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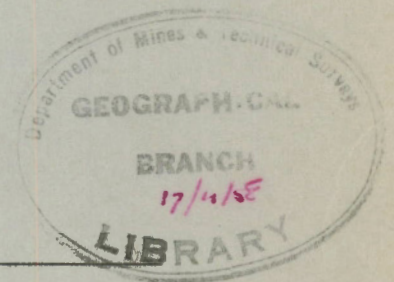
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GEOLOGICAL SURVEY OF CANADA

WATER SUPPLY PAPER No. 325

GROUND-WATER RESOURCES  
OF  
TOWNSHIPS 1 to 6, RANGES 10 to 13  
WEST OF PRINCIPAL MERIDIAN,  
MANITOBA  
(Pilot Mound Area)

By  
E. C. Halstead



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OTTAWA  
1954

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## Part I

Part II

## Illustrations

Preliminary map - Townships 1 to 6, ranges 10 to 13, west  
Principal meridian, Manitoba:  
Figure 1. Geological map.  
2. Map showing topography, location of wells, and  
source of water.

## PART I

### INTRODUCTION

The present report is an attempt to assemble the data on ground-water resources in a form that will be useful to well drillers, farmers, municipal authorities, and others interested in obtaining adequate water supplies.

### Publication of Results

The essential information pertaining to ground-water conditions is being issued in reports that, in Manitoba, cover a square block of sixteen townships lying between the correction lines and beginning at the Saskatchewan boundary. The reports on the most southerly strip of the province include in addition the two townships lying north of the International Boundary. The secretary-treasurer of each municipality will be supplied with the information covering that municipality, and copies of the reports will also be available for study at offices of the Provincial and Federal Departments. Further assistance in interpreting the reports may be obtained by applying to the Chief Geologist, Geological Survey of Canada, Ottawa.

### How to Use the Report

Anyone desiring information concerning ground-water in any particular locality will find the available data listed in the well records, and other pertinent information on the maps of the area. For those unfamiliar with these reports it is, perhaps, advisable that that part dealing with the area as a whole be read first, so as to be in a better position to understand the more particular descriptions of each township that follow. Also, the map accompanying the report should prove a useful source of reference when reading the text.

The map consists of two figures. Figure 1 shows bedrock and surface geology. The water-bearing properties of the bedrock change from formation to formation, and are referred to in subsequent pages. The type of glacial deposit at the surface may be determined from the map, and its possibilities as an aquifer are also discussed in this report.

Figure 2 shows the location and types of wells in the area, the land relief (topography), and the drainage pattern. Not every well is plotted on the map, but most of those giving pertinent information are shown, and probably include 90 per cent of the wells in the area. Where ground water is not readily available, or carries too much dissolved salts to be used, dugouts often form the only means of supply. The topography is shown by contours, or lines of equal elevation, spaced at vertical intervals of 50 feet.

The well records are compiled from data obtained by interviewing farmers, and in many cases their accuracy depends upon the farmer's memory. Wherever possible data were checked by plumb-line measurement to the nearest foot. The wells are tabulated by townships and sections, and the total depth of the well, depths to the water level at high and low stages, and, where possible, the depth at which the water-bearing horizon occurs, are all listed. The general character of the water is stated, and the use to which it can be put. Wells from which samples were taken for analysis are indicated on the well-record sheets. An idea of how much water a well can be expected to yield is suggested by the number of stock (cattle and horses only) that can be watered at it. One head is assumed to consume between 8 and 16 gallons of water a day. Unless followed by the word "only"



the figure for the number of stock watered is not necessarily the maximum yield of the well, but simply the greatest amount that the present user has required. The word "only" indicates that the figure given is the maximum yield of the well. To obtain the position of an aquifer at any given point, the elevation of the point should be determined from the contours on Figure 2 of the map. Elevations of adjacent wells may be found in the well records and the depth to the aquifer can usually be determined from them. By comparing elevations the depth of the aquifer below the unknown point may be estimated. This method is particularly applicable to bedrock wells, but may not be successful where information is too limited, or where the glacial drift is thick and of an irregular character. In such instances a person searching for water should refer to the text for information on the nature of the deposits in that area.

#### GLOSSARY OF TERMS USED

Alkaline. The term 'alkaline' or 'alkali' water has been applied rather loosely to waters having a peculiar and disagreeable taste, and commonly a laxative effect. The waters so described in the Prairie Provinces are those heavily charged with sulphates of magnesium and sodium (respectively Epsom salts and Glauber's salts) and are more correctly termed sulphate waters. Truly 'alkaline' waters owe that property to the presence of calcium carbonate and calcium bicarbonate. In this report an attempt to adhere to local terminology is made by referring to sulphate waters as 'alkali' in the well records, and the term 'alkaline' is avoided.

Alluvium. Deposits of clay, silt, sand, gravel, and other material in lake beds and in flood plains of modern streams. The term also includes the material in river terraces, which once formed part of the flood plain but are now above it.

Aquifer. A porous bed, lens, pocket, or deposit of material that transmits water in sufficient quantity to satisfy pumping wells and springs.

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.

Bentonite. and bentonitic clays have the property of swelling when water is added to them. They occur as white beds as much as 2 feet thick, but usually much thinner, and are probably formed by the weathering of volcanic ash.

Buried pre-Glacial Stream Channel. A channel eroded into the surface of 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.

Coal Seam. The same as a coal bed. It is 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 relatively steep slope separating level or gently slopping areas.

Flood Plain. A flat part of a river valley ordinarily above water but submerged when the river is in flood. It is an area where silt and clay are being deposited.

Glacial Drift. A general term that includes all the loose, unconsolidated materials that were deposited by the ice-sheet, or by the waters associated with it. Clay containing boulders usually forms a large part of the glacial drift in an area, and is called glacial till or boulder clay, and is not to be confused with the more general term glacial drift, which occurs in the following several forms:

(1) Terminal Moraine or Moraine. A ridge or series of ridges formed by glacial drift that was laid down at the margin of a moving ice-sheet. The surface is characterized by irregular hills and undrained basins.

(2) Kame Moraine. Assorted deposits of sand and gravel laid down at or close to the ice margin. The topography is similar to that of a terminal moraine.

(3) Ground Moraine. Boulder clay (till) laid down at the base of an ice-sheet. The topography may vary from flat to gently rolling.

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

(5) Glacial-lake Deposits. Sand, silt, and clay deposited in glacial lakes during the retreat of the ice-sheet.

Shoreline. A discontinuous escarpment, with intervening gravel beaches and bars, which indicates the former margin of a glacial lake.

Ground Water. The water in the zone of saturation below the water-table.

Hydrostatic Pressure. The pressure that causes water in a well to rise above the point at which it was first encountered in the well, namely, at the level of the aquifer.

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

Pervious or Permeable. Beds are pervious or permeable when they permit the perceptible passage or movement of ground water, as in the case of sands and gravels.

Pre-Glacial Land Surface. The surface of the land as it existed before the ice-sheet covered it with drift.

Recent Deposits. Deposits that have been laid down by the agencies of water and wind since the disappearance of the continental ice-sheet; for example, alluvium in stream valleys.

Sand Point or Driven Well. A sand point is a piece of perforated and screened pipe 2 or 3 feet long, which ends in a sharp point. It is fastened to lengths of ordinary pipe and forced down into surface deposits of a sandy or gravelly nature. The depth of such a well rarely exceeds 30 feet.

Unconsolidated Deposits. The mantle or covering of alluvium, pre-glacial soils, and glacial drift consisting of loose, unconsolidated material that overlies the bedrock.

Variegated. Beds so described show different colours in alternating beds or lenses.

Water-table. The upper limit of the part of the ground saturated with water. This may be near the surface or many feet below it. A water-table is said to be perched when a zone of saturated material is separated from the main water-table below by a zone or zones of unsaturated material.

Water-worked Till. Glacial till or boulder clay that has been subjected to water action, usually near the margins of glacial lakes, so that the fine clay has been washed out and a deposit that may be composed mainly of sand and gravel is left behind.

Wells. The term refers to any hole sunk in the ground by any means for the purpose of obtaining water. If no water is obtained they are referred to as dry holes. Wells yielding water are divided into four classes:

(1) Flowing Artesian Wells. Wells in which the water is under sufficient hydrostatic pressure to flow above the surface of the ground at the well.

(2) Non-flowing Artesian (Sub-artesian) Wells. Wells in which the water is under sufficient hydrostatic pressure to raise it above the level of the aquifer, but not above the level of the ground at the well.

(3) Non-artesian Wells. Wells in which the water does not rise above the water-table or the aquifer.

(4) Intermittent Non-artesian Wells. Wells that are generally dry for a part of each year.

#### GENERAL DISCUSSION OF GROUND WATER

Almost all the water recovered from beneath the earth's surface for both domestic and industrial uses is meteoric water, that is, water derived from the atmosphere. Most of this water reaches the surface as rain or snow. Part of it is carried off by streams as run-off; part evaporates either directly from the surface and from the upper mantle of soil, or indirectly through transpiration of plants; and the remainder sinks into the ground to be added to the ground-water supplies.

The proportion of the total precipitation that sinks into the ground will depend largely upon the type of soil or surface rock, and on the topography; more water will sink into sand and gravel, for example, than into clay; if, on the other hand, the region is hilly and dissected by numerous streams, more water will be immediately drained from the surface than in a relatively flat area. Light, continued precipitation will furnish more water to the underground supply than brief torrential floods, during which the run-off may be nearly equal to the precipitation. Moisture failing on frozen ground will not usually find its way below the surface, and, therefore, will not materially replenish the ground-water supplies. Light rains falling during the growing season may be wholly absorbed by plants. The quantity of moisture lost through direct evaporation depends largely upon temperature, wind, and humidity. Locally these deposits may become very extensive. The water-bearing properties of alluvial deposits are variable, but, in general, such deposits form favourable aquifers. They are porous, and readily yield a part of their contained water, although in places their porosity may be greatly reduced by the presence of fine silt and clay. This type of deposit may be expected to yield moderate domestic supplies through shallow wells, and larger supplies if the deposits are extensive.

In some areas of relatively steep slopes, valleys have been partly filled with sand and gravel, which, in turn, have been covered with impervious clay and silt. These circumstances commonly give rise to artesian conditions in the lower part of the valley.

## DISCUSSION OF WATER ANALYSES

Both the kind and quantity of mineral matter dissolved in a natural water depend upon the texture and chemical composition of the rocks with which the water has been in contact. Pollution is caused by contact with organic matter or its decomposition products. Analyses of well waters for mineral content are made by the Department of Health and Public Welfare, Winnipeg, and by the Bureau of Mines, Department of Mines and Resources, Ottawa.

As the ground-water survey of Manitoba progresses an effort is made to secure samples representative of each major aquifer encountered; the purpose of this is to compare the chemical characteristics of waters from the various geological horizons and, thereby, assist in making correlations of the strata in which the waters occur. The mineral content of natural waters is also of interest to the consumers, though the effects of the constituents are usually already apparent. The quantities of the various constituents for which tests are made are given as 'parts per million', which refers to the proportion by weight of each constituent in 1,000,000 parts of water. A salt when dissolved in water separates into two chemical units called 'radicals', and these are expressed as such in the chemical analyses. In one group are included the metallic elements of calcium (Ca), magnesium (Mg), sodium (Na), and iron (Fe), and in the other group are the sulphate ( $\text{SO}_4$ ), chloride (Cl), bicarbonate ( $\text{HCO}_3$ ), carbonate ( $\text{CO}_3$ ), and nitrate ( $\text{NO}_3$ ) radicals. The radicals listed in the analyses tabulated in the second part of this report can be combined to give the actual quantity of the particular salts present in the water, but this is not done here as the radicals alone give enough information to identify the water types. In fact, the sulphate, chloride, and carbonate radicals, plus the hardness, serve to identify a water, and crude field tests on the basis of these constituents were used in some areas to outline more completely zones of the various water types.

The following mineral constituents include all that are commonly found in natural waters in quantities sufficient to have any practical effect on the value of waters for ordinary uses:

Silica ( $\text{SiO}_2$ ) is dissolved in small quantities from almost all rocks. It is not objectionable except in so far as it contributes to the formation of boiler scale.

Iron (Fe) in combination is dissolved from many rocks as well as from iron sulphide deposits with which the water comes in contact. It may also be dissolved from well casings, water pipes, and other fixtures in quantities large enough to be objectionable, but separates as the hydrated oxide upon exposure of the water to the atmosphere. Excessive iron in water causes straining on porcelain or enamelled ware, and renders the water unsuitable for laundry purposes. Water is usually considered not potable if the iron content is more than 0.5 part per million.

Calcium (Ca) in the water comes from mineral particles present in the surface deposits, the chief sources being limestone, gypsum, and dolomite. Fossil shells provide a source of calcium, as does also the decomposition of igneous rocks. The common compounds of calcium are calcium carbonate ( $\text{CaCO}_3$ ) and calcium sulphate ( $\text{CaSO}_4$ ), neither of which have injurious effects on the consumer, but both of which cause hardness.

Magnesium (Mg) is a common constituent of many igneous rocks and, therefore, very prevalent in ground water. Dolomite, a carbonate of calcium and magnesium, is also a source of the element. The sulphate of



magnesia ( $MgSO_4$ ) combines with water to form 'Epsom salts,' and renders the water unwholesome if present in large amounts.

Sodium (Na) is derived from a number of the important rock-forming minerals, so that sodium sulphate and carbonate are very common in ground waters. Sodium sulphate ( $Na_2SO_4$ ) combines with water to form 'Glauber's salt' and excessive amounts make the water unsuitable for drinking purposes. Sodium carbonate ( $Na_2CO_3$ ) or 'black alkali' waters are mostly soft, the degree of softness depending upon the ratio of sodium carbonate to the calcium and magnesium salts. Waters containing sodium carbonate in excess of 200 parts per million are unsuitable for irrigation purposes<sup>1</sup>. Sodium sulphate is less harmful.

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<sup>1</sup>"The extreme limit of salts for irrigation is taken to be 70 parts per 100,000, but plants will not tolerate more than 10 to 20 parts per 100,000 of black alkali (alkaline carbonates and bicarbonates)". Frank Dixey, in 'A Practical Handbook of Water Supply', Thos. Murby & Co., 1931, p. 254.

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Sulphates ( $SO_4$ ) referred to in this report are those of calcium, magnesium, and sodium, and have been mentioned above in referring to these radicals. They are also formed by oxidation of iron sulphides, and, hence, it is not uncommon to find iron in sulphate waters. Sulphates cause permanent hardness in water, and injurious boiler scale. Sodium and magnesium sulphates are laxative when present in quantities of more than 900 parts per million. The writers found that acclimatized people could drink water containing as much as 2,000 parts per million of all three of the principal sulphates, but that when all were present in quantities over 1,500 parts per million the water was commonly laxative to those not accustomed to it.

Chloride (Cl) is a constituent of all natural waters and is dissolved in small quantities from rocks. Waters from wells that penetrate briner or salt deposits contain large quantities of chloride, usually as sodium chloride (common salt) and less commonly as calcium chloride and magnesium chloride. Sodium chloride is a characteristic constituent of sewage, and any locally abnormal quantity suggests pollution from this source. However, such abnormal quantities should not, in themselves, be taken as positive proof of pollution in view of the many sources from which chloride may be derived. Chlorides impart a salty taste to water if present much in excess of 500 parts per million. In southwestern Manitoba waters with as much as 3,000 parts per million of chloride are used domestically, though more than 1,500 parts per million is generally considered undesirable. The following figures apply to chlorides: stock will require less salt if the water bears 2,000 parts per million; more than 5,000 parts per million is unfit for human consumption; more than 8,000 parts per million is unfit for horses; more than 9,500 parts per million is too much for cattle; and more than 15,500 parts per million is excessive for sheep. Magnesium chloride, less common than sodium chloride, is very corrosive to metal plumbing.

