



CONSTRUCTING AND SEALING WATER WELLS IN MANITOBA

Information for Private Well Owners

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CONSTRUCTING AND SEALING WATER WELLS IN MANITOBA

Information for Private Well Owners

Private water wells can provide a clean, safe source of water if they are properly located, constructed and maintained. As a well owner, you are responsible for:

- hiring a licensed well drilling contractor to construct the well
- ensuring the well is properly maintained
- ensuring the water is safe to drink
- ensuring the well is properly sealed when it is no longer in use

This document provides information on what well owners should know about constructing, maintaining or sealing a water well in Manitoba. The official statutes and regulations must be consulted for all purposes of interpreting and applying the law.

In this document the term well means a water well that is used for water supply purposes, including the following purposes:

- domestic use including household or sanitary purposes, watering of lawns and gardens, and watering of livestock and poultry
- open loop geothermal
- agricultural
- irrigation
- municipal
- commercial
- industrial

Any related equipment, materials and attachments that allow the well to function such as a pump, an electrical conduit or a pitless adapter are also considered part of the well.

Water Well Legislation

Manitoba's Groundwater and Water Well Act

The rules for constructing, maintaining and sealing wells in Manitoba are set out in the [Groundwater and Water Well Act](#); and in the supporting regulations:

- 1) [Groundwater and Water Well \(General Matters\) Regulation](#)
- 2) [Well Standards Regulation](#)

The act and regulations came into force on January 1, 2017. They replace the previous Ground Water and Water Well Act and Well Drilling Regulation that were introduced in the 1960s.

The well construction requirements contained in the new act and regulations are not retroactive to wells constructed prior to January 1, 2017. Matters dealing with wells constructed prior to this time can be addressed through the issuance of well construction or well sealing orders if the well:

- is deemed a risk to human health or safety
- adversely affects any property, or any groundwater or other feature of the environment

The act means Manitoba's Groundwater and Water Well Act.

Administration of the Act

Manitoba's Department of Sustainable Development (referred to as the department) is responsible for administering the act and its regulations.

Well Construction and Well Sealing in Manitoba

The meaning of construct and sealing

The term construct applies to wells and test holes, and refers to any work in relation to the digging, drilling, installing, modifying or repairing of a well or test hole. It includes the partial sealing of a well or test hole, but does not include:

- a minor modification or repair of a well such as replacing a well cap or a pump.
- the complete sealing of an abandoned well.

The term sealing means the act of filling an abandoned well with a material or a mixture of materials in a manner that is sufficient to prevent the vertical movement of water or other substances within the well. An abandoned well must be properly sealed. Otherwise it might provide a pathway for the movement of contaminants into an aquifer and could potentially contaminate nearby wells.

Abandoned well means a well not in present use and not maintained for future use.

People who can construct a well

Only you, a Manitoba licensed well drilling contractor, or a person employed as a well driller by the contractor, can construct a well. In order to construct your own well:

- You must use equipment owned or operated by you, on land that you own or on which you operate an [agricultural operation](#).
- The water must be for your own domestic purposes and/or for the purposes of an agricultural operation, at a rate of less than 25,000 litres per day.
- The well construction work must be done in accordance with the standards developed for the construction of wells.

The average daily metered residential water use in Canada was 251 litres per person in 2011 -- a family of four would use approximately 1,000 litres per day.

Source: Residential Water Use in Canada, Environment and Climate Change Canada. 2011.



Drilling a well



Installing a large diameter well casing

People who can seal an abandoned well

Only well drilling contractor's licensed under the act can seal a flowing artesian well, a contaminated well, or a well containing saline water. Other than these exceptions any person can seal a well as long as the sealing work is done in accordance with the standards developed for the sealing of wells. However, due to a layperson's general lack of knowledge and experience, and difficulties that might arise during the sealing process, it is recommended that a Manitoba licensed well drilling contractor or an experienced well sealer be retained for any well sealing work.

A flowing artesian well is a well in which water rises above the surface of the ground, either continuously or intermittently.

