Notice

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Volatile Organic Compound (VOC) Concentration Limits for Architectural Coatings Regulations

Statutory authority

Canadian Environmental Protection Act, 1999

Sponsoring department

Department of the Environment

REGULATORY IMPACT ANALYSIS STATEMENT

(*This statement is not part of the Regulations.*)

Description

Purpose

The purpose of the proposed *Volatile Organic Compound (VOC) Concentration Limits for Architectural Coatings Regulations* (the proposed Regulations), to be made pursuant to subsection 93(1) of the *Canadian Environmental Protection Act, 1999* (CEPA 1999), is to protect the environment and health of Canadians by setting VOC

concentration limits for 49 categories of architectural coatings identified in the table in subsection 1(2) of the Schedule to the proposed Regulations.

The proposed Regulations would apply, with the exceptions identified below, to general architectural, high-performance industrial maintenance and traffic marking coatings (paints, stains, lacquers, etc.) that are manufactured, imported, offered for sale or sold in Canada, and would come into force on the day on which they are registered. The effective dates for prohibitions applicable to the manufacture and import of each of the 49 categories range from one to five years following the date of coming into force.

In 2005, Canadian urban VOC emissions (which exclude upstream oil and gas, oil sands development and forest fires) were estimated to be 1 383 kilotonnes (kt). (see footnote 1) Solvent use accounted for 25% of these emissions, with architectural coatings accounting for an estimated 51 kt. It is expected that the proposed Regulations would result in an average annual reduction in VOC emissions from these sources of over 28%, with an aggregate reduction of about 506 kt of VOC emissions over 25 years.

The proposed VOC concentration limits have been developed to align with requirements in those U.S. states that are members of the Ozone Transport Commission (OTC), (see footnote 2) with adaptations to enhance clarity, consider the unique characteristics of the Canadian market and climate, and ensure that maximum reductions in VOC emissions are effectively and efficiently achieved.

Background

VOC emissions from architectural coatings are a contributing factor in the creation of air pollution, which is a serious problem in Canada. Consumer and commercial use of architectural coatings result in the emission of VOCs from both solvent-based and, to a lesser extent, water-based coatings. These compounds are released into the atmosphere by evaporation during the drying process, following application of the coating to a surface. In the atmosphere, photochemical reactions (see footnote 3) between VOCs and other common airborne pollutants such as nitrogen oxides (NO_X) result in the formation of ground-level ozone (O_3), a respiratory irritant and a component of smog. Smog is a noxious mixture of air pollutants, including O_3 and particulate matter (PM), which can often be seen as a haze in the air, especially over urban centres.

Air pollution has been shown to have a significant adverse impact on human health, including premature deaths, hospital admissions, doctor visits, and emergency room visits. Studies (see footnote 4),[00A0]; (see footnote 5) indicate that air pollution is also associated with a long-term increased risk of lung cancer and heart disease.

Scientific evidence (see footnote 6) indicates that O_3 can have a detrimental impact on the environment. This impact can lead to reductions in agricultural crop and commercial forest yields, reduced growth and survivability of tree seedlings, and increased plant

susceptibility to disease, pests, and other environmental stresses (e.g. harsh weather).

In 1999, scientific assessments of PM and O_3 found that these substances met the criteria set out in section 64 (see footnote 7) of CEPA 1999, and PM and O_3 were added to Schedule 1 (List of Toxic Substances) of the Act. As a result of this assessment and listing, those VOCs contributing to the creation of PM and O_3 were also found to meet the section 64 criteria and were therefore added to the List of Toxic Substances in 2003. This made available the full range of management instruments under CEPA 1999, including regulating VOC emissions under subsection 93(1).

In order to address Canada-United States transboundary flows of ground-level O_3, in December 2000 Canada and the United States signed the Ozone Annex to the 1991 Canada-United States Air Quality Agreement (Ozone Annex), with commitments from both countries to reduce VOC emissions from consumer and commercial products, including architectural coatings.