Nitrates ( $NO_3$ ) found in ground water are decomposition products of organic materials; they are not harmful in themselves, but they do point to probable pollution. It is recommended that a bacterial test be made on water showing an appreciable nitrate content, if it is to be used for domestic purposes.

Carbonates ( $CO_3$ ) in water are indicated in the table of analyses as 'alkalinity'. Calcium and magnesium carbonate cause hardness in water, which may be partly removed by boiling. Sodium carbonate causes softness in waters, and is referred to under 'Sodium' above.

Bicarbonates ( $\text{HCO}_3$ ). Carbon dioxide dissolved in water renders the insoluble calcium and magnesium carbonates soluble as bicarbonates. The latter are decomposed by boiling the water, which changes them to insoluble carbonates.

Hardness is a condition imparted to waters chiefly by dissolved calcium and magnesium compounds. It here refers to the soap-destroying power of water, that is, to the amount of soap that must first be used to precipitate the above compounds before a lather is produced. The hardness of water in its original state is its total hardness, and is classified as 'permanent hardness' and 'temporary hardness'. Permanent hardness remains after the water has been boiled. It is caused by mineral salts that cannot be removed from solution by boiling, but it can be reduced by treating the water with natural softeners, such as ammonia or sodium carbonate, or with many manufactured softeners. Temporary hardness can be eliminated by boiling, and is due to the presence of bicarbonates of calcium and magnesium. Waters containing large quantities of sodium carbonate and small amounts of calcium and magnesium compounds are soft, but if the latter compounds are present in large quantities the water is hard. The following table<sup>1</sup> may

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<sup>1</sup>Thresh, J.C., and Bealo, J.F.: The Examination of Waters and Water Supplies; London, 1925, p. 21.

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be used to indicate the degree of hardness of a water:

Total Hardness

<u>Parts per million</u>	<u>Character</u>
0-50.....	Very soft
50-100.....	Moderately soft
100-150.....	Slightly hard
150-200.....	Moderately hard
200-300.....	Hard
300 + .....	Very hard

The above table gives the generally accepted figures for hardness, but the people of southwestern Manitoba have become accustomed to harder waters, and the following table, based on about 800 field determinations of hardness, by the soap method, is more applicable:

<u>Parts per million</u>	<u>Character</u>
0-100.....	Very soft
100-150.....	Soft
150-250.....	Moderately hard
250-350.....	Hard
350-500.....	Very hard
500+ .....	Excessively hard

Waters having a hardness of up to 300 parts per million are commonly used for laundry purposes. In southwestern Manitoba, hardness ranges from less than 50 parts per million to more than 2,500 parts per million.

PART II

TOWNSHIPS 1 TO 6, RANGES 10 TO 13, WEST  
PRINCIPAL MERIDIAN, MANITOBA

(Pilot Mound Area)

Introduction

An investigation of the ground-water resources of tps. 1 to 6, rges. 10 to 13, W. Princ. mer., was carried on by the writer during the field season of 1951. The account and map of the glacial geology were supplied by J. A. Elson.

Physical Features

The twenty-four townships investigated are a part of the upland just west of Pembina Mountain of the Manitoba escarpment. The surface slopes westward from the east side of the area at about 1,600 feet above sea-level and north from the International Boundary at around 1,550 feet, to the northwest corner, which stands at about 1,240 feet. In general the north half of the area is rolling, with 50 to 250 feet of relief, and the south half undulating, with about 20 feet of relief.

Geology

Table of Formations

Age	Formation	Character	Thickness (feet)
Recent	Alluvium	Stream-laid mud, silt, sand, and gravel	
Fleistocene	Glacial drift	Till, clay, boulders; assorted sand and gravel in outwash plains and eskers	0-100
Upper Cretaceous	Riding Mountain	Upper beds of medium to light grey, hard, siliceous shale (Odanah shale), with some thin layers of fine, blue sand and bentonite beds; lower beds of slippery clay shale that tend to slump	500 ±

Upper Cretaceous shales of the Riding Mountain formation underlie the Recent and Glacial deposits of the entire area but outcrop only along the sides of Pembina Valley, and of Rock and Pembina Lakes. The total thickness of the Riding Mountain formation is more than 1,000 feet but only the lower 400 feet or so are present in this area. The beds outcropping are the Odanah shale, a lithologic phase of the Riding Mountain formation and they consist of hard, siliceous, grey shale with a slight greenish cast when dry. In freshly exposed cuts the shale appears somewhat massive, but quickly weathers into fissile fragments. The hard siliceous phases, in places, are interbedded with softer bentonitic shale. The shales comprising Odanah beds characteristically show purple staining and numerous purple-stained concretions are irregularly distributed throughout the unit. The basal part of the Riding Mountain formation in this area is a clay shale that tends to slump. For further information on the bedrock geology, the reader is referred to the report of Wickenden.<sup>1</sup>

The bedrock surface slopes northwest, as does the topography. Numerous drumlinoid hills are present in the north half of the area and a few also in the south, notably Pilot Mound and Nebogwawin Butte.

The valley of Pembina River crosses the area from west to east, from the west side of tp. 3, rge. 13, swinging northeast to tp. 5, rge. 11, and then southeast to near the northeast corner of tp. 3, rge. 10. The flat valley floor is from 130 feet below the adjacent land surface in the west to about 250 feet in the east. Alluvial fans from streams made dams across the valley to form Rock Lake, Pembina Lake, and a small lake in sec. 29, tp. 4, rge. 10.

The surficial deposits in the northern part of the area are made up of about equal parts of end moraine, ground moraine, outwash, and silt. The end moraine is an interrupted belt of hummocky till and displaced bedrock extending east through tp. 4, rges. 13 to 10, and north into tp. 5, rges. 10 and 12; and north of this a plexus of hummocky till and ice-contact

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<sup>1</sup> Wickenden, R.T.D.: Mesozoic Stratigraphy of the Eastern Plains, Manitoba and Saskatchewan; Geol. Surv., Canada, Mem. 239, 1945.

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drift deposits. There are numerous eskers and kame-like deposits within the area of end moraine. Outwash deposits of sand, gravel, and silt, from 2 to 10 feet thick, and areas of poorly sorted silt that may be partly aeolian in origin also occur locally. The ground moraine is a layer, 2 to 20 feet thick, of till overlying bedrock and the presence of many stream-lined bosses (drumlinoids) indicate that the last continental glacier in this area moved towards the southeast. Small areas of clay and sand of deltaic or lake origin cover much of the north part of tp. 6, rge. 13, and here there is also an alluvial fan deposited by Cypress River. This alluvium is a poorly sorted silt, sand, and clay with some gravel containing shale pebbles. The gravel forms the bottom third of the alluvium deposit, which is at least 10 feet thick, and also some deposits perhaps formed along channels. A buried soil profile is situated 2 to 4 feet below the surface and this contains fossil oak logs, peat, and clam shells.

The thickness of the drift in the north half of the area is variable; the ground moraine is from a few inches to 20 feet thick and the end moraine and stratified drift are at least 100 feet thick. Most of the smooth hills have a core of bedrock (Odanah shale) but some are poorly sorted sand and gravel.

In the south half of the area, tps. 1 and 3, rges. 10 to 13, and tp. 4, rge. 10, the glacial and recent deposits are from 10 to 30 feet thick and they are on the average thicker in the west than in the east side. The deposits are about equal areas of ground moraine, silt, and outwash. There is washboard moraine in tp. 2, rge. 13. Ground moraine underlies both the silt and outwash and consists of a sheet of sandy-silty till up to 25 feet thick. It has a weathered buff appearance at the surface and the colour grades downward into grey at about 15 feet and below that depth clay is abundant. The silt deposits are thin, varying from 1 foot to 5 feet, and contain abundant sand and clay. This material probably was laid down in local ponds dammed by glacial ice but some may

be partly of aeolian origin. The outwash deposits are from 2 to 20 feet thick and include gravel, found mainly along the Pembina Valley, and sand and silt elsewhere. The washboard moraine in tp. 2, rge. 13, and vicinity is in the form of a series of discontinuous northeast trending ridges from 10 to 30 feet high and spaced at intervals of about 500 feet. Undrained depressions are abundant and though the ridges are sandy to silty till, the material below them is the typical ground moraine of the area.

Locally layers of boulders occur within the till. In these the boulders have their upper surfaces flattened and striated and probably were concentrated during an interglacial period of subaerial erosion. This boulder pavement at most exposures is between a sandy-clayey till below and a sandy to silty till above.

Eskers are widespread throughout the area. They are interrupted ridges of sand and shaly gravel up to a maximum of 30 feet high and 200 feet wide. Those in the south half of the area are generally less than 10 feet high and about a mile long. The sand and gravel may extend down into the till a few feet; in North Dakota stratified material has been found in the gaps in the eskers. Most eskers though apt to be shallow are nevertheless sources of ground water. Eskers in the north part of the area are generally somewhat larger than those in the south and are on top of other bodies of stratified drift. Many are on high ground, and there, are too well drained to be good aquifers.

#### Water Supply

Part of the precipitation falling as rain or snow runs off the surface to Pembina River and thence to Red River and the sea. Part of the precipitation percolates through the till to the surface of the bedrock where it moves laterally along the bedrock surface and some penetrates fractures in the bedrock. In its downward and lateral movements the water dissolves sulphates and carbonates from certain minerals in the

overburden and the bedrock. The dissolved sulphates of calcium and magnesium give the water an alkali taste.

Aquifers of the Riding Mountain formation are the best source of ground water. Bored wells, with diameters of 8 to 24 inches, at 50 feet or less in depth reach these sources in those areas where the thickness of the overburden is only from 1 foot to 30 feet. Deeper wells, 2 to 8 inches in diameter, may tap aquifers in which the water is under sufficient pressure to rise to points within 25 feet of the surface. Drilled wells, 200 feet or more in depth, tap aquifers in the bedrock that yield water carrying dissolved sodium, sulphate, and bicarbonate. Although these impart a bitter taste, the water is softer than that from shallower bedrock aquifers.

Most aquifers in the till are penetrated by dug wells less than 20 feet deep and from 4 to 6 feet in diameter. These provide a large wall area for infiltration of water and a large storage space for it between periods of pumping. Such wells yield from 2 to 10 gallons of water a minute and are equipped with hand pumps, though a few are equipped with small gasoline or electrically powered pumps. In recent years many owners have installed large capacity pumps and storage systems on these wells. Due to the abundance of rainfall in the period 1947-53 the supply has been maintained, but in dry seasons the large capacity pumps withdraw water faster than it can seep from the till into the well.

Lenses of sand or gravel in the till commonly yield sufficient water to supply a farm. These stratified deposits are limited in thickness and extent and are termed 'gravel streaks' or 'pockets' by drillers. They receive water from the till and make it more readily available to the well.

Permeable gravel and sand of outwash plains provide excellent ground water supplies that can be tapped by sandpoints.

Dugouts or dams are not required in this area as sufficient ground water for domestic and farm use is available even in years of limited rainfall.

Township 1, Range 10. The surface of the township is flat to uneven with the exception of three isolated hills, one of which, Nebogwawin Butte, rises approximately 100 feet above the surrounding area.

A supply of hard, clear water is available from fractured zones in bedrock that is overlain by overburden from 2 to 40 feet thick. Nine of the 57 wells recorded yield soft water.

The overburden is slightly permeable and yields water slowly. An excellent supply of potable ground water is present within a boulder pavement at the base of the overburden in sections 24 and 26.

Township 1, Range 11. The nearly flat to uneven surface of this township reflects the bedrock surface covered by from 8 to 30 feet of overburden. Long River crosses sections 6 and 7.

Wells dug, bored, or drilled to or into bedrock obtain an abundant supply of fresh water at depths of less than 150 feet. The quality of this water is variable but commonly the water from deep wells is softer. The shallow aquifers yield water that is alkali and unsatisfactory for domestic use but beneficial for stock.

In SW. $\frac{1}{4}$  sec. 18, three wells were drilled. One penetrated blue 'clay' and broken shale of the Riding Mountain formation to reach an aquifer at a depth of 318 feet that yields hard, clear water under sufficient pressure to rise in the well to within 14 feet of the surface. A second well, 300 feet distant, reached, at 270 feet, an aquifer of broken shale and gravel, within the Riding Mountain formation. This aquifer yields water of good quality that rises in the well to a point 14 feet from the surface of the ground. The third well, 208 feet deep, yields soft water.

Township 1, Range 12. The surface of the township is flat to uneven. Long River crosses the eastern part, entering in section 12 and leaving in section 35.

Ground moraine, which varies in thickness from 10 to 35 feet,



covers most of the township. Local patches of outwash and ice-contact stratified drift are excellent aquifers that can be reached by shallow-dug wells. Elsewhere the glacial deposits are unsatisfactory as a source of ground water.

The bedrock is the principal aquifer and wells drilled or bored into it yield a supply of water sufficient for 30 head of stock or more. These wells range in depth from 16 to 120 feet.

Forty-eight wells are recorded for the township. Eight yield soft water and these reach aquifers at depths of 100 feet or more in the bedrock.

Township 1, Range 13. The township is largely covered by ground moraine and outwash. The surface is rolling to uneven in the former case and flat to uneven in the outwash areas.

For a supply of ground water wells can be dug, bored, or drilled to the bedrock through from 10 to 35 feet of overburden, or drilled into bedrock never over 75 feet. Nine wells yield soft water. They are in the south part of the township where the overburden is pervious and allows for the direct percolation of the rainfall through it into the shale. Elsewhere the less pervious materials retard the movement of the ground water, which in its slower downward movement absorbs more salts from the overburden.

In the north part of the township the quality of the ground water is suitable for domestic and stock use except in those wells bordering the slough lands of sections 21, 22, 23, 26 and 27. Here slough waters percolate the shale to contaminate the wells.

Township 2, Range 10. The common aquifer of this township is the broken and fractured shale that underlies 8 to 20 feet of ground moraine and outwash silt deposits. Wells are dug to depths of 50 feet or less and each farm has a domestic well and a stock well.

In SE. $\frac{1}{4}$  sec. 34, 2 wells drilled 100 feet deep penetrate blue clay and yield just enough water for 15 head of stock. Test holes bored 60 to 110 feet deep in NW. $\frac{1}{4}$  sec. 25, reached aquifers in which the water was too alkali to use.

Wells drilled to depths of from 125 to 175 feet in sections 9 and 27, respectively, yield soft water.

Township 2, Range 11. The surface of the township is uneven to hilly, with isolated hills rising 35 to 50 feet above the surrounding plain. Two branches of the intermittent Crystal Creek cross the southwest quarter of the township.

The chief aquifer, the bedrock, is overlain by overburden that varies in thickness from 1 foot to 40 feet. An abundant supply of hard, clear, slightly alkali water is available from an aquifer at an average depth of 75 feet from the surface of the ground. Each farm has a domestic well and one or more stock wells.

Township 2, Range 12. Long River crosses the township from section 2 to section 31 in a valley from 1,000 to 2,000 feet wide and 25 to 30 feet deep cut through the overburden and into bedrock. Crystal Creek crosses the township from section 13 to section 34 in a valley from 2,000 to 4,000 feet wide and 10 to 15 feet deep. Both streams flow north.

Although outwash gravels cover most of the township, they are not of economic importance as aquifers. Wells are dug, bored, or drilled into the bedrock, where an abundant supply of hard, clear water is obtained. These wells are commonly less than 50 feet deep but others are recorded that are 80, 100, and 150 feet deep.

