The New Groundwater Protection Regulation Under B.C.'s *Water Sustainability Act*

The Water Sustainability Act

B.C.'s new ***Water Sustainability Act*** received Royal Assent in May 2014, after more than four years of public engagement and policy development. The new act will provide new tools to help ensure that water stays healthy and secure for future generations of British Columbians. Government plans to bring the new act into force early in 2016, at which time the existing *Water Act* — and regulations under the ***Water Act*** — will be repealed.

In order to implement the *Water Sustainability Act*, government is replacing regulations associated with the *Water Act*, updating other regulations, and developing new regulations to be phased over the next several years. This paper describes some of the proposed new policies that government will consider for incorporation into a new Groundwater Protection Regulation, and in particular those policies likely to be of interest to well owners and operators.

Why is Government Developing a New Groundwater Protection Regulation?

The existing **Ground Water Protection Regulation** under the *Water Act* addresses well construction and maintenance, setting out standards to safeguard groundwater and to ensure that activities related to wells and groundwater are undertaken in an environmentally safe manner. It will be repealed in 2016.

In order to ensure the ongoing application of these standards, government is replacing this regulation with a new Groundwater Protection Regulation under the *Water Sustainability Act*. This proposed new regulation would incorporate most existing groundwater protection policies. It would also be aligned with the *Water Sustainability Act*, and introduce new policies designed to improve well construction and maintenance standards and recognize the types of professionals certified to drill wells and install well pumps in British Columbia.

WHAT IS THE DIFFERENCE BETWEEN AN ACT AND A REGULATION?

An Act is a law that has been introduced in the Legislative Assembly as a Bill, has passed three readings and committee-study by the Legislative Assembly, and has received Royal Assent. Acts typically state legal requirements to advance the Act's intent and objectives, and establish the overall framework within which the government is expected to act.

A Regulation is "subordinate legislation" (made under the authority of an Act) that provides the details of how the general principles laid out in legislation are to be applied, and must remain inside the boundaries established by the Act. In B.C., the Lieutenant Governor in Council approves regulations.

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Many of the proposed new policies described in this paper reflect technical discussions between government officials and the groundwater and geoexchange industry associations. They address the recommendations of these associations that government provide broader regulation of groundwater and regulate the disposal of urban runoff into the ground.

The Water Sustainability Act and Groundwater Protection

One of the important changes introduced with the new *Water Sustainability Act* is greater protection for groundwater across British Columbia. While the *Water Act* addresses only well drilling practices, the *Water Sustainability Act* addresses groundwater regulation and protection more comprehensively and provides government with greater authority to regulate groundwater protection and use. The *Water Sustainability Act* subjects all wells — including those that provide water only for domestic purposes — to regulation. It provides government with the authority to: recognize those professionals qualified to provide well drilling, well pump installation and related services; establish how wells should be constructed and maintained; establish rules regarding flowing artesian wells; establish rules regarding the introduction of foreign substances (junk) in wells; control activities related to wells that may impact hydraulically-connected streams and aquifers; and regulate other aspects of groundwater protection and use.

Highlights of the Proposed New Regulation

DEFINITIONS & EXCLUSIONS FROM THE DEFINITION OF "WELL"

Government proposes to align the terminology in the new Groundwater Protection Regulation with that in the *Water Sustainability Act*. For example, the new regulation would:

- Distinguish between closed-loop geoexchange wells and geotechnical wells; and
- Exclude from the definition of "well" those types of holes that have little or no impact on groundwater, or that are regulated under other legislation. These include drains, trenches and ditches; soak-away pits that are uncased and backfilled with drain rock; and mineral exploration drill holes, whose regulation and decommissioning are already covered under the 2008 Health, Safety and Reclamation Code for Mines in B.C.

PROFESSIONAL REGISTRATION & QUALIFICATIONS

Constructing and closing wells, installing well pumps, disinfecting wells, and conducting flow tests are restricted activities that can only be performed by qualified well drillers, well pump installers or professional engineers and geoscientists. Requiring qualified persons to carry out these activities helps prevent pollution risks to drinking water and/or groundwater from poorly constructed wells.

EXEMPTIONS FROM REQUIREMENTS

Government proposes to exempt certain types of low risk wells from the requirements of the *Water Sustainability Act* and the new Groundwater Protection Regulation.

Exempted wells would include: horizontal geoexchange systems that are less than five metres deep; drainage wells; and test pits. However, owners of these as well as other types of wells, and professionals working in them, are required to: control artesian flow (see below); avoid contaminating wells; and close test pits by backfilling.

Government proposes that the new Groundwater Protection Regulation would be consistent with the WSA and:

- Recognize all current professional qualifications for well drillers and well pump installers, plus two new types of professionals certified to drill wells in B.C. — the Geotechnical/Environmental Drillers, and the Geoexchange Drillers.
- Continue to allow previously registered drillers to drill any class of well and install pumps; and
- After the regulation comes into effect, restrict the activities of new drillers based on their qualifications.

