CANADA
DEPARTMENT OF MINES

HON. T. A. CRERAR, MINISTER; CHARLES CAMSELL, DEPUTY MINISTER

BUREAU OF ECONOMIC GEOLOGY

GEOLOGICAL SURVEY

PRELIMINARY REPORT

GROUND-WATER RESOURCES OF THE RURAL MUNICIPALITY OF STONEHENGE No. 73 SASKATCHEWAN

BY

B. R. MacKay, H. H. Beach & J. M. Cameron

Water Supply Paper, No. 221

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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 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 rests upon the Ravenscrag or older formations. The formation is 30 to 125 feet thick.

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

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

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

Bearpaw Formation. The Bearpaw consists mostly of incoherent dark grey to dark brownish grey, partly bentonitic shales, weathering light grey, or, in places where much iron

is present, buff. Beds of sand occur in places in the lower part of the formation. It forms the uppermost bedrock formation over much of western and southwestern Saskatchewan and has a maximum thickness of 700 feet or somewhat more.

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

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

WATER-BEARING HORIZONS OF THE MUNICIPALITY

The rural municipality of Stonehenge covers an area of approximately 385 square miles in the south-central part of Saskatchewan. The municipality consists of nine full townships and fractions of three others. It is described as townships 7, 8, and 9, ranges 1, 2, and 3, and parts of townships 6, ranges 1, 2, and 3, that lie north of Twelvemile lake, all west of the Third meridian. The village of Limerick, situated near the centre of the municipality, lies approximately 1 miles south and 31 miles west of Moose Jaw and about 12 miles west of Assiniboia. Four branches of the Canadian Pacific railway serve this municipality. The Lethbridge-Weyburn branch, on which are located the villages of Ardwick, Valor, and Limerick, runs from east to west through the central part of the area. The Moose Jaw-Assiniboia line traverses the east side of township 9, range 1. The village of Congress is situated on this branch. The Assiniboia-Rockglen line parallels the eastern border of the municipality from Ardwick south to the southern boundary. Bexhill, Maxstone, and Ogle are stations along this branch. Stonehenge and Lakenheath are villages on the Ogle-Mankota branch that runs west from Ogle through the southern townships of the municipality.

The valley of Twelvemile lake is the major topographic feature of the area. The valley sides rise steeply from an elevation of 2,459 feet above sea-level to he irregularly rolling uplands that characterize the greater part of the southern half of the municipality. Stones and boulders are scattered over the surface in many places and are particularly noticeable on a small ridge extending in a general southeast-northwest direction approximately one mile south of Stonehenge. This rolling type of topography is also present along the northern part of the western border of the municipality, but over the north-central and northeastern townships the surface is slightly lower and forms a gently rolling plain with elevations

varying between 2,400 and 2,375 feet above sea-level.

Lynthorpe creek flowing in a westerly direction from Twelvemile lake and a small intermittent creek draining the lake valley in sec. 16, tp. 6, range 3, are the only streams in the area. Drainage in the uplands areas is entirely into small sloughs and swamps occurring in depressions. Twelvemile lake when visited in 1935 had only 1½ feet of water at the deepest part in the centre of the lake in township 6, range 2. The lake went completely dry in 1933 for the first time since the district has been settled. Such water as is obtainable from the lake is of a highly "alkaline" character and unsuited for domestic use. During the early spring when the level of the lake is up the water could probably be used for stock, but with the evaporation of the water through the summer months the mineral salts in solution become concentrated and render the water unfit for any farm use. Lynthorpe creek and wells sunk in the silts along the stream bed are sources of water supplies for both households and stock in the spring and early summer, after which time the water becomes stagnant but in places is used for stock. Sloughs and ponds in surface depressions also form sources of water for stock on several farms. Over wide areas in the western and northern parts of the municipality the ground water supplies obtainable are inadequate for local requirements. Residents are obliged to construct dams in coulées to conserve the spring run-off or excavate dugouts in order to provide water for stock. Shallow wells sunk beside these surface accumulations and deriving their supply from them by seepage yield drinking water for the households. Springs occur on several farms in the southern and western parts of the area and form a source of water for stock, and in a few places for domestic requirements. Throughout the greater part of the municipality, however, wells form the chief source of water. Recent deposits along the creeks, glacial deposits, and underlying bedrock formations are found to be productive or potential sources of ground

water in various parts of this area.

Water-bearing Horizons in the Unconsolidated Deposits

Seepage wells sunk in Recent silts and sands along Lynthorpe creek provide small supplies of water. This water can be used for domestic purposes during such time as the creek is flowing, but throughout the remainder of the year is used only for stock. Water from the Recent deposits occurring along Twelvemile lake is probably too highly mineralized even for stock use. Recent deposits that have been washed down from the hill-sides into the bottoms of valleys provide water supplies in the NE. $\frac{1}{4}$, sec. 19, tp. 6, range 3, and SW. $\frac{1}{4}$, sec. 30, tp. 8, range 3. In both places the supply obtained is sufficient for stock needs, but the water from the well in township 8, range 3, has too high a mineral salt content to be used for domestic purposes. At isolated points in some of the deeper coulées sufficient quantities of material may have accumulated to warrant prospecting for water, but in most of the coulées such deposits are too thin to form a source of ground water. Water derived from wells located in valleys and coulées is particularly liable to pollution should sewage or other decaying organic matter accumulate on the sides and along bottoms of the depressions. Care should be exercised in keeping such catchment areas free from contamination, particularly if the well is to provide water for household use.

The entire upland area of the municipality is covered by a mantle of glacial drift laid down by a great continental ice-sheet that, many thousands of years ago, advanced and retreated over the province of Saskatchewan. The thickness of the drift, as the glacial deposits are collectively termed, varies irregularly from place to place. Along the northern slopes of Twelvemile Lake valley it is less than 10 feet thick and in many places it is entirely absent and the bedrock is exposed. The drift becomes appreciably thicker over the uplands extending to a depth of 60 feet or more at several points in

the eastern and central parts and even to 140 feet along the western and northern borders of the municipality.

Four more or less distinct types of glacial deposits have been recognized in the area. These are known as till, moraine, lake clay, and glacial sands and gravels, and differ in the regularity of their surface and more particularly in their porosity and hence their water-bearing properties. As the great ice-sheet advanced from the north it laid down a layer of till over the entire area. This till is composed largely of compact boulder clay that is light buff to brown in the upper few feet of the weathered zone near the surface and bluish grey in the lower part. Scattered through the boulder clay with no apparent regularity either as to depth from the surface or individual areal extent and thickness are pockets or lenses of well-sorted sands and gravels. These lenses form the water-bearing beds in the till. As the ice-sheet gradually melted and retreated it deposited further layers of material, particularly on the higher land in this area. Such deposits, known as moraine, now cover a belt varying irregularly in width from 2 to 6 miles extending from Ogle west to the western boundary of the municipality and north along this boundary to the southern part of township 9, range 3. A narrower belt of moraine, not generally exceeding 2 miles in width, extends from Bexhill in a northwesterly direction to a point about $1\frac{1}{2}$ miles west of Limerick, and a similar belt extends from the centre of township 8, range 2, to form the main zone of moraine in the western part of township 9, range 3. The position of these belts as determined in the field are indicated on Figure 1 of the map accompanying this report. The moraine is characterized by a more irregularly rolling ground surface. Low knolls and ridges and intervening undrained depressions are common. The material composing the moraine is essentially boulder clay, but the gravel beds interspersed through it are more numerous and generally thicker than in the till-covered areas. Many of the low hills and

ridges are composed almost entirely of sorted gravels and sands. Hence, within the areas of moraine large supplies of water are obtainable at some points at shallow depths, whereas in others only clay is encountered in sinking wells and little or no water is obtained.

Large lakes were formed in the district as a result of the melting of the ice-sheet. Two of these lakes extended into this municipality, their presence being indicated by layers of compact, light bluish grey lake clay covering small areas in the northeast corner of township 8, range 1, and the northern part of township 9, range 3. Streams issuing from the ice-front also deposited beds of sands and gravels over considerable areas. Such deposits extend over the northeast corner of township 8, range 2, into township 9, range 2, and over a much smaller area in township 8, range 3, at the edge of the moraine, approximately 1½ miles west of Limerick.

Glacial outwash sands and gravels are generally a reliable source of good water at shallow depths. So far as known, no wells tap these deposits in township 8, range 3, but from the other occurrence of these deposits residents obtain supplies adequate for watering up to 30 head of stock. The water coming from porous materials at shallow depths generally does not contain any large concentration of mineral salts in solution, and hence is suitable for domestic use.

The glacial lake clays are largely impervious and little or no water can be expected from them. Water supplies in areas covered by these deposits are being obtained from thin beds of gravel and sand that occur in a few places immediately beneath the lake clays. No such pockets have been encountered under the lake clays in township 9, range 3, nor in township 10, range 3, in the municipality to the north. It is questionable if further prospecting will find an adequate water supply in this lake clay covered area. As the under-

lying bedrock is also unproductive in this area, residents must rely on surface reservoirs for their water supplies. The lake clays in township 8, range 1, are only 10 to 35 feet thick, and are immediately underlain by sands of the Eastend formation. As these sands are water-bearing it is of no great consequence that little or no water can be obtained from the overlying, compact lake clays.

The boulder clay forming the greater part of the till plain and moraine deposits is largely impervious and cannot be considered as a source of more than small quantities of ground water. It is also regarded as the source of the mineral salts that upon being taken into solution cause the disagreeable taste and laxative effects characteristic of many of the waters from the drift.

The sand and gravel pockets interspersed through the boulder clay form the water-bearing beds in these drift deposits, and appear to be more numerous in the areas of moraine than in the till. The quantity of water available from these sand and gravel beds depends upon the size and porosity of the pockets, the larger and more porous the pocket the greater the supply obtainable. The depth at which they occur below the surface is important in relation to the amount of mineral salts the water will contain. Supplies from extensive porous beds near the surface are soft or only moderately hard and not highly mineralized. Water from the deeper beds has of necessity seeped through greater thicknesses of boulder clay, and, consequently, the quantity of dissolved sulphate salts present is appreciably greater.

The importance of the glacial drift as a source of ground water varies in different parts of the municipality. In areas in which the drift overlies the Ravenscrag and Eastend bedrock formations (as shown on Figure 1) large supplies of water are to be expected in the bedrock and the sinking of wells to bedrock is advisable rather than to prospect for productive pockets that may or may not be present in the drift. In areas where water from the bedrock is not suitable for domestic use, however, shallow wells in the drift or sunk beside surface

reservoirs must be depended upon for a domestic supply. The Bearpaw bedrock formation is a poor source of water, and in the areas underlain by this formation supplies from the glacial deposits are important sources of water for both household and stock purposes. In these areas the glacial drift should be carefully prospected, as in many farms productive beds have been found that yield adequate supplies for all household and stock requirements. In some places, however, several holes encountering only clay will be sunk before porous water-bearing beds are tapped.

The occurrence of a rather peculiar type of water-bearing sediment, variously referred to as "sea-mud" and "black muck" by the well drillers of the district, has been noted in several wells in the northwest corner and along the northern part of the western border of the municipality. Despite the fact that no detailed descriptions of this material were obtained it is evident that these terms are not used to designate the same type of deposit at different points, and correspondingly the quality and yield of water from these beds vary in different parts. At places where the "muck" is essentially a very fine-grained dark grey sand or mud it probably represents the weathered upper few feet of the Bearpaw shale and is found to be sufficiently porous to form a source of large supplies of water which is generally drinkable. At other places a thick black mud interbedded with reeds and other evidences of vegetable material is found at the base of the drift or immediately overlying the bedrock. Such material is regarded as representing deposits accumulated in swamps existing before the advance of the ice-sheet and eventually covered by the boulder clay deposits from the advancing ice. Water from this source, if allowed to stand, quickly develops a scum on the surface, and the disagreeable taste of the water makes it unsuited to household use. It is, nevertheless, being used for watering stock with no reported ill effects. These deposits are in most places quite porous and many

individual wells tapping this horizon in the northwestern parts of this municipality yield supplies sufficient for 50 head of stock or more, although a few yield barely sufficient water for 10 head. The occurrence of this "sea-mud" is widespread in municipalities to the north and west, and suggests the existence of a swampy condition over the exposed bedrock surface either before or in the early stages of deposition of the glacial drift.

Water-bearing Horizons in the Bedrock

Two of the four bedrock formations present in this municipality are important sources of ground water. The other two are generally unproductive, consequently, a knowledge of the areal extent and porosity of each formation within the area is important in determining the advisability of sinking wells through the glacial deposits into the bedrock in any part of the area. The non-existence of outcrops over all but the southern townships and a lack of drilling records giving accurate descriptions of the character of the sediments penetrated in drilling has greatly added to the difficulties of indicating the boundaries of these formations on the geological maps. The southern boundaries have been accurately traced, but in the northern townships the boundaries are at best approximations. In the descending order of their occurrence the four formations represented are known as the Ravenscrag, the Eastend, the Whitemud, and the Bearpaw formations (See Figure 1).

The Ravenscrag formation consists of a series of light brown clays and shales, and coarse grey sandstones interbedded with thin seams of lignite coal. A thick bed of coarse sand lies at the base of this formation. The coal seams and sand beds, particularly the basal sand member, are the most productive water-bearing horizons in that part of the municipality in which this formation is present. The beds comprising the bedrock of the municipality dip in a north-easterly direction at the rate of about 10 feet a mile. The most

extensive water horizon in the Ravenscrag slopes down from an elevation of 2,537 feet above sea-level in the NE. ¼, sec. 25, tp. 6, range 3, to an elevation of 2,360 feet on the east side of township 8, range 1. The horizon is encountered at intermediate elevations in the intervening townships. Other smaller horizons are confined to particular areas in the formation, and are discussed in the section of the report dealing with the individual townships. Generally, residents have obtained supplies adequate for their stock needs within 100 feet of the surface in the area underlain by the Ravenscrag. The water contains in many places large amounts of dissolved mineral salts, iron being a common constituent, particularly if the water is derived from coal. The large concentration of salts limits the use of many of these supplies to watering of stock, and residents are obliged to depend upon shallow wells in the drift for drinking water supplies.

The Whitemud formation consists of some 15 to 30 feet of buff to chalk-white, sandy clays extending discontinuously between the Ravenscrag and the Eastend formation. These white clays form conspicuous outcrops along the sides of Twelvemile Lake valley. The Whitemud is not a source of ground water, but serves as a readily recognizable horizon marker in wells.

The Eastend formation underlies the Ravenscrag and Whitemud formation, and immediately underlies the drift where the younger bedrock formations are absent. It is made up largely of fine sands and silts. The sands of the formation are water bearing and yield important water supplies in townships 6, 7, 8, and 9, range 3, townships 7 and 8, range 2, and township 8, range 1. The sands are encountered at elevations of about 2,470 feet above sea-level in township 6, range 3, at uniformly lesser elevations through the central and eastern townships, and at about 2,330 feet in the northeast corner of township 8, range 1. They are also encountered in isolated occurrences in township 6, range 3, township 7, range 3, township 9, range 1,

township 9, range 2, and township 9, range 3, at elevations of 2,505, 2,510, 2,320, 2,320, and about 2,360 feet, respectively, above sea-level. Wells reach the sands in general within 100 feet from the surface, the depth depending largely upon the elevation of the selected well site. The supplies obtained from these sands are usually fairly large, and are adequate in nearly every case for the stock needs of the individual owners. Although the water generally has a fairly high dissolved mineral salt content, many residents have found the presence of these salts not too highly objectionable to prohibit the use of the water for household purposes.

The Bearpaw formation underlying the entire municipality consists of compact, dark grey to black clays and shales. The formation is not a likely source of water and with rare exceptions drilling should be discontinued when these shales are encountered. The clays or shales may be distinguished from the overlying boulder clays by their darker colour, the almost entire absence of stones or pebbles, by their soapy feel to the touch when wet, and by the roughly cubical fragments into which they crumble upon drying. A few wells in the north-central part of township 8, range 1, tap what is considered to be a sandy zone interbedded with the shales near the top of the formation at an elevation of about 2,295 feet above sea-level. These wells are between 50 and 100 feet deep and obtain enough water for 50 head of stock. The water is of good quality and the owners use it for their household needs. Such water is not typical of supplies from the Bearpaw formation in other parts of the area. Generally, the small seepages obtainable contain large amounts of dissolved sulphate salts and common salt and are unsuitable even for watering stock. A few scattered wells in township 9, range 1, have penetrated small sand pockets in the formation and obtain small supplies of water that is being used for watering stock. Water supplies are particularly difficult to obtain in this township, since both the glacial deposits and the bedrock are almost entirely unproductive. In this, as in

similar areas along the western and northern boundaries of this municipality, residents are well advised to consider the excavation of dugouts or where possible the construction of dams in coulées to conserve surface water.

GROUND WATER CONDITIONS BY TOWNSHIPS

Township 6, Range 1

Only that part of this township that occurs to the north of Twelvemile lake lies within this municipality. The eastern extension of the lake bounding this area on the south has been nearly dry for several years and even in wet seasons is little more than a marsh. Most of the residents of the township derive their water supplies from wells, but on at least one farm surface water for stock use is stored by means of a dam in a coulée bottom.

The unconsolidated Recent and glacial deposits do not form as important sources of ground water in this township as do horizons in the underlying bedrock formations. It is improbable that any water found at shallow depths in the Recent deposits occurring along the bottom of Twelvemile lake will be sufficiently low in dissolved mineral salt content to be used domestically, and it is not generally regarded as being satisfactory for stock use.

The glacial deposits over the greater part of the area are very thin and composed almost entirely of blue-grey boulder clay, and hence cannot be regarded as a source of sufficient water for stock. It is possible that extended prospecting at shallow depths, particularly in the moraine-covered area of the west-central part, would give a satisfactory household supply, but deeper boring in all parts of this township is more certain of producing an adequate supply for stock.

The Ravenscrag formation immediately underlies the glacial drift throughout the greater part of the township. The base of the formation along the western border of the township lies at an approximate elevation of 2,495 feet above sea-level, or within about 30 feet of the lake level (2,459 feet). Due to a slight downward slope to the east, or possibly to the northeast, it lies at lake level in section 9 and at depths of 30 or 40 feet below lake level

along the eastern border, or at an approximate elevation of 2,430 feet. The Ravenscrag is underlain by some 10 to 15 feet of white clays of the Whitemud formation. These clays are exposed along the side of the lake in sections 7 and 8, but dip underground in the central part of section 9. The Eastend formation underlies the Whitemud throughout the area and varies irregularly in thickness from 30 to 55 feet. It grades downward into the shales of the Bearpaw formation.

Sand beds and coal seams that occur in the Ravenscrag form the aquifers in most of the wells in the township. The Whitemud is not productive of water, but a few wells have passed through the Ravenscrag, and Whitemud to tap beds in the Eastend formation.

The water-bearing sand beds and coal seams in the Ravenscrag occur at two fairly persistent horizons in this township. The uppermost occurs at the average elevation of 2,575 feet above sea-level where the land surface is highest, as in the northwest corner of the township. Depending upon the surface elevation at the well site, wells range from 38 to 100 feet in depth. Of the three wells tapping the horizon only the 100-foot well on the NE. $\frac{1}{4}$, section 30, fails to obtain an adequate supply of water that is suitable for both household and stock use. The 100-foot well yields only a small supply of water that contains a large amount of mineral salts in solution and is, therefore, unfit for use in the household. This well would probably obtain a better supply if deepened 50 feet to tap a lower water-bearing horizon.