A well drilled 290 feet deep, in SE.  $\frac{1}{4}$  sec. 5, yields water under sufficient pressure to rise in the well to a point 40 feet from the surface. The water has a total hardness of 172 parts per million. Of the total 3,890 parts per million of dissolved solids 2,952 are sodium chloride. Therefore, the water is salty and although soft it is not satisfactory for laundry as the sodium chloride destroys the cleaning quality of the soap.

Township 2, Range 13. The surface of the township is rolling. The south half is largely covered with ground moraine and elsewhere end moraine and outwash gravels mantle the bedrock. The surface deposits vary in thickness from 20 to 50 feet. A sufficient supply of hard, alkali water is

obtained from aquifers in the bedrock that are reached by boring to depths of 40 to 80 feet.

In NE. $\frac{1}{4}$  sec. 26, a well drilled 205 feet deep yields an abundant supply of soft water that is under sufficient pressure to rise in the casing to a point 40 feet from the surface of the ground.

Township 3, Range 10. The surface of this township is rolling. Pembina River follows a valley 200 feet deep and approximately 1 mile wide across the northeast quarter of the township.

Ground moraine, from 5 to 25 feet thick, overlies the bedrock. It is an aquifer in sections 2, 3, 4, 5, 11, and 12, where wells 18 to 24 feet deep supply a sufficient quantity of hard, clear water from gravel and sand lenses. The ground moraine in the north part of the township is largely covered by outwash sand and gravel that is too thin to be of any consequence as an aquifer. Here wells are bored or drilled 60 to 80 feet into the bedrock. An abundant supply of potable water is available from such wells but those under 60 feet in depth fail during periods of drought.

In SE. $\frac{1}{4}$  sec. 23, a well 200 feet deep yields approximately 30 gallons of water a day, but the water is soft and sufficient for domestic needs.

Township 3, Range 11. Pilot Mound, a bedrock cored hill covered with ground moraine, rises 80 to 100 feet above the surrounding uneven to level plain of the township. The southeast part of the township is covered by a clayey silt, probably of outwash origin. The remainder of the township is covered by outwash sand and gravel except an area of end moraine along the north margin.

A sufficient supply of water is available from the shale underlying the overburden. Wells in the west half of the township are dug 25 to 30 feet deep whereas in the east half deeper bored wells are common.

Township 3, Range 12. Pembina River crosses the township in a broad valley about 1 mile wide and with walls rising 100 feet or more above the flat floor, and these are gullied by short streams.

The bedrock is mantled by outwash deposits that vary in thickness from 7 to 45 feet. North of the river outwash gravel and ice-contact stratified drift are excellent aquifers and there wells are dug from 18 to 50 feet deep. Sandpoints are also used where possible. Elsewhere a sufficient supply of hard, clear water is obtained from wells dug or bored 28 to 120 feet into bedrock.

Township 3, Range 13. Rock Lake occupies that part of Pembina Valley that crosses this township from section 18 to section 12.

North of Rock Lake an abundant supply of medium hard, clear water is obtained from outwash deposits of sand and gravel in which wells are dug or driven to less than 30 feet.

Ground water pumped from the bedrock in this township is commonly alkali. Drilled wells are 125, 285, 170, and 137 feet deep in sections 1, 2, 6, and 8. In NE.  $\frac{1}{4}$  sec. 13, a well drilled 123 feet reached a zone of sand at 118 feet below till. The water in this sand was under sufficient pressure to rise to the surface and overflow at a rate of 7 gallons a minute. In section 36 two wells drilled 110 and 176 feet deep, respectively, yield alkali water sufficient for 30 head of stock.

Township 4, Range 10. The broad valley of Pembina River crosses the township from section 31 to section 2. Wells are dug or bored through 10 to 25 feet of overburden to fractured bedrock. If the supply from this aquifer is limited, the wells are deepened on an average less than 50 feet. The water is hard, slightly alkali, and sufficient for domestic and stock needs.

Township 4, Range 11. Pembina Lake occupies that part of Pembina Valley crossing the northwest quarter of the township. The surficial deposits are largely sands and silts except for an area of end moraine in the southeast quarter, and ground moraine in the west part.

The chief aquifer is the bedrock, and a sufficient supply of hard, clear water is obtained from wells bored into it to depths of 25 to 100 feet. Local patches of sand or gravel yield a limited supply of water for domestic needs but such wells are not common.



Township 4, Range 12. Pembina River crosses the township from section 2 to section 24 and an intermittent tributary crosses the northwest quarter of the township to enter the Pembina in section 24.

Ice-contact stratified drift and lenses and pockets of gravel in the overburden are local but excellent aquifers. Where these are lacking wells dug less than 40 feet deep and to the surface of the shale yield an abundance of hard, clear water.

Aquifers at depths of 95 and 90 feet in the bedrock were encountered by wells drilled in sections 9 and 16 respectively.

Township 4, Range 13. The surface of this township is uneven to hilly with undrained depressions, some of which are filled with water, covering 3 or 4 acres of land.

The thickness of the overburden is variable, in the northeast quarter bedrock lies within 45 feet of the surface whereas in section 1 a test hole penetrated 106 feet of blue clay. Wells are commonly dug into ridges, lenses, or layers of sand and gravel. These wells are less than 40 feet deep and supply sufficient hard, clear water for domestic and stock need.

Township 5, Range 10. Ground and end moraine with outwash sand and silt cover this township. The surface is irregular with elongate ridges and drumlin-like hills. The thickness of the overburden varies from 10 to 20 feet and is underlain by shale.

The chief aquifers are in the fractured surface of the bedrock. Wells are bored 20 to 50 feet deep to the bedrock and a sufficient supply of hard, clear water is pumped from them. All farms in this township have adequate water from this source.

Township 5, Range 11. The greater part of this township is included in Swan Lake Indian Reserve No. 7. The surface is rolling, with extensive wooded areas.

Water is available from the bedrock, which is reached by wells dug or bored 15 to 75 feet. The deeper wells yield alkali water.

Township 5, Range 12. The surface of this township is rolling to hilly, with abandoned channels and undrained depressions.

Throughout the township a sufficient supply of water is obtained from shallow wells that are on the average 25 feet deep. These wells reach aquifers in the overburden or the fractured surface of the bedrock. A few wells have been bored 75 to 80 feet deep but in them the water encountered was alkali and hard.

Township 5, Range 13. Numerous sloughs and wooded areas are common in the north half of this township, which is largely covered by end moraine. The south half is more even being an area of ice-contact stratified drift and outwash gravel, sand, and silt.

Bedrock lies within 10 feet of the surface in section 6 whereas in section 23 a well penetrated 65 feet of overburden. A supply of ground water is available at the contact of the overburden and the bedrock.

Township 6, Range 10. This township lies within the Tiger Hills. Undrained basins lie at irregular intervals between the hills and drainage channels of intermittent streams cross the township affording natural drainage for run-off.

Wells dug to the bedrock yield an adequate supply of hard, clear water from local and widespread aquifers. Some wells penetrate the bedrock but throughout the township they are less than 60 feet deep.

Township 6, Range 11. This township lies within the Tiger Hills, a belt of wooded hills 100 to 200 feet high, and intervening undrained basins and marsh lands. Cypress River crosses the south part of the township.

The township is largely covered by ground moraine with outwash sand and gravel and ice-contact stratified drift. These are excellent aquifers that supply much of the ground water to the farms of the township. Elsewhere wells are dug or bored to the bedrock where an abundant supply of water is encountered at depths of from 20 to 86 feet.

Township 6, Range 12. The surface of this township is rolling to hilly. Ground moraine with associated ice-contact stratified drift largely covers the bedrock, which has been moulded into drumlin-like hills. Cypress River crosses the township, flowing west from section 2 to section 18 and then north to section 31.

Wells are dug less than 40 feet into either lenses of gravel in the ground moraine or ice-contact stratified drift. Where bedrock is within 20 feet of the surface a sufficient supply of water is obtained from shallow wells dug into it.

In NW. $\frac{1}{4}$  sec. 8 and NW. $\frac{1}{4}$  sec. 10, wells drilled from 107 and 120 feet deep yield alkali water from the bedrock.

Township 6, Range 13. The surface of the township is uneven to flat except a rolling to hilly tract of ground moraine in the south part.

In the north part which is largely covered by an alluvial fan deposited by Cypress River, wells are dug less than 40 feet into sand that yields an abundant supply of hard, clear water. Sandpoints are also used. In the area of ground moraine patches of outwash gravel or lenses of sand are the most favourable aquifers. However, some wells dug from 35 to 50 feet to bedrock yield alkali water.

In NW. $\frac{1}{4}$  sec. 12, a limited supply of water, 15 to 20 gallons a day, is obtained by pumping two wells, one 127 feet deep and the other 107 feet deep.

#### Discussion of Analyses

A general discussion of water analyses will be found on page 5 of this report. Thirty samples of ground water from the Pilot Mound area were analysed by the Industrial Waters Section, Mines Branch, Department of Mines and Technical Surveys, Ottawa.

No standards for the chemical composition of potable waters have been established in Canada. In the United States, however, the need for federal control of the quality of water used by interstate water carriers

led to the establishment by the American Public Health Service of the following partial list of chemical standards.

<u>Chemical constituent</u>	<u>Maximum concentration permitted (parts per million)</u>
Dissolved solids	500, (1,000 permitted if necessary)
Chloride (Cl)	250
Sulphate (SO <sub>4</sub> )	250
Magnesium (Mg)	125
Fluoride (F)	1.5
Iron and manganese	0.3

The 30 analyses included in this report fail to show any correlation between the chemical character of the water and the aquifer from which it was taken, except possibly in the case of magnesium. The concentration of magnesium in the waters from the deeper aquifers is notably less than in the case of the shallower aquifers. Also the non-carbonate hardness is negligible in the case of the deeper aquifers and the waters are softer.

That the character of the ground water within the same aquifer varies considerably even in short distances is illustrated by the analyses for samples NW. 24-2-12 and SE. 25-2-12 (See Table of Analyses of Ground Waters). These samples were collected from wells in Crystal City, Man., owned by J. E. Montgomery and N. E. Gorrell respectively. The wells are 82 and 85 feet deep, respectively, and reach the same aquifer.

# ANALYSES OF GROUND WATERS FROM Tps. 1 to 6, Rges, 10 to 13, W. Princ. mer. Man. (Pilot Mound Area)

#	Section	Township	Range	Meridian	Depth of well (feet)	Aquifer <sup>x</sup>	Conductance (micromhos 25°C)	Hardness (as CaCO <sub>3</sub> ) (pts. per million)			Constituents as analysed (parts per million)										
								Carbonate	Noncarbonate	Total	Alkalinity (as CaCO <sub>3</sub> )	Calcium (Ca)	Magnesium (Mg)	Sodium and Potassium (Na+K)	Bicarbonate (HCO <sub>3</sub> )	Sulphate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Silica (SiO <sub>2</sub> )	Ammonia (NH <sub>4</sub> )
SE	21	1	10	WPM	41	sh.	3368	372.0	54.6	426.6	372.0	89.7	49.3	628.0	453.8	1042.0	81.0	1.20	263.6	28.9	
SW	31	2	10	"	123	sh.	7205	496.4	9.1	505.5	496.4	140.8	37.5	1324.0	605.6	7.4	218.0	0.20	20.0	26.0	
SE	34	2	10	"	100	bc.	7854	340.0	1182.4	1522.4	340.0	233.6	228.4	1136.0	414.8	509.5	2259.0	0.32	10.0	8.3	
SW	33	3	10	"	122	sh.	3751	87.8	0.0	87.8	763.2	23.0	7.4	792.0	931.1	577.8	446.4	0.32	15.2	15.3	
SW	36	3	10	"	35	sh.	2681	364.8	229.1	593.9	364.8	168.4	42.0	392.0	445.1	861.8	49.8	0.80	266.0	26.0	
SW	15	5	10	"	54	sh.	1460	373.6	484.5	858.1	373.6	208.1	82.0	13.2	455.8	381.8	25.2	0.00	80.0	26.0	
SW	27	5	10	"	38	sh.	3625	257.6	1251.4	1509.0	257.6	366.4	144.6	199.6	314.3	424.6	312.2	1.00	848.0	27.5	
NW	30	5	10	"	75	sh.	1670	221.6	388.1	609.7	221.6	87.4	95.1	98.0	270.4	74.0	118.0	0.00	467.2	25.3	
NW	31	5	10	"	60	sh.	1586	307.0	317.0	624.0	307.0	169.0	49.2	102.8	374.5	134.2	152.0	0.40	252.0	31.5	
SE	15	6	10	"	22	sh.	1806	536.0	375.0	911.0	536.0	201.2	99.4	66.1	653.9	119.4	84.0	0.60	325.0	24.3	
SW	18	1	11	"	270	gr.	2738	430.5	0.0	430.5	458.0	128.3	26.7	466.5	558.8	481.5	357.0	0.20	5.0	21.0	
NW	13	3	11	"	45	sh.	3928	284.0	1104.9	1388.9	284.0	375.2	110.0	491.0	346.5	1684.0	200.0	1.20	170.0	27.5	
NE	8	4	11	"	25	sh.	1811	226.8	519.3	746.1	226.8	207.1	55.8	163.4	276.7	822.2	11.0	0.00	4.0	25.5	
SW	10	4	11	"	30	sh.	1421	400.0	71.4	471.4	400.0	104.9	51.0	147.4	488.0	172.0	57.0	0.20	160.0	26.8	
NE	22	4	11	"	68	sh.	1894	62.0	0.0	62.0	509.2	18.4	3.9	421.0	621.2	482.2	3.6	0.00	5.7	26.8	
NW	23	4	11	"	96	sh.	1901	45.9	0.0	45.9	586.0	13.6	2.9	441.0	714.9	422.2	5.5	0.60	6.0	23.8	
SW	27	4	11	"	80	sh.	3444	160.3	0.0	160.3	724.8	48.4	9.6	795.0	884.3	843.6	196.0	0.00	11.6		

x - Symbols used for aquifers: sh. - shale, Riding Mountain formation.  
 gr. - gravel, layer of gravel or sand in the Riding Mountain formation.  
 bc. - blue clay, glacial drift.

ANALYSES OF GROUND WATERS FROM Tps. 1 to 6, Rges. 10 to 13, W. Princ. mer. Man. (Pilot Mound Area)																					
#	Section	Township	Range	Meridian	Depth of well (feet)	Aquifer <sup>x</sup>	Conductance (micromhos 25°C)	Hardness (as CaCO <sub>3</sub> ) (pts. per million)			Constituents as analysed (parts per million)										
								Carbonate	Noncarbonate	Total	Alkalinity (as CaCO <sub>3</sub> )	Calcium (Ca)	Magnesium (Mg)	Sodium and Potassium (Na+K)	Bicarbonate (HCO <sub>3</sub> )	Sulphate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Silica (SiO <sub>2</sub> )	Ammonia (NH <sub>4</sub> )
NW	33	1	12	WPM	112	sh.	4291	105.4	0.0	105.4	523.0	108.0	31.9	848.0	638.1	784.4	676.0		7.0	27.3	6.7
SE	5	2	12	"	290	sh.	6978	172.4	0.0	172.4	631.6	42.9	15.7	1516.0	770.6	5.0	1962.0	0.0	0.0	23.5	trace
SE	6	2	12	"	40	sh.	8486	499.0	954.3	1393.3	499.0	311.0	440.4	1860.0	608.8	4491.4	109.0	0.4	65.2	28.8	
NW	24	2	12	"	82	sh.	2925	65.8	0.0	65.8	612.0	18.8	4.6	672.0	746.6	311.2	404.4	0.4	4.5	25.0	
SE	25	2	12	"	85	sh.	1536	328.0	0.0	328.0	344.0	87.8	26.5	239.2	419.7	430.4	36.6	0.4	4.0	20.5	
SE	7	4	12	"	41	sh.	3344	371.0	0.0	371.0	505.2	79.7	41.9	742.0	616.3	1321.0	11.4	0.6	0.0	25.8	1.8
SW	20	1	13	"	28	sh.	4157	481.0	908.0	1389.0	481.0	210.0	210.4	456.0	586.8	633.8	352.0		103.0	28.5	trace
NW	29	1	13	"	74	sh.	2498	462.0	363.1	825.1	462.0	202.0	78.1	345.0	563.6	991.8	46.8	0.6	2.5	26.8	trace
SE	36	1	13	"	90	sh.	2810	151.0	0.0	151.0	602.0	36.6	14.5	644.0	734.4	582.7	216.0		13.5	28.5	
SW	6	2	13	"	61	sh.	6224	488.0	0.0	488.0	604.8	110.9	51.4	1456.0	737.9	2392.6	330.0		0.0	20.5	
NE	26	2	13	"	205	sh.	5690	118.8	0.0	118.8	820.0	29.8	10.8	1220.0	1000.4	4.2	1416.0	0.2	0.0	22.5	
SW	1	3	13	"	125	sh.	3872	611.0	1415.0	2026.0	610.8	227.0	354.7	324.2	745.2	1945.8	354	0.6	3.0	24.8	
SW	2	3	13	"	285	sh.	4286	400.3	0.0	400.3	523.0	108.0	31.9	848.0	638.1	784.4	676.0		7.0	27.3	2.8

x - Symbols used for aquifers: sh. - shale, Riding Mountain formation.



