	"	"	Bored	47	2,637	− 32	2,605	32	2,605	Glacial sand	Hard, "alkaline"	44	D, S	Sufficient supply.
34	SE.	17	"	"	"	Bored	60	2,616	− 45	2,571	45	2,571	Glacial sand	Hard, "alkaline"	44	D, S	Insufficient supply.
35	SW.	17	"	"	"	Dug	12	2,600	− 9	2,591	9	2,591	Glacial gravel	Soft	48	S	Sufficient supply.
36	NE.	18	"	"	"	Dug	19	2,557	− 10	2,547	10	2,547	Glacial drift	Soft	48	S	Sufficient supply.
37	NW.	18	"	"	"	Dug	28	2,573	− 20	2,553	20	2,553	Glacial gravel	Hard	46	S	Sufficient supply.
38	NW.	18	"	"	"	Dug	48	2,593	− 40	2,553	40	2,553	Glacial drift	Soft		D, S	Sufficient supply.
39	SE.	21	"	"	"	Bored	65	2,635	− 45	2,590	60	2,575	Glacial quicksand	Hard	44	D, S	Insufficient supply.
40	NE.	22	"	"	"	Bored	80	2,643	− 50	2,593	50	2,593	Glacial drift	Hard, iron	44	D, S	Sufficient supply.
41	NE.	22	"	"	"	Bored	60	2,600	− 0	2,600			Glacial drift	Soft	42	S	Intermittent supply.
42	NW.	22	"	"	"	Bored	75	2,638	− 60	2,578	60	2,578	Glacial drift	Hard	44	S	Insufficient supply.
43	SE.	23	"	"	"	Dug	13	2,582	− 5	2,577	5	2,577	Glacial sand	Hard	48	D, S	Sufficient supply.
44	NE.	23	"	"	"	Dug	13	2,608	− 8	2,600	8	2,600	Glacial quicksand	Hard	46	D, S	Insufficient supply.
45	NE.	23	"	"	"	Dug	12	2,615	− 10	2,605	10	2,605	Glacial gravel	Soft	48	S	Sufficient supply.
46	SW.	23	"	"	"	Dug	53	2,600	− 5	2,545	55	2,545	Glacial drift	Hard, "alkaline"		D, S	Insufficient supply.
47	SW.	24	"	"	"	Dug	24	2,589	− 10	2,579	10	2,579	Glacial drift	Soft	48	S	Sufficient supply.
48	NE.	24	"	"	"	Dug	18	2,570	− 8	2,562	16	2,554	Glacial sand	Soft	48	S	Sufficient supply.

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

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

WELL RECORDS—Rural Municipality of ENTERPRISE, NO. 172, 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
49	NW.	24	16	28	3	Bored	70	2,580	- 57	2,523	57	2,523	Glacial drift	Hard, iron, yellow	48	D	Insufficieint supply.
50	SW.	25	"	"	"	Dug	40	2,600	- 34	2,566	34	2,566	Glacial gravel	Hard, iron, "alkaline"		D, S	Insufficient supply.
51	NE.	25	"	"	"	Bored	60	2,595	- 54	2,541	54	2,541	Glacial gravel and sand	Soft	44	D, S	Intermittent supply; two other wells.
52	SE.	27	"	"	"	Bored	68	2,640	- 68	2,572	68	2,572	Glacial quick-sand	Hard, iron, sulphur, cloudy, yellow	44	D, S	Insufficient; haul water in summer.
53	SE.	27	"	"	"	Dug	12	2,600	- 7	2,593	7	2,593	Glacial gravel	Soft	48	S	Intermittent supply.
54	NW.	27	"	"	"	Bored	60	2,610	- 47	2,563	47	2,563	Glacial quick-sand	Hard, "alk-aline"	46	D, S	Sufficient supply.
55	NW.	27	"	"	"	Bored	40	2,616	- 37	2,579	37	2,579	Glacial quick-sand	Hard, "alk-aline"	44	S	Sufficient supply; 6 wells 40 feet in quicksand.
56	NE.	28	"	"	"	Bored	65	2,626	- 60	2,566	60	2,566	Glacial quick-sand	Hard, iron, "alkaline"	45	S	Intermittent supply.
57	NE.	28	"	"	"	Bored	55	2,616	- 35	2,581	35	2,581	Glacial quicksand	Hard	46	D, S	Intermittent supply.
58	NW.	28	"	"	"	Dug	24	2,586	- 8	2,578	8	2,578	Glacial drift	Hard		S	Intermittent supply.
59	SE.	31	"	"	"	Drilled	90	2,550	- 75	2,475	75	2,475	Glacial drift	Hard, iron		D, S	Sufficient supply.
60	NE.	32	"	"	"	Dug	14	2,554					Glacial drift	Soft		N	?
61	SE.	34	"	"	"	Dug	7	2,585	- 3	2,582	3	2,582	Glacial drift	Soft	46	N	Insufficient supply.
62	NE.	34	"	"	"	Dug	13	2,538	- 10	2,528	10	2,528	Glacial sand	Soft, iron, sediment, colour	44	S	?
63	SE.	35	"	"	"	Bored	24	2,605	- 11	2,594	11	2,594	Glacial drift	Soft, cloudy	46	N	Insufficient supply.
64	SW.	35	"	"	"	Dug	17	2,670	- 7	2,663	7	2,663	Glacial drift	Soft	48	D, S	Intermittent supply.
65	SE.	36	"	"	"	Dug	16	2,610	- 11	2,599	8	2,602	Glacial sand	Hard, iron, "alkaline", cloudy	46	S	Sufficient supply for 30 head stock.
66	SW.	36	"	"	"	Bored	9	2,624	- 7	2,617	7	2,617	Glacial sand and gravel	Soft, cloudy	44	S	Sufficient supply.
1	NW.	1	16	29	3	Bored	25	2,520	- 15	2,505	15	2,505	Glacial drift	Hard, "alk-aline"	46	D, S	Sufficient supply.
2	SE.	2	"	"	"	Bored	80	2,553	- 66	2,487	66	2,487	Glacial drift	Hard, "alk-aline"	44	D, S	Sufficient supply.
3	NW.	2	"	"	"	Bored	60	2,505	- 25	2,480	25	2,480	Glacial drift	Hard, iron, yellow	45	S	Sufficient supply.
4	NE.	3	"	"	"	Bored	46	2,530					Glacial drift	Hard	44	N	Sufficient supply.
5	SW.	4	"	"	"	Bored	60	2,496	- 20	2,476	20	2,476	Glacial drift	Hard, iron, "alkaline"	46	D, S	Sufficient supply.
6	NW.	4	"	"	"	Dug	34	2,495	- 19	2,476	19	2,476	Glacial drift	Hard, "alk-aline"	46	D, S	Intermittent supply; also use spring.
7	NE.	6	"	"	"	Dug	30	2,576	- 22	2,554	22	2,554	Glacial drift	Hard, iron	44	D, S	Sufficient supply.

