

FAQs for the Ground Water Protection Regulation

What is the Ground Water Protection Regulation?

On November 1, 2005, a new regulation that affects well drilling, including geotechnical, environmental and low temperature geothermal drilling in B.C. came into force to improve the safety and protection of British Columbia's ground water resources. The Ground Water Protection Regulation (the regulation) establishes standards to protect ground water supplies by requiring all wells in British Columbia, including geotechnical wells (boreholes, test pits, and closed loop geothermal wells), to be properly constructed, maintained, and at the end of their service, properly closed or deactivated.

What are the new requirements?

All geotechnical wells constructed after November 1, 2005 must meet the minimum construction standards in the Ground Water Protection Regulation. This means: If a geotechnical well is to be drilled into or through an aquifer (see notes), the geotechnical well must be constructed by a qualified well driller or under the direct supervision of a qualified well driller or qualified professional (P. Eng. or P. Geo. registered with the Association of Professional Engineers and Geoscientists of British Columbia). A three-foot surface seal is required when constructing a closed loop geothermal well. If drilling encounters artesian flow, the flow must be controlled or stopped. The well must be closed (within 30 days for boreholes and 90 days for other geotechnical wells) by filling the well throughout its length with a combination of appropriate sealants and backfill if it is no longer to be used.

What types of geotechnical holes are captured under the Water Act and regulation?

Any borehole (including a cone penetration test borehole), test pit or well constructed for stratigraphic, hydrologic or geotechnical information, or as a closed loop geothermal well is deemed a geotechnical well regulated under the Water Act and regulation.

Stone columns, caissons and piles are not considered geotechnical wells. The flow chart in the brochure: B.C.'S GROUND WATER PROTECTION REGULATION - Some Frequently Asked Questions Related to Geotechnical Wells (www.env.gov.bc.ca/wsd/plan_protect_sustain/groundwater/gw_regulation/faq_geotechnical.pdf) shows examples of geotechnical wells and their requirements.

Who can drill or close geotechnical boreholes, test pits or closed loop geothermal wells?

A geotechnical borehole or test pit, or closed loop geothermal well must be constructed (e.g., drilled, closed) by a qualified well driller (QWD) registered with the Ministry of Environment or under the direct supervision of a QWD or qualified professional. A QWD is not required if the geotechnical borehole, test pit, or closed loop geothermal well, will not encounter an aquifer or is constructed by digging to < 50 feet depth.

The Register of QWD's may be viewed at:

www.env.gov.bc.ca/wsd/plan_protect_sustain/groundwater/wells/applications/well_drillers_reg.pdf

Who is responsible for a well?

The driller or the driller supervising the work is generally responsible for the construction, alteration or closure work for a well. However, in instances where a driller is working under the direct supervision of an engineering consultant, the engineering consultant is the person responsible for work on the well.

The driller and the engineering consultant should be clear about their supervisory relationship and their respective responsibilities under the regulation prior to starting work.

A well owner has responsibility for operating and maintaining a well and having the well closed at the end of its life.

When and how are alternative specifications used?

Some requirements in the regulation (e.g., surface seal, well closure, well cap) allow for alternative specifications in specific circumstances where the minimum standards in the Code of Practice can not be feasibly met.

A qualified professional with competency in hydrogeology or geotechnical engineering can provide written alternative specifications if the minimum standards cannot feasibly be met, provided the alternative specification achieves the same objectives as the standards in the Code of Practice. The work must then be done according to the alternative specifications. A copy of the written alternative specifications must be attached to the submitted report (where required) on the completed work or retained by the owner of the well.

What is meant by "feasible"?

"Feasible" is accepted by the Ministry to mean "capable of being done or carried out" or "possible and practical to achieve easily or conveniently". The term is not defined in the legislation or regulation and whether something is feasible or not must be determined by a Qualified Professional under the GWPR based on the common meaning of the term "feasible" as indicated by its dictionary definitions.