Sample SW. 6-2-13 was taken from a bored well in Mather, Man., owned by A. L. Fulford. The analysis showed a concentration of 1430.0 ppm. sodium and 2392.6 ppm. sulphate. These constituents combine to produce sodium sulphate, which crystallizes from the water as the hydrate, Glauber's Salt. Needle-shaped crystals of Glauber's Salt line the inside of the wooden cribbing during wet seasons and rapidly dry and fall as a powder during drier seasons. Glauber's Salt is also commonly seen as a white precipitate on and near watering troughs.

The presence of nitrate in ground water may indicate organic contamination. It is recommended that water containing more than 45 ppm. of nitrate should not be used in feeding infants because of the danger of infant cyanosis (methemoglobinemia), resulting in the so-called blue baby.

The presence of fluoride in drinking water in excess of 1.5 ppm. may cause mottling of the enamel of teeth in young children, but fluoride in concentrations less than 1 ppm. is regarded by many as beneficial to the development of the teeth.

#### Record of Wells

The following table of well records has been prepared from drillers' records and data collected by the Geological Survey of Canada.

The following abbreviations are used:

Sec.	Section
Drl.	Drilled well
Brd.	Bored well
Drn.	Driven well (sandpoint)
R.M.	Riding Mountain formation
Dom.	Domestic use
Stk.	Stock use
Not	Not used
Mun.	Municipal use
#	Well from which sample was taken

REPRESENTATIVE WELL RECORDS, PILOT MOUND AREA, MANITOBA

Township 1 Range 10

Sec.	4	Type of well	Elev. (feet)	Depth (feet)	Depth to water (feet)	Depth to bedrock (feet)	Aquifer	Quality of water	Use	Remarks
1	NE	Dug	1,563	28	13	14	RM	Hard	Dom. Stk.	Sufficient supply
2	NE	Dug	1,584	28	7	12	RM	Hard	Dom. Stk.	Also three dug wells
3	NE	Brd.	1,592	85	16	-	RM	Hard	Dom. Stk.	Sufficient supply
4	NW	Dug	1,558	30	5	-	RM	Hard	Dom. Stk.	"
5	SE	Dug	1,553	14	-	-	Sand	Hard	Dom. Stk.	"
6	NE	Brd.	1,555	55	11	-	RM	Hard	Dom. Stk.	" for 30 head
7	NW	Dug	1,575	30	-	-	RM	Hard	Dom. Stk.	Also a dug well 30 ft. deep
8	NW	Drl.	1,589	99	25	-	RM	Hard	Dom. Stk.	Also a well 100 feet deep
9	SW	Brd.	1,558	45	30	-	RM	Hard	Dom. Stk.	Sufficient for 20 head
10	NE	Brd.	1,591	180	90	-	RM	Soft	Dom. Stk.	" 40 "
12	NE	Dug	1,563	40	12	-	RM	Hard	Dom. Stk.	Sufficient supply
13	NE	Drl.	1,566	175	20	-	RM	Hard	Dom. Stk.	Water at 91 feet.
15	NE	Brd.	1,593	35	20	-	RM	Hard	Dom. Stk.	Sufficient for 40 head
16	NW	Drl.	1,604	140	20	-	RM	Soft	Dom. Stk.	Sufficient supply.
17	NE	Dug	1,585	25	5	-	RM	Hard	Stk.	Sufficient for 60 head
18	SW	Brd.	1,576	28	12	2	RM	Hard	Dom. Stk.	" 15 "
19	NE	Dug	1,564	22	10	-	RM	Hard	Dom. Stk.	" 15 "
21	SE	Brd.	1,587	41	17	-	RM	Hard	Dom. Stk.	Sufficient supply
22	NW	Brd.	1,613	90	40	10	RM	Hard	Dom. Stk.	Sufficient for 70 head
23	SE	Drl.	1,573	35	5	-	RM	Hard	Dom. Stk.	New well
24	SE	Drl.	1,552	100	16	-	RM	Hard	Dom.	Also a bored well 85 ft. deep for stock
26	NE	Brd.	1,568	38	-	-	Till	Hard	Dom. Stk.	Water in zone of boulders at 33 feet
28	SE	Dug	1,553	22	10	4	RM	Hard	Dom. Stk.	Sufficient for 5 head only
29	NW	Brd.	1,607	57	35	-	RM	Hard	Dom.	Sufficient supply
31	NW	Brd.	1,557	45	20	-	RM	Hard	Dom. Stk.	"
32	NW	Brd.	1,565	100	12	-	RM	Hard	Stk.	Also a well dug 16 feet
33	SE	Brd.	1,573	30	10	-	RM	Soft	Dom.	
34	NE	Brd.	1,577	42	18	-	RM	Hard	Stk.	
35	NW	Drl.	1,579	60	18	18	RM	Hard	Dom. Stk.	Usually sufficient for 30 head
36	NE	Brd.	1,574	60	19	-	RM	Hard	Dom. Stk.	Sufficient for 30 head only

REPRESENTATIVE WELL RECORDS, PILOT MOUND AREA, MANITOBA

Township 1 Range 11

Sec.	1/4	Type of well	Elev. (feet)	Depth (feet)	Depth to water (feet)	Depth to bedrock (feet)	Aquifer	Quality of water	Use	Remarks
1	NE	Brd.	1,570	30	10	-	-	Hard	Dom. Stk.	Sufficient supply
2	NW	Brd.	1,563	42	20	24	RM	Hard	Dom. Stk.	" "
3	NW	Brd.	1,577	35	14	-	RM	Hard	Dom.	" "
4	SW	Brd.	1,563	92	11	-	RM	Hard	Stk.	Sufficient for 40 head
5	NW	Brd.	1,546	36	12	-	-	Hard	Stk.	Alkali water.
6	SE	Brd.	1,526	78	54	-	RM	Hard	Stk.	Sufficient for 40 head
8	SW	Brd.	1,547	33	12	-	RM	Hard	Dom. Stk.	Sufficient supply
10	NE	Brd.	1,585	85	30	20	RM	Hard	Dom. Stk.	" "
11	NE	Drl.	1,573	175	30	-	RM	Soft	Dom. Stk.	" "
13	SE	Drl.	1,573	86	12	20	RM	Hard	Dom. Stk.	" "
14	NW	Brd.	1,566	60	20	25	RM	Hard	Dom. Stk.	Sufficient for 50 head
15	SW	Brd.	1,572	56	17	-	RM	Hard	Dom. Stk.	" " 30 "
16	SE	Brd.	1,559	75	30	-	RM	Soft	Dom. Stk.	" " 20 "
17	NW	Brd.	1,553	40	15	-	RM	Hard	Stk.	" " 30 "
18	SW	Drl.	1,516	270	15	-	-	Hard	Dom.	Drawdown 40 feet
20	SE	Brd.	1,550	60	13	10	RM	Soft	Stk.	Also a drilled well over 150 feet deep
21	NW	Brd.	1,546	60	12	8	RM	Hard	Dom. Stk.	" "
22	NE	Brd.	1,572	70	44	-	RM	Hard	Dom. Stk.	Sufficient for 50 head
23	NW	Brd.	1,573	39	12	-	-	Hard	Dom.	" "
24	SE	Brd.	1,518	34	9	-	-	Hard	Dom. Stk.	Sufficient supply
25	SE	Dug	1,544	10	3	-	Gravel	Hard	Dom.	" "
26	NW	Brd.	1,569	80	20	-	RM	Hard	Dom. Stk.	Sufficient for 80 head
27	SW	Brd.	1,543	40	20	-	RM	Hard	Dom. Stk.	" " 25 "
28	NE	Brd.	1,540	52	20	-	RM	Hard	Dom. Stk.	" " 40 "
29	SW	Brd.	1,533	40	-	-	RM	Hard	Dom. Stk.	" " 50 "
30	NE	Brd.	1,537	35	25	32	RM	Hard	Dom. Stk.	Sufficient supply
31	SE	Brd.	1,544	72	38	8	RM	Hard	Dom.	Also a stock well 90 feet deep
32	NE	Brd.	1,477	38	21	-	RM	Hard	Dom. Stk.	Sufficient supply
35	NW	Drl.	1,546	28	-	-	RM	Hard	Dom.	Well at Eton School
36	NW	Brd.	1,554	39	17	-	-	Hard	Dom. Stk.	" "

REPRESENTATIVE WELL RECORDS, PILOT MOUND AREA, MANITOBA

Township 1, Range 12

Sec.	1/4	Type of Well	Elev. (feet)	Depth (feet)	Depth to water (feet)	Depth to bedrock (feet)	Aquifer	Quality of water	Use	Remarks
2	NE	Brd.	1,553	66	17	-	RM	Hard	Dom. Stk.	Sufficient supply
4	SE	Brd.	1,557	68	23	-	RM	Hard	Dom. Stk.	Sufficient for 10 head
6	NE	Brd.	1,569	35	6	-	RM	Hard	Stk.	Sufficient supply
7	NW	Brd.	1,564	45	20	35	RM	Hard	Dom. Stk.	Sufficient for 25 head
10	NW	Drl.	1,546	113	12	-	RM	Soft	Dom. Stk.	Sufficient supply
12	NE	Drl.	1,516	100	13	-	RM	Hard	Dom. Stk.	Also a well 47 feet deep
13	NW	Dug	1,516	21	12	18	RM	Hard	Dom. Stk.	Sufficient supply
14	NE	Drl.	1,516	107	27	-	RM	Soft	Dom. Stk.	"
16	NE	Brd.	1,532	40	20	-	RM	Hard	Dom. Stk.	Sufficient for 25 head
17	NE	Brd.	1,551	59	18	-	RM	Hard	Dom. Stk.	Temperature of water 42°F
18	NE	Brd.	1,551	60	-	-	RM	hard	Dom. Stk.	Sufficient for 35 head
19	NE	Brd.	1,545	120	7	-	-	Soft	Dom. Stk.	Sufficient supply
20	SE	Brd.	1,540	55	10	-	RM	Hard	Dom. Stk.	Sufficient for 20 head
21	NE	Brd.	1,539	30	12	18	RM	Hard	Dom. Stk.	Sufficient supply
22	SW	Brd.	1,533	50	15	-	RM	Hard	Dom. Stk.	"
23	NE	Brd.	1,516	40	32	-	Till	Hard	Dom. Stk.	"
24	NE	Brd.	1,508	28	-	-	RM	Hard	Dom. Stk.	Stock well 40 feet deep
25	SW	Drl.	1,519	16	12	10	RM	Hard	Dom. Stk.	Sufficient supply
27	SE	Brd.	1,518	44	17	-	-	Hard	Dom. Stk.	"
28	NW	Brd.	1,524	40	18	-	RM	Hard	-	Alkali water
29	NW	Brd.	1,536	46	19	-	RM	Hard	Dom. Stk.	Temperature of water 39°F
30	NE	Brd.	1,536	42	12	-	-	Hard	Not	
31	SE	Brd.	1,543	60	45	-	RM	Hard	Dom. Stk.	Sufficient Supply
32	NE	Brd.	1,518	46	-	-	RM	Hard	Dom. Stk.	350 gals. a day (approx.)
33	NW	Drl.	1,519	112	30	-	RM	Hard	Dom. Stk.	Sufficient for 45 head
34	SW	Brd.	1,513	40	14	-	RM	Hard	Stk.	House well 23 feet deep
35	NW	Brd.	1,495	90	-	-	RM	Hard	Dom. Stk.	Sufficient supply
36	NW	Drl.	1,504	75	20	-	RM	Soft	Dom.	Stock well 70 feet deep

REPRESENTATIVE WELL RECORDS, PILOT MOUND AREA, MANITOBA

Township 1, Range 13

Sec.	1/4	Type of Well	Elev. (feet)	Depth (feet)	Depth to water (feet)	Depth to bedrock (feet)	Aquifer	Quality of water	Use	Remarks
1	NE	Brd.	1,608	65	12	9	RM	Soft	Dom. Stk.	Sufficient supply
4	NW	Brd.	1,563	50	25	-	RM	Soft	Dom. Stk.	Sufficient for 30 head
5	NW	Brd.	1,544	56	10	-	RM	Hard	Dom. Stk.	Sufficient supply
6	NW	Drl.	1,551	200	20	32	RM	Soft	Dom. Stk.	Sufficient for 70 head
7	NE	Drl.	1,549	32	20	-	-	Hard	Stk.	" " 30 "
8	NW	Dug	1,554	16	12	-	Drift	Hard	Dom.	Sufficient supply
9	NW	Drl.	1,549	140	20	20	RM	Soft	Stk.	Sufficient for 30 head
10	NW	Drl.	1,572	187	40	15	RM	Soft	Dom. Stk.	Sufficient supply
11	NW	Brd.	1,570	53	12	18	RM	Soft	Stk.	" "
12	NE	Brd.	1,569	142	30	-	RM	Hard	Dom. Stk.	" "
14	NW	Brd.	1,566	60	15	-	RM	Hard	Stk.	House well 40 feet deep
15	SW	Brd.	1,560	45	16	6	RM	Hard	Dom. Stk.	Sufficient for 35 head only
16	NW	Brd.	1,552	43	12	-	RM	Hard	Dom.	
17	SE	Dug	1,541	25	9	-	RM	Hard	Dom.	
18	NW	Brd.	1,536	37	15	33	RM	Hard	Not	Also a well 35 feet deep
19	NW	Dug	1,525	17	4	-	Drift	Hard	Dom. Stk.	Sufficient for 40 head
20	SW	Dug	1,539	28	16	-	-	Hard	Dom. Stk.	Sufficient supply
23	NW	Brd.	1,547	40	8	-	-	Hard	Not	Also a well 60 feet deep
24	SW	Brd.	1,567	75	45	-	RM	Hard	Dom. Stk.	Sufficient for 100 head
27	NE	Brd.	1,552	60	20	-	RM	Hard	Dom. Stk.	" " 25 "
28	NW	Brd.	1,549	63	40	-	RM	Hard	Dom. Stk.	Sufficient supply
29	NW	Drl.	1,543	74	16	-	RM	Hard	Not	Also a well 85 feet deep
30	NE	Dug	1,532	46	15	15	RM	Hard	Dom. Stk.	Sufficient for 30 head
31	NE	Dug	1,525	38	11	14	RM	Hard	Dom. Stk.	" " 40 "
32	SW	Brd.	1,521	60	40	-	RM	Hard	Dom. Stk.	" " 30 " only
33	SW	Brd.	1,536	76	14	60	Rif	Hard	Dom. Stk.	Sufficient supply
34	SE	Brd.	1,549	63	16	-	RM	Hard	Dom. Stk.	Sufficient for 30 head only
35	NW	Brd.	1,548	70	30	-	RM	Hard	Dom. Stk.	Sufficient supply
36	SE	Drl.	1,547	90	40	-	RM	Hard	Dom.	