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

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

WELL RECORDS—Rural Municipality of ENTERPRISE, NO. 172, SASKATCHEWAN.

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
8	NW.	6	16	29	3	Dug	20	2,520	− 6	2,514	6	2,514	Glacial sand and gravel	Soft	46	S	Sufficient supply.
9	NW.	6	"	"	"	Bored	55	2,555	− 37	2,518	37	2,518	Glacial quick-sand	Hard, iron, "alkaline"	44	N	Sufficient supply.
10	SE.	7	"	"	"	Bored	70	2,545	− 50	2,495	50	2,495	Glacial drift	Hard, iron, yellow	44	D, S	Sufficient supply; another similar well.
11	SW.	7	"	"	"	Bored	70	2,580	− 35	2,545	35	2,545	Glacial drift	Hard	44	D, S	Sufficient supply.
12	SE.	8	"	"	"	Bored	28	2,450					Glacial drift	Soft	45	S	Sufficient supply.
13	SW.	8	"	"	"	Bored	45	2,532	− 30	2,502	30	2,502	Glacial drift	Soft, "alkaline"	44	D, S	Sufficient supply.
14	NE.	8	"	"	"	Dug	6	2,565					Glacial drift	Soft	65	S	Sufficient supply.
15	SE.	9	"	"	"	Bored	50	2,535					Glacial drift	Hard, "alkaline"	46	N	
16	SW.	9	"	"	"	Dug	30	2,560	− 24	2,536	24	2,536	Glacial sand	Hard	46	D, S	Sufficient supply.
17	NW.	10	"	"	"	Bored	77	2,600	− 72	2,528	72	2,528	Glacial drift	Hard		D, S	Insufficient supply.
18	SW.	11	"	"	"	Dug	20	2,535	− 10	2,525	10	2,525	Glacial drift	Hard	46	S	Sufficient supply.
19	SW.	12	"	"	"	Dug	71	2,550	− 49	2,501	63	2,487	Glacial gravel	Hard, iron, "alkaline"	44	D, S	Sufficient supply.
20	SE.	13	"	"	"	Bored	55	2,572	− 35	2,537	35	2,537	Glacial quick-sand	Hard	46	D, S	Intermittent supply.
21	NE.	13	"	"	"	Dug	50	2,548	− 34	2,514	34	2,514	Glacial drift	Hard, iron	46	D, S	Sufficient supply; another well.
22	SE.	14	"	"	"	Bored	45	2,670	− 35	2,635	35	2,635	Glacial drift	Hard, iron, "alkaline"	46	D, S	Sufficient supply.
23	SW.	14	"	"	"	Bored	42	2,584	− 21	2,563	21	2,563	Glacial sandy clay	Hard, "alkaline"	46	D, S	Sufficient supply.
24	SW.	14	"	"	"	Bored	62	2,592	− 42	2,550	42	2,550	Glacial sand	Hard, "alkaline"	46	D, S	Insufficient supply; intermittent.
25	SE.	15	"	"	"	Bored	40	2,560	− 30	2,530	30	2,530	Glacial drift	Hard, "alkaline", iron	44	D, S	Intermittent supply.
26	SW.	15	"	"	"	Bored	72	2,617	− 64	2,553	64	2,553	Glacial drift	Hard, "alkaline"	42	D, S	Sufficient supply.
27	SE.	17	"	"	"	Bored	30	2,505	− 18	2,487	18	2,487	Glacial drift	Hard, iron, "alkaline"	46	D, S	Sufficient supply.
28	SW.	18	"	"	"	Dug	24	2,505	− 14	2,591	14	2,591	Glacial drift	Hard, "alkaline"	45	D, S	Intermittent supply.
29	SW.	18	"	"	"	Bored	50	2,520	− 45	2,475	45	2,475	Glacial drift	Hard, "alkaline"	45	D, S	Insufficient supply.
30	NW.	19	"	"	"	Dug	6	2,510	− 4	2,506	4	2,506	Glacial drift	Soft	46	S	Sufficient supply.
31	NE.	20	"	"	"	Bored	90	2,612	− 60	2,552	50	2,562	Glacial drift	Hard	42	D, S	Sufficient supply.
32	NW.	20	"	"	"	Dug	16	2,566	− 10	2,556	10	2,556	Glacial gravel	Soft	46	D, S	Intermittent supply; two other wells.
33	SE.	21	"	"	"	Dug	20	2,598	− 13	2,585	13	2,585	Glacial drift	Soft	46	S	Sufficient supply.
34	SE.	22	"	"	"	Bored	34	2,664	− 30	2,634	30	2,634	Glacial drift	Hard, "alkaline"	44	D	Sufficient supply.