On March 27, 2004, the Ministers of the Environment and of Health published Canada2019;s *Federal Agenda for Reduction of Emissions of Volatile Organic Compounds (VOCs) from Consumer and Commercial Products* (see footnote 8) (the Federal Agenda). The Federal Agenda outlined the Government of Canada2019;s plan to develop Regulations under CEPA 1999 to set VOC emission standards for architectural coatings.

In October 2006, the Government of Canada published the *Notice of intent to develop and implement regulations and other measures to reduce air emissions* (the notice of intent). The notice of intent outlined the approach that would be taken to reduce the emission of air pollutants, including a commitment to propose regulations under CEPA 1999 to limit the concentration of VOCs in architectural coatings.

In April 2007, the Government of Canada released its *Regulatory Framework for Air Emissions* (see footnote 9) (the regulatory framework). The regulatory framework identifies the reduction of VOC emissions from architectural coatings as part of the national Clean Air Regulatory Agenda (CARA). The key components of the regulatory framework, as they relate to consumer and commercial products, include

- significant reductions of VOC emissions and other smog precursors from industrial, commercial and consumer products;
- bringing forward regulations between 2007 and 2010 to limit VOC concentration in architectural coatings, automotive refinishing products, and certain consumer products; and
- aligning the VOC concentration limits, where appropriate, with similar requirements in the .

Actions in other jurisdictions

A number of actions have been taken in other jurisdictions to control the concentration of VOCs in architectural coatings, and are described in the following sections.

European Union

In April 2004, the European Union (E.U.) finalized a directive that is expected to reduce VOC emissions from certain decorative paints and varnishes. The directive sets VOC concentration limits for 12 categories of architectural paints and varnishes, effective January 1, 2007. More stringent concentration limits are scheduled to become effective on January 1, 2010.

The E.U. approach includes broad coating categories that make no distinction between general use coatings, which often can be formulated with low VOC concentrations, and some niche specialty coatings which require higher VOC concentrations. Furthermore, the E.U. uses total liquids (including water) in the formula for calculating VOC concentrations. Conversely, the U.S. and the proposed approaches do not include the volume of water and exempt compounds in the VOC equation, removing any incentive to use dilution as a means of achieving the required concentration.

U.S. Environmental Protection Agency

In 1998, the U.S. Environmental Protection Agency (EPA) promulgated the *National Volatile Organic Compound Emission Standards for Architectural Coatings* (the National Rule (see footnote 10)). The National Rule specifies VOC concentration limits for 61 architectural coating categories which are, in general, similar to categories set out in the proposed Regulations. Recent advances in technology, however, now make it feasible to set lower VOC concentration limits in 26 categories, while maintaining levels of performance and durability similar to those of coatings with higher VOC concentrations.

California Air Resource Board

Beginning in the 1970s, the California Air Resources Board (CARB) and local California districts began developing Suggested Control Measures (SCMs) and rules for VOC emission sources, like architectural coatings, in an effort to address the smog problem affecting many of its cities. The 2000 CARB SCM set architectural coating VOC concentration limits that are currently recommended for use by several districts in California. In 2007, CARB amended the SCM to include more stringent VOC concentration limits for certain architectural coating categories, effective beginning in 2010. One district, the South Coast Air Quality Management District (SCAQMD, which includes Los Angeles and its surroundings), also amended its Architectural Coatings Rule in 2006 with new, more stringent limits effective in 2007 and 2008.

Some of the 2007 CARB SCM and the latest SCAQMD limits are considered 201C;technology forcing201D; by industry representatives (in some cases, innovation and new technology may be required to achieve the required limits) and are suitable in the

special context of California. These very stringent limits were not suitable as a basis for developing the VOC concentration limits under the proposed Regulations, as Canada does not experience the same extreme smog episodes with high associated health and environmental costs.

Ozone Transport Commission

The Ozone Transport Commission (OTC) is a multi-state organization created under the U.S. *Clean Air Act* (CAA). The OTC is responsible for developing and implementing regional solutions to the ground-level ozone problem in the Northeast and Mid-Atlantic regions, including 12 states and the District of Columbia. The OTC member states together experience seasonal weather variations and extremes similar to those in many Canadian jurisdictions.