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 REPRESENTATIVE WELL RECORDS, PILOT MOUND AREA, MANITOBA  
 Township 2, Range 10

Sec.	1/4	Type of Well	Elev. (feet)	Depth (feet)	Depth to water (feet)	Depth to bedrock (feet)	Aquifer	Quality of water	Use	Remarks
1	SW	Drl.	1,573	100	25	-	RM	Soft	Dom.	Stock well 80 feet deep
2	SW	Brd.	1,579	50	18	10	RM	Hard	Stk.	House well bored 45 feet
3	SE	Brd.	1,592	32	17	-	-	Hard	Not	
4	NE	Brd.	1,568	35	20	-	RM	Soft	Dom.	Sufficient for 40 head
5	SE	Dug	1,572	30	10	18	RM	Hard	Stk.	Sufficient for 40 head
6	NE	Brd.	1,570	50	18	15	RM	Hard	Dom.	Sufficient supply
7	SW	Brd.	1,574	48	18	13	RM	Hard	Dom.	Sufficient supply
9	SE	Drl.	1,560	175	40	-	RM	Soft	Dom.	Sufficient supply
10	SW	Brd.	1,568	30	10	-	RM	Hard	Stk.	Sufficient supply
12	SE	Brd.	1,564	73	20	12	RM	Hard	Dom. S	Stock well 24 feet deep
13	NE	Dug	1,588	25	9	-	-	Hard	Dom.	A dugout for stock
14	NW	Dug	1,565	45	35	-	-	Hard	Dom.	Sufficient for 20 head only
15	SE	Drl.	1,572	54	12	-	RM	Hard	Dom.	Sufficient supply
16	NE	Brd.	1,558	60	30	-	RM	Hard	Stk.	House well 28 feet deep
17	NE	Brd.	1,546	35	20	-	-	Hard	Dom.	Sufficient for 25 head
18	NE	Brd.	1,547	50	35	-	RM	Hard	Stk.	Alkali water
20	NW	Dug	1,549	27	20	-	RM	Hard	Dom.	Sufficient supply
21	SE	Dug	1,545	30	-	-	RM	Hard	Dom.	Sufficient for 30 head
22	NE	Brd.	1,559	18	10	-	Gravel	Hard	Dom.	Also a well 48 feet deep
26	SE	Brd.	1,568	75	10	-	RM	Hard	Not	Also a dug well 30 feet deep
27	SE	Drl.	1,560	122	4	-	RM	Soft	Dom.	Stock well 70 feet deep
28	SW	Dug	1,547	16	15	16	RM	Hard	Stk.	
29	NW	Brd.	1,563	43	20	-	RM	Hard	Dom.	Sufficient for 25 head
30	SW	Drl.	1,553	18	16	-	-	Hard	Dom.	Sufficient supply
31	SW	Drl.	1,543	128	20	-	RM	Hard	Dom.	Sufficient for 20 head
32	NE	Brd.	1,557	30	11	-	-	Hard	Dom.	Sufficient supply
33	NE	Brd.	1,548	50	20	18	RM	Hard	Dom.	Also a dug well 20 feet deep
34	SE	Drl.	1,558	100	15	-	Till	Hard	Dom.	Yields approx. 50 gals. per day
36	SW	Dug	1,557	13	8	-	-	Hard	Not	



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 REPRESENTATIVE WELL RECORDS, PILOT MOUND AREA, MANITOBA  
 Township 2, Range 11

Sec.	1/4	Type of Well	Elev. (Feet)	Depth (feet)	Depth to water (feet)	Depth to bedrock (feet)	Aquifer	Quality of water	Use	Remarks
1	NE	Brd.	1,562	46	11	-	RM	Hard	Dom. Stk.	Sufficient supply
2	NW	Brd.	1,551	35	27	1	RM	Hard	Dom. Stk.	Alkali water
4	NW	Brd.	1,513	50	-	-	-	Hard	Stk.	Used only in winter months
5	NE	Brd.	1,516	35	-	-	-	Hard	Dom. Stk.	
6	NW	Dug	1,516	25	17	-	RM	Hard	Dom. Stk.	Sufficient for 30 head
7	NE	Dug	1,507	35	12	-	RM	Hard	Dom.	Crystal Creek crosses farm
9	NW	Dug	1,511	35	-	-	RM	Hard	Stk.	House well 90 feet deep
10	SE	Brd.	1,548	25	18	-	RM	Hard	Dom.	Sufficient supply
11	SW	Brd.	1,545	26	13	-	RM	Hard	Dom. Stk.	Sufficient supply
12	SE	Brd.	1,570	47	19	-	RM	Hard	Dom. Stk.	Sufficient supply
14	NE	Brd.	1,543	30	15	15	RM	Hard	Dom.	Also a stock well 44 feet deep
15	NW	Brd.	1,556	50	15	10	RM	Hard	Not	
17	NE	Dug	1,515	28	25	27	RM	Hard	Dom.	Also a stock well 28 feet deep
18	NW	Brd.	1,512	18	5	-	RM	Hard	Stk.	
19	NW	Brd.	1,516	42	10	40	RM	Hard	Dom. Stk.	Sufficient supply
20	SW	Brd.	1,514	43	15	26	RM	Hard	Dom. Stk.	Well dug in 1951
21	SE	Dug	1,531	24	9	-	-	Hard	Dom.	Sufficient supply
22	SW	Brd.	1,555	21	13	-	-	Hard	Dom.	
24	SW	Dug	1,539	47	7	-	-	Hard	Not	Also a stock well 26 feet deep
25	SW	Brd.	1,545	36	13	-	-	Hard	Dom.	Also a stock well 58 feet deep
26	SW	Brd.	1,549	65	-	-	RM	Hard	Stk.	Sufficient for 40 head
27	NW	Drl.	1,540	80	25	-	RM	Hard	Dom.	Sufficient supply
28	NE	Brd.	1,532	47	13	-	RM	Hard	Dom. Stk.	Sufficient supply
29	NW	Brd.	1,523	54	18	-	RM	Hard	Dom. Stk.	Sufficient supply
30	NW	Dug	1,486	45	32	3	RM	Hard	Stk.	Drilled well 70 feet deep
31	SW	Dug	1,519	80	25	3	RM	Hard	Stk.	Sufficient for 40 head
32	NE	Brd.	1,516	25	7	-	-	Hard	Stk.	Also a house well 20 feet deep
33	NE	Brd.	1,535	53	20	-	-	Hard	Dom. Stk.	Sufficient supply
34	SE	Drl.	1,545	70	-	-	RM	Hard	Dom.	Yields about 100 gallons a day
36	NE	Brd.	1,543	40	12	10	RM	Hard	Stk.	Also a well bored 50 feet

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 REPRESENTATIVE WELL RECORDS, PILOT MOUND AREA, MANITOBA  
 Township 2, Range 12

Sec.	+	Type of well	Elev. (feet)	Depth (feet)	Depth to water (feet)	Depth to bedrock (feet)	Aquifer	Quality of water	Use	Remarks
1	NE	Drl.	1,515	35	14	7	RM	Soft	Dom.	Also a stock well bored 50 feet
2	SW	Brd.	1,596	80	-	-	RM	Hard	Dom. Stk.	
3	NW	Brd.	1,511	30	20	10	RM	Hard	Dom.	Also a well drilled 150 feet
4	SW	Brd.	1,519	100	35	-	RM	Hard	Dom. Stk.	Sufficient for 45 head
5	SE	Drl.	1,523	290	-	-	RM	Hard	Stk.	House well over 100 feet deep
6	SE	Brd.	1,518	40	10	40?	RM	Hard	Dom.	Sufficient supply
7	SE	Brd.	1,520	43	9	-	RM	Hard	Not	Well bored in 1951
8	SE	Dug	1,509	25	11	-	RM	Hard	Dom.	Also a stock well 41 feet deep
9	NW	Brd.	1,507	65	19	-	RM	Soft	Stk.	Sufficient for 20 head
12	NW	Brd.	1,523	66	15	5	RM	Hard	Dom. Stk.	Sufficient supply
13	SW	Brd.	1,518	80	60	-	RM	Hard	Stk.	Sufficient supply
14	SE	Brd.	1,513	100	20	-	RM	Hard	Stk.	Sufficient for 50 head
15	SW	Drl.	1,522	150	-	-	RM	Soft	Dom. Stk.	Dug several dry holes
16	SW	Dug	1,504	36	29	-	RM	Hard	Not	Alkali water
17	SE	Brd.	1,486	50	-	8	RM	Hard	Stk.	Also a house well bored 37 feet
18	NW	Brd.	1,496	26	5	-	RM	Hard	Dom. Stk.	Two such wells
19	SE	Brd.	1,498	42	12	-	RM	Hard	Dom. Stk.	Sufficient supply
20	NW	Drl.	1,492	80	-	-	RM	Hard	Dom. Stk.	Sufficient for 20 head
21	NW	Brd.	1,501	42	27	-	-	Hard	Dom.	Sufficient supply
22	NE	Brd.	1,511	37	20	-	RM	Hard	Dom.	Also a stock well 35 feet deep
23	NE	Brd.	1,510	60	40	-	RM	Hard	Stk.	Water is salty; waters 15 head
24	NE	Brd.	1,503	70	20	20	RM	Hard	Stk.	Sufficient supply
26	NE	Brd.	1,524	56	40	-	Till	Hard	Dom. Stk.	
27	SW	Brd.	1,500	65	50	-	RM	Hard	Dom. Stk.	Sufficient supply
28	NW	Brd.	1,508	43	22	-	Till	Hard	Dom. Stk.	Sufficient supply
30	SW	Brd.	1,491	39	28	-	RM	Soft	Dom. Stk.	Well beside a creek
31	SW	Brd.	1,514	72	25	-	RM	Hard	Dom. Stk.	Sufficient for 200 head
32	SE	Brd.	1,509	42	17	41	RM	Hard	Dom. Stk.	Sufficient supply
33	NE	Brd.	1,518	40	35	-	RM	Hard	Dom. Stk.	Sufficient for 20 head
36	SE	Drl.	1,517	80	20	18	RM	Hard	Dom.	Also a stock well 40 feet deep

REPRESENTATIVE WELL RECORDS, PILOT MOUND AREA, MANITOBA  
Township 2, Range 13

Sec.	1/4	Type of Well	Elev. (feet)	Depth (feet)	Depth to water (feet)	Depth to bedrock (feet)	Aquifer	Quality of water	Use	Remarks
1	NE	Brd.	1,535	55	20	-	RM	Hard	Dom.	Also a stock well bored 60 feet
2	SW	Brd.	1,543	40	15	-	RM	Hard	Stk.	Sufficient for 20 head
3	NE	Brd.	1,523	80	35	-	RM	Hard	Dom.	Sufficient for 40 head
4	NW	Drl.	1,545	56	20	12	RM	Hard	Dom.	Sufficient supply
5	NW	Brd.	1,527	40	15	--	RM	Hard	Dom.	Sufficient supply
6	SW	Brd.	1,519	55	25	12	RM	Hard	Dom.	
7	NE	Brd.	1,546	27	17	-	Sand	Hard	Stk.	Sufficient for 40 head
8	SE	Brd.	1,523	40	20	-	RM	Hard	Dom.	Sufficient for 30 head
10	SW	Brd.	1,530	52	16	-	RM	Hard	Not	
11	SW	Brd.	1,528	70	34	-	RM	Hard	Dom.	Sufficient supply
13	NE	Brd.	1,506	40	15	-	RM	Hard	Dom.	Sufficient for 15 head
15	NE	Dug	1,516	19	10	-	RM	Hard	Dom.	Sufficient for 25 head only
16	NE	Brd.	1,549	70	20	-	RM	Hard	Dom.	Sufficient supply
17	SE	Brd.	1,534	30	18	-	Till	Hard	Dom.	Sufficient for 25 head
18	NE	Brd.	1,534	50	20	-	-	Hard	Dom.	Sufficient for 30 head
19	SW	Drl.	1,533	104	20	-	RM	Soft	Dom.	Sufficient 40 head
22	NW	Drl.	1,518	80	18	22	RM	Soft	Dom.	Also a stock well 65 feet deep
24	NE	Drl.	1,594	50	20	-	RM	Hard	Dom.	Sufficient supply
26	NE	Drl.	1,506	205	8	-	RM	Hard	Dom.	Also a dug well 52 feet deep
27	SE	Brd.	1,521	44	17	-	-	Hard	Dom.	
28	SE	Brd.	1,507	70		-	RM	Soft	Dom.	Sufficient for 100 head
29	NW	Brd.	1,527	71	24	-	RM	Hard	Dom.	Sufficient supply
30	NW	Brd.	1,532	66	25	-	RM	Hard	Dom.	Well for stock 85 feet
32	NW	Brd.	1,522	80	60	-	RM	Hard	Dom.	Sufficient for 20 head only
33	SW	Brd.	1,525	56	25	-	RM	Hard	Dom.	Also a well 56 feet deep
34	SE	Brd.	1,527	60	45	-	-	Hard	Dom.	Sufficient for 40 head
35	NW	Brd.	1,508	47	20	-	RM	Hard	Dom.	Sufficient supply

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 REPRESENTATIVE WELL RECORDS, PILOT MOUND AREA, MANITOBA  
 Township 3, Range 10

Sec.	1/4	Type of Well	Elev. (feet)	Depth (feet)	Depth to water (feet)	Depth to bedrock (feet)	Aquifer	Quality of water	Use	Remarks
1	NW	Brd.	1,556	64	8	-	Sand	Hard	Stk.	Sufficient supply
2	NW	Brd.	1,551	20	-	-	-	Hard	Dom.	Stock well 24 feet deep
3	NW	Dug	1,547	18	8	-	-	Hard	Dom.	Sufficient supply
4	SW	Dug	1,559	23	20	-	Sand	Hard	Dom.	Well 32 feet deep for stock
5	NW	Drl.	1,562	200	27	20	RM	Soft	Dom.	Sufficient supply
6	SW	Brd.	1,549	22	18	12	RM	Hard	Dom.	Also stock well bored 70 feet
7	SW	Dug	1,545	14	-	-	RM	Hard	Dom.	Sufficient supply
8	SW	Brd.	1,583	110	40	-	RM	Hard	Dom.	Sufficient for 25 head
9	SE	Brd.	1,546	85	20	-	RM	Hard	Dom.	Sufficient for 35 head
10	SW	Dug	1,547	30	4	20	RM	Hard	Dom.	Stock well 45 feet deep
12	SE	Dug	1,550	25	20	-	Sand	Hard	Dom.	Abundant supply
13	SW	Brd.	1,540	60	40	-	RM	Hard	Stk.	Also a house well 12 feet deep
14	SW	Dug	1,563	28	17	-	-	Hard	Dom.	Sufficient supply
15	NW	Brd.	1,578	60	25	3	RM	Hard	Dom.	Sufficient for 40 head
16	NE	Brd.	1,541	20	10	5	RM	Hard	Dom.	Sufficient supply
17	SE	Brd.	1,548	96	48	-	RM	Hard	Stk.	Sufficient supply
19	SW	Dug	1,566	20	-	-	RM	Hard	Dom.	Also a stock well 200 feet
20	NE	Brd.	1,566	90	24	-	RM	Hard	-	Alkali water
21	NW	Brd.	1,575	80	25	-	RM	Hard	Dom.	Alkali water
22	SE	Dug	1,576	26	6	-	RM	Hard	Dom.	Sufficient supply
23	NW	Brd.	1,533	80	-	-	RM	Hard	Dom.	Sufficient supply
27	SE	Brd.	1,564	57	12	8	RM	Hard	Dom.	Sufficient supply
28	SE	Drl.	1,578	86	29	-	-	Hard	-	Water in gravel at 86 feet
29	SE	Drl.	1,578	70	-	-	RM	Hard	Dom.	Sufficient for 50 head only
30	SW	Drl.	1,547	195	40	-	RM	Hard	Stk.	Domestic well 21 feet
32	NE	Drl.	1,553	110	55	-	RM	Soft	-	Domestic well 24 feet
33	SW	Drl.	1,569	122	74	-	RM	-	-	-
36	NW	Dug	1,532	69	30	-	Gravel	Hard	Dom.	Sufficient supply
36	NE	Brd.	1,527	75	56	6	RM	Hard	Dom.	Sufficient supply