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

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

WELL RECORDS—Rural Municipality of ENTERPRISE, NO. 172, 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
35	SE.	22	16	29	3	Bored	35	2,654	− 20	2,634	20	2,634	Glacial drift	Hard, "alkaline"	44	D, S	Sufficient supply.
36	NW.	22	"	"	"	Bored	53	2,630	− 39	2,591	39	2,591	Glacial drift	Hard, "alkaline"	45	D	Sufficient supply.
37	SW.	23	"	"	"	Bored	25	2,610	− 5	2,605	5	2,605	Glacial drift	Hard		D	Sufficient supply.
38	SE.	24	"	"	"	Dug	45	2,550	− 29	2,521	29	2,521	Glacial drift	Hard, iron	46	D, S	Sufficient supply.
39	NE.	24	"	"	"	Bored	80	2,618	− 40	2,578	40	2,578	Glacial drift	Hard, iron	44	S	Sufficient supply.
40	SE.	25	"	"	"	Dug	14	2,625	− 3	2,622	3	2,622	Glacial drift	Soft	44	D	Sufficient supply.
41	SE.	25	"	"	"	Bored	73	2,627	− 36	2,591	36	2,591	Glacial quicksand	Hard, iron, "alkaline", salty	44	S	Sufficient supply.
42	SW.	26	"	"	"	Dug	14	2,640	0	2,640	0	2,640	Glacial drift	Soft		S	Sufficient supply.
43	NE.	26	"	"	"	Bored	55	2,630	− 20	2,610	20	2,610	Glacial quicksand	Hard, "alkaline"	44	S	Sufficient supply.
44	SW.	27	"	"	"	Bored	75	2,648	− 67	2,581	67	2,581	Glacial black sand and gravel	Hard, salty, green colour	45	S	Intermittent supply; bad for humans.
45	SW.	27	"	"	"	Bored	50	2,645	− 15	2,630	15	2,630	Glacial drift	Hard	46	D	Sufficient supply.
46	SW.	27	"	"	"	Bored	70	2,652	− 40	2,612	40	2,612	Glacial black sand	Soft, "alkaline"	43	S	Sufficient supply.
47	NW.	27	"	"	"	Bored	35	2,680	− 19	2,661	19	2,661	Glacial drift	Soft	46	D, S	Sufficient supply; dry hole 8 feet deep.
48	NW.	27	"	"	"	Bored	58	2,709	− 32	2,677	32	2,677	Glacial drift	Hard, iron, "alkaline"	44	S	Sufficient supply.
49	SE.	28	"	"	"	Bored	85	2,649	− 66	2,583	66	2,583	Glacial drift	Hard, "alkaline"	44	D, S	Sufficient supply.
50	NE.	28	"	"	"	Bored	30	2,625	− 24	2,601	24	2,601	Glacial drift	Hard, "alkaline"	46	D, S	Intermittent supply.
51	SE.	29	"	"	"	Dug	20	2,594	− 10	2,584	10	2,584	Glacial drift	Soft	46	D, S	Intermittent supply.
52	SW.	29	"	"	"	Dug	10	2,566	− 4	2,562	4	2,562	Glacial drift	Soft	48	S	Sufficient supply.
53	SE.	30	"	"	"	Bored	40	2,600	− 28	2,572	28	2,572	Glacial drift	Hard, iron, yellow	47	D, S	Sufficient supply.
54	SW.	30	"	"	"	Bored	30	2,600	− 15	2,585	15	2,585	Glacial drift	Soft	46	D, S	Sufficient supply.
55	SW.	30	"	"	"	Bored	45	2,560	− 15	2,545	15	2,545	Glacial drift	Soft	46	D, S	Sufficient supply.
56	NE.	31	"	"	"	Bored	90	2,672	− 60	2,612	60	2,612	Glacial drift	Hard, iron, yellow	44	D, S	Intermittent supply.
57	NW.	32	"	"	"	Bored	86	2,679	− 54	2,625	54	2,625	Glacial drift	Hard, iron, salty	45	S	Sufficient supply.
58	NW.	32	"	"	"	Bored	101	2,679	− 69	2,610	69	2,610	Glacial drift	Hard, iron, salty	46	D, S	Sufficient supply; several dry holes overs 50 feet deep; one 110-foot dry hole.
59	NE.	33	"	"	"	Bored	40	2,707					Glacial drift	Soft	46	D, S	Sufficient supply.
60	NE.	34	"	"	"	Bored	60	2,670	− 36	2,634	36	2,634	Glacial drift	Hard, iron	40	N	?