The lower horizon, a bed of coarse sand lying at or near the base of the Ravenscrag, appears to be fairly persistent over the township. This horizon is encountered at an average elevation of 2,535 feet in the west-central part of the township, but due to the slight dip of the beds to the northeast it occurs at elevations of 2,507 to 2,458 feet in the central and eastern parts of the area.

The wells tapping the horizon vary in depth from 50 to 100 feet, and generally yield adequate supplies that are being used for watering stock. However, in many places, a high concentration of mineral salts and particularly iron renders the water unfit for domestic use.

A well located on section 10 has been sunk to depth of 108 feet, to an elevation of 2,424 feet, and derives a moderately large supply of soft water from the sands of the Eastend formation. Two other wells, 165 and 160 feet deep, on the NW. and NE. ¼'s, section 18, have found adequate water supplies in the same formation at elevations of 2,405 and 2,443 feet. Water from this source often contains "soda", which tends to render it unsuitable for garden irrigation. The Eastend sands are probably a source of water in the northern part of the township, but on the higher land deeper wells sunk to a maximum depth of about 250 feet would be necessary before water-bearing beds are reached. Drilling below the Eastend formation is not advisable as the Bearpaw formation below the Eastend is believed to be either entirely unproductive or to yield only small supplies of highly mineralized water.

Township 6, Range 2

Twelvemile lake forms the southern boundary of the part of this township lying in the municipality of Stonehenge. The lake, when visited, contained only about 1½ feet of water. The water is stagnant and contains a large amount of mineral salts in solution, and as a consequence does not serve even as a stock supply. Residents of this township obtain their water supplies entirely from wells penetrating the bedrock formations underlying the thin mantle of unconsolidated deposits covering the area. Small supplies of water probably exist in the Recent deposits of sands and silts along Twelvemile lake, but this water is probably too highly mineralized for ordinary farm purposes.

The mantle of glacial deposits consists of moraine in the northeast and northwest corners and of till throughout the remainder of the township. The deposits are only a few feet thick near the lake, but become thicker towards the north where, on sections 32 and 33, they are 30 to 35 feet thick. Both the till and moraine consist essentially of yellow boulder clay. A 50-foot well on the NW. $\frac{1}{4}$, section 33, encountered a dry gravel bed in the yellow boulder clay at a depth of 35 feet, and it was necessary to extend the well down into the bedrock before an adequate water supply was obtained. It is possible, however, that water-bearing gravel and sand beds could be located in the glacial deposits. Only small supplies of water can be expected from such a source, but the water would be of good quality and suitable for domestic use.

The same bedrock formations are present beneath the glacial deposits in this township, as in the township to the east. The Ravenscrag formation has been eroded away from the western lowland parts and occurs only in the northeast corner and in a narrow band extending through the sections along the northern border. This formation is believed to extend down to an approximate elevation of 2,525 feet above sea-level in section 31, but, due to a slight easterly dip of the beds, extends to increasingly lower elevations in an easterly direction, and its base lies at an approximate elevation of 2,480 feet at the eastern border. The 10 to 15 feet of white, sandy clays comprising the Whitemud formation underlie the Ravenscrag and form conspicuous outcrops along the sides of the lake valley. The Whitemud is underlain by the Eastend. This formation lies immediately beneath the drift and Recent deposits in the west-central lowlands where the overlying bedrock formations have been eroded away. The Eastend probably does not exceed 40 feet in thickness at any point in the area, and everywhere overlies the shales of the Bearpaw formation.

The boundaries of the formations are outlined on the accompanying map (Figure 1).

Wells in the northeast corner of the township tap coal seams in the Ravenscrag formation lying at a fairly constant horizon, which slopes from an elevation of 2,540 feet in section 23 down to 2,515 feet in section 36. The wells vary from 56 to 80 feet in depth except on the SE. ¼, section 23, where the lower land surface made it possible to reach this horizon at a depth of 12 feet. All wells with the exception of this shallow well obtain an adequate supply of water for about 20 head of stock. The water from the 80-foot well on the NE. ¼, section 24, is highly mineralized and unfit for domestic use, but from the others it is used satisfactorily for both household and stock.

A lower horizon of water-bearing sands or coal seams in the Ravenscrag, dipping from an elevation of 2,525 feet on the SW. ¼, section 31, in an easterly direction to an elevation of 2,497 feet on the NE. ¼, section 35, is tapped by wells located along the northern sections of the township. The horizon is also tapped by an 80-foot well on the SE. ¼, section 24, at an elevation of 2,490 feet. The depths of the wells in the northern sections varies from 115 feet in the uplands on the west to 4 feet in a low area on the SW. ¼, section 34, and again increases to 65 feet on the NE. ¼, section 35. Supplies from the wells, with the exception of the 75-foot well on the NE. ¼, section 32, are sufficient for 15 to 25 head of stock. The waters taken from the carbonaceous shale or coal in the well on the NW. ¼, section 33, and from the coal in the well on the SW. ¼, section 34, are suitable only for stock use, but the other wells tapping the horizon obtain usable domestic supplies.

The Eastend sands are tapped by only one well in this township. This well located on the SW. ¼, section 33, is 125 feet feet deep. It obtains a supply of hard, "alkaline" water adequate for the owner's stock needs, but the water is too highly mineralized

to be used for domestic purposes.

One well has been sunk into the Bearpaw formation. This well, 110 feet deep, located on the NW. $\frac{1}{4}$, section 23, taps what is considered to be a sandy pocket in the shale rather than an extensive water-bearing bed. The aquifer lies at an elevation of 2,410 feet, and from it the well derives a supply of water usable in the household and in sufficient quantity for 30 head of stock. This water is of much better quality than the water usually obtained from this formation, but it is by no means certain that other wells sunk to the same elevation would be equally productive. Hence, water should be sought for in the Ravenscrag and Eastend formations, in which it is believed satisfactory water supplies can be obtained anywhere in the township.

Township 6, Range 3

Only the northern part of this township lies in the municipality of Stonehenge. Twelvemile lake forms the eastern part of the southern boundary of this part of the township. The water in the lake is stagnant and highly mineralized, and cannot always be used for stock watering. Lynthorpe creek flows from the lake in a westerly direction across the area. This creek valley always contains water although the creek does not flow throughout the year. It forms a source of water for stock in the vicinity. Wells sunk into the Recent deposits along Lynthorpe Creek and Twelvemile Lake valleys, into the glacial deposits that mantle the uplands, and into the underlying bedrock formations, provide most of the water supplies in the township. Shallow wells sunk into the Recent deposits of sands and silts lying along Lynthorpe creek provide small supplies of water that are used where the supplies from other sources are inadequate. During times when the creek is flowing the water from the seepage wells may be used in the household. Such sources are easily polluted and care must be taken to keep them free of decaying animal and vegetable matter. The water from seepage wells sunk in the Recent sand and silts along the edge of Twelvemile lake is apt to be highly mineralized, and suitable neither for

household or stock use. A 16-foot well, located in a valley on the NE. ¼, section 19, draws a supply of water of good quality and sufficient for 15 head of stock from Recent sandy clays that have been washed down from the valley sides. Similar deposits occurring at the bases of slopes and in valleys are worthy of prospecting at shallow depths.

The mantle of glacial drift that overlies the township probably in no place exceeds a thickness of 20 feet. The deposits consist of till, except along the northern boundary where the extensive area of moraine in the township to the north extends into this area. Both the till and the moraine are made up essentially of a few feet of top soil underlain by yellow boulder clay. Small sand and gravel pockets occur scattered at random through the yellow boulder clay, and are generally water bearing. Two wells, 10 and 46 feet deep, located on the SE. ¼, section 30, and the NE. ¼, section 36, respectively, obtain water supplies from such pockets. The 46-foot well strikes a pocket at 14 feet, the additional depth of well merely providing a reservoir. This well does not provide a supply sufficient for 20 head of stock, but the supply from the 12-foot well is adequate for at least 12 head. The water from both wells is of good quality and suitable for use in the household. It is probable that in other places in the township small supplies of good water can be obtained from the sand and gravel pockets in the glacial deposits, although considerable testing with an auger may be necessary before a sufficiently productive bed is tapped. Throughout the southwestern lowlands and where the drift is underlain by the shales of the Bearpaw formation prospecting in the drift is more advisable than deeper drilling.

Three bedrock formations occur beneath the glacial drift in different parts of this township. The Ravenscrag formation is present in a small area of high relief in the northeast corner. The Eastend formation underlies the Ravenscrag and extends beneath the drift in a band of varying width in the eastern and northern sections west and

south of the area overlain by the Ravenscrag. The Eastend also occurs in a small area of greater relief in the northwest corner of the township. The Bearpaw formation underlies the Eastend at all places in which it is present and immediately underlies the drift throughout the remaining lowland areas of the township. Each formation is known to be water bearing within the area.

The Ravenscrag is tapped by only one well, 65 feet in depth, on the NE. ¼, section 25, which obtains a supply of water sufficient for 35 head of stock and of suitable quality for domestic use. The water is coming from a sand horizon which may be productive throughout the area underlain by this formation.

The Eastend formation is the main source of well water in the township. Wells in the central and northern parts of the area obtain water from sand beds in the formation at an approximate elevation of 2,465 feet above sea-level. The wells vary in depth from 12 to 80 feet, the deeper wells being nearer the western border. With the exception of the 50- and 52-foot wells on the SE. ¼, section 32, and SE. ¼, section 23, respectively, all the wells obtain supplies adequate for the stock needs of the resident. The water in all cases is suitable for domestic use.

A well sunk to a depth of 85 feet on the SE. ¼, section 21, obtains a supply of water from what is considered to be a sand pocket in the Bearpaw formation. The supply except in dry seasons is sufficient for watering 40 head of stock. The water is of good quality and suitable for domestic use. In the absence of other wells tapping the upper part of the Bearpaw formation the areal extent of this productive sand has not been determined. In general, however, a fairly large supply of usable water can be obtained within 85 feet of the surface anywhere in the township. Wells sunk greatly below this depth in the lowlands part of the township will enter the compact shale and clay phase of the Bearpaw from which little or no water can be expected.

Township 7, Range 1

The ground water supply of this township is derived both from glacial deposits and from water-bearing horizons in the underlying Ravenscrag bedrock formation.

The glacial deposits probably nowhere exceed 12 feet in thickness in the southern part of the township, but become thicker in the central and northern parts. In places in the north they probably reach to depths of 40 feet or more. The deposits differ in character from place to place, a strip of moraine, approximately 1½ miles wide, extends in southeasterly direction across the township from the central part of the western border to the southeast corner. A small area in the southwest corner is similarly covered. Throughout the remainder of the area the glacial drift forms a till plain. Both the moraine and the till consist, in general, of a few feet of top soil underlain by boulder clay that is usually yellow in colour near the surface and bluish grey at depth. Good supplies of water can generally be expected in wells tapping pockets of sand and gravel in the glacial deposits. Wells sunk entirely in boulder clay near sloughs or dugouts will obtain a supply by slow seepage. Moraine generally contains more extensive sand and gravel beds than the till and, consequently, is a more likely source of ground water at shallow depths than the till. In this township, three wells less than 36 feet deep, located on the SW. ¼, section 17, NE. ¼, section 19, and NW. ¼, section 20, obtain supplies from the "moraine" deposits. Only the well on the NW. ¼, section 20, fails to obtain a supply adequate for stock needs. The water from this well, however, is suitable for household use, as is the water from the well on the SW. ¼, section 17. The well on the NE. ¼, section 19, yields water that is mineralized to such an extent as to be suitable only for stock use. A 22-foot well on the NE. ¼, section 34, draws its supply from a sand bed in the boulder clay. The supply is small and the water so highly mineralized as to be unfit for domestic use. A 28-foot well on the SW. ¼, section 36, also obtains a

supply from a sand and gravel pocket in the boulder clay. The supply from this well is large, the water being under sufficient hydrostatic pressure to rise above the aquifer and flow at the surface. This water is suitable for domestic purposes.

Should a reasonable amount of testing within 30 feet of the surface fail to produce an adequate water supply boring to greater depths into the bedrock immediately underlying the drift is recommended. Porous beds in the Ravenscrag formation are the chief sources of ground water in this township. Although the formation is fairly uniform, porous beds undoubtedly occur that form aquifers only over small areas. The 54-foot well located on the SE. $\frac{1}{4}$, section 4, probably derives its supply from such a horizon. Most of the wells tapping the bedrock are considered to have tapped extensive water-bearing horizons in which coarse sand beds or coal seams form the aquifers. In the two southern rows of sections, and in sections 18, 19, and 30, along the western side of this township, aquifers are struck at elevations between 2,492 and 2,455 feet above sea-level; in the central sections between 2,456 and 2,429; and in the northern and east-central sections between 2,428 to 2,364 feet. Wells tapping them are in general 50 to 90 feet deep. They obtain water supplies adequate for 15 to 50 head of stock. The flowing artesian wells on the SW. $\frac{1}{4}$, section 13, SE. $\frac{1}{4}$, section 14, and SE. $\frac{1}{4}$, section 23, tap aquifers that are fed from the hills to the south. The water from the Ravenscrag aquifers is generally highly mineralized, and that in about half the wells can be used only for stock.

No difficulty is experienced in obtaining a water supply satisfactory at least for stock within 90 feet of the surface in this township. Drinking water can be obtained from shallow wells or by catching the rainfall in cisterns.

Township 7, Range 2

Water supplies in this township are derived almost entirely from wells. A few permanent springs and dugouts, however, provide

water for stock in some places.

Wells derive their supplies almost entirely from water-bearing horizons in the bedrock formations. The glacial deposits that mantle this area are probably in no place thicker than 30 feet, and consist essentially of impervious boulder clay. Several shallow wells have been sunk in the deposits beside sloughs and dugouts, and obtain small supplies of water suitable for household use. Such wells are necessary on farms where water from the bedrock is too highly mineralized for drinking. The drift covering the area is largely moraine, and hence may be considered to be generally more porous and productive than the till covering the central and northern townships. The Ravenscrag formation underlies the thin mantle of drift over all the township except possibly a small area in the northwest corner. Here the Ravenscrag has been largely removed by erosion and is too thin to be a source of ground water. The Whitemud and Eastend formations which successively underlie the Ravenscrag in this corner of the township are near the surface. The Whitemud formation does not extend continuously under the Ravenscrag throughout the township. Where present, however, the white clays are conspicuous. Several wells in the east-central part of the township have penetrated the white clays and are considered to be deriving their production from the Eastend formation.

Sand beds and occasionally coal seams in the yellow clays of the Ravenscrag formation are the main source of well water throughout most of the township. The aquifers are encountered in wells between elevations of 2,531 and 2,465 feet above sea-level, although the common elevation is about 2,500 feet. The position of the base of the Ravenscrag has not been accurately determined throughout the area and some of the wells of moderate depths along the western and northwest corner may obtain their water supply from the fine grey sands of the Eastend formation. Wells vary in depth from a maximum of 120 feet in the uplands of the east central sections to a minimum of 10 feet in

a coulée on the NW. ¼, section 36; the average depth of well being 45 feet in the western sections and about 80 feet throughout the remainder of the township. Only three of these wells fail to yield supplies adequate for all local stock needs. Two of these wells, located on the NW. ¼, section 4, and SE. ¼, section 14, would probably produce larger supplies if deepened 30 to 40 feet. A slight deepening of the well on the NW. ¼, section 17, might cause it to be more productive, as wells on section 19 struck moderately large supplies of water in blue sand at an approximate elevation of 2,470 feet. It has not been definitely determined whether this latter horizon lies at the base of the Ravenscrag or in the Eastend. Should shale or other unproductive material be found to be present throughout the next 50 feet down, deeper drilling will not likely prove more productive. It would then be necessary to attempt to find water at shallow depths by careful testing, or to conserve surface waters by excavating dugouts. The water from the Ravenscrag aquifers in the southeast corner of the township is in many places too highly mineralized for domestic use and some is even unsuitable for stock. Elsewhere in the township the water generally is suitable for domestic use.

The Eastend formation in many places contains considerable thicknesses of sand that is water bearing. Wells 98, 76, and 150 feet deep, on the NE. ¼, section 12, SE. ¼, section 13, and NE. ¼, section 24, tap these sands between elevations of 2,489 and 2,440 feet above sea-level. Two wells 95 and 96 feet deep, located on the SE. ¼, section 31, and NW. ¼, section 32, also tap these sands, but at elevations of 2,385 and 2,424 feet, respectively. Each of these wells will water as many as 40 head of stock. The water with the exception of that from the 98-foot well on the NE. ¼, section 12, is suitable for domestic use. The water from the 98-foot well contains large amounts of sodium sulphate and sodium carbonate in solution and is used only for watering stock.

In general, adequate supplies of water for stock can be obtained in this township within 120 feet of the surface. Dugouts or additional wells would provide auxiliary supplies if needed. Shallow seepage wells or cisterns to catch the rainfall are found to be necessary to provide drinking wate in some places.

Township 7, Range 3

Water supplies in this township are derived almost entirely from wells. The wells are sunk into the bedrock except along the western boundary where supplies are difficult to obtain from this source and reliance for water is placed on shallow wells sunk into the glacial deposits.

The glacial deposits are of moraine except for a one-mile wide strip across the northeast corner and a small area in the southwest corner that consist of till. Both the moraine and the till are generally between 20 and 40 feet thick and consist essentially of boulder clay which is yellow in the upper, weathered part. Porous beds of sands and gravels occur only sparingly in the boulder clay and careful prospecting will be required in many parts before a sufficiently productive bed is found. The thickness of the morainic deposits evidently increases toward the northwest corner. A well in section 30 is believed to have passed through 80 feet of boulder clay before it obtained water in a bed of "black muck" at or near the base of the drift. Two wells, 35 and 50 feet deep, respectively, have tapped similar beds of black mud in the NW. $\frac{1}{4}$, section 20, and NE. $\frac{1}{4}$, section 33. These water-bearing beds occur at different elevations in these wells, and this would seem to indicate that the "muck" occurs in isolated pockets in the glacial drift. These wells yield fairly large supplies of water which from the two shallower wells is usable for domestic purposes, but from the 80-foot well is unfit for human or stock use. A 12-foot well on the SW. $\frac{1}{4}$, section 19, obtains a supply of usable water ample for 35 head of stock, from a gravel bed

of possibly limited areal extent. Throughout the remainder of the township the glacial deposits are a source of only small domestic supplies, the water from shallow depths in the glacial deposits being in many places of better quality than that from the deeper bedrock horizons in this area.

The Ravenscrag formation underlies the glacial drift in the eastern third of the township, and is in turn underlain by the Eastend and Bearpaw formations. Farther west where the Ravenscrag has been eroded away the Eastend occurs immediately under the glacial deposits, and in the lowlands still farther west the Eastend is absent and the Bearpaw forms the uppermost bedrock formation. The approximate area underlain by each of these formations is shown on the accompanying map (Figure 1). The character of the bedrock is of the utmost importance so far as the ground water conditions of this township are concerned. The Ravenscrag and Eastend are generally productive, but considerable difficulty will be experienced in obtaining an adequate supply from the Bearpaw formation, which is near the surface in the western part of the township.

