

ENVIRONMENT & ENERGY BULLETIN



VOLUME 9, ISSUE 2, APRIL 2017

UNDERSTANDING THE IMPLICATIONS OF THE CONTAMINATED SITES REGULATION UPDATES

HIGHLIGHTS

- In November 2017, the BC Ministry of Environment (BC MOE) is set to update the Contaminated Sites Regulation (CSR), referred to as the “Stage 10 Omnibus Amendments.” This is the most significant change to the CSR since its inception in April 1997.
- Using currently available science on chemical toxicity, transport, and land use, and BC MOE’s ecological protection goals, both the regulation and many of its standards for chemicals in soil, water, and soil vapour are updated.
- The [BC Contaminated Sites Approved Professional \(CSAP\) Society](#) funded a study comparing various sites’ data against current and new [Omnibus] standards. The CSAP study focused on three site categories: gas stations, dry cleaners, and metals (i.e., typical fill sites). This exercise shed light on whether the Omnibus changes will make remediating contaminated sites in BC more or less onerous, and also identifies potential impacts to remediation costs.
- This article summarizes the Stage 10 Omnibus Amendments, the key findings of the CSAP study, and speculates on how the Omnibus changes may impact sites that already have a BC MOE Instrument (i.e., a Certificate of Compliance).

WHAT’S NEW THIS TIME AROUND?

The CSR Omnibus Amendments have four primary goals:

1. Universal updating of existing standards, and derivation of new standards for emerging contaminants;
2. Add purpose-derived new standards for Wildlands and High Density Residential land uses;
3. Add a mandatory provision for “fixed-term” future updating of standards on a 5-year cycle; and,
4. Address consequential amendments.

The BC MOE has recalculated the environmental standards for soil,

groundwater, and soil vapour -- based on new scientific information. In general, the new standards are:

- More stringent (i.e., lower standards) for certain substances, including many metals and hydrocarbons, but less stringent (i.e., higher standards) for others — including dry cleaning solvents and soil vapour (in certain situations).
- Many new “emerging” substances are added which were not regulated before.

WHEN DO THE NEW STANDARDS COME INTO EFFECT?

The new standards are effective November 1, 2017. Until then, the

current process and standards remain in effect for the delineation of contamination. If the likelihood of obtaining a BC MOE Instrument before November 1, 2017 is low, land owners and project proponents should begin comparing data against the new standards now in order to understand the impacts.

WHAT ARE THE POTENTIAL IMPACTS OF THESE CHANGES?

Property transfers rely on an understanding of the environmental condition of a site. When evaluating acquisitions or dispositions before November 1, 2017, it will be important to consider possible impacts related

to the proposed standard changes. These impacts may include:

- Some sites investigated under existing standards and determined to be not contaminated (aka “clean”) may be considered to contain contamination on November 1, 2017, or vice versa.
- Considerations for the newly-added (previously un-regulated) substances should be made when evaluating new and old sites.
- With the new standards, the remediation requirements for existing and future development projects may vary significantly from previous estimates. While it is typical to expect the costs to increase, in some cases remediation costs may in fact be significantly reduced (e.g., for underground parkades).

WHAT SHOULD BUSINESSES DO?

If a party currently owns land with known or suspected contamination, it should evaluate the property against current and upcoming Omnibus standards to understand how the CSR changes may impact land use plans and potential for remediation. Also, if a firm acquires or divests land between now and November 1, it should consider the effects of the new Omnibus standards on the environmental conditions at the site.

In some instances, there may be reasons to accelerate the environmental programs and resolve matters before the new standards come into effect on November 1, 2017. Some sites may benefit from slowing down activities and waiting for the new regulations.

In some instances, there may be reasons to accelerate the environmental programs and resolve matters before the new standards come into effect on November 1, 2017. Some sites may benefit from slowing down activities and waiting for the new regulations.

The following sections provide a general overview of the Omnibus Amendments and how the revised standards may affect “typical” sites. However, a site-by-site evaluation is important in order to understand actual implications.

WHAT IS THE EFFECT FOR A SITE WITH AN EXISTING INSTRUMENT?