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 ENTERPRISE, NO. 1 72, 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
61	SE.	35	16	29	3	Bored	40	2,665	− 29	2,636	29	2,636	Glacial sand	Hard, "alkaline"	44	D, S	Sufficient supply.
62	NE.	35	"	"	"	Bored	49	2,635	− 19	2,616	19	2,616	Glacial sand	Hard, "alkaline"		S	Sufficient supply.
63	NW.	36	"	"	"	Bored	39	2,587	− 20	2,567	20	2,567	Glacial drift	Hard, "alkaline"	44	S	Sufficient supply.
1	SE.	12	16	30	3	Bored	22	2,625	− 14	2,611	14	2,611	Glacial sand	Hard, iron	46	D, S	Insufficient supply.
2	SE.	12	"	"	"	Dug	16	2,598	− 5	2,593	5	2,593	Glacial sand	Hard, iron, "alkaline", yellow	46	S	Sufficient supply.
3	SE.	24	"	"	"	Dug	23	2,520	− 13	2,507	13	2,507	Glacial gravel	Hard	45	S	Intermittent supply.
4	SE.	24	"	"	"	Dug	13	2,520	− 9	2,511	9	2,511	Glacial sand	Hard	45	S	Intermittent supply.
5	NE.	24	"	"	"	Bored	27	2,520	− 22	2,498	22	2,498	Glacial sand	Soft	46	D	Intermittent supply.
6	NE.	25	"	"	"	Dug	30	2,598	− 10	2,588	10	2,588	Glacial drift	Soft	46	S	Sufficient supply.
7	NE.	25	"	"	"	Bored	50	2,600	− 42	2,558	42	2,558	Glacial drift	Hard, iron, "alkaline", yellow	42	D, S	Sufficient supply.
8	SE.	36	"	"	"	Dug	20	2,650	− 17	2,633	17	2,633	Glacial drift	Soft	48	S	Sufficient supply.
1	NE.	1	17	28	3	Bored	60	2,525	− 56	2,469	60	2,465	Glacial quicksand	Hard, "alkaline"	44	S	Insufficient supply; two similar wells.
2	SE.	2	"	"	"	Bored	60	2,580	− 40	2,540	60	2,520	Glacial drift	Hard, iron, "alkaline", yellow	44	S	Sufficient supply.
3	NW.	3	"	"	"	Bored	75	2,540	− 57	2,483	75	2,465	Glacial sand	Hard, iron, "alkaline"		D, S	Sufficient supply.
4	SW.	4	"	"	"	Bored	56	2,455	− 13	2,442	56	2,399	Glacial sand	Hard, iron, "alkaline", yellow		D, S	Sufficient supply.
5	SE.	5	"	"	"	Bored	34	2,567	− 17	2,550	34	2,533	Glacial sand	Hard, iron, "alkaline"	46	D, S	Sufficient supply; a 15-foot well intermittent supply.
6	SW.	6	"	"	"	Bored	50	2,603	− 42	2,561	50	2,553	Glacial drift	Hard, iron, "alkaline"	43	S	Insufficient; laxative; two wells 30 and 50 feet deep; dry hole 60 feet deep.
7	NE.	6	"	"	"	Dug	14	2,569	− 10	2,559	10	2,559	Glacial quicksand	Hard	47	S	Sufficient supply; a 6-foot intermittent well.
8	SE.	7	"	"	"	Bored	40	2,558	− 34	2,524	34	2,524	Glacial black sand	Hard, "alkaline"	46	S	Insufficient supply.
9	NE.	7	"	"	"	Bored	92	2,530	− 52	2,478	92	2,438	Glacial drift	Hard, iron, "alkaline"	44	D, S	Sufficient supply.
10	NW.	8	"	"	"	Dug	13	2,535	− 11	2,524	11	2,524	Glacial sand	Soft	47	D, S	Insufficient supply.
11	NE.	9	"	"	"	Bored	65	2,502	− 45	2,457	65	2,437	Glacial drift	Hard, iron, "alkaline"	46	D, S	Sufficient supply.
12	SW.	10	"	"	"	Dug	16	2,540	− 12	2,428	12	2,428	Glacial sand		47	D	Sufficient for house; an 8-foot well for stock
13	NE.	10	"	"	"	Bored	42	2,500					Glacial sand	Hard, sulphur	46	S	Sufficient supply; 16-foot well with soft water.
14	SE.	13	"	"	"	Bored	50	2,450	− 22	2,428	30	2,420	Glacial gravel	Hard, "alkaline"	44	D, S	Sufficient supply.