The Ravenscrag is comprised essentially of light clays and in places shales, with thin interbedded coal seams and sand beds forming more or less continuous water-bearing horizons. Two such horizons have been found to be productive in this township.

In the eastern half of section 1, two 48-foot wells tap the uppermost of these horizons at an elevation of approximately 2,566 feet above sea-level. The horizon yields fairly large supplies of hard, drinkable water, and is probably similarly productive for a few miles north, but it is doubtful whether the bed extends for a distance greater than a mile west from the eastern boundary of the township.

Wells in the northeast corner of the township tap the lower productive horizon in the Ravenscrag. This horizon, occurring at an

average elevation of 2,480 feet, is reached at depths of 100 and 116 feet from the surface in sections 35 and 36 and at depths between 40 and 72 feet farther south in sections 24, 25, and 26. The wells with the exception of the 116-foot well on section 36 obtain adequate supplies for local stock needs. The 116-foot well obtains only enough water for 15 head of stock. The wells yield water suitable for domestic use with the exception of the 65-foot well on the NW. ¼, section 24, which obtains water that is highly "alkaline" and suitable only for stock.

The sands of the Eastend formation are the chief source of well water in the central part of the township. Wells reaching the productive sand beds range from 60 to 90 feet deep in the northern part of this area and from 30 to 60 feet in the south. They obtain supplies sufficient to water 10 to 30 head of stock, and with few exceptions are adequate for the needs of the farms on which they are situated. The water is generally quite highly mineralized, and from about half of the wells can be used only for stock. A 28-foot well on the NW. ¼, section 6, taps a yellow, sandy clay horizon in a narrow westward projection of the Eastend formation forming the hills in the southwest corner of the township. The well obtains a supply of water of good quality that is adequate for the household and 15 head of stock.

No water supplies have been obtained from the Bearpaw formation in the western part of the township. Prospecting for water in this area should be confined to the glacial drift, and particularly to the upper part of the drift as water found at greater depths is likely to be "alkaline" and unsuitable even for stock. The Bearpaw formation consists almost entirely of dark grey to black, compact shales that yield only very small seepages of highly mineralized water which is unsuited to any farm use. It is advisable to cease digging or boring as soon as these shales are encountered in any part of the township.

Dugouts or dams across coulées are suggested as a means of obtaining stock supplies in the western part of the township. Should a reasonable amount of prospecting in the drift fail to yield an adequate water supply, seepage wells dug beside the reservoirs would provide drinking water.

Township 8, Range 1

Water supplies in this township are obtained almost entirely from wells sunk either in the drift or to greater depths into the underlying bedrock. Dugouts provide water for stock in a few places.

The glacial drift shows some variation in composition in different parts of the township, consisting of glacial lake clay in the northeast corner and of boulder clay throughout the remainder of the area. The glacial lake clay is bluish grey, and is probably nowhere thicker than 35 feet. The clay is compact and largely impervious, as evidenced by the marshes and sloughs that form over this area during periods of ample precipitation. It is not a source of ground water. In this area residents are obliged to sink wells through the clay into the fine, grey sands of the immediately underlying Eastend bedrock formation.

The till covering the remainder of the township undoubtedly varies in thickness from place to place, as it is regarded as having been laid down over an irregular bedrock surface. It probably does not greatly exceed 20 to 25 feet in thickness in the southern third of the township, but evidence from wells in the central parts suggests that at isolated places it may reach to depths of 80 feet. Along the northern boundary, however, it appears to be generally 30 feet thick. The boulder clay yields very little water, but thin beds of sand and gravel interspersed through the clay at random are often water-bearing. Since supplies derived from the underlying bedrock are not always satisfactory for domestic use, extensive

prospecting of the upper 20 to 30 feet of the drift for such pockets may be necessary to provide suitable household supplies. These shallow wells do not generally yield any large supplies of water, but the quality of the water makes such wells highly important on many farms in the area. Pockets found at greater depths in the drift may yield larger supplies, but the water is almost invariably highly mineralized and may not be suitable for domestic use.

Two wells sunk to depths of 60 feet on the SW. ¼ s, sections 4 and 10, are believed to draw their supplies from pockets in the lower part of the blue-grey boulder clay. The wells obtain water that is too highly mineralized for household use, although suitable for stock. The well on section 10 apparently taps a very small pocket as it yields only a small supply of water, whereas the other well, on section 4, obtains a supply sufficient to water 100 head of stock. Should prospecting in the drift fail to produce an adequate water supply in any part of the township residents are advised to sink wells into the underlying bedrock formations.

The Ravenscrag, Eastend, and Bearpaw bedrock formations underlie the glacial drift in different parts of the township. The Ravenscrag, the uppermost of these formations, is present only in the southern part of the area. The exact boundary of the formation cannot be traced accurately, but coal, which is not known to occur in the lower formations in this area, is reported in a well on section 13, indicating that the beds of this formation probably extend at least this far north of the southern boundary. The approximate areal extent of the Ravenscrag formation in this township is shown on the accompanying map (Figure 1). The Eastend underlies the Ravenscrag in the south, but occurs immediately beneath the drift throughout most of the remainder of the area. The Eastend may be absent in the extreme northwest corner where as a result of more extensive erosion the Bearpaw formation may underlie the glacial drift.

Coal seams and sand beds that occur in a fairly persistent horizon in the Ravenscrag provide most of the water supplies in the southern part of the township. The elevation of this horizon declines from about 2,440 feet above sea-level on the west of the township down to nearly 2,360 feet on the east. The wells tapping the horizon are generally from 60 to 90 feet in depth, but owing to differences in elevation of the ground surface the productive beds in places are only 12 feet below the surface and in others as much as 100 feet. These wells yield supplies that are adequate for the stock needs of the different residents, even though some require sufficient water for as many as 100 head of stock. The water from this source is generally highly mineralized, and from many of the wells is only used for watering stock. Shallow wells in the drift are used for household needs.

Sands in the Eastend formation at an elevation of 2,335 feet above sea-level provide water supplies in the northern sections of the township. Wells reach the sand at decreasing depths from west to east, being 68 feet below the surface on the NW. $\frac{1}{4}$, section 30, but only 12 feet on the NE. $\frac{1}{4}$, section 34. These wells obtain supplies sufficient for 10 to 30 head of stock. The water is generally suitable for household use, but from the 68-foot well on the NW. $\frac{1}{4}$, section 30, and the 63-foot well on the NW. $\frac{1}{4}$, section 33, it is highly mineralized and suitable only for stock use. The higher mineral salt content is believed to be characteristic of water found at greater depths in the formation. The 80-foot well on the NW. $\frac{1}{4}$, section 6, and 100-foot well on the NE. $\frac{1}{4}$, section 9, are also believed to draw their supplies from the Eastend. The supply in the 80-foot well comes from a sand horizon, and is used only for stock, the resident having a shallow well in glacial drift for his household needs. The supply in the 100-foot well comes from a bed of fine dark grey sand, referred to locally as "sea-mud". This well waters 30 head of stock and the water is considered to be suitable for household use.

Wells 45, 60, 100, and 100 feet deep, located on the NW. ¼, section 23, SE. ¼, section 27, SE. ¼, section 28, and SE. ¼, section 33, respectively, obtain supplies from a sand horizon believed to lie in the Bearpaw formation at an average elevation of 2,285 feet above sea-level. The supplies are ample for the stock needs of the residents and the water is suitable for household use.

Water supplies are, in general, sufficient in this township. Aquifers in the bedrock formation are found to be productive within 35 feet of the surface in the northeast corner of the township and within 110 feet throughout the remainder of the area. Water from the deeper wells in the bedrock are in many places not suitable for domestic use and shallow wells in the glacial drift must then be depended upon.

Drilling below an elevation of 2,250 feet above sea-level will enter the compact dark grey shales of the Bearpaw formation from which a suitable water supply cannot be expected.

Township 8, Range 2

The water supply for this township is derived mainly from wells, but dugouts and dams provide water for stock in some places.

The glacial drift varies in thickness, being 40 to 70 feet thick in the eastern and northern parts of the township, but generally thinner throughout the central and southern parts. The deposits consist of boulder clay throughout most of the township. A small belt of moraine covers the western part of section 6, and a larger area in the north-central sections of the township. An area of glacial outwash sands and gravels borders the moraine on the east and extends over the northeast corner, as shown on Figure 1 of the accompanying map.

The outwash sand and gravel deposits are porous and form shallow, water-bearing beds from which fairly large supplies of water are obtainable. The water is generally of good quality and used for household purposes. The 72-foot well on the SW. ¼, section 35, and the 66-foot well on the SW. ¼, section 36, however, have been sunk

through these deposits and draw at least a part of their supply from lower beds either in the glacial drift or the bedrock. The poor quality of the water from the 66-foot well results from the large amount of mineral salts it dissolves from the lower aquifer rather than from the upper sands and gravels.

Several wells in the eastern sections of the township tap sand and gravel pockets interspersed through the boulder clay. Most of the pockets encountered are about 45 feet below the surface, but one was reached at 20 feet. The Limerick town well was sunk to a depth of 66 feet before water-bearing gravels were encountered, and obtains a fairly large supply of water of good quality which is used for household purposes. Still deeper drilling into the bedrock in this town would undoubtedly provide water suitable at least for fire protection. A 65-foot well on the NE. $\frac{1}{4}$, section 10, is also believed to draw its supply from the glacial drift. The water is too "alkaline" for house use, but serves as part of the resident's supply of water for stock. The yield from this well alone is insufficient for the stock requirements. A dugout has been excavated to provide additional supplies.

Owing to lack of outcrops of bedrock and of any detailed descriptions of the materials passed through in the sinking of the wells, the determination of the exact areal extent of the bedrock formations in this township has been practically impossible. The lower part of the Ravenscrag formation is known to occur immediately beneath the drift in the areas of higher elevation in the southeastern parts of the township down to an approximate elevation of 2,440 feet above sea-level. The Ravenscrag rests either upon the Whitemud or the Eastend formation. No definite evidence of the occurrence of the white clays of the Whitemud was obtained, so probably this formation is absent and the Ravenscrag rests upon the Eastend. This latter formation extends under the drift over the greater part of the lowlands, but in

the areas of lowest surface elevation in the northeast corner and possibly in the southeast corner the Eastend has been also removed by erosion and the Bearpaw formation is the uppermost bedrock formation. The higher areas in the northwest are underlain by a fairly thick section of the Eastend, whereas in the lower, northeast part this formation appears to be entirely absent. The approximate boundaries of the areas in which these different formations occur are shown on the accompanying map (Figure 1). Undoubtedly, however, local erosion and possibly variations in the regional northeasterly dip of the bedrock make these boundaries only approximate.

Sand beds in the Ravenscrag formation extending fairly continuously and lying at an average elevation of 2,440 feet above sea-level are the chief source of well water in the southeast corner of the township. The wells tapping the beds are generally only 25 to 50 feet deep along the western edge of the area covered by this formation, but are from 60 to 90 feet deep away from this edge toward the eastern boundary of the township. Supplies from individual wells generally are ample for 10 to 30 head of stock, and from the 50-foot well on the NE. $\frac{1}{4}$, section 15, enough water is obtained for 70 to 80 head. The water from this horizon is generally suitable for domestic use. From only one well was the water reported to be so highly mineralized as to be fit only for stock use. The 100-foot well on the NE. $\frac{1}{4}$, section 2, did not find water at this horizon, but struck a small water-bearing bed lying near the base of the formation. The well obtains a supply sufficient for only 12 head of stock, but the water is of good quality and is used in the resident's household. The 90-foot well on the SE. $\frac{1}{4}$, section 1, also failed to find water in the upper horizon in the Ravenscrag, but on being sunk deeper found a supply in a sand bed in the Eastend formation. This supply is sufficient for the resident's 15 head of stock, and is suitable for domestic use.

Two sand horizons in the Eastend formation, one lying about 50 feet below the other, are productive in this township. The higher of these horizons, occurring at an average elevation of 2,390 feet above sea-level, is encountered by wells in sections 14, 16, and 22, and many of the western sections of the township. The depth of wells tapping this horizon varies with changes of surface elevation from 50 to 120 feet in depth. These wells generally obtain supplies ample for the stock needs of the residents, but a 110-foot well on the NW. $\frac{1}{4}$, section 19, does not yield sufficient in dry years, and the 85-foot well on the NW. $\frac{1}{4}$, section 22, provides only enough for 15 head of stock. Water from the horizon in the southwest corner of the township is suitable for household use, but in other parts of the township the water is more highly mineralized and used only for watering stock. The lower horizon in the Eastend occurs at an elevation of about 2,330 feet above sea-level. This horizon is tapped on sections 18, 21, 23, 24, and 25 by wells varying in depth from 80 to 120 feet. All these wells, with the exception of the poorly productive 90-foot well on the NE. $\frac{1}{4}$, section 24, obtain fairly large supplies of water, sufficient for 25 to 40 head of stock. The quality of the waters from the different wells differs considerably. The 120-foot well on the SE. $\frac{1}{4}$, section 18, yields a soft, soda-bearing type of water that is suitable for domestic use. The other wells provide hard, "alkaline" waters that vary in the amount of salts they contain. The 107-foot well on the SW. $\frac{1}{4}$, section 21, and the 90-foot well on the NE. $\frac{1}{4}$, section 24, yield water too highly mineralized for domestic use but suitable for stock. The 94-foot well on the NE. $\frac{1}{4}$, section 25, gives water that is too highly mineralized even for stock use. Only from the 80-foot well on the NW. $\frac{1}{4}$, section 23, is the water sufficiently low in mineral salt content to be suitable for both household and stock use.

No water supplies have been obtained from the Bearpaw formation. Holes have been sunk into the dark grey shales on section 29 to depths of 130 feet without obtaining even small seepages. Prospecting

for water in the areas in which this bedrock formation is uppermost should be confined to the glacial deposits. Deep drilling in this township is not recommended.

Township 8, Range 3

The ground water supply of this township is obtained from wells and from a few springs. These springs flow throughout the year and provide water for stock on several farms. One well has been sunk into Recent alluvium lying in the bottom of a small valley, but at all other places the producing water-bearing horizons occur in the glacial drift or the underlying bedrock.

The well in Recent valley deposits on the SW. ¼, section 30, was dug to a depth of 7 feet and yields a supply of water that is adequate for the owner's stock needs. The water is not used for household purposes. The run-off water from the slopes of the valley collects under the alluvium which itself at one time was washed down from the hill-sides. Such deposits have only a limited areal extent in this township, and only in isolated places could any large supply be obtained from them. Deposits along valley or coulée bottoms are worthy of prospecting at shallow depths for water for domestic use.

The mantle of glacial drift that covers the entire area varies greatly in thickness. It is between 20 and 70 feet thick over the eastern parts of the township, but in places in the west it is at least 100 feet thick. Deposits of moraine characterized by irregularly rolling topography cover a small area in the northeast corner, another larger area in the southeast corner, and the entire western third of the township. In the intervening areas, except a small area of glacial outwash sands and gravels that flanks the moraine in sections 11 and 14, the deposits form a comparatively flat till plain. So far as known, no wells have been sunk in the area of the glacial sands and gravels. These deposits are generally quite

porous however, and are considered to form a likely source of moderately large supplies of good water at shallow depths. The location of the deposits is shown on the map (Figure 1) accompanying this report.

In the areas covered by the deposits of moraine and till plain supplies of ground water are obtained from random sand and gravel beds or pockets interspersed through the boulder clay that forms the greater part of these deposits. These pockets are generally of more widespread occurrence in deposits of moraine, and, consequently, less prospecting is required in order to locate them in this type of deposit. In this township, however, little difference appears to exist in the ground water conditions in the till and in the moraine, and little prospecting is required in most places in order to obtain a satisfactory ground water supply. It is to be noted, however, that in the southeastern area, in which the glacial deposits overlie the Eastend formation, shallow wells in the drift are used largely for household supply, and the larger supplies necessary for watering stock are obtained from the bedrock. Throughout the greater part of the township the generally unproductive dark shales of the Bearpaw formation underlie the drift and hence it is the chief source of ground water for all farm purposes. Some of the shallow wells do not exceed 30 feet in depth, and yield varying supplies of water depending upon the size of the pocket encountered. The water is generally only moderately hard and satisfactory for domestic use. At other places, and particularly in the central and western parts of the township, residents have been obliged to sink to greater depths through the blue-grey boulder clay before encountering productive beds. Existing evidence seems to indicate that a thin but fairly extensive bed of gravel occurs either near the base of the drift or at the contact of the drift with the underlying bedrock. The depth of well necessary to reach this horizon varies from place to place, as throughout the area probably the drift lies upon an irregularly rolling bedrock

surface. Although many of the wells find water at depths of 50 to 70 feet in some sections, such as 17, 18, and 20, wells are 80 to 100 feet deep. The supplies available from individual wells tapping these sand and gravel beds are generally sufficient for 20 to 40 or more head of stock. The water although usually hard and slightly "alkaline" is in only a few places considered unsuited to household use.

An 80-foot well on NE. ¼, section 18, struck "black muck" at an elevation of 2,412 feet above sea-level, and a well on SW. ¼, section 30, struck a similar material at an elevation of 2,390 feet. This muck is believed to be similar to occurrences in the townships to the south and northeast, and occurs at approximately the same elevation. Its possible origin has been discussed in a section of the report dealing with the ground water conditions of the municipality. The well on the SW. ¼, section 30, is now filled in, but the 80-foot well obtains a good supply of drinkable water from the "black muck".

The Eastend bedrock formation is believed to underlie the southeast and northeast corners of the township. In the intervening areas the Eastend has been eroded away allowing the Bearpaw to occur immediately beneath the glacial drift. Sands of the Eastend are the chief source of water supplies in the southeast corner of the township. In the northeast no wells have been sunk sufficiently deep to determine the actual water conditions existing in the sands of this formation. In the southeast corner the water-bearing sands are encountered at elevations ranging between 2,421 feet and 2,352 feet above sea-level. The wells are generally 50 to 100 feet in depth, although in an area of low elevation on the SW. ¼, section 2, a well reaches the sand at a depth of 20 feet. These wells generally obtain supplies adequate for the stock needs of the residents; only the 88-foot well on the SE. ¼, section 5, failing to satisfy local requirements. It is possible that the Eastend formation is very thin in this area and hence does not

form a large reservoir. The waters contain fairly large amounts of mineral salts in solution, sulphates and iron being the dominant impurities. For this reason the water from many of the wells can be used only for stock. The 65-foot well on the SE. $\frac{1}{4}$, section 12, was probably not sunk deep enough to tap the sands in the Eastend and hence yields only a small seepage supply. However, a 90-foot well on the same quarter has reached the sands and obtains a supply satisfactory for stock use. It is improbable that sinking wells below an approximate elevation of 2,420 feet above sea-level in the areas covered by the Eastend formation will yield a supply of ground water that will be satisfactory for any farm use. Throughout the remainder of the area the almost entirely unproductive shales of the Bearpaw formation underlie the drift, and as suggested above search for water in these areas should be confined to the glacial drift.

