

CSR OMNIBUS UPDATING: Protocol Summary - Amendments to CSR Schedule 6

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Protocol Summary

1. Repeal existing CSR Schedule 6 and Schedule 10 and move updated existing Schedule 6 and 10 substances into a new single schedule (Schedule W) that consolidates Schedule 6 and 10 water standards.
2. Where sufficient toxicological data exists or an approved jurisdiction has an available water standard, derive or adopt aquatic life (AW) and/or drinking water (DW) standards for use in Schedule W. Where such updates are not possible, retain the existing CSR Schedule 6 or 10 standards.
3. Where sufficient toxicological data exists or another approved jurisdiction has an available water standard, derive or adopt water standards for new and emerging contaminants of concern relevant to British Columbia (BC).

Associated Omnibus Updating Documents

Details relating to the proposed changes to CSR Schedule 6 and 10 water standards are available in the following ministry's 2015 Omnibus Draft Discussion Documents:

- [CSR OMNIBUS UPDATING: Proposed Amendments to Schedule 6](#) [1]
- [CSR OMNIBUS UPDATING: Proposed Amendments to Schedule 10](#) [2]

Details relating to the Ministry's response/decisions on stakeholder comments received on the proposed changes to CSR Schedules 6 and 10 are available in:

- [Omnibus Updating of CSR Standards Draft Discussion Documents – Land Remediation Response to Stakeholder Comment](#) [3]

Protocol Details Related to Water Standards for the CSR Stage 10 Amendment

The CSR Schedule 6 water standards were mainly adopted from BC Ministry of Environment (MOE) approved [4] or working Water Quality Guidelines (WQGs) [5] for the protection of aquatic life, irrigation, livestock or drinking water; or Canadian Councils of Ministers of the Environment (CCME) approved or interim WQGs for the protection of aquatic life and agriculture [6]; or Canadian drinking water (DW) guidelines [7].

Schedule W

As a component of the CSR Stage 10 Amendment, CSR Schedules 6 and 10 will be repealed and replaced by a new single schedule (Schedule W) of updated water standards for the protection of aquatic life (AW), irrigation water (IW), livestock watering (LW) and DW.

Updating of CSR Schedule 6 and 10 water standards

1. CSR Schedule 6 water standards were updated in general accordance with methods described in or adapted from:
 - a. The “Procedure to establish Water Quality Standards used in Contaminated Sites Regulation” [8];
 - b. BC Environment Responses to Expert Panel Recommendation [9];
 - c. Generic Numerical Drinking Water Standards for Aluminum, Iron and Manganese, Director’s Interim Standards for Contaminates Sites [10].

For most substances, updating of Schedule 6 water standards was accomplished through adoption of current (i.e. in effect as of 2015) water quality guidelines from BC MOE [4, 5], CCME [6], and Health Canada [7] for substances new to, or currently listed in, Schedule 6, with a focus on AW and DW standards. This included adoption of guidelines or standards for substances that previously did not have such standards or new substances to be prescribed under the CSR. For DW standards, maximum allowable concentrations were preferentially selected over aesthetic (taste and odour) objectives, if both types of guidelines were available [7].

2. CSR Schedule 10 DW standards were updated based on current 2015 United States (US) Environmental Protection Agency (EPA) Regional Screening Levels for drinking water [11] and these updated DW standards will be moved to Schedule W.

US EPA Regional Screening Levels were also adopted as DW standards for substances new to, or currently listed in, Schedule 6 for which no other DW guideline was available. However, US EPA Regional Screening Levels were not adopted as DW standards for some Schedule 6 substances where it would create an inconsistency with BC MOE policies or procedures, (e.g.) organotins, petroleum hydrocarbons.

Procedures for the Derivation of Standards for Carcinogenic Substances

In recognition that a carcinogenic substance may elicit both non-carcinogenic and carcinogenic toxic effects, the ministry [13] modified the 1996 CSST Protocol [12] as follows:

1. Determine if a substance is a carcinogenic or a non-carcinogenic contaminant in accordance with the CSST Protocol definition of “carcinogenic substance”.

2. Where appropriate toxicity reference values (TRVs) are available for a non-carcinogenic substance, calculate both non-carcinogenic and carcinogenic toxic endpoint-based standards for the substance.
3. Adopt as the new final CSR standard for the substance, the most stringent of the carcinogenic or non-carcinogenic standards, as the CSR Schedule W, DW standard.
3. Updating of Schedule 6 and 10 substances also included *de novo* derivation of toxicologically based AW and/or DW standards for some priority substances, substances with exclusively aesthetic-based DW guidelines available from BC MOE or Health Canada [4, 5, 7], and new emerging substances for which available water guidelines were lacking.