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

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

WELL RECORDS—Rural Municipality of ENTERPRISE, NO. 172, 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
15	SW.	15	17	28	3	Bored	40	2,482	− 25	2,457	25	2,457	Glacial drift	Hard, "alkaline"	48	D, S	Insufficient supply.
16	SW.	18	"	"	"	Dug	15	2,520	− 9	2,511	9	2,511	Glacial gravel	Soft	47	D, S	Insufficient supply.
17	NE.	18	"	"	"	Bored	80	2,520	− 20	2,500	80	2,440	Glacial drift	Hard, iron, "alkaline"	44	D, S	Sufficient supply; an 18-foot well gives good supply soft water.
18	SE.	19	"	"	"	Bored	90	2,504	− 40	2,464	25	2,479	Glacial sand	Hard, "alkaline"	44	S	Insufficient supply.
19	SE.	21	"	"	"	Bored	70	2,487	− 35	2,452	70	2,417	Glacial sand	Hard, iron, "alkaline", yellow	44	D, S	Sufficient supply.
20	NW.	21	"	"	"	Bored	60	2,482	− 25	2,457	60	2,4[illegible]2	Glacial quick-sand	Hard, rusty, "alkaline", yellow	44	S	Sufficient supply; a 20-foot well of "alkaline" water.
21	NW.	22	"	"	"	Bored	45	2,495	− 40	2,455	40	2,455	Glacial drift	Hard, iron, "alkaline"	46	S	Insufficient supply.
22	NW.	22	"	"	"	Dug	32	2,460	+ 4	2,464	32	2,428	Glacial gravel	Hard, "alkaline"		D, S	Sufficient supply; #.
23	SE.	23	"	"	"	Bored	80	2,510	− 74	2,436	74	2,436	Glacial drift	Hard, iron, "alkaline"	45	D, S	Sufficient supply.
24	NW.	23	"	"	"	Bored	85	2,471	− 30	2,441	85	2,386	Glacial drift	Hard, iron, cloudy	45	D, S, M	Sufficient supply; #. Another well in town 73 feet deep, 40-foot of water.
25	NW.	25	"	"	"	Bored	60	2,340	− 10	2,330	60	2,280	Glacial sand	Hard, "alkaline"	44	D, S	Sufficient supply.
26	SW.	26	"	"	"	Bored	75	2,470	− 40	2,430	75	2,395	Glacial drift	Hard, iron, "alkaline"	45	D, S	Sufficient supply.
27	SW.	27	"	"	"	Bored	75	2,480	− 35	2,445	35	2,445	Glacial quick-sand	Hard, iron		D, S	Sufficient supply.
28	NE.	30	"	"	"	Bored	60	2,490	− 30	2,460	60	2,430	Glacial drift	Hard, iron, "alkaline"	45	S	Sufficient supply.
29	SW.	31	"	"	"	Bored	60	2,470	− 40	2,430	60	2,410	Glacial drift	Soft	44	D, S	Sufficient supply.
30	SE.	32	"	"	"	Bored	50	2,492	− 45	2,447	45	2,447	Glacial quick-sand	Hard	45	D, S	Supply intermittent.
31	NE.	32	"	"	"	Bored	20	2,485	− 8	2,477	20	2,465	Glacial quick-sand	Soft	46	S	Sufficient supply.
32	SE.	33	"	"	"	Bored	55	2,482	− 25	2,457	55	2,427	Glacial sand	Hard, iron, "alkaline"	46	S	Sufficient supply.
33	SW.	33	"	"	"	Bored	50	2,484	− 30	2,454	50	2,434	Glacial drift	Hard, iron	44	D, S	Sufficient supply.
34	NE.	34	"	"	"	Bored	95	2,480	− 68	2,412	92	2,388	Glacial gravel	Hard, iron, "alkaline"	44	D, S	Sufficient supply.
35	SW.	35	"	"	"	Bored	50	2,480	− 50	2,430	50	2,430	Glacial sand	Hard, iron, "alkaline"	45	S	Insufficient supply; a similar 72-foot well.
36	SE.	36	"	"	"	Bored	70	2,370	− 40	2,330	70	2,300	Glacial drift	Hard, black, "alkaline"	44	S	Sufficient supply; laxative.
1	NW.	1	17	29	3	Bored	65	2,580					Glacial drift	Hard, "alkaline"	44	S	Sufficient supply; two other wells; 25-foot dry hole.
2	NE.	2	"	"	"	Bored	92	2,480	− 38	2,542	92	2,488	Glacial sand	Hard, "alkaline"		D, S	Sufficient supply.
3	NW.	2	"	"	"	Bored	40	2,615	− 30	2,585	30	2,585	Glacial drift	Hard, "alkaline"		D, S	Barely sufficient for 13 head stock.
4	NW.	3	"	"	"	Bored	40	2,590	− 20	2,570	30	2,560	Glacial sand	Hard, "alkaline"		D, S	Sufficient supply.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of ENTERPRISE, NO. 172, 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
5	SE.	4	17	29	3	Bored	88	2,660	- 30	2,630	88	2,572	Glacial drift	Hard, "alkaline"		S	Sufficient supply.
6	NW.	4	"	"	"	Bored	60	2,605	- 18	2,587	60	2,545	Glacial sand	Hard, iron		D, S	Sufficient for 27 head stock.
7	SE.	5	"	"	"	Bored	64	2,630	- 44	2,586	64	2,566	Glacial sand	Hard, iron		S	Sufficient supply.
8	NW.	6	"	"	"	Bored	80	2,605	- 50	2,555	80	2,525	Glacial sand	Hard, iron, cloudy		D	Sufficient for house; two other wells dug with poor supply.