SITING OF WATER SUPPLY & DEWATERING WELLS

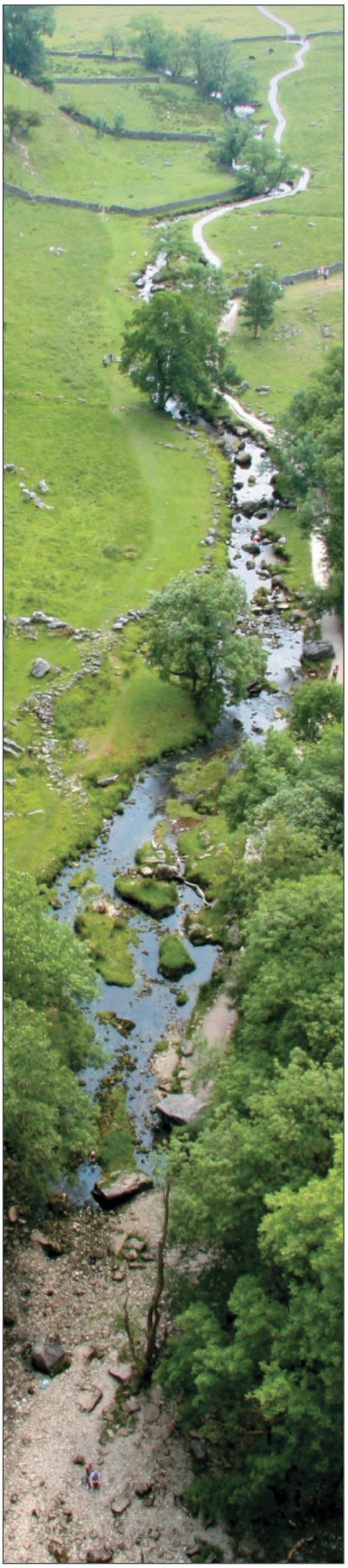
Groundwater pumping from a well has the potential to affect water supply in nearby wells. The location of new water supply wells and permanent dewatering wells used to lower local groundwater level is therefore important. The goal is to minimize the risk that new wells will impact existing groundwater users, who have priority rights to water under British Columbia's 'First-in-Time, First-in-Right' system of water allocation. Analysis of groundwater data suggests that a 15 to 30 metre setback can reduce interference between water supply wells; while the smaller setback offers adequate protection, it is more realistic as it allows owners to site wells on and develop small parcels of land.

Government therefore proposes that the new Groundwater Protection Regulation would:

- Require that new wells be set back at least 15 metres from existing water supply wells; this setback would not apply where an existing well is not in use and not intended to be used in future.
- Permit the owner of an existing water supply well to drill one additional well within 15 metres of the existing well.
- Allow a smaller setback proposed by a professional if the new well would not significantly increase the risk of interference with an existing well, and if the proposed setback is accepted by the statutory decision maker.

SITING OF STORMWATER RECHARGE/INJECTION WELLS

Local governments and land developers are increasingly using recharge or injection wells to direct stormwater runoff from urban areas away from local streams and into the ground — often into an underlying aquifer. Where urban run-off is conveyed directly into the deeper saturated zone (i.e., below the groundwater table) of a water supply aquifer, there is a risk of contamination of water in the aquifer and in nearby wells. The *Water Sustainability Act* applies to wells used for the underground infiltration of urban runoff to an aquifer, and such wells can therefore be subject to regulation.



Government proposes that the new Groundwater Protection Regulation would:

- Require a qualified hydrogeologist or geotechnical engineer to design and oversee the construction of these types of wells;
- Prohibit the direct recharge/injection of stormwater runoff into the saturated zone of an aquifer;
- Require the point of release of urban runoff to be above the saturated zone at all times of year;
- Require that new recharge wells be set back at least 60 metres from existing water supply wells; and
- Allow a shorter setback proposed by a professional if there is no significant increase in the risk of impact to groundwater quality, and the proposed setback is accepted by the statutory decision maker.

CONTROLLING ARTESIAN FLOW

The word 'artesian' refers to situations where groundwater is confined under pressure below layers of relatively impermeable rock or soil (e.g., clay). Water confined in this way is said to be under artesian pressure, and the aquifer is called an artesian aquifer. 'Artesian flow' refers to the flow of water under pressure in a confined aquifer. If an artesian aquifer is tapped by a well, water will rise above the top of the aquifer and may even flow from the well onto the land surface. Uncontrolled artesian flow can cause significant property and environmental damage and deplete groundwater resources.

The *Water Sustainability Act* requires a well driller or a professional who encounters artesian conditions during well construction to ensure that any artesian flow is stopped or brought under control. A non-professional who encounters artesian conditions during well construction must ensure that a qualified well driller or professional is engaged. The owner of a flowing artesian well — or of the land on which such a well is located — must engage a qualified well driller or professional to stop the flow or bring it under control.

Government proposes that the new Groundwater Protection Regulation would require well drillers who are dealing with artesian wells to:

- Equip wells to prevent backflow;
- Produce construction and decommissioning reports for all artesian wells;
- Measure and report shut-in pressure; and
- Report on the management of artesian flows that cannot be controlled.