In 2001, the OTC adopted an Architectural and Industrial Maintenance (AIM) Coatings Model Rule for state regulations based on the VOC concentration limits of the 2000 CARB SCM, with the exception of two architectural coating categories. Adopting the CARB limit for industrial maintenance coatings would cause performance problems due to the climate (i.e. more required coats or frequent re-application). For conversion varnish, the CARB limit would not allow their continued marketing and use, as reformulation was not technologically feasible at that time. For these reasons, the VOC concentration limits for these categories were set higher than those of the 2000 CARB SCM.

Implementation of the OTC Model Rule began in 2005 and has now been implemented in a majority of the OTC states, providing evidence of the economic and technical feasibility of the Model Rule concentration limits. In 2007, the U.S. EPA announced that it planned to model amendments to its National Rule on the OTC Model Rule.

The proposed Regulations

The proposed Regulations would set mandatory VOC concentration limits for architectural coatings. These limits were developed through stakeholder consultation, technical assessment and international benchmarking, with the objective of maximizing VOC emission reductions with measures that are technologically and economically feasible.

The VOC concentration limits in the existing EPA rule are less stringent than those that have been shown to be technologically and economically feasible in the OTC states. The more stringent standards for a limited number of coating categories offered by the latest CARB and SCAQMD models would be inappropriate in light of the high cost and the limited expected incremental reduction in emissions.

The OTC has developed a Model Rule specifically for a region of the United States that experiences weather conditions similar to those in many Canadian jurisdictions. Given the expected performance of concentration limits based on the OTC Model Rule, the economic and technological feasibility of the associated concentration limits, and the benefit of harmonizing Canada2019;s requirements with those in

many U.S. states, the concentration limits set out in the OTC Model Rule were selected as the most appropriate basis for the proposed Regulations, with adaptations to reflect the Canadian context.

Application

The proposed Regulations would apply to the 49 categories of architectural coatings identified in column one of subsection 1(2) of the schedule to the proposed Regulations (the Schedule). The coating categories and associated exceptions were chosen to align Canada2019;s categories, where appropriate, with those in the OTC Model Rule, with additional adjustments provided to account for conditions unique to Canada and reflect developments in low-VOC technologies. The proposed Regulations apply to the concentration of VOC in the final architectural coating product and not to VOC emissions resulting from the manufacture of the coatings. The following exceptions have been provided for

- The manufacture or import of architectural coatings for the purpose of export only or for shipping to other manufacturers for processing or repackaging. Architectural coatings for export would be subject to the VOC requirements in the importing country (the same as in E.U. and regulations).
- Coatings for application to a product or a component of a product, in or on the premises of a factory or a shop, as part of a repairing, manufacturing or processing activity. The control of VOC emissions from such coating applications traditionally is the responsibility of provinces and territories; it may, in addition, be controlled under the industrial initiatives of CARA.
- Aerosol coatings or adhesives, as these VOC emission sources are expected to be addressed by separate control measures.
- Pesticidal coatings, which are managed by Health 2019;s Pest Management Regulatory Agency (PMRA) and are regulated under the authority of the *Pest Control Products Act*.
- Specific architectural coatings, identified in subsection 2(3) of the proposed Regulations, sold in containers with volumes of one litre or less (the 201C;small container exemption201D;). These coatings would be exempt from meeting the VOC concentration limits, but would be subject to labelling requirements. This exemption is being proposed to allow the continued manufacture of identified niche and specialty products that require higher VOC concentrations, generally made by small or medium enterprises, and whose costs of compliance would be high, with small volumes of emissions being reduced. Due to the limited volumes, the impacts on the environment and on human health are expected to be small. Sales of these coatings would be monitored by Environment Canada in future reports, surveys or studies, to ensure that the associated emissions remain low.
- Architectural coatings used in scientific research or as a laboratory analytical standard. The coating quantities used and the associated VOC emissions are very small, with little risk to the environment or to human health.