9	NW.	7	"	"	"	Bored	35	2,570	- 27	2,543	27	2,543	Glacial sand	Hard, cloudy		D, S	Insufficient supply.
10	SW.	9	"	"	"	Bored	52	2,585	- 15	2,570	52	2,533	Glacial drift	Hard, "alkaline"		S	Sufficient supply; laxative.
11	NW.	9	"	"	"	Bored	68	2,600	- 58	2,542	58	2,542	Glacial drift	Hard		D, S	Sufficient supply.
12	NW.	10	"	"	"	Bored	60	2,595	- 58	2,537	58	2,537	Glacial drift	Hard		D, S	Insufficient supply; a 30-foot well also.
13	NE.	11	"	"	"	Bored	40	2,573	- 32	2,541	32	2,541	Glacial sand	Hard		D, S	Insufficient supply.
14	NW.	11	"	"	"	Bored	[illegible]	2,568	- 40	2,528	60	2,508	Glacial drift	Hard, "alkaline"		D, S	Sufficient supply.
15	NW.	11	"	"	"	Bored	40	2,580	- 30	2,550	30	2,550	Glacial drift	Hard, "alkaline"		D, S	Insufficient supply.
16	SW.	13	"	"	"	Bored	30	2,570	- 20	2,550	20	2,550	Glacial drift	Hard		D, S	Sufficient supply; another similar well.
17	SE.	14	"	"	"	Bored	60	2,570	- 50	2,520	50	2,520	Glacial drift	Hard, "alkaline"		D, S	Insufficient supply; another well also used.
18	NE.	16	"	"	"	Bored	77	2,587	- 73	2,514	73	2,514	Glacial quicksand	Hard, iron, cloudy		D, S	Insufficient supply; 8 wells from 40 to 80 feet deep plugged by quicksand.
19	NW.	17	"	"	"	Bored	75	2,545	- 60	2,485	75	2,470	Glacial drift	Hard, "alkaline"		D, S	Sufficient supply.
20	SE.	18	"	"	"	Bored	90	2,576	- 70	2,506	90	2,486	Glacial drift	Hard, "alkaline"		D, S	Sufficient supply for 20 head stock.
21	NE.	19	"	"	"	Bored	90	2,560	- 82	2,478	82	2,478	Glacial drift	Hard, "alkaline"		D, S	Sufficient supply.
22	SE.	22	"	"	"	Bored	72	2,586	- 30	2,556	72	2,514	Glacial drift	Hard, iron		D, S	Sufficient supply.
23	SE.	22	"	"	"	Dug	30	2,576	- 14	2,562	30	2,546	Glacial sand	Soft		D, S	Sufficient supply; abandoned.
24	NW.	23	"	"	"	Bored	62	2,575	- 31	2,544	62	2,513	Glacial sand	Hard, "alkaline"		D, S	Sufficient supply.
25	NE.	26	"	"	"	Bored	75	2,500	- 45	2,455			Glacial drift	Hard, cloudy, "alkaline"		D, S	Sufficient supply.
26	SE.	28	"	"	"	Bored	70	2,575	- 50	2,525	70	2,505	Glacial sand	Hard		D, S	Sufficient supply.
27	SW.	30	"	"	"	Bored	90	2,540	- 72	2,468	90	2,450	Glacial sand	Hard, iron		D, S	Insufficient supply.
28	NW.	30	"	"	"	Bored	55	2,500	- 48	2,452	48	2,452	Glacial sand	Hard, "alkaline"		D, S	Sufficient supply.
29	NE.	31	"	"	"	Dug	44	2,480	- 40	2,440	40	2,440	Glacial sand	Hard		D, S	Sufficient supply.
30	NW.	33	"	"	"	Bored	80	2,530	- 75	2,455	75	2,455	Glacial drift	Hard, "alkaline"		D, S	Sufficient supply.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of ENTERPRISE, NO. 172, 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	17	29	3	Bored	70	2,490	- 63	2,427	63	2,427	Glacial sand	Hard, cloudy, "alkaline"		S	Insufficient supply; laxative.
32	NW.	34	"	"	"	Bored	120	2,560	- 95	2,465	95	2,465	Glacial drift	Hard, iron, "alkaline"		S	Sufficient supply; #.
33	SE.	35	"	"	"	Bored	88	2,472	- 68	2,404	86	2,386	Glacial sand	Hard, iron	46	S	Sufficient supply; unfit for house.
34	NW.	35	"	"	"	Bored	90	2,550	- 18	2,532	18	2,532	Glacial drift	Hard, "alkaline"		D, S	Insufficient supply.
35	SE.	36	"	"	"	Bored	50	2,560	- 35	2,525	50	2,510	Glacial sand	Hard		D, S	Sufficient supply.
36	NE.	36	"	"	"	Bored	56	2,440	- 41	2,399	56	2,384	Glacial sand	Hard, "alkaline"		D, S	Sufficient supply.
1	NW.	1	17	30	3	Bored	80	2,605	- 35	2,570	35	2,570	Glacial drift	Soft, cloudy		D, S	Insufficient supply.
2	NE.	12	"	"	"	Dug	26	2,535	- 18	2,517	26	2,509	Glacial gravel	Hard, "alkaline"		S	Sufficient supply.
3	SE.	13	"	"	"	Bored	18	2,530	- 16	2,514	16	2,514	Glacial drift	Soft		D	Also another well 30 feet deep.
4	SE.	24	"	"	"	Bored	60	2,536	- 30	2,506	30	2,506	Glacial drift	Hard		S	Insufficient supply.
5	NE.	36	"	"	"	Dug	40	2,485	- 36	2,449	36	2,449	Glacial sand	Hard		D, S	Sufficient supply.
1	SW.	1	18	28	3	Bored	100	2,445	- 75	2,370	100	2,345	Glacial gravel	Hard, iron, "alkaline"	44	S	Sufficient supply; a 10-foot well; soft, drinking water.
2	NE.	3	"	"	"	Bored	104	2,435	- 34	2,401	104	2,331	Glacial sand	Hard, iron, "alkaline"		N	Well caved in.