What does this mean for sites with existing BC MOE legal Instruments (i.e., a Certificate of Compliance (COC), Determination, etc.)? MOE notes that existing Instruments are retroactive and valid. The new standards should not affect their validity. However, if the land use changes, MOE may require amendments to an existing Instrument.

1. CSR STAGE 10 OMNIBUS AMENDMENTS

The Omnibus Amendments reflect contemporary science related to the derivation of environmental standards. Many existing CSR standards, dated circa 1996, do not reflect current toxicological

information or understanding of acceptable human or ecological health risks. Soil standards are most significantly affected (soil before 1997, circa Expo 86), followed by groundwater standards (also adopted in 1997 but updated on an ad-hoc basis), and lastly soil vapour (~2008).

The Omnibus Amendments include a comprehensive review and updating of the CSR numerical standards, taking into consideration:

- The new BC MOE groundwater model;
- New information on the toxicity of substances; and,
- New derivation protocols for environmental quality standards from environmental agencies around the world.

As before, the numerical standards are presented as either “generic” or “matrix.” Generic standards are a single numerical standard intended to protect human health and the environment, at any site regardless of site-specific features. *Matrix standards* provide more site-specific flexibility, separate environmental and human health protection components, and include multiple receptor-specific (e.g. humans versus aquatic life) with exposure-pathway-specific (e.g. soil ingestion versus effect on potable groundwater) health-based standards for a given substance.

The 11 existing CSR standards schedules (i.e., standards tables) have been reorganized and consolidated into four schedules: Schedules 3.1 (soil), 3.2 (water), 3.3 (vapour) and 3.4 (sediment). The original categories of water quality standards (e.g. protection of

aquatic life, water used for irrigation, livestock watering, and drinking water) are unchanged.

New exposure and land use scenarios include:

- Residential land use is defined into two uses – **High Density Residential** (four storeys or higher) and **Low Density Residential** (three storeys or less) – to acknowledge that these developments have different likelihoods of exposure to contaminants. For example, a high-rise apartment is often atop a lot-line to lot-line excavation for underground parking, and is less likely to have a backyard vegetable garden than at a single-family home.
- Wildlands now have two tiers of soil standards to address distinct and different levels of

environmental protection.

- **Natural Wildlands** are more stringent than Reverted, applicable to wildland areas protected under specific statutes for their high conservation value; and,
- **Reverted Wildlands** are less stringent than Natural, applicable to wildlands lacking designated statutory protection, including land previously used for industrial purposes (i.e., such as historic mine sites or maintenance camps), which have or will revert to wildlands use.
- A new category of [less stringent] **Parkade Vapour Standards** applies for at-surface or below-grade parking structures, to acknowledge the ventilation inherent in parking

structures. These new parkade standards apply only to the part of a building used as a parkade.

A formal review of the existing sediment quality criteria confirmed that many North American jurisdictions have adopted sediment quality standards like the sediment criterion in the current CSR. Therefore, the numerical limits for prescribed substances in sediment remain unchanged for the time being.

There are consequential amendments to the Hazardous Waste Regulation and Organic Matter Recycling Regulation to maintain consistency with the new CSR standards—these consequential amendments are not discussed here, and are generally far less significant than the primary CSR updates.

TABLE 1: **OMNIBUS STATISTICS - COMPARISON TO EXISTING CSR STANDARDS**

Schedule			Type of Standard		↑ %	↓ %	N/C %
					Becoming less stringent	Becoming more stringent	
X	Soil	Part 1	Matrix	Human health	27	50	23
			Matrix	Ecological health	18	23	59
			Matrix	Soil to groundwater	28	56	16
		Part 2	Generic	Human health	24	75	1
		Part 3	Generic	Ecological health	5	0	95
W	Water		Aquatic life		8	5	87
			Drinking water		16	19	66
V	Vapour		Residential		37	29	34
			Commercial		42	31	27
			Industrial		48	26	26
S	Sediment		All standards		0	0	100

2. PREDICTED EFFECT OF CHANGES IN NUMERICAL STANDARDS

The CSAP Society's study examined the expected effects of the changes to the CSR standards on typical contaminated sites by comparing existing historical investigation data for sites that have already been assessed. The study compared about 160,000 anonymous chemical data records to the amended standards for three general classes of site contaminants:

1. Gas station sites with petroleum hydrocarbons;
2. Dry cleaner sites with solvents; and
3. Sites with metals.

The method used evaluated the percent change in the number of samples exceeding various land use standards under the existing and new CSR standards. The table on the previous page depicts the number of contaminants within each Schedule that have an increase or decrease in their standard.