Prohibition

The proposed Regulations would prohibit the manufacture, sale or import of architectural coatings with concentrations of VOCs in excess of the category-specific limits set out in column two of the Schedule. A most-restrictive-limit provision is included in section 7 of the proposed Regulations to ensure that coatings with multiple uses meet the lowest possible VOC concentration limits.

Other provisions

The proposed Regulations also include provisions defining methods for the determination of VOC concentrations and other test methods, labelling requirements and record keeping. These provisions are included to facilitate the operation and enforcement of the proposed Regulations.

Coming into force

The proposed Regulations would come into force on the day on which they are registered. Prohibitions applicable to manufacture and import, as set out in section 3, would be effective

- one year after the coming into force date for most coating categories. This would allow a one-year transition period;
- three years after the coming into force date for bituminous roof primers (item 4 in subsection 1(2) of the Schedule), any other bituminous roof coatings (item 5), form release compounds (item 11), and traffic marking coatings (item 46). These coatings are all typically used outdoors in a construction context and may require adaptations for cold or damp weather applications. As a result, additional time has been provided to allow for planning and equipment changes; and
- five years after the coming into force date for recycled coatings (item 42). Recycled coatings contain waste coatings from consumers, manufacturers and retailers. Providing an extension to this coating category is expected to provide a cost-effective option for managing the disposal of pre-Regulations, non-compliant coatings, and to limit waste.

For each coating category, there would be a two-year sell-through period, as set out in section 4, during which coatings manufactured and imported prior to the effective date could still be sold. The sell-through period is intended to provide the sector with time to sell coating volumes manufactured or imported prior to the effective dates as set out in the proposed Regulations. In the absence of this provision, it is expected that large volumes of coatings would need to be disposed of, with significant cost to manufacturers, importers and retailers.

<u>Sector profile</u>

The Canadian architectural coatings sector produces coatings for three main segments: general architectural, industrial maintenance, and traffic marking. General architectural coatings include

architectural or decorative paint (e.g. flats, non-flats, stains, lacquers, etc.) that is sold to painting contractors, and to the general public through retail outlets. Industrial maintenance coatings are high-performance architectural coatings for industrial or professional application to surfaces exposed to extreme conditions. Traffic marking coatings are used for marking and striping streets, highways, or other traffic surfaces.

Participants in the architectural coatings business system include upstream suppliers and distributors of raw materials (resins, solvents, additives and packaging materials), architectural coatings manufacturers, and downstream distributors, retailers, and end users (businesses, the general public and government users).

Resin suppliers typically have operations that service the entire North American market, with some having international networks of resin production, supply and research.

The manufacture of architectural coatings is largely performed by manufacturers who blend raw materials in batch processes, package the coatings (including labelling), and distribute them to retailers and/or end users. It is estimated that approximately 289 million litres of architectural coatings were sold in Canada in 2002, resulting in total revenues of $1.4 billion. (see footnote 11) Of these coatings, 80% were manufactured in Canada by an estimated 120160 domestic and multinational manufacturers. The remaining 20% of coatings were imported, primarily from the United States. The table below summarizes estimates of architectural coating use in 2002. (see footnote 12)

Table 1: 2002 Architectural Coating Volumes, Sales and VOC Emissions

Coating Segment	**2002 Canadian Architectural Coatings**		
	Consumption Volume (Millions of Litres)	**Sales Value ($M)**	**Resulting VOC Emissions (kt)**
General architectural	233	1,047	39.7
Industrial maintenance	36	313	12.4
Traffic marking	20	41	6.6
Total	**289**	**1,401**	**58.7**

Ontario manufacturers produce an estimated 61% of Canadian-consumed coatings, while Quebec and British Columbia account for an additional 26%, with the remaining 13% distributed between Alberta, Manitoba, New Brunswick and Nova Scotia. Approximately 700A0;200 Canadians were employed by architectural coatings

manufacturers in 2002. (see footnote 13)

A majority of general architectural coatings are sold to consumers and paint contractors through traditional retail outlets. Some industrial maintenance coatings or specialty general architectural coatings are sold directly to contractors or other users, or sold through a distributor. Traffic marking coatings users typically are private, municipal and provincial marking operators and tend to be sold directly to contractors, municipalities or governments.