A list of licensed well drilling contractors in Manitoba is available from [Manitoba's public register of licensed well drilling contractors](#).

Some Manitoba Conservation Districts also operate well sealing programs. Information on the programs can be obtained by contacting your [local Conservation District office](#).

Permits for constructing or sealing a well

A permit is not required for the construction or sealing of a well that is used for water supply purposes under the Groundwater and Water Well Act. However a permit may be required under these other Manitoba acts:

The Water Rights Act

There may be a requirement to obtain a permit prior to undertaking any test drilling or well construction if a well is to be used for:

- agricultural, municipal, industrial, irrigation or other purposes.
- domestic purposes where the consumption exceeds 25,000 litres (5,500 imperial gallons) per day.

Permit information can be obtained by contacting Manitoba Sustainable Development, Water Use Licensing at 204-945-3983 or by email at mws@gov.mb.ca.

Information on the water rights licensing process is available at www.manitoba.ca/waterstewardship/licensing/wlb/obtaining.html

The Environment Act

A permit must be obtained prior to drilling, modifying or sealing a well in the Rockwood Sensitive Area ([Map of Area](#)) under the Rockwood Sensitive Area Regulation of the Environment Act. Permit information can be obtained by contacting Manitoba Sustainable Development at 204-785-5030.

Information on the trichloroethylene (TCE) contamination in the Rockwood Sensitive Area is available at www.manitoba.ca/conservation/waterstewardship/odw/public-info/fact_sheets/pdf/final_factsheet_tce_dec9_2014.pdf



Sealing an abandoned well



A flowing artesian well

The Municipal Act

Any person drilling or sealing a well should also check with the municipality in which the well is being drilled or sealed to determine if there are any municipal bylaws regulating the drilling or sealing of wells.

Contact information for Manitoba municipalities is available at:
www.manitoba.ca/ia/contactus/pubs/manitoba_municipalities.pdf

Contamination found during construction or sealing of wells

If, during the construction or sealing of a well, contamination or suspected contamination of groundwater or soil is found (such as observing a hydrocarbon product or detecting a hydrocarbon odour in the soil or water), the person performing the work must immediately:

- stop the construction or sealing of the well
- report the finding of contamination or suspected contamination by calling Manitoba's emergency response office at 204-944-4888

The construction or sealing work cannot resume unless authorized by the department.

Well protection in designated flood areas

If your well is located within a designated flood area you must ensure it complies with one of the following flood protection measures:

- (a) the well is within a designated diking system

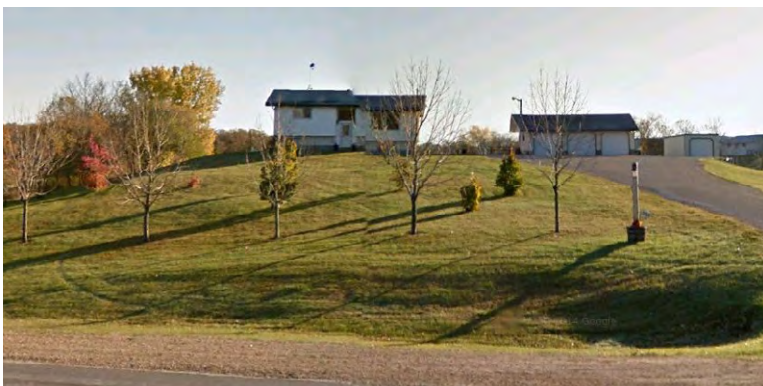
There are currently two designated flood areas in Manitoba:

- Red River Valley designated flood area
- Lower Red River designated flood area

Maps of the designated flood areas are available at: www.manitoba.ca/ia/livestock/red_river_map.html

Information on Manitoba's designated flood areas and flood protection levels can be obtained by contacting Water Management Planning and Standards at 204-945-6474.