What if a geotechnical borehole is converted to a monitoring well or piezometer?

Any well whose purpose is changed must meet the minimum well construction standards for the type of well to which it has been changed to. Where a geotechnical borehole is completed with a standpipe to monitor water levels over time, the geotechnical borehole is deemed as being converted to a monitoring well and minimum well construction standards for a monitoring well must be met.

What is my responsibility as a Qualified Professional, respecting geotechnical wells under the Water Act and regulation?

As the Qualified Professional responsible for the geotechnical well drilling work, you must:

- develop specifications that meet or exceed the minimum specifications for a geotechnical well,
- ensure the well is constructed and ultimately closed in accordance with the minimum standards in the regulation,
- provide written alternative specifications for the geotechnical well if it is not feasible to comply with the minimum standards, and
- complete and retain the well reports.

Does a well owner require authorization under the Environmental Management Act to discharge storm water into an aquifer via recharge wells?

No, a well owner does not require authorization to discharge storm-water into an aquifer via recharge wells under the Environmental Management Act. Management of storm-water is a responsibility of local governments.

However, the Ministry of Environment does have a guidebook: *Storm-water Planning: A Guidebook for British Columbia* which provides a framework for effective storm-water management throughout the province. The storm-water planning guidebook — a new tool for local governments — presents a methodology for moving from planning to action that focuses on implementing early action where it is most needed. The guidebook approach is designed to eliminate the root cause of negative ecological and property impacts of storm-water by addressing the spectrum of rainfall events. The guidebook may be found at www.env.gov.bc.ca/epd/epdpa/mpp/stormwater/stormwater.html.

Does a well owner require authorization under the Environmental Management Act to discharge water from open-loop geothermal wells into an aquifer or nearby creek?

A well owner does not require authorization under the Environmental Management Act to discharge water from open-loop geothermal wells into a nearby creek. The well owner should also check with the local Water Stewardship Division regional office about whether an approval under the Water Act would be required.

The discharge of water from open-loop geothermal wells is an activity that may fall under the Waste Discharge Regulation (under the Environmental Management Act) for "deep well disposal" which means the disposal of waste fluids underground to porous rock formations, through wells or other means. This regulation was originally developed to apply to disposal of waste from the oil and gas industry. Discharge of water from open-loop geothermal wells into an aquifer is currently considered as low risk and no authorization from the Ministry of Environment is required for this activity.

What are the risks of contamination of ground water from a circulation fluid leakage from a closed loop geothermal well?

For commercial buildings, the recommended practice is to isolate the water loop from the heating/cooling system. That is, the heat is passed from the circulation fluid from the well through a heat exchanger, so that the circulation fluid from the well does not come in direct contact with the heating/cooling system and there is less potential risk.

The water-anti-freeze (e.g., methanol) solution being circulated in the closed loop may contain a dye which would make any leakage evident. Nonetheless, leakage within the U-tube in the bore is generally thought to be unlikely because the joints in the tubing are thermally fused and tested for leaks after installation.

For more information of ground-sourced heat exchange systems, visit the Geoexchange BC web site (<http://www.geoexchangebc.ca/>) or Canadian Geoexchange Coalition website (<http://www.geoexchange.ca/en/home/>).

Is a dug-out a well?

Depending on circumstances, the answer may be either "yes" or "no". If the dug-out was constructed to capture primarily snowmelt runoff (i.e., surface water), then no, it is not considered a well. If the dugout was constructed (in sand and gravel) primarily to intercept the water table and for extracting and using ground water, then it is considered a well as it falls within the definition of a well under the Water Act.

Although dugouts may constitute a well as that term is defined in the Water Act, there may be aspects of the regulation that would not make practical sense to apply in respect of them (e.g. capping and sealing requirements). Ground water officials must use their discretion in deciding whether and how to pursue compliance with such rules.

What can I, as an owner of a water supply well, do without hiring a qualified well driller or qualified well pump installer?

