

## Environmental Quality Standards

Environmental quality standards are the “measuring stick” against which the presence and concentration of substances in soil, surface water, ground water, and sediment are determined. They help us better assess the quality of the environment and “how clean clean is.”

### What hazards are posed by environmental contamination?

**Human health** – The potential effects of environmental contamination on humans range from minor physical symptoms to life-threatening diseases such as cancer. Children are often most at risk from exposure to contaminated soil, air, water, and food.

**Environmental health** – Contamination can seriously affect the environment by releasing substances that kill fish, impair the reproduction of birds, and contaminate the food web.

**Utilities and services** – In several cases, contamination has affected underground services. For example, short circuits in street lighting have been reported, the result of wire insulation being corroded by gasoline leaking from an underground tank.

### What types of standards are there?

The contaminated sites legislation and Contaminated Sites Regulation define two general types of standards:

- **Numerical standards** are acceptable concentrations of substances in soil, surface water, groundwater, and sediments.
- **Risk-based standards** are acceptable risk levels from exposure to substances at sites.

#### How do the standards protect the environment and human health?

Standards can be used to:

- determine if a site is contaminated;
- determine when a site has been adequately cleaned up;
- determine when soil relocation may occur; and
- identify potential safety hazards such as fires and explosions in utilities or underground services.

To meet stakeholders’ requests for flexibility, the ministry has further developed these into five specific types of standards:

- generic numerical standards and criteria,
- matrix numerical standards,
- site-specific numerical standards,
- Director’s interim standards, and
- risk-based standards.

*Generic numerical standards and criteria* are intended to protect human health and the environment at any site regardless of site-specific features except land or sediment use.

*Matrix numerical standards* separate environmental and human health protection components. Compared with generic numerical standards, these ones feature a more flexible matrix of standards.

*Site-specific numerical standards* are derived using models, equations, site data, and specific site features. These are the most flexible numerical standards and apply only to a specific site.

*Director’s interim standards* are environmental quality standards that a Director of Waste Management has the legal power to adopt when

he or she chooses to. Such a standard has the same legal effect as a standard set out in a schedule in the Regulation, but it must be adopted in regulation after one year or it becomes void.

*Risk-based standards* currently pertain only to the protection of human health. Thus, for a particular site, a report assessing environmental risks of the contaminants on the site must accompany assessments related to risk-based standards. The default risk-based lifetime cancer standard of 1 in 100,000 is similar to that used in many jurisdictions throughout North America.

### **How were the standards derived – that is, what are they based on?**

*The generic numerical standards* in Schedules 4, 6, 9, and 10 of the Regulation are generally based on the interim environmental quality criteria of the Canadian Council of Ministers of the Environment (CCME) for soil, groundwater, and surface water. Some of these standards originate from the Royal Society of Canada, others from well-respected work by Canadian scientists on water quality, and many from the U.S. Environmental Protection Agency. The sediment criteria of Schedule 9 were developed in BC through extensive consultations.

*The matrix numerical standards* in Schedule 5 are based on work by the provincial Contaminated Sites Soils Task Group (CSST), which was composed of government health and environment experts from the Ministry of Health, Medical Health Officers, Environmental Health Officers, and scientists and engineers from the Ministry of Environment. The CSST developed the matrix numerical standards by using CCME guidance to create equations for deriving standards to account for some site-specific features.

*The site-specific numerical standards* are usually calculated for each site using the same equations developed to derive the matrix numerical standards or sediment criteria. These standards do not appear in any table in the Regulation, but are calculated for each site based on specific site characteristics and features.

*The default risk-based standards* are similar to those recommended by the expert public health committee that advised the province on risk levels considered acceptable for exposure to contaminants at the former Expo '86 site.

### **How do these standards compare with those in other jurisdictions'?**

The ministry conducted a survey of 61 government agencies across North America (9 Canadian provinces, 50 U.S. states, and 2 U.S. Environmental Protection Agency regional offices) to compare their generic numerical and risk-based standards. The results confirmed that BC's standards are:

- practical, given the years of regulatory experience elsewhere in using similar standards to manage contaminated sites;
- consistent with those used in other North American jurisdictions; and
- effective in contributing to the protection of human health and the environment.

As well, BC's sediment criteria have been derived from similar protocols to those used in a number of jurisdictions in North America, and in fact some jurisdictions are adopting the BC process.

*Note: This summary is solely for the convenience of the reader. The current legislation and regulations should be consulted for complete information.*

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