- (b) the elevation of the site on which the well is located is above the flood protection level
- (c) the well is within a dyke that has been constructed in accordance with the criteria illustrated in [Schedule D of the Designated Flood Area Regulation](#)



Well located on a pad above the flood protection level
(Photo credit – Google Earth, October 2014)



Well protected by a dike
(Photo credit – The Canadian Press, March 2013)

- (d) the well:
- (i) is covered with a watertight cap or other approved cover
 - (ii) has any electrical conduit or other appurtenance connected to or associated with it, and any other opening into the well, plugged or covered in such a manner that flood water cannot enter the well

Any well construction commencing January 1, 2017, must comply with the above measures. Wells constructed prior to January 1, 2017, must be in compliance with the flood protection measures by January 1, 2019.



Flood protected well constructed with a watertight cap, snorkel well cap vent and cap cable seal

Reporting the construction and sealing of wells

Whenever a new well is constructed, an existing well is modified or an abandoned well is sealed, information on the construction or sealing must be reported to the department by completing a well construction or well sealing report. A well drilling contractor or well sealer is responsible for providing a well construction or well sealing report to the well owner and to the department within 45 days of completing the construction or sealing work. If you are constructing or sealing your own well then you are responsible for submitting a report to the department within 45 days of completing the work.

Blank well construction and well sealing reports can be obtained by contacting Groundwater Management by telephone at 204-945-6959 or by email at groundwater@gov.mb.ca.

Information from a [well construction report](#) or [well sealing report](#) is entered into a provincial water well database to ensure a record of the construction or sealing is available to the current and any future owner of the well. The report also allows the department to assess well construction and sealing compliance measures with the act and provides information to better understand Manitoba's aquifers and groundwater.

If you don't have a well construction report for your well, a record might be available in the provincial water well database. To enquire about a report, contact Groundwater Management by telephone at 204-945-6959 or by email at groundwater@gov.mb.ca.

Standards for the Construction and Sealing of Water Wells

The Well Standards Regulation has been developed to provide measures to ensure that wells are constructed and sealed to standards that protect the environmental quality of Manitoba's aquifers and groundwater, and human health and safety. The person constructing a well or sealing an abandoned well is responsible of ensuring that the standards are followed. Standards under the regulation include the following:

Locating a well

Your well must be located at least 1.5 metres (five feet) from any property boundary and in accordance with [minimum setback distances](#) from sources of contamination including sewage disposal, livestock manure, fuel storage tanks and pesticide and fertilizer storage areas. The setback distances specified for sewage disposal and livestock manure are complementary to those specified in applicable regulations under the Environment Act. As the specified setback distances are minimum distances, greater distances are encouraged, if your lot size allows, for added groundwater protection.

Your well must also be located so that it is accessible for cleaning, treatment, maintenance, repair, testing, inspection and visual examination. The ground around the well must also be satisfactorily sloped to promote drainage away from the well.

Because wells located in well pits are more commonly associated with bacterial contamination of well water, domestic wells cannot be located inside a well pit or later be modified to include a well pit.

Well pit means a pit constructed below the ground surface for the purpose of housing a well.



Well located inside of a well pit

Materials and additives

There are specific requirements for the type of materials and additives used in the construction and sealing of wells, including the materials used in the construction of well casings, well screens and well covers and the type of materials and additives used to drill a well, backfill an annular space surrounding a well casing and seal an abandoned well. The materials and additives must meet or exceed any specifications set out for that material or additive by the Canadian Standards Association (CSA), the American Society for Testing and Materials (ASTM), American Water Works Association (AWWA) or the National Sanitation Foundation (NSF).