Alternatives

Canadian emissions of VOCs, including those from architectural coatings, need to be reduced in order to protect the health and environment of Canadians and to ensure that Canada remains compliant with its international obligations under the Ozone Annex. In order to achieve these objectives, several alternative responses have been considered, including the status quo, additional voluntary action, market-based instruments, and regulation.

Status quo

Voluntary measures have been used in the architectural coatings sector for many years. (see footnote 14) In 2002, the Canadian Council of Ministers of the Environment published *Recommended Standards and Guidelines for the Reduction of VOC Emissions from Canadian Industrial Maintenance Coatings.* These standards and guidelines were based on U.S. legislation and were developed with the participation of industry. They recommend maximum VOC concentrations for manufacturers, importers and users of industrial maintenance coatings and four sub-categories of industrial maintenance coatings, and for users of traffic marking coatings. The standards and guidelines were implemented between January 1, 2003 (manufacturers and importers) and January 1, 2005 (users). Compliance by industry remains voluntary.

Voluntary measures, combined with a market trend toward low-VOC coatings, have reduced VOC concentrations in architectural coatings to their current levels. The industry has developed lower-VOC products, but significant additional reductions are still necessary; data indicate that VOC concentrations in architectural coatings on the Canadian market could still be appreciably reduced, as there are disparities in concentration within coating categories. The data show that further reductions are technologically and economically achievable, but that there is insufficient incentive for manufacturers and importers to widely develop and market low-VOC coatings.

The status quo option was therefore rejected as an option for achieving further reductions in VOC emissions from architectural coatings, protecting the health and environment of Canadians, and meeting Canada2019;s international commitments under the Ozone Annex.

Additional voluntary action

Given the large reduction in total VOC emissions that is required to meet the Government of Canada2019;s objectives, it is necessary to guarantee reductions in VOC emissions from many sectors, including architectural coatings. New voluntary measures do not provide this guarantee.

In addition to this lack of certainty, additional voluntary measures may yield an unfair advantage to those companies that choose not to participate in the initiatives and continue to market their products without having to put resources towards the research and development necessary to create coatings with lower VOC concentrations. This may disadvantage those Canadian firms willing to take steps to reformulate their products and reduce VOC emissions for the benefit of Canadians.

Emissions of VOCs from architectural coatings need to be reduced beyond levels that have been realized using voluntary measures. An additional voluntary measure was therefore rejected.

Market-based instruments

Market-based instruments, including emission trading programs, deposit-refund systems, and fees and charges, were given consideration. Market-based instruments work by encouraging changes in consumer and producer behaviour. When properly designed and implemented, these instruments can promote cost-effective ways of dealing with environmental issues. In addition, they can provide long-term incentives for pollution reduction and technological innovation.

An emission trading system was considered as a means of managing emissions of VOCs from the use of architectural coatings. However, a trading system would not function at the point of use since there are a large number of widely dispersed users. There would also be significant issues concerning the measurement and verification of emission reductions. A trading system could be envisioned at the manufacturer level; however, it is unlikely that such a system would be efficient or effective. Such a system would require setting a cap on the quantity of VOCs used for each of the facilities manufacturing architectural coatings. Moreover, a mechanism would need to be introduced to ensure that VOC reductions from coatings or substances covered under other measures were not included in the cap, nor were VOCs in coatings for export or intermediate processes. This complexity would raise the administrative costs of the mechanism substantially. A firm-size threshold would also need to be introduced so that small, niche manufacturers would not bear the relatively large administrative costs of the trading system. It is expected that the remaining large manufacturers would be limited in number and there would be insufficient differentiation in the marginal cost of abatement to support a trading system.

The purpose of a deposit-refund system is to recover and/or recycle a substance that remains in the product packaging or container or the container itself. However, as all VOCs would be emitted during application to a surface and it is not expected that any would remain in the coating containers, such an approach was considered

inapplicable.