GAS STATION SITES (PETROLEUM HYDROCARBON SUBSTANCES)

Not unexpectedly, service station sites have a greater number of contaminated soil, groundwater, and vapour samples under the updated standards. On soil, the study results show benzene, toluene, xylenes, and naphthalene are more prevalent contaminants, while ethylbenzene is less so. These same substances, along with trimethylbenzene, dibromomethane, and butadiene,

may also become more of a concern in groundwater at these sites. Like groundwater, soil vapour is also likely more contaminated with the same constituents. The increase in gas station site contamination for these substances reflects a drop in the standards for these chemicals. That drop is largely based on BC MOE's update of the standards to reflect current human health or ecological toxicological reference values, as well as hydrogeological fate and transport modelling (i.e., predicted movement from a site to an aquatic life habitat).

DRY CLEANER SITES (CHLORINATED SOLVENTS)

Dry cleaner sites – typically contaminated with the chlorinated solvent tetrachloroethylene (PCE) (aka, perchloroethylene or “PERC”) – have a similar number of contaminated samples of soil and groundwater, with percent exceedances in the range of +/-10% for select constituents. However, the CSAP study found a lesser number of contaminated samples for soil vapour under the updated standards, given the less stringent criteria for common dry cleaning contaminants in vapour (carbon tetrachloride, trichloroethylene (TCE) and 1,1-dichloroethene (DCE)). PCE had a slight increase with the more stringent standard.

METAL SITES

Sites with metals have a greater number of contaminated samples of soil and groundwater under the updated standards. With respect to soil, the study results anticipate

The CSAP study concludes that sites contaminated with chlorinated solvents may benefit from the upcoming regulatory changes. On the other hand, sites contaminated with petroleum hydrocarbons or metals (where drinking water use is applicable) are likely to see more complex issues as a result of the adoption of more stringent standards.

higher levels of arsenic, iron, manganese, selenium, thallium, vanadium, and zinc, while trivalent chromium is less of an issue. Other metals including beryllium, cobalt, lithium, mercury, thallium, vanadium, and zirconium, may become more of an issue for metals sites in groundwater. The increase in the number of contaminated samples for metals is largely driven by more stringent drinking water¹ (DW) based standards and will have the greatest effect on sites where these standards apply.

SUMMARY OF ALL SITES

The CSAP study concludes that sites contaminated with chlorinated solvents (e.g., former dry cleaner sites) may benefit from the upcoming regulatory changes. On the other hand, sites contaminated with petroleum hydrocarbons or metals (where drinking water use is applicable) are likely to see more complex issues as a result of the adoption of more stringent standards.

¹By default, DW standards apply at all sites under future land use unless proven otherwise.

Cost impacts for the three site types include:

- 1. Service Station Sites:** *New standards will likely increase remediation costs.* In general, the new standards are more conservative for protection of the groundwater pathway, and more likely to increase contamination concerns.
- 2. Dry Cleaner and Solvent Sites:** *New standards are helpful and may decrease costs.* In general, there are minimal changes to soil and groundwater standards. Some relaxation is forecast for a common driver, trichloroethylene (TCE), in soil vapour, with a 12-fold increase in the standard for commercial use.
- 3. Metal Sites:** *New standards will likely increase costs.* In general, there is a lowering of environmental standards (i.e., more stringent standards) for elements, which could result in higher investigation and remediation costs.

Overall, there are cost implications to contaminated sites because of the new Omnibus standards. In general, 50% of the standards are decreasing (i.e., becoming more stringent), 25% are increasing (i.e., becoming less stringent), and 25% remain unchanged. For many site owners, this general downward trend (i.e., toughening) in numerical standards will increase costs for investigation, delineation, and remediation of contamination. However, there are several benefits and significant savings for land use and site development scenarios for underground parking and high density residential. At this stage, it is premature to predict how the new regulated “emerging substances” will impact investigations, but increased costs are certain.

AUTHORED BY

Greg Quandt
Vice President
Hemmera (BC/YT Region)