Source water for construction and sealing

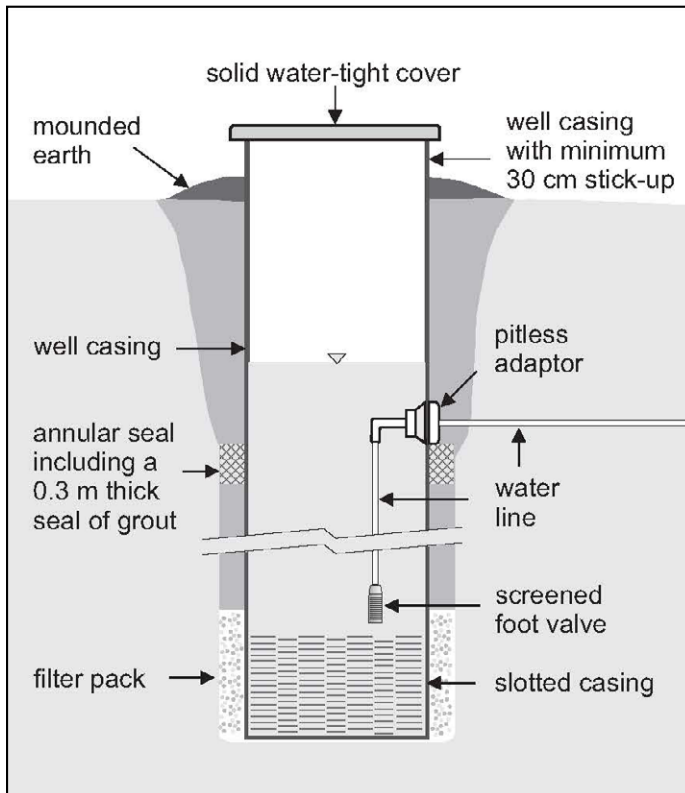
Only water from a licensed public water system or semi-public water system, or from a groundwater source that is chlorinated can be used in the construction or sealing of:

- a well that produces water for domestic purposes
- a test hole or test well for the purpose of obtaining information about a domestic well
- any other type of well within 100 metres (328 feet) of a well that produces water for domestic purposes

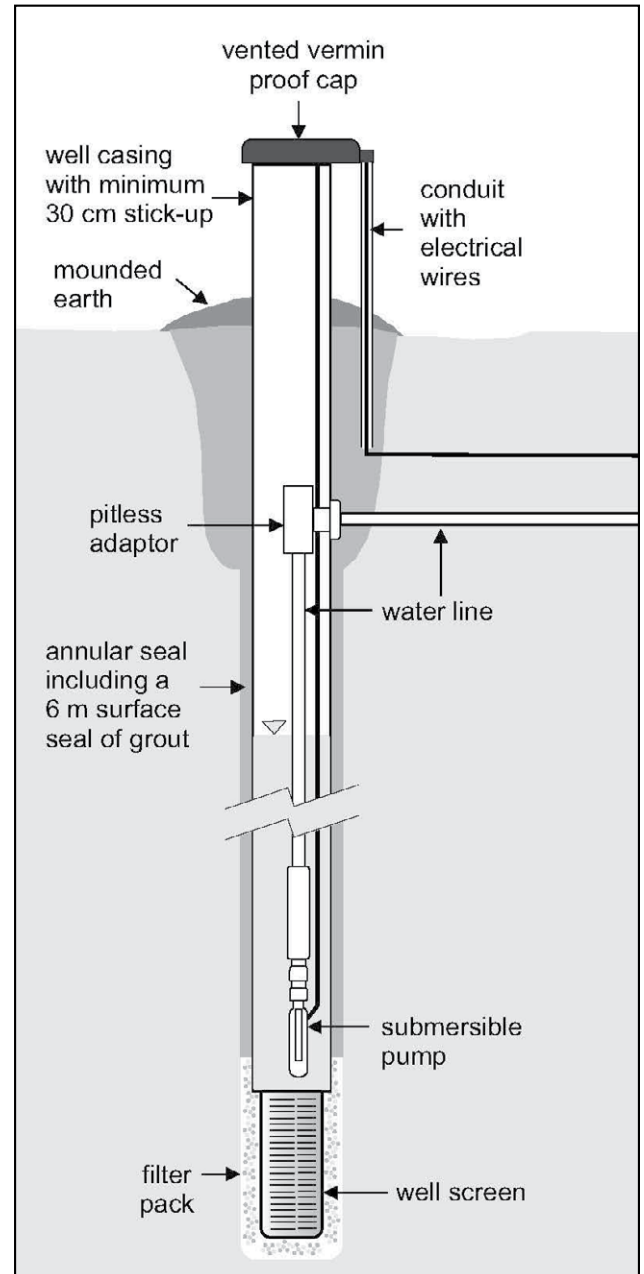
This requirement minimizes the introduction of contamination into a well or aquifer and subsequently minimizes risk to human health.