A private well owner can do the following:

- Disinfect the pump and well.
- Ensure the pump house is in good repair and kept free of chemicals and other contaminants such as pesticides, fertilizers, and gasoline.
- Attach or replace a damaged or lost well identification plate.
- Cap the well, if a commercially available cap is used.
- Take water quality samples to ensure the well water is potable.

What are my responsibilities as an owner of a residential domestic water supply well?

A private well owner is responsible for the following:

- **Deactivating or closing a well no longer in use.**
Wells that have not been used for five years must be deactivated. Deactivating a well means capping, securing, protecting, and maintaining the well in a safe and sanitary condition while it is out of service. Deactivated wells not used for 10 years must be properly closed. Closure involves backfilling and sealing the well. Drilled wells more than 5 meters (15 feet) or dug wells more than 15 meters (50 feet) deep must be closed by a QWD.
- **Capping the well.**
Ensure a secure and vermin-proof cap is installed by October 31, 2007 if the well, regardless of when it was constructed, does not have a cap.

- **Maintaining the well identification plate.**
Ensure the well identification plate is maintained and protected from damage, and the number on the plate is clearly visible. If the plate is damaged or lost, a new one must be obtained and attached to the well as soon as possible. Well identification plates can be obtained free of charge by contacting a regional Ministry of Environment office.
- **Protecting the well.**
It is illegal to put any junk (e.g., pesticides or fertilizers, carcasses, human or animal waste, refuse, or materials from construction or demolition) in an active or abandoned well. Do not disturb the wellhead or the surface seal.
Operate the well in a manner that prevents the intrusion of salt water or contaminated water into the well, or into the aquifer from which the water is withdrawn (e.g., don't over-pump).
Protect the stick-up from physical damage.

What does it mean to control a flowing artesian well?

A flowing artesian well is under control if:

- the water flows out only through the production casing,
- the flow can be stopped indefinitely without leakage along the outside of the casing, and
- the flow does not pose a threat to public safety or threat to environment.

Is a qualified well driller required to install a surface seal in an older well (drilled before November 1, 2005) if the driller is doing alterations to the well (e.g., deepening the well)?

No, the GWPR does not automatically require a seal to be installed for all alterations. However, it would be a good practice for a qualified well driller to install a surface seal for a well alteration where a seal is lacking and where the GWPR indicates that that type and depth of well should have a surface seal. According to the GWPR s. 7(3), an existing well with an existing seal must have the seal restored if it was impaired during alteration or if an annular space is created during alteration.

If a qualified well driller alters a new well (drilled after November 1, 2005) and finds that there was no surface seal around the upper portion of the well, is that driller required to install a surface seal?

The GWPR does not speak to this. If the qualified well driller (QWD) in question was the same driller who drilled the new well, and if the type and depth of well being altered requires a surface seal under the GWPR, then, yes, that qualified well driller is required to install a surface seal.

However if the QWD (i.e. the one altering the new well or installing the pump) was not the same driller who drilled the new well, and if the type and depth of well being altered requires a surface seal under the GWPR, then, no, that second QWD is not required to, or responsible for installing a surface seal. The original driller was responsible for installing the surface seal. The second QWD who discovered the lack of a seal for a new well should notify the well owner of the need for one. If the second QWD can install a seal, they

can offer to do it. If they are not able to do so, they may refer the well owner back to the original driller, to another QWD or to the Ministry of Environment. They should also take pictures. If the well owner agrees to the second QWD installing a seal, then that person doing the work would include the details of the surface seal installation works in the alteration report to be submitted to the owner and to MOE.

If a qualified well pump installer alters a new well (drilled after November 1, 2005) and finds that there was no surface seal around the upper portion of the well, is that pump installer required to install a surface seal?