REPRESENTATIVE WELL RECORDS, PILOT MOUND AREA, MANITOBA  
Township 3, Range 11

Sec.	1/4	Type of Well	Elev. (feet)	Depth (feet)	Depth to water (feet)	Depth to bedrock (feet)	Aquifer	Quality of water	Use	Remarks
1	SE	Brd.	1,547	50	12	-	RM	Hard	Not Stk.	
2	SW	Brd.	1,516	49	8	-	RM	Hard	Stk.	
3	NE	Brd.	1,562	120	10	-	RM	Hard	Stk.	Sufficient supply
4	NW	Drl.	1,540	90	25	-	RM	Hard	Stk.	Also a bored well 35 feet
5	NE	Brd.	1,535	29	14	17	RM	Hard	Dom. Stk.	Sufficient supply
6	SE	Brd.	1,509	35	15	10	RM	Soft	Stk.	
7	NE	Dug	1,535	35	20	30	RM	Hard	Dom. Stk.	Sufficient supply
8	NE	Drl.	1,529	70	20	-	RM	Hard	Dom. Stk.	Also a dug well 15 feet deep
10	NE	Dug	1,530	23	7	-	RM	Hard	Dom. Stk.	
11	SW	Brd.	1,532	55	7	15	RM	Hard	Stk.	Also a well 21 feet deep
13	SE	Dug	1,553	22	16	16	RM	Hard	Dom. Stk.	Also a well 30 feet deep
15	NW	Brd.	1,526	29	16	-	-	Hard	Dom.	Sufficient supply
17	SW	Dug	1,524	32	22	-	RM	Hard	Dom.	Also a stock well 40 feet deep
18	SW	Dug	1,483	26	20	16	RM	Hard	Dom.	" " " 40 "
19	NE	Dug	1,491	25	14	-	RM	Hard	Dom.	Sufficient supply
20	SE	Brd.	1,561	50	40	-	RM	Hard	Dom. Stk.	" " " for 25 head
22	NW	Dug	1,538	30	25	-	-	Hard	Stk.	Salty water
24	NE	Drl.	1,547	100	32	-	RM	Hard	Stk.	Sufficient supply
25	NE	Brd.	1,545	43	9	-	RM	Hard	Dom.	" " " "
28	SE	Dug	1,524	21	14	-	-	Hard	Stk.	
29	NE	Dug	1,542	24	10	-	-	Hard	Dom. Stk.	Sufficient for 50 head
30	NW	Dug	1,529	25	20	-	RM	Hard	Dom.	Also a stock well 40 feet deep
31	SE	Drl.	1,522	30	20	-	RM	Hard	Dom. Stk.	Sufficient supply
32	NE	Dug	1,530	20	12	-	RM	Hard	Dom. Stk.	" " " "
33	SE	Brd.	1,551	38	20	-	RM	Hard	Dom. Stk.	Sufficient for 40 head
34	SW	Brd.	1,557	40	25	5	RM	Hard	Dom. Stk.	Sufficient supply
35	NE	Dug	1,546	25	14	-	Gravel	Hard	Dom. Stk.	" " " "
36	NW	Drl.	1,543	80	25	-	RM	Hard	Dom. Stk.	Three wells on farm

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 REPRESENTATIVE WELL RECORDS, PILOT MOUND AREA, MANITOBA  
 Township 3, Range 12

Sec.	1/4	Type of Well	Elev. (feet)	Depth (feet)	Depth to water (feet)	Depth to bedrock (feet)	Aquifer	Quality of Water	Use	Remarks
1	SW	Dug	1,514	56	53	-	- RM	Hard	Dom. Stk.	Aquifer of fine sand
2	NE	Brd.	1,534	28	18	-	RM	Hard	Dom. Stk.	Three wells on farm
3	NE	Dug	1,507	22	12	12	RM	Hard	Dom. Stk.	Sufficient supply
4	SW	Drl.	1,509	34	23	24	RM	Hard	Not	Well at Oak School
5	NE	Dug	1,479	16	14	-	Gravel	Hard	Dom. Stk.	Sufficient supply
9	NW	Dug	1,474	17	8	13	RM	Hard	Dom. Stk.	Sufficient supply
10	NE	Drl.	1,527	45	40	45	RM	Hard	Dom. Stk.	Also a stock well 45 feet deep
11	NW	Brd.	1,513	24	14	-	-	Hard	Not	
12	SE	Dug	1,521	20	17	8	RM	Hard	Dom. Stk.	Also a stock well 60 feet deep
14	SW	Dug	1,511	20	12	-	-	Hard	Dom. Stk.	Sufficient supply
18	NE	Dug	1,455	20	18	-	Gravel	Hard	Dom. Stk.	"
19	SW	Brd.	1,477	24	20	-	Sand	Hard	Dom. Stk.	Also a sandpoint 22 feet deep
20	NW	Dug	1,466	18	-	-	Gravel	Hard	Dom. Stk.	Sufficient supply
21	SW	Dug	1,477	21	16	-	Gravel	Hard	Dom. Stk.	
22	SE	Dug	1,489	24	12	-	RM	Hard	Not	
23	SE	Brd.	1,495	30	18	-	RM	Hard	Dom.	Also a similar well for stock
24	SE	Brd.	1,487	22	17	-	RM	Hard	Dom.	Also a stock well 18 feet deep
26	NE	Drl.	1,459	85	30	-	RM	Soft	Stk.	House well 35 feet deep
28	SE	Drl.	1,450	120	30	-	RM	Soft	Dom. Stk.	Sufficient supply
30	NW	Dug	1,524	55	53	-	Till	Hard	Dom. Stk.	Sufficient supply
32	SE	Brd.	1,582	45	-	-	Till	Hard	Dom. Stk.	0-18 feet sand, 18-45 feet blue clay
33	SW	Brd.	1,491	35	30	-	Gravel	Hard	Dom. Stk.	Spring in ravine on section
35	NW	Brd.	1,438	12	6	-	-	Hard	Dom. Stk.	
36	NW	Dug	1,506	45	24	-	RM	Hard	Dom. Stk.	Sufficient supply



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 REPRESENTATIVE WELL RECORDS, PILOT MOUND AREA, MANITOBA  
 Township 3, Range 13

Sec.	1/4	Type of Well	Elev. (feet)	Depth (feet)	Depth to water (feet)	Depth to bedrock (feet)	Aquifer	Quality of Water	Use	Remarks
1	SW	Brd.	1,510	125	70	-	RM	Hard	Dom. Stk.	Sufficient supply
2	SW	Drl.	1,498	285	57	-	RM	Hard	Dom. Stk.	"
4	NW	Brd.	1,515	65	20	-	-	Soft	Dom. Stk.	"
5	SW	Brd.	1,531	60	20	-	Sand	Hard	Dom. Stk.	Sufficient supply
6	NW	Drl.	1,530	170	50	-	RM	Hard	Dom. Stk.	A drilled well for stock
7	SE	Brd.	1,515	76	30	50	RM	Hard	Dom. Stk.	Sufficient supply
8	SW	Brd.	1,486	137	-	-	-	Hard		Well flowed
13	NE	Drl.		123	-	-	Sand	Hard		Formerly flowed 7 gals. per minute
20	NE	Drn.	1,485	20	-	-	Sand	Hard	Dom. Stk.	Sufficient supply
22	NW	Dug	1,480	15	5	-	Sand	Hard	Dom. Stk.	Sufficient supply
25	NE	Dug	1,504	35	30	-	Sand	Hard	Dom. Stk.	"
27	NE	Drn.	1,485	13	-	-	Sand	Hard	Dom. Stk.	Sufficient for 40 head
30	NW	Dug	1,509	50	25	-	Sand	Hard	Dom. Stk.	Sufficient supply
31	SW	Dug	1,510	27	17	-	Drift	Hard	Dom. Stk.	"
31	SE	Brd.	1,532	33	21	-	Drift	Hard	Dom. Stk.	"
31	NE	Dug	1,560	57	48	-	Drift	Hard	Dom. Stk.	"
32	SW	Dug	1,511	36	20	-	Drift	Hard	Dom. Stk.	"
32	SE	Dug	1,514	38	32	38	RM	Hard	Dom. Stk.	"
33	SW	Drn.	1,501	18	-	-	Sand	Hard	Dom. Stk.	Sufficient for 25 head
34	SE	Drn.	1,492	27	-	-	Sand	Hard	Dom. Stk.	Sufficient supply
36	SW	Drl.	1,522	110	40	-	-	Hard	Dom. Stk.	Sufficient for 30 head
36	SE	Drl.	1,538	176	-	-	-	Hard	Dom. Stk.	Sufficient supply



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 REPRESENTATIVE WELL RECORDS, PILOT SOUND AREA, MANITOBA  
 Township 4, Range 10

Sec.	1/4	Type of Well	Elev. (feet)	Depth (feet)	Depth to water (feet)	Depth to bedrock (feet)	Aquifer	Quality of Water	Use	Remarks
1	SE	Brd.	1,509	45	20	-	RM	Hard	Dom. Stk.	Sufficient supply
4	SE	Brd.	1,534	113	63	-	RM	Hard	Dom. Stk.	"
5	SW	Brd.	1,551	56	16	20	RM	Hard	Stk.	Also a bored well 45 feet deep
6	SW	Brd.	1,544	57	33	-	RM	Hard	Stk.	Sufficient supply
8	NW	Dug	1,497	24	20	-	Drift	Hard	Dom.	Also a dug well 20 feet deep
9	SE	Drl.	1,535	66	35	10	RM	Hard	Stk.	Sufficient for 40 head
9	NE	Brd.	1,512	80	25	-	RM	Hard	Stk.	Also a dug well 55 feet deep
10	NW	Drl.	1,547	120	30	-	RM	Hard	Stk.	Also a house well 60 feet deep
12	SE	Brd.	1,525	20	10	-	-	Hard	Dom.	
13	SE	Brd.	1,534	28	19	-	RM	Hard	Dom. Stk.	Sufficient supply
17	SW	Brd.	1,537	32	15	10	RM	Hard	Dom. Stk.	Sufficient supply
18	SW	Brd.	1,568	36	26	-	RM	Hard	Dom. Stk.	"
20	SW	Dug	1,469	25	-	-	RM	Hard	Dom.	Also a well 22 feet deep for stock
22	NW	Brd.	1,534	30	-	-	RM	Hard	Dom. Stk.	Sufficient for 30 head
24	NE	Brd.	1,528	48	27	-	RM	Hard	Dom.	Sufficient supply
25	NW	Dug	1,581	45	25	-	RM	Hard	Dom. Stk.	Sufficient for 15 head only
26	NE	Brd.	1,566	35	-	-	-	Hard	Dom.	Also a drilled well
27	NE	Dug	1,546	10	6	10	RM	Hard	Stk.	
28	NE	Brd.	1,521	12	5	-	-	Hard	Dom. Stk.	Sufficient for 15 head
32	SE	Brd.	1,507	45	30	-	Drift	Hard	Dom. Stk.	Sufficient supply
33	NW	Brd.	1,543	21	9	-	Drift	Hard	Dom.	Also a stock well 20 feet deep
34	NW	Brd.	1,543	20	16	-	RM	Hard	Dom.	Sufficient supply
34	SE	Drl.	1,553	29	8	10	RM	Hard	Dom.	Sufficient for 30 head
35	NW	Brd.	1,587	56	30	-	RM	Hard	Dom. Stk.	
36	SW	Brd.	1,573	35	15	-	RM	Hard	Dom. Stk.	Sufficient supply

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 REPRESENTATIVE WELL RECORDS, PILOT MOUND AREA, MANITOBA  
 Township 4, Range 11

Sec.	+	Type of Well	Elev. (feet)	Depth (feet)	Depth to water (feet)	Depth to bedrock (feet)	Aquifer	Quality of Water	Use	Remarks
1	SE	Dug	1,537	70	10	25	RM	Soft	Not	Water has a sulphur odour
2	SE	Dug	1,552	13	7	-	Drift	Hard	Dom.	
3	NW	Brd.	1,553	53	31	-	RM	Hard	Dom.	Sufficient supply
4	NE	Brd.	1,537	36	14	-	-	Hard	Dom.	"
6	SW	Brd.	1,506	38	9	37	RM	Hard	Dom.	Also a well 50 feet
8	NE	Brd.	1,505	25	5	-	RM	Hard	Dom.	Also a stock well dug 14 feet
9	SW	Brd.	1,522	25	-	10	RM	Hard	Dom.	Sufficient for 20 head
10	SW	Brd.	1,533	30	12	-	RM	Hard	Dom.	Sufficient supply
11	NW	Dug	1,538	43	11	-	-	Hard	Dom.	Sufficient for 30 head
12	SE	Brd.	1,531	88	14	48	RM	Hard	Dom.	Bored a dry hole 72 feet deep
13	SE	Brd.	1,577	56	44	50	RM	Hard	Dom.	Sufficient supply
14	SE	Dug	1,505	23	13	-	Sand	Hard	Dom.	"
15	SW	Brd.	1,527	18	4	-	RM	Hard	Dom.	Waters 55 head of stock
16	NW	Brd.	1,548	43	15	-	RM	Hard	Dom.	Sufficient for 40 head
17	NE	Dug	1,545	25	15	5	RM	Hard	Dom.	Sufficient supply
18	SE	Drl.	1,502	69	57	-	RM	Hard	Dom.	Sufficient for 10 head only
19	SE	Dug	1,513	11	7	-	RM	Hard	Dom.	Sufficient for 50 head
20	SW	Dug	1,521	20	5	6	RM	Hard	Dom.	-
21	SE	Brd.	1,538	24	16	10	RM	Hard	Dom.	Sufficient supply
22	NE	Drl.	1,501	68	20	-	RM	Hard	Dom.	Sufficient supply
23	NW	Drl.	1,497	96	40	-	RM	Soft	Dom.	"
24	NW	Dug	1,479	18	5	-	Sand	Hard	Dom.	Also a dug well 11 feet deep
25	SW	Dug	1,474	30	15	-	Sand	Hard	Dom.	Sufficient supply
26	NE	Dug	1,473	27	8	-	RM	Hard	Dom.	"
27	SW	Drl.	1,501	80	-	-	RM	Hard	Dom.	"
28	SW	Drl.	1,516	100	25	30	RM	Soft	Dom.	"
29	SW	Brd.	1,511	84	30	-	RM	Hard	Dom.	.
30	SE	Dug	1,508	22	19	18	RM	Hard	Dom.	Sufficient supply
34	SE	Dug	1,487	19	14	-	Sand	Hard	Dom.	Stock well 34 feet deep
35	NW	Dug	1,470	12	-	-	RM	Hard	Dom.	Sufficient supply