Township 9, Range 1

Greater difficulty has been experienced in obtaining an adequate ground water supply in this township than in any other township in the municipality. This condition is due to the impervious nature of both the glacial deposits and the underlying bedrock throughout the greater part of the area. The glacial deposits covering the area consist almost entirely of till, increasing in thickness from 30 feet or less in the southeast corner to upwards of 100 feet in isolated areas in the northwest corner. The boulder clay is yellowish brown in the upper 20 feet comprising the weathered zone and becomes dark blue-grey at greater depths. Porous beds of sands and gravels occur very sparingly in the boulder clay, and in many places wells have reached the bedrock without having encountered any porous beds. At other places wells have penetrated beds of gravel 10 feet or more thick underlying 30 to 40 feet of boulder clay, but the overlying clay was evidently sufficiently impervious to prevent even small seepages of water from having entered the gravels. A further

difficulty is noted in till-covered areas, in that there is little or no evidence on the surface of any possible occurrence of porous beds at depth. Nevertheless, any extensive deposits of gravel on the surface are worthy of prospecting at shallow depths. Wells sunk on or beside low knolls or ridges or in coulée bottoms may yield at least small supplies of water satisfactory for domestic use. Such an area of surface sands and gravels is known to occur in the southwest corner of section 6. As yet no wells have been sunk in this area, but the excellent supply that the well 10 feet deep, on SW. ¼, section 7, obtains probably comes from an extension of these porous beds.

The boulder clay, in general, consists of 5 to 10 feet of top soil, 30 to 50 feet of yellow boulder clay containing scattered pockets of sand and gravel, 50 to 70 feet of blue boulder clay, and, in some places, a few feet of sand or "black muck" of interglacial or pre-glacial age occur below the blue clay. This sequence is general, but wide variations occur in particular areas.

Wells located in section 24, and the southern sections of the township, tap, within 30 feet, sand and gravel pockets in the yellow boulder clay. They obtain supplies that in most places are adequate for stock needs. The water is generally suitable for both household and stock purposes.

Wells from 80 to 98 feet deep, located on the NE. ¼, section 31, NW. ¼, section 32, and NE. ¼, section 33, tap sand beds lying at the base of blue boulder clay. The wells obtain supplies ample for the owner's stock needs, but the water has a high mineral salt content and is unfit for domestic use. A well 120 feet deep, on the NW. ¼, section 30, taps a deposit of "black muck" believed to lie on the surface of the bedrock. The supply from this bed is fairly large, but this water also is unfit for use in the household.

Two bedrock formations, the Eastend and Bearpaw, underlie the glacial drift in different parts of the township. The Eastend is present only along the eastern boundary and in isolated patches in the south. The Bearpaw underlies the Eastend wherever it occurs and underlies the glacial drift through it the remainder of the area.

The sands of the Eastend formation are a good source of water wherever they are present. Only three wells, located on the E. $\frac{1}{2}$, section 7, NE. $\frac{1}{4}$, section 12, and SW. $\frac{1}{4}$, section 18, are producing from these sands in this township. These wells are between 80 and 98 feet deep and reach the sands at elevations between 2,330 and 2,310 feet above sea-level. The supply obtained from each well is adequate for the local stock needs, but with the exception of the water from the 80-foot well the waters obtained are too highly mineralized to be suitable for household use.

The Bearpaw is productive of water only from thin, discontinuous sand beds interbedded in the shales. Many wells in this township have failed to strike such beds and are, consequently, dry. These sand beds appear to be confined to the eastern half of the township, where they occur at an approximate elevation of 2,240 feet above sea-level. Wells tapping these beds range in depth from 100 to 186 feet. The yields obtained from these wells are often large, but the water is so highly charged with dissolved mineral salts as to be unfit for any farm use. It is improbable that even small seepages can be expected at greater depths in the Bearpaw formation. In the areas underlain by this formation the glacial deposits should be thoroughly prospected before deeper drilling is considered. If this is unsuccessful wells may be sunk down to an approximate elevation of 2,200 feet above sea-level with a fair chance of obtaining water suitable for stock use. Deeper drilling is not recommended. The 420-foot hole on the E. $\frac{1}{2}$, section 22, struck a water-bearing sand at an elevation of 2,225 feet at a depth of 150 feet, but this supply apparently failed as drilling was continued to greater depths.

Generally, water conditions are better in the southern part of the township than in the northern. In the south satisfactory supplies can generally be obtained at shallow depths in the glacial deposits. In the north although small supplies for stock are obtained from pockets in the lower part of the boulder clay or in the Bearpaw, drinking water must be obtained from seepage wells or caught in cisterns. The uncertainties as to the success of deep drilling in this area warrant rather the construction of dams or the excavation of dugouts as a means of obtaining water for stock.

Township 9, Range 2

A small lake situated in section 2 provides water for stock in the vicinity. Dugouts have been excavated on many farms to meet stock requirements. Over the greater part of the area, however, wells sunk both in the drift and the underlying bedrock form the main source of water for domestic use and for stock.

Glacial till covers the greater part of the township. A lack of definite information regarding the character of the material passed through in sinking most of the wells makes it difficult to give accurate figures regarding the variations in the thickness of this mantle of drift. It is probably from 50 to 75 feet thick over the southern uplands, but may be as much as 80 to 90 feet thick over the northern lowlands. A small area of glacial outwash sands and gravels occurs in sections 1 and 2, and the eastern part of section 3. A strip of moraine is also present along the southern borders of sections 5 and 6.

So far as known, no wells have been sunk either in the area of glacial sands and gravel or in the moraine. It is probable, however, that water could be obtained by sinking shallow wells in either type of deposit.

Most wells in the areas overlain by the boulder clay have been sunk into the bedrock, but several wells located at scattered points over the area derive satisfactory stock water supplies from sand

and gravel beds interspersed at random through the upper 30 to 75 feet of the clay. The water from these beds is hard, highly mineralized, and generally is not suitable for domestic use. Wells in the northern sections of the township are in most places between 80 and 100 feet deep. Some of these wells have undoubtedly penetrated the underlying Bearpaw formation, but a few probably tap porous beds lying near the base of the glacial drift. It is impossible to state definitely from which source particular wells draw their supply, but both sources yield water that is highly mineralized and suitable only for stock. Supplies are variable, but with the exception of wells in sections 25 and 36 they are generally adequate for the local stock requirements.

Beds of "sea-mud" are encountered at 130 feet below the surface in a well located on the NE. $\frac{1}{4}$, section 28, and at 90 feet in a well on the NE.$\frac{1}{4}$, section 36. The supply from the mud on section 36 is very small, but from the bed encountered in the well on section 28 it is adequate for the stock needs of the owner. In both cases the water contains in solution a large amount of mineral salts, and water from the well on section 28 is being used for stock purposes, but from the other well the water is unfit for either human or stock consumption. The "sea-mud" may be of interglacial origin, but it is possible that it represents a weathered portion of the upper part of the Bearpaw formation.

The Eastend formation underlies the glacial drift in the southern part of the township. Sand beds lying in the formation at an average elevation of 2,340 feet above sea-level are the source of water in many wells in this area. The wells are over 100 feet deep in the southeastern corner and along the southern border of the township, and from 35 to 80 feet deep in the central and west-central sections. They yield supplies generally adequate for local stock needs, but in nearly every case the water is highly mineralized and not suitable for household use.

The northern part of the township is underlain by the Bearpaw formation. Some of the deeper wells in the area probably obtain water from isolated pockets in the formation, but it cannot be regarded as a reliable source of water. Residents in the area are well advised to thoroughly prospect the upper 30 feet of the glacial drift before attempting deeper drilling. At no place should wells be sunk to depths greater than 110 feet, as any water obtained below this depth will undoubtedly be too "alkaline" for any farm use. The uncertainties as to the success of drilling warrant serious consideration being given to the excavation of dugouts and construction of dams in coulées as a means of providing water for stock.

Township 9, Range 3

Springs occurring along both the northern and southern sides of a low upland area extend g through the southern part of the township provide large and important water supplies for stock on several farms, particularly in the southwest corner. These springs derive their water as seepage from the uplands and cannot be regarded as indicating any extensive artesian conditions in the area. Wells sunk both into glacial deposits and the underlying bedrock formations provide water for most of the farms in the area. Dugouts in many places supplement the stock supplies available from wells.

The glacial drift consist in part of moraine which covers the uplands in the southeast corner and along the southern part of the western border. The moraine grades into a till plain over the northern lowlands and in the depression in the south-central part of the area. The bed of an extinct glacial lake is marked by a layer of light blue-grey clay overlying the till in a small area in the north-central part of the township.

No accurate generalizati ns regarding the thickness of the drift throughout the area can be given. The thickness probably varies greatly within limited areas over the irregularly rolling uplands, but

over the lowlands of the northern parts is known to exceed 50 feet at several points.

The bluish grey lake clays are compact and are not a source of water, but sand or gravel beds that occur in patches between the lake clays and the underlying boulder clay are possible sources of water in the areas covered by the lake clays. A 48-foot well on the NE. ¼, section 34, obtains a fairly large supply of drinkable water from such a bed, but a well on the NW. ¼, section 17, was sunk 70 feet before reaching a productive bed. The water derived from the shallower or more extensive porous beds in most places is suitable for domestic use, but from some of the deeper wells the water contains a large concentration of sulphate salts in solution and is used only for watering stock.

Only in the central part of the township have wells encountered sand beds in the glacial till and in the northwest and northeast the till is composed almost entirely of compact boulder clay, and hence wells sunk in these parts are either dry or productive of only small seepage supplies. In these areas the underlying bedrock is probably also unproductive, and prospecting by shallow wells in the drift directed to cover as wide an area as possible is strongly recommended rather than deeper drilling. Several of the wells tapping sand beds in the central parts of the area obtain supplies that are not sufficient for local stock needs, and such supplies are often so highly mineralized that the water cannot be used for drinking.

Wells sunk on the SW. ¼, section 19, obtain a small supply of highly mineralized water that is inadequate for the stock needs of the resident from a deposit of "sea-mud" that may be of interglacial origin, as described in the section of this report dealing with water supplies of the municipality.

In the upland area a possible source of water, suitable at least for stock, exists in the sands of the Eastend formation. The approximate area in which these sands are considered to underlie the

glacial deposits is indicated on Figure 1 of the accompanying map.

Sands of the Eastend formation, lying at an approximate elevation of 2,360 feet, are tapped by wells in the eastern parts of the township. In the southern and east-central sections wells reach this horizon at about 90 feet, but it occurs proportionately nearer the surface in the lowland areas in sections 25, 26, 27, and 28, and presumably in sections 29 and 30. The yields are fairly large, but the water is highly mineralized and in most places water for the household must be obtained from a different source. No wells have as yet been sunk sufficiently deep to reach this horizon in the west-central part of the township.

Water supplies are difficult to obtain in the northwestern and northern sections of the township. Here, the Bearpaw formation that forms the bedrock under the drift is also almost entirely unproductive, and if a moderate amount of prospecting in the glacial deposits within 50 or 60 feet of the surface also proves unproductive, residents are well advised to rely on the collection of the surface water in dugouts or dams rather than to consider deep drilling. Shallow seepage wells beside the reservoirs would provide drinking water.

STATISTICAL SUMMARY OF WELL INFORMATION IN RURAL MUNICIPALITY OF STONEHENGE, NO. 73, SASKATCHEWAN

	Township	6	6	6	7	7	7	8	8	8	9	9	9	Total No. in Municipality
West of 3rd meridian	Range	1	2	3	1	2	3	1	2	3	1	2	3	
Total No. of Wells in Township		34	30	20	31	60	45	40	62	39	39	64	57	521
No. of wells in bedrock		31	29	14	23	50	39	35	38	13	13	22	15	322
No. of wells in glacial drift		3	1	3	8	10	6	5	24	25	26	42	42	195
No. of wells in alluvium		0	0	3	0	0	0	0	0	1	0	0	0	4
Permanency of Water Supply														
No. with permanent supply		33	28	20	30	59	37	40	59	37	26	55	43	467
No. with intermittent supply		1	0	0	1	0	0	0	0		2	4	6	14
No. dry holes		0	2	0	0	1	8	0	3		11	5	8	40
Types of Wells														
No. of flowing artesian wells		0	0	0	6	0	1	1	0	1	0	0	1	10
No. of non-flowing artesian wells		13	9	4	17	28	17	26	24	21	9	29	14	211
No. of non-artesian wells		21	19	16	8	31	19	13	35	15	19	30	34	260
Quality of Water														
No. with hard water		28	22	12	28	47	31	40	51	29	26	59	48	421
No. with soft water		0	6	8	3	12	6	0	8	8	2	0	1	60
No. with salty water		4	0	0	1	0	0	0	0	0	0	1	0	6
No. with "alkaline" water		17	8	11	15	24	21	16	28	16	14	26	25	221
Depths of Wells														
No. from 0 to 50 feet deep		5	13	14	11	20	24	17	30	15	18	35	43	247
No. from 51 to 100 feet deep		24	13	6	20	28	12	22	28	24	12	23	14	226
No. from 101 to 150 feet deep		3	4	0	0	6	9	1	7	0	3	6	0	39
No. from 151 to 200 feet deep		2	0	0	0	0	0	0	0	0	3	0	0	5
No. from 201 to 500 feet deep		0	0	0	0	0	0	0	0	0	1	0	0	1
No. from 501 to 1,000 feet deep		0	0	0	0	0	0	0	0	0	2	0	0	2
No. over 1,000 feet deep		0	0	0	0	0	0	0	1	0	0	0	0	1
How the Water is Used														
No. usable for domestic purposes		20	20	18	20	51	28	26	46	28	14	27	29	327
No. not usable for domestic purposes		14	8	2	11	8	9	14	13		14	32	20	154
No. usable for stock		34	25	19	28	55	37	39	55	36	28	57	48	461
No. not usable for stock		0	3	1	3	4	0	1	4		0	2	1	20
Sufficiency of Water Supply														
No. sufficient for domestic needs		33	28	20	30	55	37	40	57	37	25	55	43	460
No. insufficient for domestic needs		1	0	0	1	4	0	0	2	0	3	4	0	21
No. sufficient for stock needs		25	27	12	28	45	30	32	38	32	16	33	29	347
No. insufficient for stock needs		9	1	8	3	14	7	8	21	5	12	26	20	134

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 Stonehenge, No. 73, Saskatchewan

No.	LOCATION Qtr.	Sec.	Tp.	Rge.	Mer.	Depth of well, Ft.	Total dis'vd solids	HARDNESS Total	Perm.	Temp.	CONSTITUENTS AS ANALYSED Cl.	Alka-linity	CaO	MgO	SO_4	Na_2O	CONSTITUENTS AS CALCULATED IN ASSUMED COMBINATIONS Solids	$CaCO_3$	$CaSO_4$	$MgCO_3$	$MgSO_4$	Na_2CO_3	Na_2SO_4	NaCl	Source of Water
1	NW.	10	o	1	3	108	2,460	270	80	190	10	1,095	70	43	886	1,114	2,358	125		90		915	1,311	17	* 3
2	SW.	17	o	1	3	74	1,280	360	200	160	6	770	10	65	328	582	1,275	18		136		626	485	10	* 2
3	NE.	23	o	1	3	60	1,800												(2)		(3)	(4)	(1)	(5)	* 2
4	SW.	21	7	1	3	50	2,494												(4)		(5)	(2)	(1)	(3)	* 2
5	SW.	12	7	2	3	90	2,949												(4)		(5)	(2)	(1)	(3)	* 2
o	NE.	12	7	2	3	98	2,300	160	150	10	27	990	60	22	853	1,088	2,337	108		46		876	1,262	45	* 3
7	NW.	27	7	2	3	85	1,080	900	650	250	12	320	60	137	931	531	1,656	107		180	152		1,197	20	* 2
8	NE.	34	7	2	3	57	3,580	1,000	o50	350	18	710	40	212	1,964	1,351	3,572	72		445		115	2,910	30	* 2
9	SE.	30	7	3	3	80	10,280	3,000	3,000	n.d.	148	685	250	889	o,048	2,809	9,410	448		201	2,363		6,154	244	* 1
10	NW.	4	8	2	3	55	1,460	700	o50	50	52	365	200	148	656	247	1,347	357		7	433		464	86	* 3
11	NE.	10	8	3	3	50	2,260	700	250	450	41	805	160	97	1,017	812	2,705	286		203		293	1,505	68	* 3
12	SW.	19	8	3	3	49	2,000	450	100	350	43	885	30	72	783	947	2,125	54		150		691	1,159	71	* 1
13	NE.	31	9	1	3	90	1,620	850	750	100	33	325	100	317	877	198	1,513	179		123	769		388	54	* 1
14	SW.	4	9	2	3	130	4,440	2,100	2,000	100	85	1,205	70	284	2,087	1,650	4,343	125		594		395	3,089	140	* 3
15	SE.	17	9	2	3	58	3,660	2,000	2,000	nil	61	605	410	317	2,034	799	3,533	605	173		245		1,709	101	* 1
16	NE.	28	9	2	3	140	3,840	700	550	150	145	1,290	40	122	1,595	1,721	3,897	72		255		970	2,361	239	* 1
17	SW.	2	9	3	3	16	3,760	2,800	2,800	nil	123	405	550	486	1,907	232	3,125	405	785		1,448		284	203	* 1
18	SW.	17	9	3	3	27	2,203																		* 1

Water samples indicated thus, * 1, are from glacial drift or other unconsolidated deposits.
Water samples indicated thus, * 2, are from bedrock, Ravenscrag formation.
Water samples indicated thus, * 3, are from bedrock, Eastend formation.
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, 4, 5, and 18, by Provincial Analyst, Regina.
For interpretation of this table read the section on Analyses and Quality of Water.

Water from the Unconsolidated Deposits

No analysis was made of the waters of Lynthorpe creek or Twelvemile lake during the course of this investigation. The water is known to be highly charged with mineral salts in solution, and in such concentration as to render the water unfit for domestic use and generally unsatisfactory for stock. During periods of ample precipitation, streams, flowing from the highlands to the south into the western end of the lake, render the water of this part slightly less "alkaline" than water in the eastern marshlands. The water in Lynthorpe creek during the part of the year when it is flowing is used for stock, generally being taken from shallow wells sunk in the silts beside the stream bed, rather than directly from the stream itself. During this time of the year the water is fairly free of sulphate salts, the concentration of these salts increasing as the water becomes stagnant in the autumn. The few wells sunk in deposits of Recent alluvium covering the bottoms of some of the coulées on the uplands produce a soft, or moderately hard, drinking water. The quality of the water depends essentially upon the type of sediments through which the surface waters have percolated in passing down from the uplands to the coulée bottoms. Waters passing through boulder clay or Bearpaw shales will probably contain appreciable amounts of sulphate salts in solution, but seepages from the Ravenscrag in the southern and southeastern townships are of better quality. When water from any type of shallow well is being used for domestic purposes, care should be exercised in keeping the source free of sewage or other decaying organic materials that is likely to cause pollution.