3	SE.	4	"	"	"	Dug	27	2,475	- 21	2,454	21	2,454	Glacial quicksand	Soft	46	D, S	Sufficient supply.
4	SW.	4	"	"	"	Bored	80	2,480	- 60	2,420	80	2,400	Glacial drift	Hard, iron, "alkaline"	44	S	Sufficient supply.
5	NE.	4	"	"	"	Bored	85	2,470	- 45	2,425	85	2,385	Glacial drift	Hard, iron, "alkaline"	44	S	Sufficient supply.
6	SE.	5	"	"	"	Bored	59	2,505	- 54	2,451	54	2,451	Glacial sand	Hard, lime	45	D, S	Sufficient supply.
7	SW.	5	"	"	"	Dug	25	2,490	- 17	2,473	17	2,473	Glacial sand	Soft, iron	46	D, S	Sufficient supply.
8	NW.	5	"	"	"	Bored	60	2,480	- 37	2,443	60	2,420	Glacial sand	Hard, iron, "alkaline"	45	D, S	Sufficient supply.
9	SW.	6	"	"	"	Bored	62	2,454	- 26	2,428	62	2,392	Glacial sand	Hard, iron, "alkaline", yellow	44	D, S	Sufficient supply.
10	NE.	6	"	"	"	Dug	20	2,470	- 16	2,454	16	2,454	Glacial sand	Soft, "alkaline"	47	D, S	Insufficient supply; another 65-foot well.
11	NE.	7	"	"	"	Bored	80	2,490	- 68	2,422	80	2,410	Glacial drift	Hard, iron, "alkaline"	44	S	Sufficient supply.
12	NE.	12	"	"	"	Bored	75	2,380	- 65	2,315	75	2,305	Glacial quicksand	Hard, saltpeter, "alkaline"	45	S	Sufficient supply; also a shallow well, soft water for house.
13	NW.	14	"	"	"	Bored	88	2,420	- 48	2,372	75	2,345	Glacial sand	Hard, "alkaline"	45	D, S	Sufficient supply.
14	NE.	16	"	"	"	Bored	40	2,410	- 33	2,377	33	2,377	Glacial sand	Hard, iron, "alkaline"	45	S	Sufficient supply.
15	SE.	18	"	"	"	Bored	100	2,481	- 70	2,411	100	2,381	Glacial drift	Hard, "alkaline"	44	D, S	Sufficient supply.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of ENTERPRISE, NO. 172, 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
16	NE.	18	18	28	3	Bored	69	2,462	- 51	2,411	69	2,393	Glacial drift	Hard, "alkaline"	44	D, S	Sufficient supply.
17	NW.	18	"	"	"	Bored	75	2,480	- 55	2,425	75	2,405	Glacial sand	Hard	44	N	Sufficient supply.
18	SE.	20	"	"	"	Bored	130	2,410	- 80	2,330	130	2,280	Glacial sand	Hard, iron, "alkaline"	44	S	Sufficient supply.
19	NE.	20	"	"	"	Bored	111	2,450	- 40	2,410	111	2,339	Glacial gravel	Hard, iron, "alkaline"	44	S	Sufficient supply; another 25-foot well, soft water; intermittent supply.
20	SW.	22	"	"	"	Bored	100	2,460	- 40	2,420	100	2,360	Glacial drift	Hard, "alkaline"	44	S	Sufficient supply; two wells 80 and 22 feet deep for house use only.
21	NE.	23	"	"	"	Bored	90	2,460	- 73	2,387	90	2,370	Glacial sand	Hard, "alkaline"	44	S	Sufficient supply; a 24-foot well, soft water.
22	SE.	24	"	"	"	Bored	98	2,380	- 16	2,364	90	2,290	Glacial drift	Hard, "alkaline"		D, S	Sufficient supply.
23	SW.	24	"	"	"	Bored	95	2,390	- 30	2,360	95	2,295	Glacial drift	Hard, "alkaline"		D, S	Sufficient supply; an 18-foot well with soft water.
24	NW.	24	"	"	"	Dug	35	2,484	- 28	2,456	28	2,456	Glacial sand	Hard, lime, magnesium	46	D, S	Sufficient supply.
25	NE.	24	"	"	"	Dug	16						Glacial drift	Soft			Used for washing.
26	SW.	25	"	"	"	Dug	24	2,448	- 18	2,430	18	2,430	Glacial sand	Soft	46	S	Sufficient supply.
27	SW.	26	"	"	"	Bored	90	2,484	- 70	2,414	90	2,394	Glacial quicksand	Hard, iron, "alkaline"		S	Sufficient supply; another 16-foot well for house.
28	NE.	28	"	"	"	Bored	21	2,470	- 18	2,452	18	2,452	Glacial fine sand	Soft, lime	47	D, S	Insufficient supply.
29	NW.	28	"	"	"	Dug	22	2,460	- 14	2,446	14	2,446	Glacial sand	Hard, iron, "alkaline"	46	S	Sufficient supplly.
30	SW.	30	"	"	"	Dug	13	2,460	- 9	2,451	9	2,451	Glacial quicksand	Soft	47	S	Sufficient supply; another well 17 feet deep; dry hole 95 feet deep.
31	SE.	32	"	"	"	Dug	28	2,470	- 12	2,458	12	2,458	Glacial sand	Hard	46	D, S	Sufficient supply.
32	SW.	32	"	"	"	Bored	25	2,456	- 17	2,439	17	2,439	Glacial sand	Hard, cloudy		D, S	Sufficient supply.
33	NE.	32	"	"	"	Bored	115	2,480	- 65	2,415	115	2,365	Glacial sand	Hard, iron, "alkaline"	44	S	Sufficient supply.
34	SE.	33	"	"	"	Dug	23	2,470	- 16	2,454	16	2,454	Glacial sand	Soft	47	D, S	Insufficient supply.