REPRESENTATIVE WELL RECORDS, PILOT MOUND AREA, MANITOBA  
Township 4, Range 12

Sec.	1/4	Type of Well	Elev. (feet)	Depth (feet)	Depth to water (feet)	Depth to bedrock (feet)	Aquifer	Quality of water	Use	Remarks
1	NE	Brd.	1,491	54	16	-	Sand	Hard	Dom. Stk.	Sufficient for 40 head only
3	NW	Dug	1,482	8	-	-	Drift	Hard	Dom. Stk.	Sufficient supply
4	NE	Dug	1,532	25	-	-	Gravel	Hard	Dom. Stk.	
5	NE	Dug	1,514	22	18	-	Drift	Hard	Dom. Stk.	Sufficient supply
6	SE	Drl.	1,487	41	6	-	Drift	Hard	Dom. Stk.	Also a dug well 32 feet deep
7	SE	Brd.	1,473	41	11	39	RM	Hard	Dom. Stk.	Sufficient supply
8	SE	Dug	1,493	37	15	-	-	Hard	Dom. Stk.	Sufficient for 25 head
9	NE	Drl.	1,547	95	33	-	RM	Hard	Dom. Stk.	Drilled well for stock
10	SW	Brd.	1,533	40	21	-	-	Hard	Dom. Stk.	Sufficient supply
12	SE	Brd.	1,589	22	10	-	Drift	Hard	Dom. Stk.	Also a well 21 feet deep
15	NW	Dug	1,491	32	20	-	Till	Hard	Dom. Stk.	Sufficient supply
16	SE	Drl.	1,511	90	-	-	-	Hard	Dom. Stk.	Alkali water
17	SE	Dug	1,475	13	8	-	Drift	Hard	Dom. Stk.	Drilled well at house
18	SE	Drl.	1,459	70	20	-	-	Hard	Dom. Stk.	Sufficient for 30 head
19	SW	Brd.	1,454	44	14	-	-	Hard	Not	Two other such wells
20	NE	Drl.	1,440	60	35	32	RM	Hard	Stk.	Two other dug wells near creek
21	SE	Dug	1,468	24	14	-	Drift	Hard	Dom. Stk.	Sufficient supply
22	NW	Dug	1,483	22	18	-	Drift	Hard	Dom. Stk.	Sufficient for 50 head
22	NW	Brd.	1,477	32	15	-	-	Hard	Dom. Stk.	Well at Dry River School
25	NW	Dug	1,478	10	5	-	Drift	Hard	Dom. Stk.	Sufficient supply
26	NW	Brd.	1,490	93	45	-	RM	Hard	Stk.	Also a house well 30 feet deep
27	NW	Dug	1,462	55	40	-	Drift	Hard	Dom. Stk.	Sufficient supply
30	SE	Brd.	1,443	65	30	-	RM	Hard	Dom. Stk.	Sufficient for 60 head
32	NE	Dug	1,461	36	33	-	RM	Hard	Dom. Stk.	Sufficient supply
33	NE	Dug	1,460	25	10	-	Drift	Hard	Dom. Stk.	Sufficient supply
34	NW	Dug	1,501	23	18	16	RM	Hard	Dom. Stk.	Sufficient supply
35	NE	Dug	1,498	20	6	-	Drift	Hard	Dom. Stk.	Sufficient supply

REPRESENTATIVE WELL RECORDS, PILOT MOUND AREA, MANITOBA  
Township 4, Range 13

Sec.	1/4	Type of Well	Elev. (feet)	Depth (feet)	Depth to water (feet)	Depth to bedrock (feet)	Aquifer	Quality of water	Use	Remarks
1	SW	Dug	1,479	12	6	-	Sand	Hard	Dom. Stk.	Three other dug wells 33 feet deep
2	NE	Dug	1,474	33	20	-	Till	Hard	Dom. Stk.	Sufficient supply
3	SE	Dug	1,488	10	3	-	Till	Hard	Dom. Stk.	Sufficient supply
5	NW	Dug	1,524	30	22	-	Till	Hard	Dom. Stk.	Sufficient supply
8	NE	Dug	1,451	18	8	-	Till	Hard	Dom. Stk.	Sufficient supply
9	SE	Dug	1,450	12	-	-	Drift	Hard	Dom. Stk.	Sufficient supply
10	SW	Dug	1,457	12	7	-	Gravel	Hard	Dom. Stk.	Two dug wells
11	NE	Dug	1,457	12	4	-	Till	Hard	Dom. Stk.	Sufficient supply
12	SE	Dug	1,455	13	7	-	Till	Hard	Dom. Stk.	Sufficient supply
13	SW	Dug	1,459	22	20	-	Sand	Hard	Dom. Stk.	Also a stock well 15 feet deep
14	NE	Dug	1,460	32	25	-	Drift	Hard	Dom. Stk.	Also a stock well 12 feet deep
15	NE	Dug	1,453	34	25	-	Till	Hard	Dom. Stk.	Sufficient supply
16	SW	Brd.	1,441	50	17	-	Till	Hard	Dom. Stk.	Sufficient supply
21	SE	Brd.	1,441	20	10	-	Gravel	Hard	Dom. Stk.	Sufficient supply
22	NW	Brd.	1,442	28	14	-	Till	Hard	Dom. Stk.	Sufficient supply
24	NE	Dug	1,433	42	17	30	RM	Hard	Dom. Stk.	Sufficient supply
25	SE	Drl.	1,433	100	15	-	RM	Hard	Dom. Stk.	Sufficient for 40 head
26	SW	Dug	1,439	45	15	45	RM	Hard	Dom. Stk.	Sufficient supply
27	SW	Dug	1,436	20	-	-	Drift	Hard	Dom. Stk.	Stock well 60 feet deep
29	SW	Dug	1,436	31	20	-	Drift	Hard	Dom. Stk.	Sufficient supply
30	NW	Dug	1,419	8	4	-	Drift	Hard	Dom. Stk.	Sufficient supply
31	SW	Dug	1,427	16	12	-	Sand	Hard	Dom. Stk.	Sufficient supply
32	NW	Dug	1,424	13	10	-	Drift	Hard	Dom. Stk.	Nitrate contamination
33	NW	Dug	1,422	14	7	-	Drift	Hard	Dom. Stk.	Sufficient supply
34	NW	Dug	1,428	33	20	-	Sand	Hard	Dom. Stk.	Sufficient for 15 head only
35	NW	Brd.	1,421	60	30	-	RM	Hard	Stk.	Sufficient for 50 head
36	SE	Brd.	1,436	50	20	-	RM	Hard	Dom. Stk.	Sufficient supply

REPRESENTATIVE WELL RECORDS, PILOT MOUND AREA, MANITOBA

Township 5, Range 10

Sec.	1/4	Type of Well	Elev. (feet)	Depth (feet)	Depth to water (feet)	Depth to bedrock (feet)	Aquifer	Quality of water	Use	Remarks
1	NE	Brd.	1,572	40	20	-	RM	Hard	Dom. Stk.	Sufficient supply
3	NE	Dug	1,600	35	21	36	Drift	Hard	Dom. Stk.	Also a house well 36 feet deep
4	NE	Brd.	1,568	52	32	-	RM	Hard	Dom. Stk.	Sufficient supply
6	SW	Dug	1,531	40	20	-	RM	Hard	Dom.	Also a stock well 40 feet deep
8	SW	Dug	1,535	40	35	-	RM	Hard	Dom.	Also a stock well 40 feet deep
9	SW	Brd.	1,527	36	21	22	RM	Hard	Dom. Stk.	Sufficient supply
10	NE	Brd.	1,571	30	13	-	Drift	Hard	Dom.	Sufficient supply
11	NW	Brd.	1,578	32	13	-	-	Hard	Dom.	Bertram school well
12	SE	Dug	1,581	44	25	-	Drift	Hard	Stk.	Alkali water
13	NE	Brd.	1,554	30	28	-	RM	Hard	Dom. Stk.	Three wells on farm
15	SW	Brd.	1,566	54	37	-	-	Hard	Dom. Stk.	Bored a well 90 feet
16	NE	Dug	1,591	32	16	-	RM	Hard	Dom. Stk.	Sufficient for 20 head
19	NW	Brd.	1,548	60	50	-	RM	Hard	Dom. Stk.	Sufficient supply
20	SW	Dug	1,572	30	24	10	RM	Hard	Dom. Stk.	Sufficient supply
21	SW	Dug	1,571	13	6	8	RM	Hard	Dom.	Sufficient supply
22	NW	Dug	1,624	24	12	-	-	Hard	Dom.	Sufficient supply
23	NW	Dug	1,560	16	10	-	RM	Hard	Dom. Stk.	Sufficient supply
24	SE	Dug	1,560	80	30	-	RM	Hard	Dom. Stk.	Sufficient for 25 head
25	NE	Dug	1,543	20	14	6	RM	Hard	Dom. Stk.	Also a well dug 18 feet deep
27	SE	Brd.	1,576	38	18	-	RM	Hard	Stk.	
28	NW	Dug	1,644	38	12	-	RM	Hard	Dom.	A bored well 111 feet deep
29	SW	Dug	1,575	48	18	-	RM	Hard	Dom. Stk.	Sufficient for 30 head
30	NW	Brd.	1,581	75	30	14	RM	Hard	Dom. Stk.	Sufficient supply
31	NW	Brd.	1,590	60	35	10	RM	Hard	Dom. Stk.	Sufficient supply
32	SE	Dug	1,624	22	12	-	RM	Hard	Dom. Stk.	Also a well 68 feet deep
34	SW	Dug	1,541	34	30	-	RM	Hard	Dom. Stk.	Sufficient supply
35	SE	Brd.	1,545	60	20	-	RM	Hard	Dom. Stk.	Sufficient supply
36	SE	Dug	1,538	25	20	-	RM	Hard	Dom. Stk.	Also a well 60 feet deep

REPRESENTATIVE WELL RECORDS, PILOT MOUND AREA, MANITOBA  
Township 5, Range 11

Sec.	1/4	Type of Well	Elev. (feet)	Depth (feet)	Depth to water (feet)	Depth to bedrock (feet)	Aquifer	Quality of water	Use	Remarks
7	SW	Brd.	1,553	67	45	-	RM	Hard	Dom.	Sufficient supply
12	SE	Brd.	1,494	50	30	-	RM	Hard	Dom. Stk.	Sufficient for 40 head
13	SW	Brd.	1,505	30	20	-	Drift	Hard	Dom. Stk.	Sufficient supply
13	NW	Dug	1,465	18	15	-	RM	Hard	Dom. Stk.	Sufficient supply
18	SE	Dug	1,488	24	15	-	Drift	Hard	Dom. Stk.	Sufficient supply
19	NE	Dug	1,497	26	23	-	RM	Hard	Dom. Stk.	Sufficient supply
24	NW	Dug	1,499	16	14	-	RM	Hard	Dom. Stk.	Also a stock well dug 32 feet deep
25	SE	Dug	1,534	14	12	-	RM	Hard	Dom. Stk.	Sufficient for 15 head
25	NE	Dug	1,523	35	17	-	RM	Hard	Dom. Stk.	Also a stock well 25 feet deep
26	SW	Dug	1,512	25	22	-	RM	Hard	Dom. Stk.	Also a dug well 18 feet deep
27	NW	Dug	1,498	21	18	-	-	Hard	Dom.	Sufficient supply
28	NW	Brd.	1,513	50	45	-	Drift	Hard	Dom. Stk.	Sufficient for 10 head
29	SW	Dug	1,516	41	38	7	RM	Hard	Dom. Stk.	Sufficient supply
31	SW	Dug	1,437	63	58	30	RM	Hard	Dom.	Two wells
31	NW	Dug	1,438	15	13	-	RM	Hard	Dom. Stk.	Also a well dug 22 feet deep
33	NW	Dug	1,489	42	32	40	RM	Hard	Dom. Stk.	Sufficient supply
34	SW	Dug	1,517	45	40	-	Sand	Hard	Dom. Stk.	Sufficient supply
35	SE	Dug	1,544	75	-	30	RM	Hard	Dom. Stk.	Two other wells 20 and 40 feet deep
36	SW	Dug	1,537	18	10	-	-	Hard	Dom. Stk.	Sufficient supply
36	NE	Brd.	1,551	17	9	-	RM	Hard	Dom.	Also a stock well 24 feet deep



REPRESENTATIVE WELL RECORDS, PILOT MOUND AREA, MANITOBA

Township 5, Range 12

Sec.	1/4	Type of Well	Elev. (feet)	Depth (feet)	Depth to water (feet)	Depth to bedrock (feet)	Aquifer	Quality of water	Use	Remarks
1	NW	Dug	1,491	16	10	30	Drift	Hard	Dom.	Also a stock well bored 80 feet deep
2	NE	Drl.	1,498	68	24	-	RM	Hard	Dom.	Well at Mariapolis Hotel
3	SE	Brd.	1,496	21	12	-	Drift	Hard	Dom.	Sufficient supply
3	NW	Dug	1,476	22	10	-	Till	Hard	Dom.	Sufficient for 25 head
4	NE	Dug	1,496	14	10	-	Sand	Hard	Dom.	Sufficient supply
5	NW	Dug	1,434	32	10	-	Drift	Hard	Dom.	Sufficient supply
6	NW	Drl.	1,420	45	30	-	Till	Hard	Dom.	Sufficient supply
8	SW	Brd.	1,462	40	20	-	Drift	Hard	Dom.	Also a dug well 30 feet deep
10	SW	Dug	1,467	15	12	-	Drift	Hard	Dom.	Sufficient supply
11	NE	Dug	1,492	10	8	-	Drift	Hard	Dom.	Sufficient for 10 head
12	SW	Brd.	1,513	70	26	30	RM	Hard	Dom.	Poor quality water
14	NE	Dug	1,480	12	10	-	Gravel	Hard	Dom.	Sufficient for 50 head
16	SE	Dug	1,467	12	7	-	RM	Hard	Dom.	Sufficient supply
17	NW	Brd.	1,483	35	8	-	RM	Hard	Dom.	Sufficient supply
18	SE	Dug	1,478	33	28	-	Till	Hard	Dom.	Sufficient for 25 head only
21	SE	Dug	1,443	21	11	-	-	Hard	Dom.	Sufficient supply
22	NW	Dug	1,430	26	16	-	RM	Hard	Dom.	Sufficient supply
23	SW	Dug	1,477	15	10	-	Till	Hard	Dom.	Sufficient for 15 head
24	SE	Dug	1,514	20	10	-	Drift	Hard	Dom.	Sufficient supply
26	NW	Dug	1,448	35	33	-	RM	Hard	Dom.	Sufficient supply
27	NE	Dug	1,433	24	15	-	-	Hard	Dom.	Two other wells 24 feet deep
28	NW	Dug	1,386	12	7	-	RM	Hard	Dom.	Sufficient supply
29	SE	Dug	1,413	25	14	-	RM	Hard	Dom.	Sufficient supply
30	NW	Dug	1,394	32	28	-	Drift	Hard	Dom.	Sufficient supply
31	NW	Dug	1,397	25	18	-	-	Hard	Dom.	Sufficient supply
32	SE	Dug	1,383	30	-	-	-	Hard	Dom.	Sufficient supply
33	NE	Brd.	1,421	56	39	-	RM	Hard	Dom.	Sufficient supply
34	NW	Dug	1,365	12	9	-	RM	Hard	Dom.	Sufficient supply