Depth of well casing

Your well casing must extend to a depth of at least six metres (20 feet) below the surface of the ground unless the only useful aquifer available necessitates a shallower depth for the well casing. This measure, along with sealing requirements for the annular space, will help prevent the rapid downward movement of surface water or other substances into a well.



Typical construction of a bored (large diameter) well



Typical construction of a drilled well in a sand and gravel aquifer

Sealing of annular space

The annular space outside a well casing must not be less than 25 millimetres (one inch) in width, excluding wells for which the construction method does not create an annular space, to ensure that an annular seal can be properly placed during well construction.

Annular space means an open space between a casing or well screen and the hole used to construct the well.

The material used to backfill the annular space outside a well casing must have a permeability equal to or less than the native materials that were removed from the same depth interval within the well. If the well is a flowing artesian well, cement grout or a suitable mixture of sand-cement or bentonite-cement grout must be used to seal the entire annular space outside the well casing.

A surface seal of grout must be placed in the topmost portion of the annular space to prevent the rapid downward movement of water and other substances. The placement of the surface seal depends on the well type and casing depth.

The backfill material used to seal an annular space includes grout, filter pack and native materials.

Grout means a low permeability material and includes:

- granular bentonite grout
- slurry grout, which includes suitable mixtures of cement or high-solids bentonite grout with fresh water that can be forced through a tremie line or other method of grout placement, and which may also include additives to meet certain grouting requirements

Filter pack means granular material that is placed in the annular space surrounding a well screen to prevent formation material from entering the screen.

Native material means the drill cuttings from a well or the excavated material from a dug well, and local excavated material including clay, granular soil and crushed rock.



Open annular space outside a well casing which could allow surface water and contamination to enter the well



Placement of a surface seal using slurry grout
(Photo credit – National Driller, August 2012)

Well covers and venting

Your well must be covered with a well cap, well lid or a sanitary well seal. The well cover must be:

- made of durable materials that do not deteriorate in sunlight
- sized to fit securely to the top of the well casing
- insect- and vermin-proof

If there are any appurtenances that enter into the well, such as tubing or power cables, the well cover must incorporate openings, which have been properly sealed, to accommodate them.

If a hand pump, hydrant or a similar device is installed on your well:

- The device must be mounted to the well casing or a pump mounting sleeve in a manner that seals the top of the well casing to prevent entry of surface water or other foreign material into the well.
- The well must have a splash pad.

The well must also be vented to the outside atmosphere in a manner that will safely disperse all gases from the well casing and allow air to enter and exit the well casing during its pumping cycle. Typically, wells are vented through an insect and vermin proof well cover.



Well cap on a drilled well



Well lid on a bored well
(Photo Credit: Manitoba Water Well Association)



Sanitary well seal on a drilled well



Hand pump with a concrete splash pad

Flowing artesian well - flow control device

If your well is a flowing artesian well, it must have a flow control device that is capable of stopping the discharge of water from within the well casing, and withstanding the freezing of water in the well casing. Your well drilling contractor is responsible for installing a suitable flow control device upon completion of construction of the well. If a person other than the well drilling contractor is hooking up the well for water distribution purposes, that person is responsible for installing a flow control device that is suitable for the pumping equipment installed in the well. Following installation of a flow control device, you are responsible for ensuring that water does not flow from your well in an uncontrolled manner.

Well casing stick-up and extensions

Your well casing must extend at least 30 centimetres (one foot) above any finished surface or the established ground surface when the well is completed. If a well casing needs to be extended to meet this requirement, or for another purpose:

- The casing must be structurally sound.
- The casing connection joint must be watertight and capable of withstanding frost heave.
- Connections must be completed in accordance with generally accepted industry standards and practices.

Rubber couplings cannot be used in the extension of a casing.