No. The original driller is responsible. The QWPI should notify the well owner about the requirement for a seal and upon the owner's approval may refer the owner to a QWD or undertake the work himself if he is able. Whatever qualified person does the work, that person should include the details of the surface seal installation works in the alteration report to be submitted to the owner and to MOE.

Are "j-plugs" acceptable as well caps?

Yes. Although specifications vary by manufacturer, PVC well plugs such as j-plugs, are expandable pressure plugs developed to fit inside a pipe or casing. Upon turning the wing nut, two O-rings (one compresses as the other expands) tighten to make a water tight seal against the inside lining of the pipe or casing, thereby assuring against any contaminates leaking into the well. Generally, a locking hasp accepts a standard size padlock. The top of the cap often has a warning symbol warning that this is a monitoring well, and "do not fill" well. J-plugs are commonly used on small diameter (1/2" to 4") monitoring wells and when locked and properly installed, are generally considered to meet the requirements of the Water Act and GWPR for well caps. Locks are recommended for all j-plugs, but where they are used within a secure area (e.g., a locked, fenced compound or building) and where all authorized personnel are familiar with the purpose of the monitoring wells so "capped", then a lock may be considered optional.

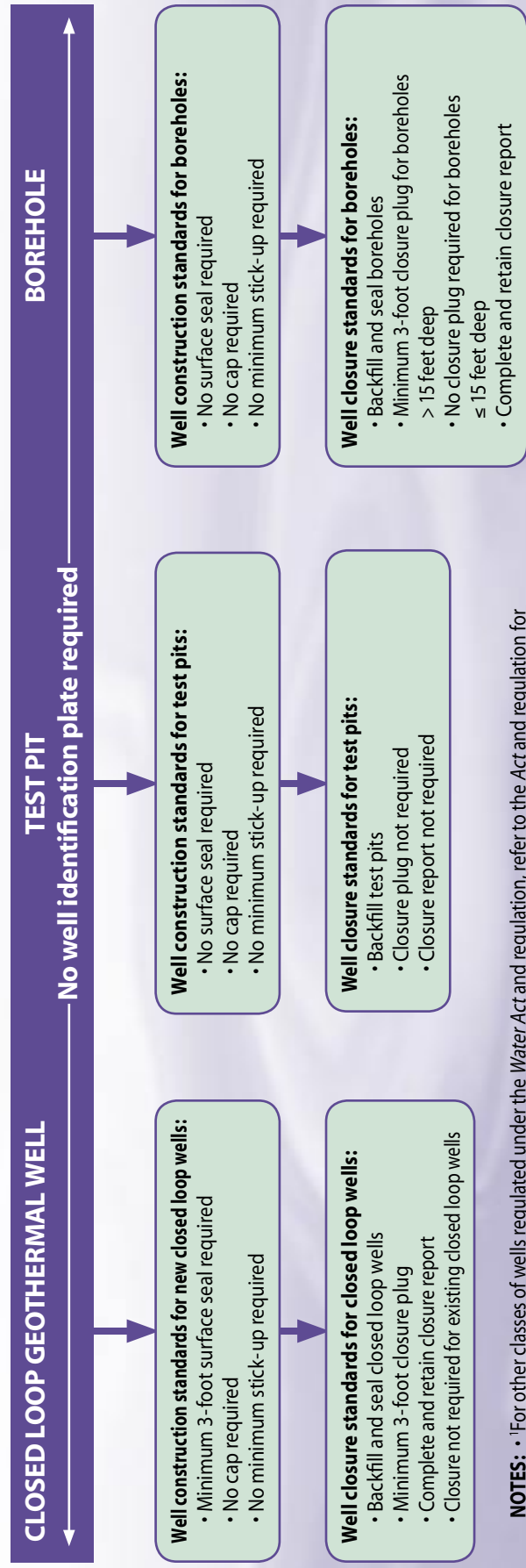
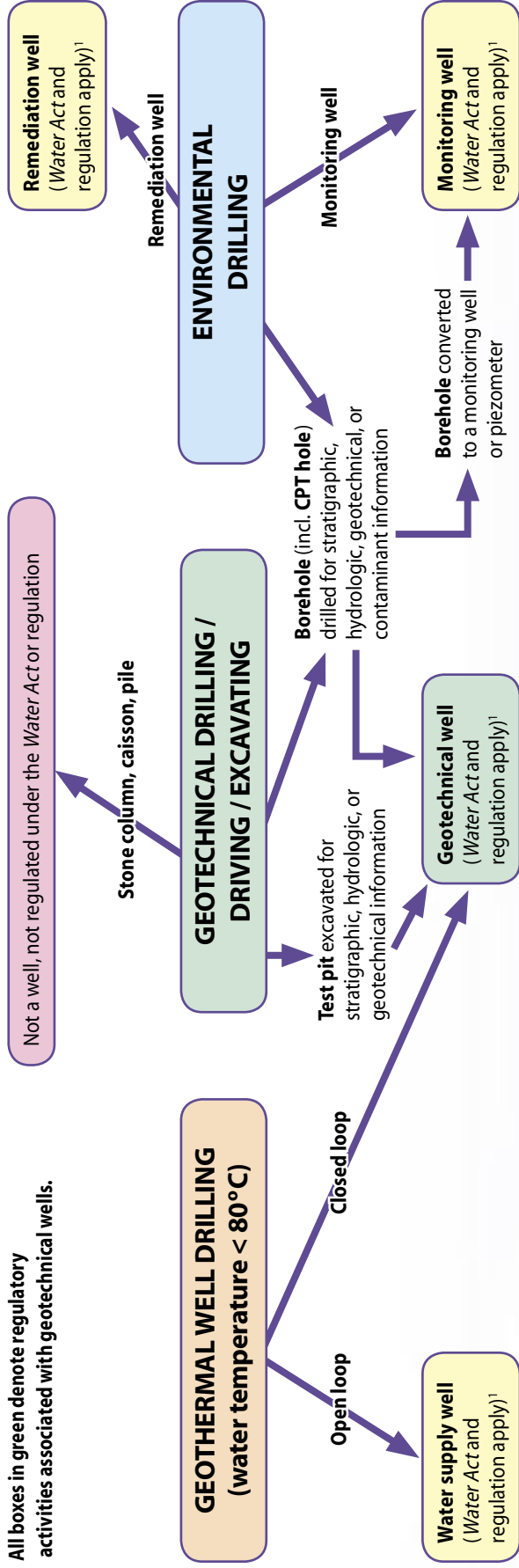
Questions?