REPRESENTATIVE WELL RECORDS, PILOT MOUND AREA, MANITOBA

Township 5, Range 13

Sec.	1/4	Type of Well	Elev. (feet)	Depth (feet)	Depth to water (feet)	Depth to bedrock (feet)	Aquifer	Quality of water	Use	Remarks
2	NE	Brd.	1,410	22	18	20	RM	Hard	Dom.	Well at Greenway Store
2	NE	Brd.	1,410	86	36	-	RM	Hard	-	Well at Greenway Rink
3	SE	Dug	1,427	21	11	-	-	Hard	Dom. Stk.	Not sufficient in dry years
4	NW	Dug	1,425	15	7	-	-	Hard	Dom. Stk.	Sufficient for 50 head only
5	SW	Dug	1,426	20	7	-	Drift	Hard	Dom.	Also a stock well
6	SW	Dug	1,422	30	10	10	RM	Hard	Stk.	Also a house well dug 25 feet deep
7	NW	Dug	1,413	25	15	-	RM	Hard	Dom.	Sufficient supply
8	NW	Brd.	1,411	21	8	-	RM	Hard	Dom.	Four other wells on farm
10	NW	Brd.	1,416	46	36	-	RM	Hard	Dom.	Sufficient supply
12	NW	Dug	1,400	20	18	-	-	Hard	Dom.	Sufficient supply
14	SE	Dug	1,398	20	8	16	RM	Hard	Dom.	Sufficient for 50 head
15	SE	Brd.	1,433	40	30	-	RM	Hard	Dom.	Sufficient for 20 head
16	SW	Dug	1,420	20	12	-	Sand	Hard	Dom.	Three other wells on farm
17	SE	Dug	1,406	20	9	-	-	Hard	Dom.	Two other wells 24 and 37 feet deep
18	SE	Dug	1,409	22	15	-	Gravel	Hard	Dom.	
20	SW	Dug	1,403	14	9	-	RM	Hard	Dom.	Sufficient supply
22	NE	Dug	1,371	39	31	-	-	Hard	Dom.	
23	SE	Dug	1,379	20	12	-	Sand	Hard	Dom.	Drilled another well 100 feet; soft water
24	NW	Brd.	1,464	25	16	-	RM	Hard	Dom.	Sufficient supply
27	NW	Brd.	1,348	24	8	-	.	Hard	Stk.	Sufficient for 20 head
28	SW	Dug	1,377	25	13	-	Gravel	Hard	Dom.	Sufficient supply
34	SW	Brd.	1,405	54	40	-	RM	Hard	Dom.	Sufficient supply
35	SW	Dug	1,374	20	15	-	RM	Hard	Dom.	Sufficient supply
36	NW	Dug	1,364	25	15	-	Drift	Hard	Dom.	Sufficient supply

REPRESENTATIVE WELL RECORDS, PILOT MOUND AREA, MANITOBA

Township 6, Range 10

Sec.	1/4	Type of Well	Elev. (feet)	Depth (feet)	Depth to water (feet)	Depth to bedrock (feet)	Aquifer	Quality of water	Use	Remarks
2	SE	Dug	1,530	40	15	-	RM	Hard	Dom. Stk.	Also a well 18 feet deep
3	SW	Dug	1,528	26	22	18	RM	Hard	Dom.	Sufficient supply
4	SE	Brd.	1,529	42	20	18	RM	Hard	Stk.	Sufficient supply
5	SW	Dug	1,601	37	15	-	RM	Hard	Dom. Stk.	Three other wells on farm
8	SE	Brd.	1,511	16	14	10	RM	Hard	Dom. Stk.	Also a well 25 feet deep
9	NW	Brd.	1,512	31	-	-	RM	Hard	Dom. Stk.	Sufficient supply
10	SE	Dug	1,529	40	31	-	RM	Hard	Dom. Stk.	Also a well 21 feet deep
11	NE	Dug	1,580	32	12	15	RM	Hard	Dom. Stk.	Sufficient supply
12	NW	Dug	1,537	40	10	-	RM	Hard	Dom. Stk.	Three other wells on farm
13	NE	Dug	1,533	13	7	-	-	Hard	Dom. Stk.	
15	SE	Dug	1,516	22	16	-	RM	Hard	Dom. Stk.	Sufficient supply
16	SW	Dug	1,494	13	11	12	RM	Hard	Dom. Stk.	Sufficient supply
17	NE	Dug	1,547	28	12	-	Drift	Hard	Dom. Stk.	Sufficient for 15 head only
18	NW	Dug	1,510	32	25	-	RM	Hard	Dom. Stk.	Sufficient supply
19	SW	Dug	1,560	10	2	-	Gravel	Hard	Dom. Stk.	Sufficient supply
20	NW	Dug	1,454	28	12	-	Till	Hard	Dom.	Sufficient for 20 head
22	NE	Dug	1,546	34	24	24	RM	Hard	Stk.	Also a well at house
25	NE	Brd.	1,522	31	19	-	RM	Hard	Dom. Stk.	Sufficient supply
27	NE	Dug	1,531	16	12	-	Gravel	Hard	Dom. Stk.	Sufficient for 20 head
28	NE	Dug	1,480	8	6	-	RM	Hard	Dom. Stk.	Spring in the bedrock
29	SW	Dug	1,495	22	19	8	RM	Hard	Dom.	Also a well 28 feet deep
30	SE	Dug	1,415	14	12	-	-	Hard	Dom. Stk.	Two wells
31	SE	Dug	1,399	20	12	-	-	Hard	Dom.	Sufficient supply
32	SW	Dug	1,403	37	7	37	RM	Hard	Dom. Stk.	Sufficient supply
34	SW	Dug	1,499	18	12	-	-	Hard	Dom.	Sufficient supply
35	NW	Dug	1,548	21	14	-	-	Hard	Dom.	Sufficient supply
36	NE	Dug	1,530	24	14	-	RM	Hard	Stk.	Also a house well 24 feet deep

REPRESENTATIVE WELL RECORDS, PILOT MOUND AREA, MANITOBA

Township 6, Range 11

Sec.	4	Type of Well	Elev. (feet)	Depth (feet)	Depth to water (feet)	Depth to bedrock (feet)	Aquifer	Quality of water	Use	Remarks
1	SE	Brd.	1,571	65	30	-	RM	Hard	Dom. Stk.	Sufficient supply
2	SE	Dug	1,500	20	17	-	Sand	Hard	Dom. Stk.	Sufficient supply
3	NW	Dug	1,453	22	12	18	RM	Hard	Dom. Stk.	Also a well dug 45 feet
4	SW	Dug	1,459	20	17	-	Gravel	Hard	Dom. Stk.	
5	NW	Dug	1,466	35	31	-	RM	Hard	Dom. Stk.	
6	SW	Dug	1,451	20	10	-	RM	Hard	Dom. Stk.	Sufficient supply
8	NW	Dug	1,485	17	13	-	Till	Hard	Dom. Stk.	Sufficient supply
9	NE	Dug	1,463	13	8	-	-	Hard	Dom. Stk.	Sufficient supply
10	NW	Dug	1,495	30	24	-	-	Hard	Dom. Stk.	Also a domestic well
11	SE	Brd.	1,490	54	35	-	RM	Hard	Dom. Stk.	Not sufficient for 18 head
12	SE	Dug	1,588	30	20	-	RM	Hard	Dom. Stk.	Sufficient supply
13	SW	Drl.	1,565	86	40	-	RM	Hard	Dom. Stk.	Also a house well 30 feet deep
14	NE	Brd.	1,604	74	24	-	RM	Hard	Dom. Stk.	Also a house well 33 feet deep
15	SE	Dug	1,477	24	20	-	-	Hard	Dom. Stk.	Has been dry in summer months
16	SW	Dug	1,465	17	13	-	Gravel	Hard	Dom. Stk.	Sufficient for 15 head
17	NE	Drl.	1,466	75	20	20	RM	Hard	Dom. Stk.	Well at Convent in Bruxelles
18	NW	Dug	1,413	28	18	-	Sand	Hard	Dom. Stk.	Sufficient for 40 head
20	SW	Dug	1,418	26	20	25	RM	Hard	Dom. Stk.	Two other dug wells
21	SE	Dug	1,437	14	8	-	Gravel	Hard	Dom. Stk.	Sufficient for 20 head
22	NE	Dug	1,607	32	13	-	Gravel	Hard	Dom. Stk.	Sufficient supply
23	NE	Dug	1,557	24	16	-	RM	Hard	Dom. Stk.	Sufficient supply
24	NE	Dug	1,450	42	25	-	RM	Hard	Dom. Stk.	Sufficient supply
26	SW	Dug	1,599	22	14	-	RM	Hard	Dom. Stk.	Dug a dry hole 40 feet deep
28	SW	Dug	1,403	27	21	-	Drift	Hard	Dom. Stk.	Sufficient for 10 head
29	SE	Dug	1,419	70	16	-	RM	Hard	Dom. Stk.	Sufficient for 30 head
30	NE	Dug	1,386	15	11	-	Sand	Hard	Dom. Stk.	Sufficient supply
32	NE	Dug	1,353	17	12	-	Drift	Hard	Dom. Stk.	Sufficient for 15 head
34	NW	Dug	1,404	25	13	-	RM	Hard	Dom. Stk.	Sufficient for 14 head
35	NW	Dug	1,391	20	-	-	RM	Hard	Dom. Stk.	Also a well 107 feet
36	SW	Dug	1,388	33	24	-	-	Hard	Dom. Stk.	Sufficient supply

REPRESENTATIVE WELL RECORDS, PILOT MOUND AREA, MANITOBA

Township 6 Range 12

Sec.	4	Type of well	Elev. (feet)	Depth (feet)	Depth to water (feet)	Depth to bedrock (feet)	Aquifer	Quality of water	Use	Remarks
1	SE	Dug	1,440	15	9	15	RM	Hard	Dom. Stk.	Sufficient supply
4	SW	Dug	1,323	25	17	-	Drift	Hard	Dom. Stk.	Sufficient supply
6	SW	Dug	1,465	27	16	-	-	Hard	Dom. Stk.	Also a well bored 80 feet
7	NW	Dug	1,290	23	13	-	-	Hard	Dom. Stk.	Sufficient supply
8	NW	Drl.	1,296	107	36	-	RM	Hard	Dom. Stk.	Alkali Water
9	NW	Dug	1,365	28	25	28	-	Hard	Dom.	Water at contact of gravel and shale
10	SW	Dug	1,420	15	5	14	RM	Hard	Dom. Stk.	Sufficient supply
11	SW	Brd.	1,421	33	15	-	Drift	Hard	Dom. Stk.	Alkali water
11	SE	Dug	1,453	60	58	-	RM	Hard	Dom. Stk.	Dry in summer months
12	SE	Dug	1,475	35	18	15	RM	Hard	Dom. Stk.	Sufficient for 20 head
13	SE	Dug	1,434	24	7	-	-	Hard	Dom. Stk.	Sufficient supply
15	SE	Dug	1,398	33	23	10	RM	Hard	Dom.	Also a well 20 feet deep in gravel
16	NW	Dug	1,327	30	26	-	Drift	Hard	Dom. Stk.	Sufficient supply
17	NE	Dug	1,369	40	15	-	RM	Hard	Dom. Stk.	Sufficient supply
18	NE	Dug	1,244	14	10	-	Sand	Hard	Dom. Stk.	Sufficient supply
19	SW	Dug	1,242	12	8	-	Sand	Hard	Dom. Stk.	Sufficient supply
20	SW	Brd.	1,264	42	23	-	Drift	Hard	Dom.	Stock well drilled 90 feet deep
22	SE	Dug	1,392	28	14	-	Sand	Hard	Dom. Stk.	Sufficient for 25 head
24	SW	Dug	1,399	17	13	-	Sand	Hard	Dom. Stk.	Sufficient for 16 head
25	NW	Brd.	1,413	70	40	13	RM	Hard	Dom. Stk.	Three other wells (each) 70 feet deep
26	NW	Brd.	1,361	42	33	-	-	Hard	Dom. Stk.	Two other wells 30 and 47 feet deep
27	NW	Dug	1,327	20	18	-	RM	Hard	Dom. Stk.	Sufficient supply
28	SW	Dug	1,309	43	23	-	RM	Hard	Dom.	Sufficient supply
30	NE	Dug	1,257	15	4	-	-	Hard	Dom.	Stock well 46 feet deep
31	NW	Dug	1,238	32	13	-	-	Hard	Dom. Stk.	Sufficient for 100 head
32	NW	Dug	1,254	22	12	6	RM	Hard	-	Well dug 1951
33	SW	Dug	1,305	28	11	-	-	Hard	Dom. Stk.	Sufficient supply
34	NW	Dug	1,293	30	18	-	-	Hard	Dom.	Sufficient supply
35	NE	Dug	1,354	40	32	10	RM	Hard	Dom.	Stock well 12 feet deep
36	SW	Dug	1,367	27	15	-	Gravel	Hard	Dom. Stk.	Sufficient supply

REPRESENTATIVE WELL RECORDS, PILOT MOUND AREA, MANITOBA  
Township 6, Range 13

Sec. 4	Type of Well	Elev. (feet)	Depth (feet)	Depth to water (feet)	Depth to bedrock (feet)	Aquifer	Quality of Water	Use	Remarks
1	NW Dug	1,371	38	34	20	RM	Hard	Dom. Stk.	Sufficient for 20 head only
2	NW Dug	1,314	35	31	-	-	Hard	Dom. Stk.	Too hard for laundry
7	SE Brd.	1,309	44	9	-	-	Hard	Dom. Stk.	
8	SW Dug	1,312	20	-	-	Sand	Hard	Dom. Stk.	Two wells on farm
9	NW Dug	1,327	32	-	-	RM	Hard	Dom. Stk.	Sufficient for 60 head
10	SW Dug	1,326	40	33	20	RM	Hard	Dom. Stk.	Sufficient supply
12	SW Dug	1,338	58	15	-	RM	Hard	Dom. Stk.	Sufficient supply
13	SE Drl.	1,302	100	46	-	RM	Hard	Dom. Stk.	Have a dugout
14	NE Dug	1,248	12	9	-	Sand	Hard	Dom. Stk.	Sufficient supply
14	SW Dug	1,280	30	15	13	RM	Hard	Dom. Stk.	Sufficient supply
15	SE Drl.	1,274	80	-	30	RM	Hard	Dom. Stk.	House well 21 feet deep
16	SE Dug	1,270	14	5	-	Sand	Hard	Dom. Stk.	Also a house well
17	SE Dug	1,264	19	5	-	Gravel	Hard	Dom. Stk.	House well 10 feet deep
18	SW Brd.	1,319	61	22	-	RM	Hard	Dom. Stk.	Sufficient supply
19	SW Brd.	1,253	90	15	-	RM	Hard	Dom. Stk.	Not sufficient in dry years
20	NW Dug	1,248	23	16	-	Sand	Hard	Dom. Stk.	Also a sandpoint 30 feet deep
22	SW Dug	1,259	32	26	-	Sand	Hard	Dom. Stk.	Also a sandpoint 32 feet deep
24	NE Dug	1,235	12	9	-	Sand	Hard	Dom. Stk.	Sufficient for 100 head
25	NW Dug	1,248	22	12	-	Drift	Hard	Dom. Stk.	Alkali water
26	SW Brd.	1,233	35	20	-	Sand	Hard	Dom. Stk.	Sufficient supply
27	SW Brd.	1,230	28	8	-	-	Hard	Dom. Stk.	Stock well 22 feet deep
28	NE Dug	1,232	17	11	-	Drift	Hard	Dom. Stk.	Temperature of water 42°F.
30	SE Dug	1,240	30	27	-	Gravel	Hard	Dom. Stk.	Sufficient supply
31	NW Drn.	1,247	30	-	-	Sand	Hard	Dom. Stk.	Two sandpoints 18 and 20 feet deep
34	NE Dug	1,234	16	8	-	Sand	Hard	Dom. Stk.	Sufficient supply
35	NW Dug	1,234	20	15	-	Sand	Hard	Dom. Stk.	Also a well 18 feet deep
36	SW Dug	1,244	22	21	-	Till	Hard	Dom. Stk.	Also a well 19 feet deep