Developing a well

Your well must be developed (cleaned out) to remove drill cuttings and drilling fluids from the intake zone (the well screen or open hole portion) of the well. This helps to ensure water can flow freely from the aquifer into the well and reduces the likelihood of pumping any sediment. If the well cannot be developed to a sediment free state, the person developing the well must verbally notify you and record this information on the well construction report.

Well yield test

A well yield test must be performed on your well after it has been sufficiently developed. The yield test involves removing water from the well for a minimum of one hour, at a constant rate, and recording the effect this has on the water level in the well at the end of the test. If the yield cannot be sustained for an hour, then a recovery test must be performed. This test provides data needed to determine a pump-setting depth and pumping rate for the well. This information must be recorded on your well construction report.



Developing a well by air lifting

Well hook-up, pumping equipment and disinfection

It is best to have licensed well drilling contractors or experienced plumbers make the well hook-up for water distribution purposes, and install the pumping equipment. Be sure to have the information from your well construction report available so they know the recommended pump-setting depth and pumping rate.

The connection to the well casing for water distribution purposes must be watertight, and be made with a commercially-manufactured pitless adaptor or unit, or a commercially-manufactured well seal. If the well is under flowing artesian conditions, it must be designed to control the flow of water from the well, and if required, be vented to the outside atmosphere.

Upon completing construction of a well for domestic use, the person who constructed the well must

- disinfect the well so that a concentration between 50 and 200 mg/l of available chlorine is present throughout the water in the well
- maintain the concentration in the well for a period of at least 12 hours

Well identification tag

A well drilling contractor must attach a well identification (ID) tag to

- a newly constructed well
- an existing well (that does not have a well ID tag) that has been modified or rehabilitated

Well ID tags were introduced in 2017. They assign a unique identification number to your well. The well ID number is recorded on a well construction report and is entered into the provincial water well database.

Sealing an abandoned well

It is your responsibility to ensure any abandoned wells on your property are properly sealed. If not, they could provide a potential pathway for the movement of contaminants into your existing well or a neighbouring well.

An abandoned well must be sealed with well sealing material in a manner that is sufficient to prevent the vertical movement of water or other substances in the well. Information on sealing abandoned wells is available in the [Guide for Sealing Abandoned Water Wells in Manitoba](#). [Provide a hyperlink to the guide – this guide is being updated. Once complete a link can be provided]



Example of a pitless adaptor



Example of a Well ID Tag

Well Owner Responsibilities after Well Construction

Well Maintenance

You are responsible for ensuring that your well is properly maintained. Under the act, you must ensure that:

- the well is protected at the ground surface from physical damage
- the land around your well is satisfactorily sloped to promote drainage away from the well
- minimum setback distances are maintained between your well and sources of contamination
- the upper open end of the well casing is properly covered and vented
- the minimum well casing stick-up requirements are satisfied
- the well and the well site are maintained in a manner that prevents any substance that could adversely affect the quality of water in the well from entering the well
- the well is protected from flooding, if it is located in an area where it may be subject to damage by flood water
- a well pit is not added to your well if it was constructed for domestic purposes
- a flow control device is installed on the well if it is a flowing artesian well
- the well remains accessible for cleaning, treatment, maintenance, repair, testing, inspection and visual examination at all times
- the well ID tag is not defaced, damaged or removed

Manitoba's [Well Aware booklet](#) contains useful information on inspecting and maintaining a well.

Drinking Water

You are responsible for testing and ensuring that your well water is safe to drink. Manitoba's [Well Aware booklet](#) contains information on water testing and helping you understand the test results.

In addition, Manitoba's series of [private well fact sheets](#) provide valuable information on reducing the risk of well water contamination, testing for and understanding your well water bacteria results, nitrate and naturally occurring trace elements in well water, and instructions on how to disinfect a well.

Contact Us

Any questions or concerns regarding the construction, sealing or maintenance of your well or on the Groundwater and Water Well Act and its regulations can be directed to Groundwater Management by telephone at 204-945-6959 or by email at groundwater@gov.mb.ca.