The derivation protocol for DW standards was adapted from [10], included consideration of the carcinogenicity of a substance as described above [13], and used the following hierarchy for TRV selection:

- a. as defined under the Ministry's [Technical Guidance 7](#) [14], US EPA Integrated Risk Information System (IRIS) will be used with the exception of the following substances: chlorinated dioxins and furans, PCBs, lead, and methyl mercury, for which Health Canada TRVs will be used;
- b. Health Canada;
- c. World Health Organization;
- d. any of (i.e. no order of preference):
 - i. ATSDR
 - ii. ORNL (RAIS)
 - iii. RIVM
 - iv. California EPA
 - v. US EPA Regional Screening Levels or Preliminary Remediation Goals
 - vi. Other Canadian Province's or US State Agencies

The ministry reserves the right to substitute or derive TRVs in preference to any of the sources identified in this hierarchy.

4. The CSST protocol [12] rounding rule was applied to substances that were updated by adoption or derivation, with the exception that IW, LW and DW standards from BC MOE, CCME, or Health Canada were adopted as exact values.

Next Cycle Revisions

1. Consider including as new substances for Schedule W: derivatives of metals, naphthenic acids, chlorinated paraffins, nanotechnology products, siloxanes, and other substances that could be important contaminants in BC (e.g., some pharmaceuticals or current-use pesticides).

2. Identify inappropriate, outdated or obsolete substances for possible removal of water standards. This may include substances that are no longer relevant or found in BC or those that represent historical-use contaminants that are not bioaccumulative or persistent toxicants.
3. Update AW, IW, LW and DW standards by adopting water quality guidelines for these uses from BC MOE, CCME or other jurisdictions, or deriving standards, as appropriate.
4. Consider updating or revising the protocol for adopting or deriving IW and LW standards. Consider revising the protocol for deriving DW standards, including evaluating the potential for using: the inhalation from showering or grooming route of exposure for volatile or semi-volatile substances, and the toddler or child receptor as the most sensitive receptor.

References

- [1] British Columbia. (2015). [*CSR OMNIBUS UPDATING: Proposed Amendments to Schedule 6.*](#) Ministry of Environment, Victoria, British Columbia. June, 2015.
- [2] British Columbia. (2015). [*CSR OMNIBUS UPDATING: Proposed Amendments to Schedule 10.*](#) Ministry of Environment, Victoria, British Columbia. June, 2015.
- [3] British Columbia. (2015). [*CSR OMNIBUS UPDATING: Proposed Amendments to Schedule 10. Omnibus Updating of CSR Standards Draft Discussion Documents – Land Remediation Response to Stakeholder Comment.*](#) Ministry of Environment, Victoria, British Columbia. December, 2015.
- [4] British Columbia. (2015). [*Approved Water Quality Guidelines.*](#) Ministry of Environment, Victoria, British Columbia. September, 2015.
- [5] British Columbia. (2015). [*Working Water Quality Guidelines.*](#) Ministry of Environment, Victoria, British Columbia. September, 2015.
- [6] Canadian Council of Ministers of the Environment. (2015). [*Canadian Water Quality Guidelines.*](#) November, 2015.
- [7] Health Canada. (2014). [*Canadian Drinking Water Guidelines.*](#) October, 2014.
- [8] British Columbia. (1995). [*Procedure to establish Water Quality Standards used in Contaminated Sites Regulation.*](#) Ministry of Environment, Victoria, British Columbia. October 4, 1995. 2 p.
- [9] British Columbia. (1996). [*BC Environment Responses to Expert Panel Recommendations.*](#) Ministry of Environment, Victoria, British Columbia. Sept. 16, 1996. 22 p.

- [10] British Columbia. (2013). Generic Numerical Drinking Water Standards for Aluminum, Iron and Manganese. Director's Interim Standards for Contaminated Sites. Ministry of Environment, Victoria, British Columbia. 7 p.
- [11] United States Environmental Protection Agency (US EPA). (2015). Regional Screening Levels: Residential Tapwater. November, 2015.
- [12] British Columbia. (1996). Overview of Contaminated Sites Soil Task Group (CSST) Procedures for the Derivation of Soil Quality Matrix Standards for Contaminated Sites. Ministry of Environment, Victoria, British Columbia. January 31, 1996.
- [13] British Columbia. (2015). Request for Comments on Consultation Paper: Carcinogenic substances. Ministry of Environment, Victoria, British Columbia. December, 2015.
- [14] British Columbia. (2015). Technical Guidance 7 on Contaminated Sites: Supplemental Guidance for Risk Assessment. Ministry of Environment, Victoria, British Columbia. Version 4, November, 2015.