Four samples of water from various sources in the glacial drift in this municipality were collected and analysed by the Geological Survey. The result of a total salt determination of another sample by the Provincial Analyst, Saskatchewan, is also available and recorded on the accompanying table. Considerable changes occur in the character

and porosity of the sediments forming the glacial deposits over the municipality, and often within limited areas. Corresponding changes in the character of water derived from the drift are also to be expected. Hence, if undrinkable water is found at one location or at a specific horizon, it does by no means follow that such conditions prevail over large areas. The compact bluish grey boulder clay is generally regarded as being the source of the greater amounts of the mineral salts that contaminate waters from the drift. Hence, wells sunk entirely in boulder clay yield a water that is usually highly charged with mineral salts of which sodium sulphate (Na_2SO_4), magnesium sulphate ($MgSO_4$), and calcium sulphate ($CaSO_4$), are the most common. The total solid content of such waters may exceed 4,000 parts per million which renders them unfit for drinking purposes, and causes marked scouring effects when used for watering stock.

Extensive beds of sands and gravels, lying at or near the surface, and not covered by any appreciable thickness of clay, yield a water that is similar to surface supplies. It is soft or only moderately hard, and having had little opportunity of absorbing mineral salts is of good quality for all domestic requirements. In general porous beds of sands and gravels buried under greater thicknesses of clay are correspondingly more highly mineralized. Many exceptions are found, due to irregularities in the texture of the boulder clay, but in general, the deeper wells in the drift yield the more "alkaline" water. Since the essential differences in the moraine and till deposits is in porosity and abundance of porous beds and pockets, the foregoing generalizations are applicable to both. Analyses Nos. 12, 13, 15, 17 and 18 are of waters taken from sand and gravel pockets forming aquifers in the "moraine" and the till deposits. These waters are all highly mineralized, the lowest having a total salt content of 1,620 parts per million. Analyses Nos. 13, 15, 16, and probably 18, contain excessive amounts of magnesium and sodium sulphate; Epsom and

Glauber's salts, respectively. These waters are not suitable for domestic use and would tend to cause scour in stock. The water would not be as harmful during the winter months when the stock are fed dry fodder, but it is doubtful whether water of the quality indicated by analysis No. 17, containing as it does 1,448 parts per million of magnesium sulphate, the more harmful of the two salts, should be used for stock at any time, if better water is available. Sample No. 12 indicates a large concentration of sodium carbonate, Na_2CO_3. The occurrence of this salt in solution in such large amounts is uncommon in waters from the glacial drift, and suggests rather that the water may be from the Eastend formation although the resident reported the aquifer to be gravel. It is probable, however, that a part of this well's supply does come from the underlying bedrock into the glacial aquifer. The water is quite soft, as the 2,000 parts per million of dissolved salts present are largely salts of sodium which do not contribute to hardness. The total hardness is only 450 parts per million, 300 parts of which are temporary and removable by boiling. The total solids are made up of 1,159 parts of sodium sulphate, 691 parts of sodium carbonate (black alkali or soda), and only minor amounts of several salts. The sodium sulphate is not present in sufficient amounts to be harmful to persons accustomed to the use of mineralized water. The presence of the sodium carbonate tends to give the water a flat taste, and to render it harmful to vegetation, although the resident uses this water for irrigating his garden with apparently satisfactory results.

Samples Nos. 9 and 16 are of waters that come from deposits of "black muck" occurring in the glacial deposits. The water of sample No. 9 comes from a bed that lies on top of the Bearpaw and where the salts inherent in the clays of this formation are dissolved in the water. This analysis is typical of a water from the Bearpaw, having an exceedingly high mineral salt content, 10,280 parts per million, made up largely of sodium sulphate (6,154 parts per million) and

magnesium sulphate (2,363 parts p r million). The large amount of salts dissolved in this water prohibit its use even for stock. The water of sample No. 16 has also been modified by the proximity of the aquifer to the Bearpaw formation. The water has a total mineral salt content of 3,840 parts per million, of which 2,361 parts are sodium sulphate, 970 parts sodium carbonate, and 239 parts sodium chloride (common salt). The vegetation in the black "muck" gives an oil-like scum to this water. It is unfit for household use, and does not prove satisfactory when used for watering stock, and should not be used for this purpose.

Water from the Bedrock

Three samples of water from the Ravenscrag were collected and analysed by the Geological Survey, and the results of three other analyses by the Provincial Analyst, Saskatchewan, are also given on the accompanying table. In making generalizations regarding the character of waters from the Ravenscrag, or for that matter any of the bedrock formations, it is difficult to determine what percentage of the salts present in solution are inherent in the bedrock and what are dissolved from the overlying glacial deposits by the downward percolating waters. In nearly all the waters analysed from the Ravenscrag formation, sodium sulphate is the predominant salt present, ranging from 400 to over 3,000 parts per million. These figures do not seem to show any direct relationship with depth of well or character of aquifer. Waters from the Ravenscrag differ from drift waters, however, in that they generally contain a much large concentration of sodium carbonate (Na_2CO_3) and minor amounts only of magnesium sulphate ($MgSO_4$). Magnesium carbonate also seems to be more characteristic of waters from the Ravenscrag than the drift. Hence, water from the Ravenscrag is generally softer than water from the drift. Persons unaccustomed t highly mineralized waters will undoubtedly be affected by the high sodium sulphate content of water

from this source, and the high sodium carbonate content would in many instances render these waters unsuitable for irrigating gardens. This water is being used extensively for drinking, however, and forms the main supply for the town of Maxstone. Nearly all Ravenscrag waters contain varying amounts of iron. Iron in any very large amount is objectionable in water. A considerable part of it may be removed by allowing the water to come in contact with the air, whereupon the iron in solution will appear as a brown precipitate, which, given sufficient time, will settle on the bottom of the container. A simple method of aeration, which has proved effective in some areas, is to suspend a sheet of galvanized iron between the pump and the trough. The water is allowed to pass over the sheet in a thin stream, presenting as great a surface area to the air as possible. The iron upon oxidation settles out on the bottom of the trough. Agitation of the water is also effective in removing iron. In general, waters from the Ravenscrag formation in this area are inferior for domestic use to waters found at shallow depths in the glacial deposits.

Five samples, Nos. 1, 6, 10, 11, and 14, were collected from the Eastend formation and analysed. The samples, with the exception of No. 10, are typical of waters from this formation in that they contain between 2,260 and 4,440 parts per million of dissolved mineral salts, made up mainly of sodium sulphate and sodium carbonate with lesser amounts of calcium and magnesium carbonate and sodium chloride. The high amount of sodium sulphate in these waters renders them of inferior quality for domestic use, and the 3,089 parts per million present in sample No. 14 renders this water unsatisfactory even for stock use. The high content of sodium carbonate in these waters makes them of doubtful value for irrigation. Sample No. 10 is more typical of water from a glacial source, and it is probable that part at least of the well's supply comes from the overlying drift. This

water is used for domestic purposes, although the 433 parts of magnesium sulphate that the water contains undoubtedly gives it a laxative effect.

No samples of water from the Bearpaw formation were collected, but it is believed that waters from the upper beds in this formation contain both sodium and magnesium sulphates in fairly large amounts, together with appreciable amounts of common salt. Such waters are unsuitable for domestic use, but have been used for watering stock when better supplies are not available. Waters from greater depths in the dark grey shales of the formation generally exhibit such a concentration of sulphate and chloride salts as to be unfit for any farm use.

WELL RECORDS—Rural Municipality of STONEHENGE, NO. 73, 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.	10	6	1	3	Bored	108	2,532	-103	2,429	108	2,424	Eastend grey sand	Soft, clear, iron		D, S	Sufficient for 20 head stock; #.
2	NW.	12	"	"	"	Bored	79	2,547	- 65	2,482	77	2,470	Ravenscrag coal	Soft, clear		D, S	Sufficient for 20 head stock.
3	NE.	14	"	"	"	Bored	54	2,542	- 51	2,491	64	2,478	Ravenscrag blue clay	Hard, clear, "alkaline"	46	S	Sufficient for 35 head stock; another well 22 feet deep is used for domestic needs.
4	SW.	14	"	"	"	Bored	61	2,578	- 41	2,537	61	2,517	Ravenscrag clay	Hard, clear, "alkaline"		S	Sufficient for 50 head stock; another well 35 feet deep is used for domestic needs.
5	SE.	15	"	"	"	Bored	80	2,540	- 40	2,500			Ravenscrag blue clay	Soft, clear, "alkaline"		D, S	Insufficient for local needs.
6	SE.	16	"	"	"	Bored	76	2,610	- 60	2,550	76	2,534	Ravenscrag	Soft, clear, "alkaline"		D, S	Sufficient for local needs.
7	SW.	17	"	"	"	Bored	74	2,606	- 71	2,535	70	2,536	Ravenscrag sand	Hard, clear, iron		D, S	Sufficient for 18 head stock; #.
8	NE.	18	"	"	"	Bored	160	2,600	-145	2,455	157	2,443	Eastend blue clay	Hard, clear, iron, red, sediment		D, S, I	Sufficient for 35 head stock.
9	NW.	18	"	"	"	Bored	165	2,550	-145	2,405	145	2,405	Eastend brown sand	Hard, clear		D, S	Sufficient for local needs.
10	NW.	19	"	"	"	Bored	80	2,615	- 60	2,555	76	2,539	Ravenscrag sand	Hard, clear		D, S	Sufficient for 20 head stock.
11	NW.	20	"	"	"	Dug	76	2,670	- 70	2,600	70	2,600	Ravenscrag coal	Hard, clear, iron, sulphur		S	Sufficient for 100 head stock.
12	SE.	20	"	"	"	Bored	105	2,600					Ravenscrag sand				
13	NE.	21	"	"	W.	Bored	110	2,593	- 70	2,523	110	2,483	Ravenscrag sand	Hard, clear		D, S	Sufficient for local needs.
14	SW.	22	"	"	"	Bored	60	2,631	- 50	2,581			Ravenscrag clay	Hard, clear, "alkaline"		D, S	Intermittent supply. Well caved in now.
15	NE.	23	"	"	"	Bored	60	2,543	- 45	2,498	60	2,483	Ravenscrag sand	Hard, clear, "alkaline"		D, S	Sufficient for local needs; #.
16	NW.	25	"	"	"	Bored	50	2,528					Ravenscrag	Hard, clear, "alkaline"		D, S	Sufficient for local needs.
17	SE.	26	"	"	"	Bored	70	2,518	- 56	2,462	60	2,458	Ravenscrag coal	Hard, clear, "alkaline"		S	Sufficient for 20 head stock.
18	SE.	28	"	"	"	Bored	80	2,570	- 68	2,502	80	2,490	Ravenscrag blue clay	Soft, clear, iron		D, S	
19	NE.	30	"	"	"	Bored	100	2,645	- 84	2,561	84	2,561	Ravenscrag yellow sandy clay	Hard, clear, salty, white sediment, "alkaline"		S	Insufficient for local needs; also a number of similar.
20	SE.	31	"	"	"	Bored	38	2,597	- 18	2,579	37	2,560	Ravenscrag coal	Hard, clear		D, S	Oversufficient for local needs.
21	NE.	31	"	"	"	Bored	75	2,571					Ravenscrag green-grey clay	Hard, clear, iron, soda, "alkaline"		S	Sufficient for local needs.
22	NW.	32	"	"	"	Bored	90	2,573	- 55	2,518	90	2,483	Ravenscrag clay	Hard, clear		D, S	Sufficient for local needs.
23	NE.	32	"	"	"	Bored	60	2,557	- 52	2,505	48	2,509	Ravenscrag sand	Hard, "alkaline"		S	Sufficient for 30 head stock; also a number of similar wells.
24	NW.	33	"	"	"	Dug	8	2,560					Glacial drift	Hard		D	Sufficient for local needs.
25	NW.	34	"	"	"	Bored	80	2,570	- 30	2,540	80	2,490	Ravenscrag clay	Hard, yellow		S	Sufficient for local needs.

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 STONEHENGE, NO. 73, SASKATCHEWAN.

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
26	SW.	35	6	1	3	Bored	69	2,550	- 40	2,510	69	2,481	Ravenscrag sand	Soft		D, S	Sufficient for 40 head stock.
1	NE.	13	6	2	3	Dug	22	2,525					Ravenscrag yellow sand	Soft, clear		D, S	Sufficient for 20 head stock.
2	NW.	23	"	"	"	Bored	110	2,520	- 50	2,470	110	2,410	Bearpaw blue clay	Soft, clear		D, S	Sufficient for 30 head stock.
3	SE.	23	"	"	"	Dug	12	2,550	- 8	2,542	10	2,540	Ravenscrag coal	Hard, clear, soda		D, S	Sufficient for 14 head stock; a number of similar wells.
4	SE.	24	"	"	"	Bored	80	2,570	- 40	2,530	80	2,490	Ravenscrag	Hard, clear		D, S	Sufficient for 20 head stock; another well 90 feet deep; also a dry hole 100 feet deep.
5	NE.	24	"	"	"	Bored	80	2,607	- 70	2,537	80	2,527	Ravenscrag	Hard, clear, iron, "alkaline"		S	Sufficient for local needs; water for domestic needs is hauled from NW.¼, section 18.
6	SW.	25	"	"	"	Bored	56	2,596	- 39	2,557	55	2,541	Ravenscrag coal	Hard, clear		D, S	Sufficient for 15 head stock.
7	SE.	26	"	"	"	Bored	65	2,590	- 59	2,531	62	2,528	Ravenscrag coal	Hard, clear, iron, red sediment		D, S	Oversufficient for 20 head stock; also a dry hole 120 feet deep.
8	NE.	26	"	"	"	Bored	90	2,575					Ravenscrag				Abundant supply, but water of poor quality; 2 other similar wells 60 feet and 20 feet deep.
9	SW.	31	"	"	"	Bored	115	2,490	-100	2,540	115	2,525	Ravenscrag greyish black clay	Hard, clear, iron, lime, red sediment		D, S	Sufficient for local needs.
10	NE.	31	"	"	"		12	2,600					Glacial drift				
11	NE.	32	"	"	"	Dug	75	2,582	- 68	2,514			Ravenscrag clay	Hard, cloudy		D	Sufficient for domestic needs only; another well 45 feet deep is sufficient for stock needs.
12	SE.	32	"	"	"		45						Ravenscrag			S	Insufficient for local needs.
13	SW.	33	"	"	"	Bored	125	2,592	-120	2,472	125	2,467	Eastend yellow, sandy clay	Hard, clear, iron, "alkaline", red sediment		S	Sufficient for 20 head stock; drinking water hauled.
14	NW.	33	"	"	"	Bored	50	2,550	- 40	2,510	45	2,505	Ravenscrag black muck	Hard, clear, "alkaline"		D, S	Sufficient for 8 to 10 head stock.
15	SW.	34	"	"	"	Bored	80	2,532	- 52	2,480	54	2,478	Ravenscrag clay	Hard, clear, white sediment		D, S	Sufficient for local needs when in use; but water has become contaminated.
16	SW.	34	"	"	"	Dug	4	2,480	- 1	2,479	3	2,477	Ravenscrag coal slack	Soft, clear, white sediment, "alkaline"		S	Sufficient for 21 head stock; also two other wells 7 feet and 80 feet deep.
17	NW.	35	"	"	"	Dug	16	2,518	- 12	2,506			Ravenscrag clay	Soft, clear, "alkaline"		D, S	Sufficient for 20 head stock; another well 9 feet deep.
18	NE.	35	"	"	"	Bored	65	2,562	- 45	2,517	65	2,497	Ravenscrag	Hard, clear, iron, "alkaline", red sediment		D, S	Sufficient for 18 head stock.
19	NW.	36	"	"	"	Bored	65	2,580	- 52	2,528	65	2,515	Ravenscrag	Hard, clear, "alkaline"		D, S	Sufficient for 18 head stock.
1	NE.	14	6	3	3	Dug	40	2,518	- 38	2,480			Eastend yellow clay	Hard, clear, "alkaline"		D	Sufficient only for domestic needs; another well 18 feet deep is used for stock needs.
2	SW.	19	"	"	"								Recent alluvium	Hard, bitter			Several shallow wells.

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 STONEHENGE, NO. 73, 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
3	NE.	19	6	3	3	Dug	16	2,460	- 10	2,450			Recent yellow, sandy clay	Soft, clear, iron, red sediment		D, S	Sufficient for 15 head stock; another well 20 feet deep with strongly mineralized water.
4	SE.	21	"	"	"	Bored	85	2,507	- 40	2,467	85	2,422	Bearpaw	Soft, clear, "alkaline"		D, S	Insufficient for 40 head stock during dry seasons; another similar well 82 feet deep.
5	SE.	23	"	"	"	Bored	52	2,524	- 49	2,475	47	2,477	Eastend sand	Hard, clear, "alkaline"		D	Sufficient only for domestic needs.
6	SW.	24	"	"	"	Dug	22	2,500	- 19	2,481	20	2,480	Eastend yellow, sandy clay	Hard, clear, "alkaline"		D, S	Sufficient for 30 head stock.
7	NE.	25	"	"	"	Dug	65	2,598	- 61	2,537	61	2,537	Ravenscrag fine, yellow sand	Hard, clear		D, S	Sufficient for 35 head stock.
8	SW.	26	"	"	"	Dug	12	2,468	- 8	2,460	9	2,459	Eastend grey sand	Hard, clear, "alkaline"		D, S	Sufficient for 15 head stock.
9	SE.	30	"	"	"	Dug	10	2,500	- 5	2,495	5	2,495	Glacial clay	Hard, clear, "alkaline"		D, S	Sufficient for 12 head stock.
10	NW.	30	"	"	"	Bored	60	2,565	- 54	2,511			Eastend	Soft, clear, iron, red sediment		D, S	Insufficient for local needs; supplies two barrels a day.
11	SE.	32	"	"	"	Bored	50	2,515	- 42	2,473			Eastend grey clay	Hard, clear, "alkaline"		D, S	Insufficient for 10 head stock.
12	NE.	32	"	"	"	Bored	80	2,556	- 20	2,536	80	2,476	Eastend	Hard, clear		D, S	Sufficient for 20 head stock.
13	NW.	34	"	"	"	Bored	50	2,500	- 30	2,470	30	2,470	Eastend sandy clay	Hard, clear, iron, red sediment, "alkaline"		D, S	Sufficient for 20 head stock.
14	SW.	35	"	"	"	Dug	20	2,476	- 16	2,460	16	2,460	Eastend sand	Soft, clear		D, S	Sufficient for 20 head stock.
15	NW.	35	"	"	"	Dug	32	2,496	- 22	2,474	32	2,464	Eastend sand	Soft, clear, soda		D, S	Sufficient for 30 head stock.
16	NE.	36	"	"	"	Bored	46	2,619	- 14	2,605	14	2,605	Glacial yellow, sandy clay	Soft, clear		D, S	Insufficient for local needs; enough for about 10 head stock; another similar well 50 feet deep.
1	NE.	4	7	1	3	Bored	42	2,504	- 15	2,489	42	2,462	Ravenscrag sand	Hard, clear		S	Sufficient for local needs.
2	NW.	5	"	"	"	Bored	87	2,579	- 73	2,501	73	2,501	Ravenscrag grey sand	Hard, clear		D, S	Sufficient for 20 head stock.
3	NW.	7	"	"	"	Bored	90	2,558	- 50	2,508	90	2,468	Ravenscrag blue sand	Hard, clear, iron, "alkaline"		D, S	Sufficient for 50 head stock.
4	SE.	11	"	"	"	Bored	60	2,532	- 57	2,475			Ravenscrag clay	Hard, clear		D, S, I	Sufficient for 14 head stock.
5	SE.	12	"	"	"	Bored	93	2,562	- 63	2,499			Ravenscrag	Soft, clear, iron		D, S	Sufficient for local needs; used also by mines.
6	SW.	13	"	"	"	Bored	60	2,458	+ 5	2,463	60	2,398	Ravenscrag sand (?)	Soft, clear, "alkaline"		D, S	Sufficient for local needs.
7	SE.	14	"	"	"	Bored	63	2,451	0	2,451	63	2,388	Ravenscrag sand	Hard, clear, soda		D, S	Sufficient for local needs.
8	NW.	15	"	"	"	Bored	60	2,506	- 53	2,453	60	2,446	Ravenscrag sand	Hard, clear, iron		D, S	Sufficient for local needs; can be pumped dry, but refills in one-half hour.
9	SW.	17	"	"	"	Dug	31	2,513	- 12	2,501	31	2,482	Glacial gravel	Soft, clear		D, S	Sufficient for 15 head stock; also two other wells 56 and 72 feet deep, with mineralized water.