Any questions regarding private well water testing, understanding well water quality, well disinfection and water treatment devices can be directed to the Office of Drinking Water by telephone at 204-945-5762. To locate a local office near you, refer to www.manitoba.ca/waterstewardship/odw/reg-contacts/

Appendices

Agricultural Operation ([back to page 5](#))

Under the Farm Practices Protection Act:

An agricultural operation means an agricultural, aquacultural, horticultural or silvicultural operation that is carried on in the expectation of gain or reward, and includes:

- (a) the tillage of land
- (b) the production of agricultural crops, including hay and forages
- (c) the production of horticultural crops, including vegetables, fruit, mushrooms, sod, trees, shrubs and greenhouse crops
- (d) the raising of livestock, including poultry
- (e) the production of eggs, milk and honey
- (f) the raising of game animals, fur-bearing animals, game birds, bees and fish
- (g) the operation of agricultural machinery and equipment
- (h) the process necessary to prepare a farm product for distribution from the farm gate
- (i) the application of fertilizers, manure, soil amendments and pesticides, including ground and aerial application
- (j) the storage, use or disposal of organic wastes for farm purposes

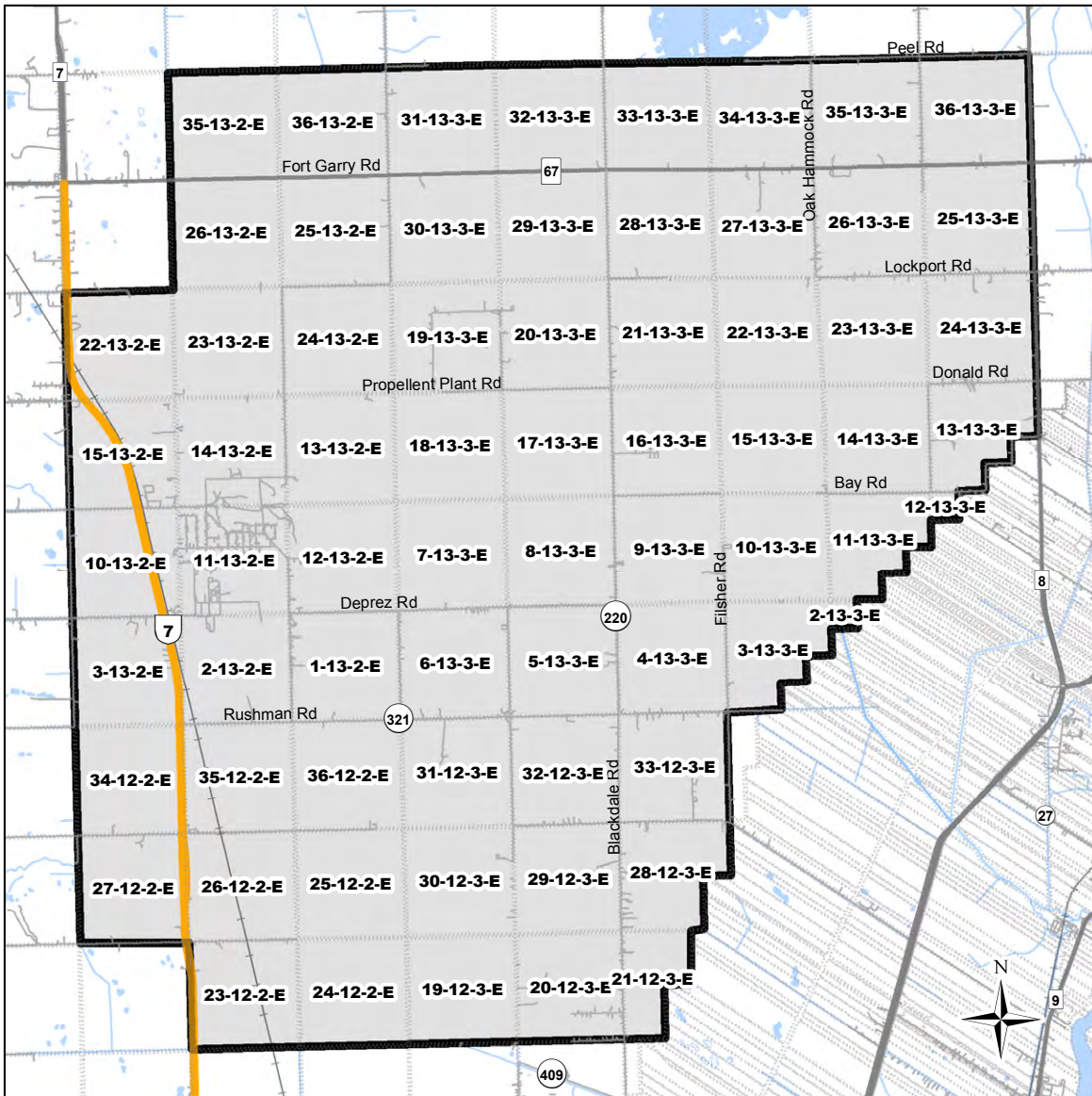
Saline Water ([back to page 6](#))