For the purpose of achieving VOC emission reductions, fees and charges were considered and analyzed as potential measures. Fees and charges could be levied on products containing VOCs above the proposed concentrations. It is expected that such a system would require a significant amount of time to implement, and as technology evolves, it would be costly and time-consuming to make changes to the fee structure to achieve additional cost-effective reductions. This approach was therefore also rejected.

The use of market-based instruments, therefore, does not present itself as an effective option for reducing VOC emissions.

Regulatory measure aligned with OTC model rule

In order to meet Canada2019;s international obligations and to protect human and environmental health, it is necessary to secure reductions in VOC emissions from many sources, including architectural coatings. A regulatory measure would guarantee these reductions.

It is expected that the proposed Regulations would result in an average annual reduction of VOC emissions from the use of architectural coatings of 28% and would align Canada2019;s regulations pertaining to the concentration of VOCs in architectural coatings with requirements adopted in the OTC states. The proposed Regulations would result in the most significant reduction in VOC emissions according to what is technologically and economically feasible, would result in a more significant contribution to the protection of human and environmental health, and would help Canada deliver on its international commitments under the Ozone Annex.

Benefits and costs

An analysis of benefits and costs was conducted to assess the economic impact of the proposed Regulations on stakeholders, including the Canadian public, industry and government.

Analytical framework

The approach to the cost-benefit analysis identifies, quantifies and monetizes, where possible, the incremental costs and benefits associated with the proposed Regulations. The cost-benefit framework consists of the following elements:

- *Incremental impact*: Incremental impacts are analysed in terms of incremental emission reductions, costs and benefits to all interested parties as well as the economy. The incremental impacts were determined by comparing two scenarios: one without the proposed Regulations and the other with the proposed Regulations. The two scenarios are presented below.
- *Timeframe for analysis*: The time horizon used for evaluating economic impacts is 25 years. The first year of the analysis is 2010, when the expected prohibitions applicable to the

manufacture and import take effect for most coating categories in the proposed Regulations.

- *Data aggregation*: The level of detail in the cost data does not allow a separate analysis for each coating category. In the analysis, traffic marking coatings and industrial maintenance coatings are treated separately, and the remaining coatings are aggregated as 201C;general architectural coatings.201D; Using this approach, some detail may be lost, given that several general architectural coatings have different effective timelines. However, these exceptions are limited in volume and impact, and do not impact the conclusions.
- *Approach to Cost and Benefit Estimates*
- Costs have been estimated in monetary terms to the extent possible and are expressed in 2006 Canadian dollars.
- Attempts were made to estimate the benefits associated with the proposed Regulations; however, due to modelling constraints, it was not possible to analyze the impact of VOC emission reductions from architectural coatings on ambient air quality and related environmental and human health benefits. A qualitative assessment of benefits was therefore completed and is supplemented using benefit estimates from other jurisdictions.
- *Discount Rate*: A discount rate of 5% was used for this analysis. Since benefits could not be estimated, only the present value of the stream of costs was calculated. Sensitivity analysis was conducted using discount rates of 3% and 7%.

The following sections provide an overview of the baseline and regulated scenarios, with the incremental costs and benefits of the proposed Regulations described below.

Baseline scenario

The cost-benefit analysis is dependent on forecasts of the consumption of architectural coatings, the resulting VOC emissions, and the cost of compliance with the proposed Regulations. Under the baseline scenario, where there is no cost of compliance, the forecast demand for (and consumption of) coatings between 2010 and 2034 is expected to be influenced by a number of factors, including population growth, housing construction, home sales, total industrial output, and overall economic activity. In aggregate, these demand-side factors are used to forecast an annual growth rate in the consumption of architectural coatings of 1% (see footnote 15) between 2010 and 2034.

It is expected that emissions of VOCs would be proportional to the consumption of VOC-containing coatings, and the analysis therefore applies an annual growth rate of 1% to the total emissions of VOCs.