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 STONEHENGE, NO. 73, 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
10	NE.	19	7	1	3	Bored	36	2,495	- 31	2,464			Glacial drift	Hard, clear, "alkaline"		S	Sufficient for only 6 horses.
11	NW.	20	"	"	"	Dug	20	2,489	- 10	2,479			Glacial clay	Hard, clear		D	Intermittent supply; hauls water.
12	SE.	20	"	"	"	Bored	66	2,506	- 42	2,464	64	2,442	Ravenscrag	Hard, rusty, iron		S	Sufficient for local needs; cannot be pumped dry.
13	SW.	21	"	"	"	Bored	50	2,506					Ravenscrag	Hard, cloudy, brown sediment		D	Sufficient for local needs; cannot be pumped dry, #.
14	SE.	21	"	"	"	Bored	77	2,506	- 52	2,454	70	2,436	Ravenscrag gravel	Hard, clear		D, S	Sufficient for 15 head stock.
15	SE.	23	"	"	"	Bored	51	2,443	0	2,443	50	2,393	Ravenscrag sand	Hard, clear, "alkaline"		D, S	Sufficient for local needs.
16	NE.	23	"	"	"	Bored	80	2,444	- 40	2,404	80	2,364	Ravenscrag clay	Hard, clear, "alkaline"		S	Sufficient for local needs.
17	NW.	24	"	"	"	Dug	18	2,410	- 10	2,400	18	2,392	Ravenscrag black-sand	Hard, clear, "alkaline"		D	Sufficient for local needs; also used by neighbours.
18	SE.	24	"	"	"	Bored	54	2,450	- 4	2,446	40	2,410	Ravenscrag shale	Hard, clear, "alkaline"		S	Sufficient for local needs.
19	SW.	27	"	"	"	Bored	40	2,470	+ 1	2,471	40	2,430	Ravenscrag	Hard, black		S	Sufficient for local needs.
20	SW.	30	"	"	"	Bored	95	2,550	- 79	2,471	95	2,455	Ravenscrag sand	Hard, clear, soda		D, S	Sufficient for local needs.
21	SE.	31	"	"	"	Bored	98	2,500	- 48	2,452	88	2,412	Ravenscrag black-sand	Hard, clear, salty		D, S	Sufficient for local needs.
22	SW.	32	"	"	"	Bored	68	2,496	- 61	2,435	68	2,428	Ravenscrag coal	Hard, clear, iron		D, S	Sufficient for local needs.
23	SW.	33	"	"	""	Bored	60	2,464	- 45	2,419	60	2,404	Ravenscrag clay	Hard, clear, iron, "alkaline"		S	Sufficient for local needs.
24	NW.	34	"	"	"	Bored	52	2,440	- 30	2,410			Ravenscrag clay	Hard, clear, "alkaline"		D, S	Sufficient for 10 head stock.
25	NE.	34	"	"	"	Dug	22	2,420	- 18	2,402	19	2,401	Glacial sand	Hard, clear, "alkaline"		N	Insufficient for local needs, and unfit for use.
26	NW.	36	"	"	"	Bored	40	2,430	- 36	2,394			Ravenscrag clay	Hard, clear		D, S	Sufficient for 15 head stock; also a flowing well 20 feet deep.
27	SW.	36	"	"	"	Bored	28	2,445	+ 5	2,450	15	2,430	Glacial sand and gravel	Hard, clear, "alkaline"	37	D, S	Oversufficient for 60 head stock.
28	NE.	36	"	"	"	Bored	65	2,437	- 15	2,422	64	2,373	Ravenscrag sand	Hard, clear, iron, "alkaline"		S	Sufficient for local needs.
1	SE.	1	7	2	3	Dug	20	2,562	- 5	2,557	18	2,544	Ravenscrag white sand	Soft, clear		D, S	Sufficient for 16 head stock; neighbours obtain their domestic supply from this well.
2	NE.	1	"	"	"	Dug	38	2,563					Ravenscrag coal	Hard		D, S	Sufficient for 50 head stock.
3	NW.	4	"	"	"	Bored	35	2,560	- 15	2,545	35	2,525	Ravenscrag dark sandy clay	Hard, clear		D, S	Insufficient for 19 head stock; another similar well 35 feet deep.
4	SE.	5	"	"	"	Dug	15	2,560					Glacial drift	Hard, clear		D, S	Sufficient for local needs.
5	SE.	6	"	"	"	Bored	100	2,566	- 80	2,486	80	2,486	Ravenscrag brown sand and clay	Hard, clear, iron, "alkaline"		N	Unfit for use; another well 40 feet deep with very small supply.
6	SE.	6	"	"	"	Dug	20	2,563	- 17	2,546	16	2,547	Glacial sand and gravel	Soft, clear, iron, red sediment		D	Sufficient only for domestic needs.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of STONEHENGE, NO. 73, 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
7	SW.	6	7	2	3	Spring		2,588					Glacial drift	Hard		D, S	Sufficient for local needs; also a 20-foot well with good supply.
8	NW.	7	"	"	"	Dug	48	2,540	- 30	2,510	40	2,500	Ravenscrag sand	Hard, clear, iron, red sediment		D, S	Sufficient for local needs; also used by neighbours.
9	NW.	8	"	"	"	Drilled	71	2,550	- 40	2,510	71	2,479	Ravenscrag	Soft, clear	40	D, S, I	Sufficient for local needs.
10	SE.	9	"	"	"	Bored	89	2,595	- 83	2,512	83	2,512	Ravenscrag sandy clay	Hard, clear, iron, "alkaline", red sediment		D, S	Sufficient for 20 head stock.
11	NW.	9	"	"	"	Bored	55	2,590	- 50	2,540			Ravenscrag clay	Clear, "alkaline"		S	Sufficient for local needs; another well 16 feet deep is used for domestic needs.
12	NE.	10	"	"	"	Bored	120	2,624	-105	2,519	105	2,519	Ravenscrag sand and gravel	Hard, clear, red sediment		D, S	Insufficient for local needs; also an 18-foot seepage well.
13	NW.	12	"	"	"	Bored	100	2,556					Ravenscrag sand	Hard, clear, iron, "alkaline"		D, S	Sufficient for local needs.
14	SW.	12	"	"	"	Bored	90	2,590	- 70	2,520	85	2,505	Ravenscrag coal slack	Hard, iron, "alkaline"		D, S	Sufficient for 20 head stock. #.
15	NE.	12	"	"	"	Bored	98	2,550	- 60	2,500	60	2,500	Eastend yellow clay	Hard, clear, iron, "alkaline", white sediment		S	Insufficient supply; enough for 40 head stock; another well 12 feet deep is used for domestic needs; and a 60-foot well is not used. #.
16	SE.	13	"	"	"	Bored	76	2,546	- 57	2,489	57	2,489	Eastend yellow sand	Hard, clear, white sediment		D, S	Sufficient for 12 head stock; another similar well 66 feet deep; also a 100-foot well with poor supply.
17	NW.	13	"	"	"	Bored	105	2,579	- 95	2,484	105	2,474	Ravenscrag coal	Hard, clear, iron, "alkaline", white sediment		D, S	Sufficient for 30 head stock.
18	SE.	14	"	"	"	Bored	110	2,600	-100	2,500			Ravenscrag white clay	Soft, cloudy, iron, soda		S	Insufficient supply; enough for about 5 head stock.
19	NE.	14	"	"	"	Bored	120						Ravenscrag coal	Hard			Poor supply; so well was filled in.
20	SW.	16	"	"	"	Bored	80	2,562	- 30	2,532	80	2,482	Ravenscrag sand	Hard, clear, iron, "alkaline", red sediment		S	Sufficient for 10 head stock; another well 16 feet deep is used for domestic needs.
21	SW.	17	"	"	"	Bored	42	2,534	- 32	2,502	42	2,492	Ravenscrag	Hard, clear, iron, "alkaline", red sediment		D, S	Sufficient for 20 head stock; another well 10 feet deep is used for domestic needs.
22	NW.	17	"	"	"	Bored	45	2,526	- 10	2,516	35	2,491	Ravenscrag sandy clay	Hard, clear, "alkaline" white sediment		D, S	Insufficient supply; enough for about 5 horses during dry seasons.
23	SE.	18	"	"	"	Dug	30	2,540	- 20	2,520	30	2,510	Ravenscrag sand	Hard, clear		D	Sufficient supply; used by three farms; another well 70 feet deep is unfit for use.
24	SW.	18	"	"	"	Dug	27	2,540	- 10	2,530	27	2,513	Ravenscrag sand	Hard, clear, "alkaline"		D, S	Sufficient for 10 head stock.
25	SW.	19	"	"	"	Dug	50	2,520	- 5	2,515	48	2,472	Ravenscrag blue sand	Soft, clear, soda, "alkaline"		D, S	Oversufficient for 8 head stock.

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

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of STONEHENGE, NO. 73, SASKATCHEWAN.

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
26	NW.	19	7	2	3	Bored	60	2,536	- 20	2,516	60	2,476	Ravenscrag clay	Hard, clear, iron, "alkaline"		D, S	Sufficient for 12 head stock.
27	SW.	20	"	"	"	Bored	80	2,571	- 55	2,516	80	2,491	Ravenscrag	Hard, clear, "alkaline"		D, S	Sufficient for local needs; cannot be pumped dry.
28	NE.	21	"	"	"		50	2,572	- 20	2,552			Ravenscrag gravelly clay	Soft		N	
29	SW.	22	"	"	"	Bored	56	2,576	- 36	2,540	45	2,531	Ravenscrag gravelly clay	Hard, clear, iron, "alkaline"		D, S	Sufficient for 15 head stock.
30	SW.	23	"	"	"	Bored	82	2,575	- 15	2,560	82	2,493	Ravenscrag sand	Hard, clear, iron, red sediment		D, S	Sufficient for 23 head stock.
31	NW.	23	"	"	"	Bored	72	2,582	- 68	2,514	72	2,510	Ravenscrag white sand	Hard, clear, "alkaline"		D, S	Sufficient for 20 head stock.
32	NE.	23	"	"	"	Bored	120	2,598	-100	2,498	90	2,508	Ravenscrag yellow sand	Hard, clear, "alkaline"		D, S	Sufficient for 12 head stock.
33	NW.	24	"	"	"	Bored	39	2,575	- 7[illegible]	[illegible],501	83	2,492	Ravenscrag sand (?)	Hard, clear, "alkaline"		D, S	Sufficient for local needs.
34	NE.	24	"	"	"	Bored	150	2,596	-130	2,466	150	2,446	Eastend white sand	Hard, iron, [illegible]dy		D, S	Sufficient for local needs; cannot be pumped dry.
35	NE.	25	"	"	"	Bored	70	2,547	- 62	2,485	62	2,485	Ravenscrag gravel	Soft, clear		D, S	Sufficient for local needs; used also by neighbours.
36	SW.	27	"	"	"	Bored	82	2,584	- 70	2,514	82	2,502	Ravenscrag sand	Hard, clear		D, S	Sufficient for 35 head stock; another well 80 feet deep with poor supply.
37	NW.	27	"	"	"	Bored	85	2,585	- 76	2,509	85	2,500	Ravenscrag sandstone	Hard, clear, "alkaline"		D, S	Sufficient for 20 head stock; another similar well 90 feet deep used only in an emergency. #.
38	SE.	30	"	"	"	Bored	40	2,556	- 20	2,536	40	2,516	Ravenscrag	Soft, clear		D, S	Sufficient for 8 head stock; also used by neighbours.
39	NE.	30	"	"	"	Bored	50	2,584	- 30	2,534	50	2,514	Ravenscrag	Hard, clear		D, S	Sufficient for 12 head stock.
40	SE.	31	"	"	"	Bored	95	2,480	- 87	2,393	87	2,393	Eastend yellow sand	Soft, clear		D, S	Sufficient for 32 head stock; also a dry hole 44 feet deep.
41	NW.	32	"	"	"	Bored	96	2,520	- 81	2,439	96	2,424	Eastend blue sand	Soft, clear		D, S	Sufficient for 40 head stock.
42	NE.	34	"	"	"	Bored	57	2,538	- 45	2,493	54	2,484	Ravenscrag	Hard, clear, soda, iron		D, S	Sufficient for 20 head stock; #.
43	SW.	35	"	"	"	Bored	5	2,535	- 2	2,533			Glacial clay	Hard, clear, "alkaline"		D, S	Sufficient for local needs.
44	NW.	36	"	"	"	Dug	10	2,475	- 2	2,473	10	2,465	Ravenscrag fine sand	Hard, clear, sulphur		D, S	Sufficient for 25 head stock; also a spring on farm.
1	SE.	1	7	3	3	Bored	48	2,609	- 23	2,586	48	2,561	Ravenscrag clay	Hard, clear		D, S	Sufficient for local needs.
2	NE.	1	"	"	"	Dug	48	2,614	- 43	2,571	43	2,571	Ravenscrag sand	Hard, clear		D, S	
3	NW.	3	"	"	"	Bored	30	2,490	- 15	2,475	15	2,475	Eastend clay	Hard, clear, "alkaline"		D, S	Sufficient for local needs.
4	SE.	4	"	"	"	Bored	60	2,510	- 50	2,460	60	2,450	Eastend fine yellow sand	Hard, clear, "alkaline"		S	Sufficient for local needs; another well 20 feet deep is used for domestic needs.
5	SW.	4	"	"	"	Bored	50	2,490	- 30	2,460	30	2,460	Eastend fine yellow sand	Hard, clear, "alkaline"		D, S	Sufficient for 20 head stock; also several similar wells.
6	NW.	4	"	"	"	Bored	42	2,494	- 32	2,462	42	2,452	Eastend sand	Soft, clear, iron		D, S	Sufficient for 20 head stock; also several similar wells.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of STONEHENGE, NO. 73, 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
7	NW.	5	7	3	3	Bored	136	2,555									Three dry holes; base in Bearpaw soapstone.
8	NW.	6	"	"	"	Dug	28	2,538					Eastend yellow, sandy clay	Soft, clear, "alkaline"		D, S	Sufficient for 15 head stock.
9	NW.	9	"	"	"	Bored	33	2,480	- 26	2,454	26	2,454	Eastend fine, yellow sand	Soft, clear		D, S	Sufficient for 13 head stock.
10	SE.	10	"	"	"	Bored	52	2,510	- 33	2,477	43	2,467	Eastend red sand	Hard, reddish, iron, "alkaline"		D, S	Insufficient for local needs.
11	NW.	10	"	"	"	Bored	50	2,508	- 32	2,476	40	2,468	Eastend fine yellow sand	Hard, clear, "alkaline", red sediment		D, S	Sufficient for 30 head stock.
12	SW.	17	"	"	"	Bored	40	2,480	- 30	2,450			Eastend brown clay	Hard, clear, "alkaline", white sediment		S	Insufficient for 20 head stock; another similar well.
13	NW.	18	"	"	"	Bored	45	2,490	- 33	2,457			Eastend yellow clay	Hard, clear		D, S	Sufficient for local needs.
14	SW.	19	"	"	"	Dug	12	2,518	- 7	2,511	7	2,511	Glacial clay	Hard, clear, "alkaline"		D, S	Sufficient for 35 head stock.
15	SW.	20	"	"	"	Dug	120	,530									Several dry holes; base in Bearpaw blue soapstone.
16	NW.	20	"	"	"	Dug	35	2,500	- 23	2,477	25	c,-75	Inter-glacial black muck	Hard, clear, "alkaline"		D, S	Sufficient for 200 sheep and 20 head stock; also used by neighbours.
17	NE.	20	"	"	"	Bored	90	2,532	- 50	2,482	60	2,472	Eastend yellow, sandy clay	Hard, clear, iron, "alkaline"		S	Sufficient for 50 head stock.
18	NW.	24	"	"	"	Bored	65	2,548	55	2,493	60	2,488	Ravenscrag sand	Hard, iron, cloudy, "alkaline"		S	Sufficient for 8 head stock.
19	SE.	25	"	"	"	Bored	72	2,524					Ravenscrag	Hard, clear		D, S	Sufficient for 14 head stock.
20	SE.	26	"	"	"	Dug	40	2,544	- 36	2,508	38	2,506	Ravenscrag sand	Hard, clear		D, S	Sufficient for 12 head stock; another well 90 feet deep with a smaller supply.
21	NE.	27	"	"	"	Bored	68	2,508	- 38	2,470	68	2,440	Eastend	Hard, clear, iron, "alkaline"		S	Sufficient for 20 head stock.
22	NE.	27	"	"	"	Bored	67	2,502	- 37	2,465	65	2,437	Eastend bluish sand	Hard, clear, iron, red sediment		D, S	Sufficient for 30 head stock.
23	NW.	27	"	"	"	Bored	72	2,510	- 18	2,492	72	2,438	Eastend sand	Hard, reddish, "alkaline"		S	Sufficient for local needs.
24	SE.	30	"	"	"	Bored	80	2,500	- 20	2,480	80	2,420	Inter-glacial black muck	Hard, iron, yellowish, "alkaline"		S	Sufficient for local needs. #.
25	NW.	31	"	"	"	Dug	23	2,520	- 11	2,509	11	2,509	Glacial drift	Hard, clear		D, S	Insufficient for 10 head stock.
26	NE.	33	"	"	"	Bored	50	2,455	0	2,455	50	2,405	Inter-glacial sand	Hard, clear, iron		D, S	Sufficient for local needs.
27	SE.	34	"	"	"	Bored	54	2,486	- 34	2,452	54	2,432	Eastend	Hard, clear, iron, "alkaline", red sediment		D, S	Sufficient for 18 head stock.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of STONEHENGE, NO. 73, SASKATCHEWAN.