35	NW.	33	"	"	"	Bored	105	2,485	- 19	2,394	105	2,380	Glacial sand	Hard, mineralized		S	Insufficient supply, a seepage well supplies water for house.
36	SE.	34	"	"	"	Bored	14	2,480	- 9	2,471	9	2,471	Glacial sand	Hard	46	D, S	Sufficient supply; two other wells 13 and 18 feet deep.
37	NW.	35	"	"	"	Bored	40	2,490	- 38	2,452	38	2,452	Glacial sand	Hard, iron, "alkaline"	46	D, S	Insufficient supply.
38	SW.	35	"	"	"	Dug	20		- 10				Glacial drift	Soft		S	Only used for stock.
39	SE.	36	"	"	"	Dug	18	2,398	- 15	2,383	15	2,383	Glacial sand	Hard	46	D, S	Sufficient supply.
40	SW.	36	"	"	"	Bored	52	2,440	- 48	2,392	48	2,392	Glacial sand	Hard	44	D, S	Sufficient supply.
1	NE.	2	18	29	3	Bored	55	2,451	- 15	2,436	55	2,396	Glacial quicksand	Hard, "alkaline"		S	Sufficient supply.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of ENTERPRISE, NO. 172, 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
2	SE.	3	18	29	3	Bored	40	2,443	- 35	2,408	40	2,403	Glacial sand	Hard, "alkaline"		D, S	Sufficient supply.
3	SE.	4	"	"	"	Dug	40	2,450	- 32	2,418	32	2,418	Glacial sand	Hard, "alkaline"		D, S	Sufficient for 50 head stock.
4	SW.	7	"	"	"	Bored	60	2,480	- 30	2,450	60	2,420	Glacial sand	Hard, "alkaline"		D, S	Sufficient supply.
5	NW.	7	"	"	"	Bored	80	2,476	- 60	2,416	80	2,396	Glacial sand	Hard, iron, amber colour		D, S	Insufficient supply.
6	SE.	9	"	"	"	Bored	108	2,455	- 68	2,387	108	2,347	Glacial sand and gravel	Hard, "alkaline"		D, S	Sufficient supply.
7	SW.	9	"	"	"	Bored	106	2,555	- 96	2,459	106	2,449	Glacial sand	Hard		D, S	Sufficient supply.
8	SE.	10	"	"	"	Bored	50	2,448	- 40	2,408	40	2,408	Glacial sand	Hard, iron, "alkaline"		D, S	Insufficient supply; a 60-foot similar well.
9	NW.	10	"	"	"	Bored	72	2,427	- 47	2,380	72	2,355	Glacial gravel	Hard, iron		D, S	Sufficient supply.
10	SE.	12	"	"	"	Bored	80	2,480	- 65	2,415	65	2,415	Glacial drift	Hard, "alkaline"		S	Insufficient supply; laxative.
11	NW.	12	"	"	"	Bored	75	2,460	- 40	2,420	75	2,385	Glacial sand	Hard, "alkaline"		D, S	Sufficient supply; laxative.
12	NE.	13	"	"	"	Bored	70	2,485	- 50	2,435	70	2,415	Glacial sand	Hard, iron, "alkaline"	44	S	Sufficient supply.
13	NW.	14	"	"	"	Bored	70	2,425	- 40	2,385	70	2,355	Glacial gravel	Hard		D, S	Sufficient supply.
14	SE.	15	"	"	"	Dug	24	2,418	- 12	2,406	24	2,374	Glacial drift	Hard		D, S	Sufficient supply.
15	SW.	15	"	"	"	Bored	60	2,500	- 30	2,470	60	2,440	Glacial drift	Hard		D, S, I	Sufficient supply.
16	SE.	16	"	"	"	Bored	63	2,490	- 33	2,357	63	2,327	Glacial quicksand	Hard, "alkaline"		D, S,	Sufficient supply.
17	SW.	18	"	"	"	Bored	45	2,485	- 15	2,470	45	2,440	Glacial drift	Hard, iron, amber colour		D, S	Sufficient supply; laxative.
18	NW.	18	"	"	"	Bored	40	2,475	- 10	2,465	40	2,435	Glacial drift	Hard		D, S	Sufficient supply.
19	NW.	23	"	"	"	Bored	60	2,425	- 40	2,385	60	2,365	Glacial gravel	Hard		S	Sufficient supply; laxative.
20	NE.	24	"	"	"	Bored	80	2,510					Glacial sand	Hard, iron		N	Well caved in; two other wells 104 feet deep.
21		26	"	"	"	Bored	30						Glacial drift	Soft		S	Water 20 head stock.
22	NE.	27	"	"	"	Bored	60	2,428	- 45	2,383	45	2,383	Glacial sand	Soft		D, S	Sufficient supply.
23	SW.	30	"	"	"	Bored	80	2,486	- 20	2,466	80	2,406	Glacial sand and gravel	Hard		D, S	Insufficient supply; well caved in; 3 dry hole 80 to 90 feet deep.
24	SE.	31	"	"	"	Drilled	225	2,485	- 90	2,395	225	2,260	Glacial sand	Hard, iron, "alkaline"		S	Sufficient supply; a 15-foot well, soft water for drinking.
25	NW.	32	"	"	"	Dug	18	2,480	- 16	2,464	16	2,464	Glacial gravel	Soft		D, S	Insufficient supply; hauls water.
1	SE.	12	18	30	3	Bored	65	2,485	- 18	2,467	65	2,420	Glacial sand	Hard, iron		D, S	Sufficient supply.
2	NW.	12	"	"	"	Bored	40	2,480					Glacial sand	Hard, iron		D, S	Sufficient supply; several other wells unfit for use.
3	NE.	36	"	"	"	Bored	40	2,495	- 37	2,358	37	2,358	Glacial quicksand	Hard		D, S	Insufficient supply.

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