RESTRICTING WELL PITS

A well pit is an excavated hole, lined with a concrete, metal or wooden cribbing, that contains the well casing stick-up and associated works. In areas where the ground freezes in winter, water supply wells were historically constructed in pits below the frost line to prevent water connections from freezing.

There are thousands of well pits in British Columbia, most of which house small domestic wells. Poorly constructed and maintained well pits can lead to groundwater contamination due to the collection of debris and floodwaters around the wellhead. The confined space within the well pit also poses a potential safety hazard because dangerous gases (e.g., carbon dioxide and methane) can accumulate in the pit, resulting in an oxygen deficient and/or toxic environment.

The widespread availability of pitless adapters since the mid-1980s has eliminated the need for well pits to provide a frost free connection for water supply wells. For locations where land use and traffic interference are concerns, however, it may still be appropriate to construct wells below the surface of the ground.

Government proposes that the new Groundwater Protection Regulation would:

- Prohibit new well pits for new and altered water supply wells;
- Prohibit the addition of a new well pit to an existing well; and
- Allow an exception for well pits designed by a professional and accepted by the statutory decision maker or under an authorization.

WELL MAINTENANCE

The *Water Sustainability Act* stipulates that a person must operate a well in accordance with the regulations and any directions of an engineer.

Government proposes that the new Groundwater Protection Regulation would require well owners to ensure proper maintenance, whether or not a well is in use. For example, owners would be required to:

- Maintain access to the wellhead and keep the area clear of obstructions;
- Promptly undertake any repairs, and maintain the well's surface seal, casing stick up, caps/covers, drainage, etc.;
- Prevent entry of contamination into the well and store potential contaminants more than three metres away;
- Protect equipment for controlling artesian flow; and
- Orient surface drainage away from the wellhead.

WELL DEACTIVATION AND DECOMMISSIONING

The *Water Sustainability Act* defines when a well is considered to be 'in service' and 'not in service.' For example, it states that a well that is used regularly or 'actively maintained as a backup water supply' is considered to be 'in service.' It authorizes government to prescribe a period of time after which the owner must deactivate or decommission a well that is 'not in service.'

Government proposes that the new Groundwater Protection Regulation would:

- Require that a well considered to be 'not in service' be deactivated or decommissioned after five years;
- Require that a well that is deactivated be decommissioned (closed) after five years;
- Allow a well owner to keep a well deactivated for longer than five years if approved by the comptroller or regional water manager; and
- Specify that a well is considered to be 'kept active' as a backup water supply if it is maintained according to the requirements in the regulation.

A well is decommissioned to put it permanently out of service. For most wells, decommissioning includes removing equipment (e.g. well pump, monitoring devices, etc.) from the well, filling the well with sealant and backfill materials, and installing a closure plug. Proper well decommissioning helps ensure the well does not become a safety hazard and prevents contaminants and other materials from entering the aquifer.

Government proposes that the new Groundwater Protection Regulation would:

- For all wells — except boreholes less than five metres deep and water supply wells — require a minimum one metre closure plug;
- For water supply wells less than five metres deep, require that the length of the closure plug equal the depth of the well; and
- For water supply wells greater than five metres deep, require a minimum five metres closure plug length.

Next Steps

This paper describes some of the new policies that government proposes to incorporate into a new Groundwater Protection Regulation, and in particular those policies likely to affect well owners and operators. Government will consider these policies in the fall of 2015. The policies are therefore subject to change, depending on government direction. Pending government review and approval, the new Groundwater Protection Regulation would be brought into force along with the *Water Sustainability Act* in 2016.

To support implementation of the new act, government is replacing or updating existing regulations related to essential water management activities, including authorizing stream water and groundwater use, water fees and rentals, changes in and about a stream, well construction and maintenance, and compliance and enforcement. Once work on these initial regulations is completed, government expects to start work on other regulatory components required to fully implement the *Water Sustainability Act*.

We invite you to share your ideas about the proposed new groundwater protection policies and the new Groundwater Protection Regulation by visiting the *Water Sustainability Act* blog at:
http://engage.gov.bc.ca/watersustainabilityact/

You may also send related questions and comments to government by email at livingwatersmart@gov.bc.ca.

FOR MORE INFORMATION

General Information About the *Water Sustainability Act* and Engagement
http://engage.gov.bc.ca/watersustainabilityact/

The *Water Sustainability Act*
http://leg.bc.ca/40th2nd/3rd_read/gov18-3.htm

The *Water Act*
http://www.bclaws.ca/civix/document/id/complete/statreg/96483_01

About Groundwater Protection
http://www.env.gov.bc.ca/wsd/plan_protect_sustain/groundwater/index.html

The Groundwater Protection Regulation under the Water Act
http://www.bclaws.ca/civix/document/id/complete/statreg/299_2004

This paper describes proposed policies related to compliance and enforcement and is not intended to support interpretation of the Water Sustainability Act or the Violation Ticket Administration and Fines Regulation. The policies described are subject to review and approval by government.

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