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
28	SE.	35	7	3	3	Bored	100	2,575	- 80	2,495	100	2,475	Ravenscrag	Hard, clear, iron, "alkaline", red sediment		D, S	Sufficient for 10 head stock.
29	NE.	35	"	"	"		64						Ravenscrag	Hard		S	Not a large supply.
30	NE.	36	"	"	"	Bored	116	2,586	- 86	2,500	101	2,485	Ravenscrag	Hard, clear, iron, "alkaline", red sediment		D, S	Insufficient for local needs; enough for about 15 head stock.
1	SW.	2	8	1	3	Bored	80	2,440	- 40	2,400	80	2,360	Ravenscrag clay	Hard, clear, "alkaline"		D, S	Sufficient for 19 head stock.
2	SW.	3	"	"	"	Bored	55	2,432	- 25	2,407	55	2,377	Ravenscrag clay	Hard, clear, "alkaline"		D,S	Sufficient for 100 head stock.
3	SE.	4	"	"	"	Bored	86	2,440	- 56	2,384	86	2,354	Ravenscrag clay	Hard, clear, "alkaline"		D	Sufficient for local needs.
4	SW.	4	"	"	"	Bored	60	2,500	- 38	2,462	60	2,440	Glacial drift	Hard, rusty, "alkaline"		S	Sufficient for 100 head stock.
5	NW.	6	"	"	"	Dug	15	2,436	- 12	2,424			Glacial clay	Hard, clear		D	Sufficient for local needs; another well 80 feet deep is used for stock needs.
6	NW.	8	"	"	"	Bored	70	2,472	- 20	2,452	70	2,402	Ravenscrag	Hard, clear, "alkaline"		S	
7	NE.	9	"	"	"	Bored	100	2,457	- 50	2,407	100	2,357	Eastend	Hard, clear		D, S	Sufficient for 20 head stock; another well 50 feet deep; unfit for use.
8	SW.	10	"	"	"	Bored	60	2,461	- 56	2,405			Glacial clay	Hard, clear, "alkaline"		S	Insufficient for 5 head stock.
9	NE.	11	"	"	"	Bored	96	2,483	- 58	2,427	96	2,384	Ravenscrag shale	Hard, clear		D, S	Sufficient for local needs; cannot be pumped dry.
10	NW.	12	"	"	"	Bored	96	2,470	- 51	2,419	96	2,374	Ravenscrag clay	Hard, clear, iron		S	Sufficient for local needs; another well 10 feet deep.
11	SE.	12	"	"	"	Bored	102	2,468	35	2,433	102	2,366	Ravenscrag sand	Hard, clear		D, S, I	Sufficient supply; 200 barrels a day; another 40-foot well is used for domestic needs and garden.
12	NE.	13	"	"	"	Bored	35	2,430					Ravenscrag sand	Hard, clear, iron		S	Sufficient for local needs; another well 12 feet deep is used for domestic needs.
13	SW.	13	"	"	"	Bored	60	2,444	- 25	2,419	60	2,384	Ravenscrag sand (?)	Hard, clear		D, S	Oversufficient for 11 head stock.
14	SE.	16	"	"	"	Bored	40	2,413					Ravenscrag clay	Hard, clear, "alkaline"		S	Sufficient for local needs.
15	SW.	17	"	"	"	Bored	85	2,490	- 60	2,430	85	2,405	Ravenscrag	Hard, clear, "alkaline"		S	Sufficient for local needs.
16	NE.	18	"	"	"	Bored	100	2,512	- 80	2,432			Ravenscrag	Hard, clear, "alkaline"		S	Sufficient for 10 head stock.
17	NW.	18	"	"	"	Bored	77	2,510	- 47	2,463	70	2,440	Ravenscrag	Hard, clear, "alkaline"		S	Sufficient for 15 head stock.
18	NW.	19	"	"	"	Bored	92	2,535	- 87	2,448	92	2,443	Ravenscrag gravel	Hard, clear, iron		D, S	Sufficient for 15 head stock; 2 barrels every 1½ hours.
19	NE.	20	"	"	"	Dug	24	2,412	- 12	2,400	12	2,400	Ravenscrag yellow sand	Hard, clear		D	Sufficient for domestic needs.
20	SW.	22	"	"	"	Bored	39	2,410	0	2,410	30	2,380	Ravenscrag sand	Hard, clear, "alkaline"		S	Farm deserted.
21	NW.	23	"	"	"	Drilled	45	2,353	- 20	2,333	45	2,308	Bearpaw sand	Hard, clear		D, S	Sufficient for local needs; 10 barrels every 3 hours.

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 STONEHENGE, NO. 73, 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
22	SE.	24	8	1	3	Bored	84	2,426	- 49	2,377	84	2,362	Ravenscrag sand	Hard, clear		D, S	Sufficient for 20 head stock.
23	NE.	24	"	"	"	Dug	12	2,407					Ravenscrag sand	Hard, clear		D	Oversufficient for local needs.
24	NW.	25	"	"	"	Dug	18	2,344	- 15	2,329	13	2,331	Eastend yellow sand	Hard, clear		D, S	Sufficient for 10 head stock.
25	SE.	27	"	"	"	Bored	60	2,358	- 20	2,338	60	2,298	Bearpaw clay	Hard, clear, iron		D, S	Sufficient for 50 head stock.
26	SE.	28	"	"	"	Bored	100	2,380	- 35	2,345	100	2,280	Bearpaw clay(?)	Hard, clear, iron		D, S	Sufficient for local needs.
27	SE.	30	"	"	"	Bored	30	2,435	- 8	2,427	30	2,405	Ravenscrag shale	Hard, "alkaline"		S	Sufficient for 50 to 100 head stock.
28	NW.	30	"	"	"	Bored	68	2,410	- 33	2,377	68	2,342	Eastend clay	Hard, rusty, "alkaline"		S	Sufficient for 40 head stock; another well 30 feet deep is used for domestic needs.
29	SE.	32	"	"	"	Bored	56	2,390	- 26	2,334	56	2,334	Eastend	Hard, clear, sulphur		D, S	Sufficient for 20 head stock; another well 48 feet deep.
30	NW.	33	"	"	"	Bored	63	2,400	- 50	2,350	63	2,337	Eastend sand	Hard, clear, "alkaline"		S	Sufficient for 25 head stock.
31	SE.	33	"	"	"	Bored	100	2,370					Bearpaw	Hard, clear, "alkaline"		D, S	Sufficient for 9 head stock.
32	NE.	34	"	"	"	Dug	12	2,348	- 10	2,338			Eastend	Hard, clear		D, S	Sufficient for 20 head stock.
33	SE.	35	"	"	"	Bored	32	2,367	- 26	2,341			Eastend clay	Hard, clear, soda		D, S	Sufficient for local needs.
1	SE.	1	8	2	3	Drilled	90	2,453					Eastend sand	Hard, soda, cloudy, "alkaline"		D, S	Sufficient for 15 head stock; another well 20 feet deep is used for domestic needs.
2	NE.	2	"	"	"	Bored	100	2,500	- 95	2,405			Ravenscrag	Hard, clear		D, S	Insufficient supply; enough for about 12 head stock; also a spring and a well 16 feet deep.
3	SE.	2	"	"	"	Bored	60	2,500	- 59	2,441	60	2,440	Ravenscrag sand	Hard, clear		D, S	Sufficient for 12 head stock.
4	NW.	4	"	"	"	Bored	55	2,466	- 45	2,421	55	2,411	Eastend yellow sand	Hard, clear, "alkaline"		D, S	Sufficient for 20 head stock; another well 35 feet deep is used for domestic needs; #.
5	SW.	5	"	"	"	Bored	85	2,500	- 55	2,435	85	2,415	Eastend sand	Soft, clear		D, S, I	Sufficient for 30 head stock; another similar well 85 feet deep.
6	NW.	6	"	"	"	Bored	44	2,488	- 26	2,462			Glacial drift	Hard, clear, "alkaline"		D, S	Sufficient for 30 head stock.
7	NW.	6	"	"	"	Bored	44	2,500	- 39	2,461	39	2,461	Glacial gravel	Hard, clear, "alkaline"		D	Sufficient only for domestic needs.
8	SE.	7	"	"	"	Bored	74	2,460	- 60	2,400	74	2,386	Eastend yellowish, sandy clay	Hard, clear, iron, "alkaline"		D, S	Sufficient for 15 head stock.
9	SW.	8	"	"	"	Bored	80	2,466	- 64	2,402	80	2,386	Eastend	Hard, clear, iron		D, S	Sufficient for 40 head stock.
10	SW.	10	"	"	"	Bored	75	2,526	- 73	2,453	73	2,453	Ravenscrag sand	Hard, clear, "alkaline"		D, S	Sufficient for 8 head stock.
11	NW.	10	"	"	"	Bored	36	2,466	- 16	2,450	36	2,430	Ravenscrag sand	Hard, clear, iron, "alkaline"		S	Sufficient for 30 head stock.
12	NW.	10	"	"	"	Dug	25	2,466	- 17	2,449	17	2,449	Ravenscrag sand	Soft, clear		D, S	Sufficient for 10 head stock.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of STONEHENGE, NO. 73, 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
13	NE.	10	8	2	3	Bored	65	2,472	- 20	2,452	20	2,452	Glacial drift	Hard, clear, iron, "alkaline"		S	Oversufficient for local needs; another well 40 feet deep with very poor supply.
14	NW.	11	"	"	"	Bored	50	2,494	- 40	2,454	50	2,444	Ravenscrag	Hard, clear		D, S	Sufficient for 20 head stock.
15	SW.	12	"	"	"	Dug	90	2,520	- 50	2,470	90	2,430	Ravenscrag sand	Hard, clear, iron, "alkaline"		D, S	Sufficient for 20 head stock; cannot be pumped dry.
16	NW.	13	"	"	"	Bored	46	2,482	- 28	2,454	40	2,442	Ravenscrag yellow sand	Hard, clear, "alkaline"		D, S	Sufficient for 35 head stock; another similar well 52 feet deep.
17	NW.	14	"	"	"	Bored	80	2,478	- 50	2,428	80	2,398	Eastend	Hard, clear, "alkaline"		D, S	Sufficient for 12 head stock.
18	NE.	15	"	"	"	Bored	50	2,490	- 30	2,460	50	2,440	Ravenscrag	Hard, clear		D, S	Sufficient for 70 to 80 head stock.
19	SE.	15	"	"	"	Bored	50	2,487					Ravenscrag sand	Hard, clear		D	Sufficient for local needs; another similar well 40 feet deep.
20	NW.	16	"	"	"	Bored	51	2,447	- 30	2,417	51	2,396	Eastend(?) sand	Hard, clear, "alkaline"		S	Sufficient for 25 head stock; hauls domestic supply.
21	SW.	16	"	"	"	Dug	35	2,455	- 31	2,424	35	2,420	Ravenscrag fine, yellow sand	Hard, clear		D, S	Sufficient for 30 head stock.
22	SE.	17	"	"	"	Dug	40	2,480	- 36	2,444	36	2,444	Ravenscrag sand	Soft, clear,		D, S	Sufficient for 20 head stock.
23	NW.	17	"	"	"	Bored	83	2,470	- 78	2,392	80	2,390	Eastend	Hard, clear, "alkaline"		S	Sufficient for 10 head stock.
24	SE.	18	"	"	"	Dug	20	2,473	- 14	2,459			Glacial clay	Hard, clear		D	Sufficient for local needs; another well 2,200 feet deep with insufficient supply.
25	SW.	18	"	"	"	Bored	80	2,477	- 40	2,437	42	2,435	Glacial gravel	Hard, clear, "alkaline"		D, S, I	Sufficient for 12 head stock; used by town. Another similar well 80 feet deep.
26	SE.	18	"	"	"	Bored	120	2,460	- 65	2,395	120	2,340	Eastend	Soft, clear, iron, "alkaline"		D, S	Sufficient for 25 head stock; another well 80 feet deep is not used.
27	NW.	18	"	"	"	Bored	94	2,477	- 44	2,433	60	2,417	Glacial gravel	Hard, clear, iron, "alkaline"		D	Sufficient for domestic needs.
28	SW.	19	"	"	"	Bored	50	2,487	- 25	2,462	50	2,437	Glacial drift	Hard, clear, iron		D	Sufficient for domestic needs.
29	NW.	19	"	"	"	Bored	110	2,496	- 70	2,426	110	2,386	Eastend	Hard, clear, iron, red sediment		S	Insufficient for 30 head stock.
30	SW.	20	"	"	"	Bored	120	2,497	- 70	2,427	120	2,377	Eastend	Hard, clear, iron, "alkaline"		D, S	Sufficient for 45 head stock.
31	SW.	21	"	"	"	Bored	107	2,430	- 77	2,353	107	2,323	Eastend sand	Hard, clear, "alkaline"		S	Sufficient for 30 head stock.
32	NW.	22	"	"	"	Bored	85	2,460	- 35	2,425			Eastend	Hard, clear, iron, "alkaline"		S	Insufficient for 20 head stock; enough for about 15 head stock; another well 30 feet deep is not used.
33	NW.	23	"	"	"	Bored	80	2,397	- 30	2,367	70	2,327	Eastend sand	Hard, clear, iron, red sediment		D, S	Sufficient for 40 head stock; used also by neighbours.
34	NE.	24	"	"	"	Bored	90	2,425	- 84	2,341			Eastend	Hard, grey, "alkaline"		S	Insufficient for 10 head stock.
35	NE.	25	"	"	"	Bored	94	2,418	- 34	2,384	34	2,384	Eastend	Hard, "alkaline"		N	Sufficient supplies; yields 3 to 4 barrels a day.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of STONEHENGE, NO. 73, 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
36	SW.	29	8	2	3	Bored	120	2,500	- 50	2,450	119	2,381	Eastend sand	Hard, clear, iron, "alkaline"		D, S	Sufficient for 90 to 100 head stock;another well 15 feet deep is used for domestic needs. A 116-foot well is not used; also 3 dry holes 80, 90 and 130 feet deep.
37	NW.	31	"	"	"	Bored	15	2,444	- 8	2,436			Glacial clay	Hard, clear		D, S	Sufficient for 12 head stock.
38	SW.	32	"	"	"	Bored	72	2,504	- 46	2,558			Glacial sand	Hard, "alkaline"		D, S	Insufficient for 5 head stock; another well 18 feet deep has a good supply.
39	NE.	34	"	"	"	Dug	22	2,400	- 12	2,388	12	2,388	Glacial gravel	Hard, clear		D, S	Pumped 60,000 gallons an hour.
40	SE.	34	"	"	"	Dug	22						Glacial sand and gravel	Hard		D	Sufficient for local needs.
41	NW.	35	"	"	"	Dug	12	2,376	- 10	2,366	10	2,366	Glacial gravel	Soft, clear		D, S	Oversufficient for local needs.
42	SW.	35	"	"	"	Dug	78	2,430	- 22	2,408	22	2,408	Glacial sandy clay	Soft, clear, white sediment		D, S	Sufficient for 30 head stock.
43	SW.	36	"	"	"	Bored	66	2,446	- 25	2,421	25	2,421	Glacial gravel	Hard, clear, "alkaline"		S	Sufficient for 35 head stock; another well 18 feet deep is used for domestic needs.
1	SW.	1	8	3	3	Dug	60	2,496	- 35	2,461	60	2,436	Eastend reddish sand	Hard, clear, iron, "alkaline"		S	Sufficient for 25 head stock; a similar well 59 feet deep is used for domestic needs.
2	NW.	2	"	"	"	Bored	60	2,473	- 35	2,436	60	2,413	Eastend	Hard, clear, iron, "alkaline"	45	D, S	Sufficient for 15 head stock.
3	SW.	2	"	"	"	Dug	20	2,440	- 10	2,430	10	2,430	Eastend yellow, sandy clay	Hard, clear		D, S	Sufficient for 6 head stock.
4	NE.	4	"	"	"	Bored	90	2,500	- 40	2,460	90	2,410	Eastend sand and gravel	Hard, iron, cloudy, "alkaline"		D, S	Sufficient for 15 head stock.
5	SW.	4	"	"	"	Bored	83	2,466	- 15	2,451	70	2,396	Eastend sand	Hard, clear, iron, "alkaline"		D, S	Sufficient for 20 head stock.
6	SE.	5	"	"	"	Bored	88	2,509	- 50	2,459	88	2,421	Eastend sandstone	Hard, clear, "alkaline"		D, S	Insufficient for 20 head stock; also 80-foot dry hole.
7	NE.	10	"	"	"	Bored	50	2,415	- 3	2,412	47	2,368	Eastend sand	Hard, clear, "alkaline"		D, S	Oversufficient for local needs. #.
8	SE.	10	"	"	"	Bored	65	2,450	- 25	2,425	65	2,385	Eastend sand	Hard, clear, iron, "alkaline"		S	Sufficient for local needs; another well 15 feet deep is used for domestic needs.
9	SE.	12	"	"	"	Bored	65	2,500	- 59	2,441	60	2,440	Glacial drift	Hard, clear, iron		D	Sufficient for domestic needs; another well 90 feet deep.
10	SE.	13	"	"	"	Bored	100	2,475	- 15	2,460	100	2,375	Eastend black sand	Soft, clear, iron, black sediment		D, S	Oversufficient for local needs.
11	SE.	15	"	"	"		50	2,412					Eastend	Hard			
12	SW.	16	"	"	"	Bored	60	2,478	- 40	2,438	55	2,423	Glacial sand	Hard, clear,		D, S	Insufficient for 6 head stock.
13	NW.	17	"	"	"	Bored	90	2,518	- 60	2,458	90	2,428	Glacial drift	Hard, clear, iron, red sediment		D, S	
14	NE.	18	"	"	"	Bored	80	2,488	- 35	2,453	76	2,412	Inter-glacial black "muck"	Hard, bluish iron, soda, "alkaline"		D, S	Sufficient for local needs.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of STONEHENGE, NO. 73, 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.	19	6	3	3	Bored	49	2,445	- 20	2,425	20	2,425	Glacial gravel	Soft, clear, soda		D, S, I	Sufficient forlocal needs; used also by neighbours; #.
16	NE.	20	"	"	"	Bored	100	2,450	- 10	2,440	100	2,350	Glacial gravel	Soft, clear, iron, soda		D, S	Oversufficient for local needs.
17	NW.	22	"	"	"	Bored	65	2,424	- 25	2,399	50	2,374	Glacial sand and gravel	Hard, clear, "alkaline"		S	Oversufficient for 14 head stock.
18	SE.	23	"	"	"		65	2,439	- 25	2,414	65	2,374	Eastend	Cloudy, "alkaline"		S	Oversufficient for local needs.
19	SE.	24	"	"	"	Dug	42	2,470	- 33	2,437	34	2,436	Glacial gravel	Hard, clear		D, S	Sufficient for 30 head stock.
20	NE.	24	"	"	"	Bored	60	2,494	- 50	2,444	60	2,434	Glacial sand	Hard, clear, "alkaline"		D, S	Sufficient for 7 head stock; another well 60 feet deep is not used.
21	NE.	25	"	"	"	Bored	65	2,520	- 45	2,475	65	2,455	Glacial sand	Hard, clear, "alkaline"		D, S	Sufficient for 50 head stock.
22	SW.	30	"	"	"	Dug	7	2,409	0	2,409	0	2,409	Recent grey clay	Soft, clear		S	Sufficient for local needs. Also a 40-foot well now filled in.
23	SE.	30	"	"	"	Spring		2,409					Glacial drift	Hard		D, S	Sufficient for local needs.
24	NW.	31	"	"	"	Bored	50	2,500	- 18	2,482	50	2,450	Glacial brownish clay	Hard, clear, iron		S	Sufficient for 65 head stock.
25	NW.	33	"	"	"	Bored	55	2,464	- 35	2,429	55	2,409	Glacial drift	Hard, clear, iron, "alk-		D, S	Sufficient for 35 head stock.
26	SE.	33	"	"	"	Spring							Glacial drift	Hard		D, S	Sufficient for local needs.
27	SE.	34	"	"	"	Bored	58	2,482	- 30	2,452	30	2,452	Glacial sand	Hard, clear		D	Sufficient for domestic needs.
28	SE.	34	"	"	"	Bored	30	2,486	- 60	2,426	30	2,406	Glacial drift	Hard, clear, iron, "alkaline"		S	Sufficient for 10 head stock.
29	NE.	34	"	"	"	Dug	15	2,425	- 5	2,420	15	2,410	Glacial sand and gravel	Soft, clear		D, S	Sufficient for 10 head stock.
30	NW.	35	"	"	"	Dug	15	2,431	- 5	2,426	12	2,419	Glacial sand and gravel	Soft, clear		D, S	Sufficient for 10 head stock; two other similar wells.
31	SW.	35	"	"	"	Bored	70	2,491	- 55	2,436	70	2,421	Glacial drift	Hard, clear, iron, brownish sediment		D, S	Sufficient for 20 head stock.
32	NE.	36	"	"	"		45	2,515									Dry hole; base in glacial drift.
1	SE.	1	9	1	3	Bored	27	2,390	- 18	2,372	18	2,372	Glacial white sand	Hard, clear, iron, "alkaline"	43	S	Sufficient for local needs; another well 11 feet deep is used for domestic needs.
2	SE.	2	"	"	"	Bored	95	2,350									Dry hole; base in Bearpaw soapstone.
3	NW.	3	"	"	"	Dug	14	2,410	- 10	2,400	14	2,396	Glacial sand	Hard, clear, "alkaline"		D, S	Sufficient for local needs; also a dry hole 40 feet deep.
4	NE.	3	"	"	"	Bored	20	2,375	- 15	2,360	5	2,370	Glacial sand	Soft, clear	43	D, S	Sufficient for local needs.
5	SE.	6	"	"	"	Dug	16	2,410	- 13	2,397	13	2,397	Glacial sand	Hard, "alkaline"		S	Insufficient for local needs; two other similar wells.
6	E½	7	"	"	"	Bored	98	2,400	- 90	2,310	90	2,310	Eastend clay	Hard, cloudy, mineralized	42	S	Intermittent supply; another well 16 feet deep is used for domestic needs.
7	SW.	7	"	"	"	Dug	10	2,435	- 8	2,427	10	2,425	Glacial sand	Soft, clear	43	D, S	Sufficient for local needs.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of STONEHENGE, NO. 73, 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	NE.	10	9	1	3	Bored	186	2,400	-116	2,284	186	2,214	Bearpaw sand	Hard, mineralized	41	S	Sufficient for local needs; haul drinking water.
9	SW.	12	"	"	"	Drilled	527	2,390									Dry hole; base in Bearpaw.
10	NE.	12	"	"	"	Bored	90	2,410	- 70	2,340	90	2,320	Eastend sand	Clear, "alkaline"	42	S	Sufficient for local needs; another well 18 feet deep.
11	SE.	14	"	"	"	Drilled	750	2,410									Dry hole; base in Bearpaw.
12	SW.	18	"	"	"	Bored	80	2,410	- 64	2,346	80	2,330	Eastend sand	Clear, iron, sulphur		D, S	
13	SE.	21	"	"	"	Bored	140	2,390									Dry hole; base in Bearpaw.
14	NE.	21	"	"	"	Drilled	100	2,350					Bearpaw sand	Hard, clear, mineralized		D, S	Was a very strong supply; now nearly dry.
15	E½.	22	"	"	"	Drilled	420	2,375									Dry hole; base in Bearpaw shale; supply obtained from shallow seepage wells.
16	SE.	23	"	"	"	Bored	50	2,415	0	2,415	0	2,415	Glacial clay	Hard, clear		D, S	Usually sufficient for local needs.
17	SE.	24	"	"	"	Dug	15	2,390	- 10	2,380	10	2,380	Glacial gravel	Hard, clear, iron		S	Insufficient for local needs.
18	NW.	24	"	"	"	Dug	30	2,380	- 10	2,370	10	2,370	Glacial sand	Hard, clear	44	D, S	Sufficient for local needs during wet seasons.
19	S½.	25	"	"	"	Bored	85	2,350									Several dry holes; base in glacial clay.
20	NE.	25	"	"	"	Bored	180	2,410	-100	2,310	180	2,230	Bearpaw	Hard, clear, "alkaline"		S	Sufficient for local needs.
21	NE.	28	"	"	"	Bored	196	2,355									Dry hole; base in Bearpaw blue clay; also two seepage wells.
22	NW.	30	"	"	"	Bored	120	2,360	- 60	2,300	100	2,260	Inter-glacial black "muck"	Hard, clear, "alkaline"	41	S	Sufficient for local needs; another well 14 feet deep is used for domestic needs.
23	NE.	31	"	"	"	Bored	90	2,365	- 35	2,330			Glacial coarse sand	Hard, clear, iron, brown sediment	42	S	Intermittent supply; another well is used for domestic needs; #.
24	NW.	32	"	"	"	Bored	80	2,360	- 30	2,330			Glacial clay	Hard, clear, "alkaline"		S	Sufficient for local needs.
25	NE.	33	"	"	"	Bored	85	2,360	- 60	2,300	60	2,300	Glacial drift	Hard, clear, "alkaline"		S	Sufficient for local needs.
26	SW.	34	"	"	"	Bored	125	2,365	-110	2,255	125	2,240	Bearpaw sand	Hard, cloudy, mineralized	43	S	
1	NW.	3	9	2	3	Bored	75	2,435	- 70	2,365	75	2,360	Glacial gravel	Hard, clear, iron, "alkaline"	42	S	Insufficient for local needs.
2	SW.	4	"	"	"	Bored	130	2,450	- 80	2,370	130	2,320	Eastend sand	Hard, clear, "alkaline"		S	Sufficient for local needs. #.
3	NE.	6	"	"	"	Bored	55	2,430	- 35	2,395	55	2,375	Eastend sand	Hard, clear, iron, "alkaline"	43	S	Insufficient for local needs during dry seasons; a 15-foot well is used for domestic needs.
4	SE.	7	"	"	"	Bored	65	2,410	- 30	2,380	65	2,345	Eastend sand	Hard, clear, iron	43	D, S	Sufficient for local needs.
5	N½.	7	"	"	"	Bored	80	2,440	- 56	2,384	80	2,360	Eastend sand	Hard, clear, iron, "alkaline", red sediment	42	S	Sufficient for local needs; another similar well 80 feet deep; also a 14-foot well is used for domestic needs.

