

Applying Water Quality Standards to Groundwater and Surface Water

The [Contaminated Sites Regulation](#) contains requirements to ensure that groundwater at a site is suitable for direct use and is of adequate quality to protect adjacent water uses.

This document explains how these provisions are applied by the ministry on a site-by-site basis throughout British Columbia.

Relevant provisions in the Regulation

Section 12 (2) of the Regulation states that “for the purpose of using the standards in this regulation, the surface water uses or groundwater uses which apply, at any given time, to a particular site or part of a site are based on

- (a) the uses of the surface water or groundwater at the site or on neighbouring sites, and
- (b) the potential for the groundwater or surface water to cause pollution.”

Section 12 (4) allows a Director of Waste Management to specify any of the following applicable water uses under subsection (2) from the following:

- aquatic life water use,
- irrigation water use,
- livestock water use, or
- drinking water use.

Site investigations and water use standards

For the purposes of a preliminary site investigation, the ministry does not expect a detailed evaluation of groundwater flow. If a preliminary site investigation indicates that a detailed site investigation is required, then more detailed information, including estimates of groundwater flow direction and velocity, are required. These estimates would show the potential for groundwater to cause pollution.

A site owner or operator may present arguments as to why certain water use standards should or should not be applied. Otherwise, a Director will decide, on the basis of existing information, which water uses and water quality standards apply at a site.

Guidance for direct groundwater use

Whether or not a groundwater source is suitable for direct use can be determined by comparing monitoring results with the applicable water standards in Schedules 6 and 10 of the Regulation.

Guidance for selecting water uses for groundwater flowing into surface water

If there are potential impacts of groundwater flowing into adjacent surface water, the selection of the appropriate water uses at a site is not so straightforward. For example, the distance of

groundwater to surface water, the assimilative capacity of surface water, and conditions governing the movement of groundwater in the soil can have a strong bearing on the time groundwater takes to reach surface water – and thus on its potential to cause pollution.

Experienced hydrogeologists and other experts assessing and managing contaminated sites have suggested the following simple rules to determine if a particular water use at a site should be specified.

Aquatic life use

If the travel time of groundwater from a site to the closest surface water containing aquatic life is *greater than 50 years*, the ministry considers it unlikely that the groundwater at the site will pollute that aquatic receiving environment. In this situation, aquatic life water use standards would not normally be applicable.

Groundwater travel times of more than 50 years almost always exist when a site is located farther than 1 km from surface water supporting aquatic life. Thus, at the preliminary site investigation stage of site characterization, aquatic water use standards in Schedule 6 of the Regulation are generally not considered applicable at sites located more than 1-km radius from surface water with aquatic life.

Drinking water use

Groundwater travel time must normally be *greater than 100 years* to the nearest existing, or probable future drinking water source before the ministry will consider that the Schedules 6 and 10 drinking water standards do not apply. The equivalent radius is 1.5 km.

The Director will also consider whether drinking water supplies could be affected by the infiltration of contaminants from groundwater (e.g., across plastic piping or inline gaskets).

Irrigation and livestock watering uses

The 100-year groundwater travel time and 1.5 km radius guideline apply to these two water uses.

Site-specific flexibility

In addition to these general guidelines, a Director will consider several other circumstances when specifying an applicable water use, including:

- whether contaminated groundwater has migrated offsite, in which case the groundwater travel time must be calculated between the leading edge of the contaminated groundwater plume and the closest water use; and
- whether there are any preferential pathways between the site and the water use, such as storm drains or utility conduits.

Requesting a Director's determination of water use

Site owners or operators can formally request a Director to make a determination about whether any of the water uses apply to a particular site. Such a request must be accompanied by supporting documentation.

Note that groundwater quality at a site must also meet the Hazardous Waste Regulation standards applicable to groundwater.

For more information, contact the Environmental Management Branch at site@gov.bc.ca