Ministry of Environment officials are responsible for administering the *Water Act* and Ground Water Protection Regulation. Any questions about the legislation should be directed to the nearest Ministry of Environment office (see listing below). The Water Act and Ground Water Protection Regulation can be found on the Ministry's Water Stewardship Division web site: www.env.gov.bc.ca/wsd/index.html.

Vancouver Island Region, Nanaimo (250) 751-3100
Lower Mainland Region, Surrey (604) 582-5200
Thompson and Cariboo Regions, Kamloops (250) 371-6200
Kootenay and Okanagan Regions, Nelson (250) 354-6333
 Penticton (250) 490-8200
Omineca Peace & Skeena Regions, Prince George ..(250) 565-6135

Flow Chart for Ground Water Protection Regulation Requirements for the Geotechnical Industry

All boxes in green denote regulatory activities associated with geotechnical wells.



NOTES:

- For other classes of wells regulated under the Water Act and regulation, refer to the Act and regulation for specific requirements related to those other classes of wells.
- “New” means a borehole, test pit or closed loop geothermal well constructed on or after November 1, 2005.
- “Existing” means a borehole, test pit or closed loop geothermal well constructed before November 1, 2005.
- “Aquifer” means a) a geological formation, b) a group of geological formations or c) part of one or more geological formations that is water bearing and capable of storing, transmitting and yielding water.