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.

STONEHENGE, NO. 73, SASKATCHEWAN. B 4-4

WELL RECORDS—Rural Municipality of .....

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	S½.	8	9	2	3	Bored	60	2,440	- 25	2,415	60	2,380	Glacial gravel	Hard, clear, iron	42	S	Sufficient for local needs.
7	S½.	9	"	"	"	Bored	100	2,440	- 50	2,390	50	2,390	Eastend	Hard, clear, iron, "alkaline"	42	S	Sufficient for local needs.
8	NW.	12	"	"	"	Bored	105	2,420	-100	2,320	100	2,320	Eastend white sand	Hard, clear, iron, brown sediment	42	D, S	Insufficient for local needs during dry seasons.
9	SE.	15	"	"	"	Bored	75	2,420	- 55	2,365	75	2,345	Eastend sand	Hard, clear, iron, "alkaline"	42	S	Sufficient for local needs; also seepage wells for domestic use.
10	SW.	16	"	"	"	Bored	60	2,400	- 30	2,370	60	2,340	Eastend sand	Hard, clear, iron, "alkaline", red sediment		S	Sufficient for local needs; another well 16 feet deep is used for domestic needs.
11	N½.	16	"	"	"	Bored	58	2,400	- 20	2,380	58	2,342	Eastend sand	Hard, clear, iron, "alkaline", red sediment		S	Sufficient for local needs; another well 25 feet deep is used for domestic needs.
12	SE.	16	"	"	"	Bored	65	[illegible]	- 25	2,385			Eastend clay	Hard, clear, iron, rusty, sediment		S	Sufficient for local needs.
13	SE.	17	"	"	"	Bored	58	2,385	- 5	2,380	58	2,327	Eastend sandy clay	Hard, clear, iron, "alkaline", red sediment		S	Sufficient for local needs; also seepage wells on farm; #.
14	NW.	17	"	"	"	Bored	65	2,410	- 30	2,380	65	2,345	Glacial gravel	Hard, clear, iron, "alkaline"	42	D, S	Sufficient for 30 to 40 head stock; also a 20-foot seepage well.
15	SE.	18	"	"	"	Bored	80	2,430	- 77	2,353	77	2,353	Eastend fine sand	Hard, clear, iron, "alkaline", brown sediment	45	S	Insufficient for local needs; six pails a day.
16	NW.	18	"	"	"	Bored	50	2,385	- 20	2,365	50	2,335	Eastend	Hard, clear, "alkaline"	42	S	Sufficient for local needs; another similar well in pasture.
17	S½.	19	"	"	"	Bored	53	2,390	- 13	2,377	13	2,377	Glacial sand and gravel	Hard, iron, cloudy	43	S	Sufficient for local needs; another well 18 feet deep is used for domestic needs.
18	NW.	19	"	"	"	Bored	35	2,395	- 15	2,380	35	2,360	Eastend sandy clay	Hard, iron, cloudy	42	S	Sufficient for local needs; a seepage well is used for domestic needs.
19	NE.	19	"	"	"	Bored	35	2,400	- 15	2,385	35	2,365	Eastend sand	Hard, clear, iron, "alkaline"		S	Sufficient for local needs; another well 20 feet deep has mineralzied water.
20	SW.	21	"	"	"	Bored	80	2,415	- 40	2,375			Eastend	Hard, clear, iron		S	Sufficient for local needs.
21	NW.	22	"	"	"	Bored	40	2,400	- 15	2,385	40	2,360	Eastend sand	Hard, clear, iron, "alkaline"	41	S	Sufficient for local needs; also several dry holes; another well for domestic needs.
22	SW.	23	"	"	"	Bored	58	2,400	- 38	2,362			Eastend	Hard, "alkaline"	43	S	Sufficient for local needs; also a seepage well.
23	NE.	24	"	"	"	Bored	40	2,350	- 25	2,325	25	2,325	Glacial drift	Hard, clear, iron		S	Sufficient for local needs.
24	NW.	25	"	"	"	Bored	90	2,360	- 20	2,340	20	2,340	Glacial clay	Hard, clear, "alkaline"		S	Intermittent supply; another well is used for domestic needs.

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 STONEHENGE, NO. 73, SASKATCHEWAN.

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
25	SW.	27	9	2	3	Bored	110	2,385									Dry hole; base in Bearpaw soapstone; also three seepage wells.
26	NW.	27	"	"	"	Bored	30	2,360	- 15	2,345	18	2,342	Glacial sand	Hard, clear		D, S	Sufficient for local needs.
27	NE.	28	"	"	"	Bored	140	2,360	- 50	2,310	140	2,220	Glacial sand and gravel	Hard, clear, "alkaline"		S	Sufficient for local needs. #.
28	SE.	29	"	"	"	Dug	40	2,380	- 22	2,358	40	2,340	Glacial clay	Hard, clear, iron, "alkaline", red sediment	43	S	Sufficient for local needs; another well 30 feet deep is used for domestic needs.
29	NE.	31	"	"	"	Bored	80	2,360	- 40	2,320	80	2,280	Glacial sand	Hard, cloudy, "alkaline"		S	Sufficient for local needs.
30	SE.	32	"	"	"	Bored	96	2,370	- 15	2,355	96	2,274	Glacial black sand	Hard, clear, iron, "alkaline", red sediment, sulphur		S	Sufficient for local needs.
31	NE.	32	"	"	"	Bored	97	2,350	- 10	2,340	97	2,253	Glacial clay(?)	Hard, clear, iron, "alkaline", red sediment	42	S	Sufficient for local needs.
32	SW.	32	"	"	"	Dug	25	2,350					Glacial sand	Hard		D	Farmer on NE.¼, section 19, hauls drinking water from here.
33	NW.	35	"	"	"	Bored	110	2,385	- 60	2,325	110	2,275	Glacial drift	Hard, clear, "alkaline"		S	Sufficient for local needs; another well 25 feet deep is used for domestic needs.
34	SW.	36	"	"	"	Bored	90	2,375	- 40	2,335	90	2,285	Glacial blue sand	Hard, salty, cloudy	40	S	Sufficient for local needs; another well 40 feet deep is used for domestic needs.
35	NE.	36	"	"	"	Bored	140	2,380									Dry hole; Bearpaw soapstone at base.
36	NE.	36	"	"	"	Bored	100	2,370	- 80	2,290	90	2,280	Glacial seamud	Hard, "alkaline", soapy taste		N	Unfit for use; shallow wells are used for domestic needs.
1	SW.	1	9	3	3	Dug	20	2,465	- 16	2,449	20	2,445	Glacial gravel	Hard, clear		D, S	Sufficient for local needs.
2	NE.	1	"	"	"	Bored	90	2,460	- 50	2,410			Eastend clay	Hard, clear, "alkaline"	42	S	Usually sufficient for local needs; another well 22 feet deep is used for domestic needs.
3	SW.	2	"	"	"	Dug	16	2,440	- 13	2,427	13	2,427	Glacial sand and gravel	Hard, clear, mineralized	43	S	Insufficient for local needs; another well is used for domestic needs. #.
4	SE.	3	"	"	"	Dug	14	2,460	- 5	2,455	7	2,453	Glacial sand	Hard, clear, "alkaline"		D, S	Sufficient for 25 head stock.
5	SE.	4	"	"	"	Dug	12	2,460	- 6	2,454	6	2,454	Glacial sandy clay	Hard, clear, iron		D, S	Sufficient for local needs.
6	SW.	6	"	"	"	Dug	21	2,520	- 17	2,503	17	2,503	Glacial sand and gravel	Hard, clear	44	D, S	Sufficient for local needs.
7	NW.	7	"	"	"	Spring		2,480	+ 3	2,483			Glacial gravel	Hard, clear, "alkaline"		S	Sufficient for local needs.
8	SW.	10	"	"	"	Bored	97	2,465	- 82	2,383	97	2,368	Eastend fine sand	Hard, clear	42	S	Sufficient for local needs; another well 28 feet deep is used for domestic needs.
9	NW.	11	"	"	"	Bored	90	2,450					Eastend sand	Hard, clear, "alkaline"		S	Farm deserted.
10	SW.	13	"	"	"	Bored	90	2,450	- 45	2,405	90	2,360	Eastend sand	Hard, clear, "alkaline"	42	S	Sufficient for local needs.
11	E½	14	"	"	"	Bored	80	2,450	- 40	2,410	80	2,370	Eastend sand	Hard, clear, "alkaline"	42	S	Sufficient for 23 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 STONEHENGE, NO. 73, SASKATCHEWAN.

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
12	SW.	14	9	3	3	Bored	85	2,450	- 50	2,400	85	2,365	Eastend fine sand	Hard, clear, "alkaline"	42	S	Sufficient for local needs; another well 15 feet deep has mineralized water.
13	SE.	15	"	"	"	Bored	70	2,445	- 50	2,395	70	2,375	Eastend sand	Hard, clear, "alkaline"	43	D,S	Sufficient for local needs.
14	NW.	16	"	"	"	Bored	70	2,440	- 45	2,395	70	2,370	Glacial gravel	Hard, clear, "alkaline"	42	S	Sufficient for local needs; also two other wells 20 feet deep.
15	SW.	17	"	"	"	Dug	27	2,485	- 20	2,465			Glacial sand	Hard, clear, iron, "alkaline"	43	D, S	Intermittent supply; #.
16	E.½	18	"	"	"	Dug	23	2,480	- 18	2,462	18	2,462	Glacial gravel	Hard, clear, "alkaline"	42	D, S	Sufficient for 60 head stock.
17	SW.	18	"	"	"	Bored	37	2,470	- 30	2,440	37	2,433	Glacial gravel	Hard, clear	42	D, S	Sufficient for local needs.
18	SW.	19	"	"	"	Bored	100	2,550	- 85	2,465	85	2,465	Inter-glacial "seamud"	Hard, clear, "alkaline"	42	S	Insufficient for local needs; another well 40 feet deep; also 7 dry holes.
19	NE.	19	"	"	"	Bored	40	2,480					Glacial drift	Hard, clear		S	
20	NE.	20	"	"	"	Bored	50	2,435	- 40	2,395			Glacial coarse gravel	Hard, clear, "alkaline"	42	D, S	Insufficient for 9 head stock.
21	SW.	21	"	"	"	Bored	30	2,450	- 27	2,423	27	2,423	Glacial sand	Hard, clear, "alkaline"		S	Intermittent supply.
22	NE.	21	"	"	"	Dug	42	2,420	- 32	2,388	32	2,388	Glacial clay	Hard, clear, "alkaline"	43	S	Intermittent supply; also a shallow seepage well for domestic needs.
23	N.½	23	"	"	"	Bored	75	2,420	- 10	2,410	75	2,345	Eastend sand	Hard, clear, "alkaline"	43	S	Sufficient for local needs; another well 12 feet deep is used for domestic needs.
24	SW.	24	"	"	"	Bored	50	2,420	- 5	2,415	50	2,370	Eastend sand	Hard, clear, "alkaline"	42	S	Sufficient for local needs.
25	SE.	25	"	"	"	Bored	35	2,380	- 15	2,365	15	2,365	Eastend sandy clay	Hard, iron, cloudy	42	S	Sufficient for local needs.
26	NW.	25	"	"	"	Bored	40	2,390	- 12	2,378	40	2,350	Eastend sand	Hard, clear, iron, "alkaline"	42	S	Sufficient for 40 head stock; a shallow seepage well is used for domestic needs.
27	W.½	26	"	"	"	Bored	32	2,390	- 16	2,374	16	2,374	Eastend sand	Hard, clear, "alkaline"	44	D, S	Sufficient for local needs.
28	SW.	27	"	"	"	Bored	36	2,390	- 30	2,360	30	2,360	Eastend sand	Hard, clear, "alkaline"	43	D, S	Insufficient for local needs.
29	SE.	28	"	"	"	Dug	38	2,380	- 28	2,352	38	2,342	Eastend sand	Hard, clear, "alkaline"	43	D, S	Sufficient for local needs; also a spring in dugout.
30	SE.	31	"	"	"	Dug	50	2,380	- 10	2,370	10	2,370	Glacial clay(?)	Hard, "alkaline"		N	Unfit for use; also shallow seepage wells.
31	SW.	32	"	"	"	Bored	50	2,380	- 40	2,340			Glacial clay	Hard, clear, "alkaline"	42	S	Intermittent supply.
32	NE.	34	"	"	"	Bored	48	2,360	- 23	2,337	42	2,318	Glacial gravel	Hard, clear	43	D, S	Sufficient for local needs.
33	SE.	36	"	"	"	Bored	60	2,390	- 57	2,333			Glacial sand	Hard, clear, "alkaline"	42	S	Intermittent supply; another well 20 feet deep.
34	W.½	36	"	"	"	Bored	50	2,365									Dry hole; base in Bearpaw shale; also two wells 20 feet deep.

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

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