Under the Groundwater and Water Well (General Matters) Regulation:

Saline water means, in relation to the sealing of a well, water that has

- (a) a concentration of total dissolved solids in excess of 3,500 mg/l; or
- (b) an equivalent electrical conductivity in excess of 5,000 micro-Siemens/cm.

Rockwood Sensitive Area Map (back to page 6)



Map of Rockwood Sensitive Area in Section- Township- Range Format

Extent of Rockwood Sensitive Area as prescribed by *The Environment Act*:

**Rockwood Sensitive Area Regulation(121/94):
Section 2, Designation of Rockwood Sensitive Area**



Table of Minimum Setback Distances ([back to page 9](#))

Feature	Minimum distance that a well must be setback from the feature (not including a monitoring well or a geotechnical well)
Human grave or mausoleum	<ul style="list-style-type: none"> • 15 m (50 ft), if the well is constructed with at least 6 m (20 ft) of casing below ground surface • 30 m (100 ft), for all other wells
Septic tank ¹ (including an aerobic treatment unit ¹)	<ul style="list-style-type: none"> • 8 m (26 ft)
Disposal field ¹	<ul style="list-style-type: none"> • 15 m (50 ft), if the well is constructed with at least 6 m (20 ft) of casing below ground surface • 30 m (100 ft), for all other wells
Greywater pit ¹	<ul style="list-style-type: none"> • 15 m (50 ft), if the well is constructed with at least 6 m (20 ft) of casing below ground surface • 30 m (100 ft), for all other wells
Pit privy ¹	<ul style="list-style-type: none"> • 15 m (50 ft), if the well is constructed with at least 6 m (20 ft) of casing below ground surface • 30 m (100 ft), for all other wells
Vault privy ¹ or Pail privy ¹	<ul style="list-style-type: none"> • 8 m (26 ft)
Manure storage facility ²	<ul style="list-style-type: none"> • 100 m (328 ft)
Confined livestock area ² comprised of more than 10 animal units ²	<ul style="list-style-type: none"> • 100 m (328 ft)
Underground fuel storage tank	<ul style="list-style-type: none"> • 15 m (50 ft), if the well is constructed with at least 6 m (20 ft) of casing below ground surface • 30 m (100 ft), for all other wells
Above-ground fuel storage tank	<ul style="list-style-type: none"> • 15 m (50 ft), if the fuel tank storage area has secondary containment • 30 m (100 ft), in all other cases
Pesticide storage area	<ul style="list-style-type: none"> • 15 m (50 ft), if the pesticide storage area has secondary containment • 30 m (100 ft), in all other cases
Fertilizer storage area	<ul style="list-style-type: none"> • 15 m (50 ft), if the fertilizer storage area has secondary containment • 30 m (100 ft), in all other cases

Minimum Setback Distances

Footnotes:

¹ As defined in the Onsite Wastewater Management Systems Regulation, M.R. 83/2003.

² As defined in the Livestock Manure and Mortalities Management Regulation, M.R. 42/98.