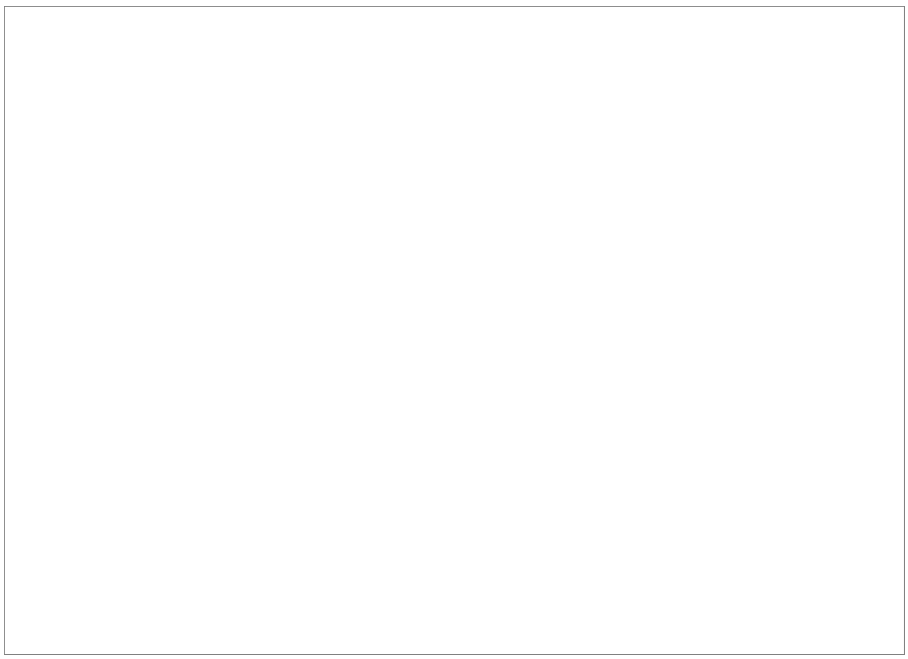
Regulated scenario

The estimated costs of reducing VOC concentrations are based on the economic background study. The underlying assumptions were communicated to stakeholders and modified to ensure consistency with expected costs. The supply-side impacts of the proposed Regulations are discussed in detail below, but include one-time and

recurring costs which increase the cost of manufacturing a given quantity of coatings. While there may be a small incremental impact on coating prices, which may result in a small incremental reduction in the quantity of coatings demanded, it is not expected that these changes would be significant given the magnitude of impacts described below. With little impact on the demand for coatings, the regulated scenario is subject to the same demand-side assumptions as the baseline scenario, and consumption under the regulated scenario is therefore expected to continue to grow at a rate of 1% per year.

On the benefit side, the regulated scenario assumes implementation of the proposed Regulations according to the timeline set out in the schedule. Following the anniversary dates, the VOC concentrations in architectural coatings would fall to the levels identified in the schedule, with a corresponding decrease in total VOC emissions. Due to the continued growth in demand for, and consumption of, architectural coatings, it is expected that following the initial reduction, total emissions would continue to grow at 1% per year. It is assumed that the proposed Regulations would come into force in 2009, with anniversary dates therefore scheduled in 2010, 2012 and 2014 for the three coating groups identified in the description of the proposed Regulations above. The following figure shows the expected impact of the proposed Regulations on VOC emissions.

Figure 1: Total Estimated VOC Emissions from Architectural Coatings (2009 to 2034)



Costs

In order to comply with the requirements of the proposed Regulations, manufacturers of non-compliant architectural coatings would have to reformulate or discontinue production of these coatings. These actions would have implications for the manufacturers2019; demand for resins and solvents (upstream), on their production process (including employment and profitability) and on the quantity and properties of coatings supplied to users (downstream, including possible changes in coating prices at retail, and changes in equipment required for effective coating application).

The Government of Canada would also incur costs associated with compliance promotion, enforcement and administration of the proposed Regulations.

Impact on industry

The impacts on industry are expected to manifest themselves largely in the operations of coating manufacturers. Other impacts on industry include those on resin and solvent suppliers, and those on commercial coating users (painting contractors, etc.)

Upstream, the net impact on resin and solvent suppliers is expected to be small, given that the overall quantity of manufactured coatings would not differ significantly from the baseline. Resin suppliers are expected to experience a net gain in revenues, as the demand for more expensive, low-VOC resins increases. Solvent suppliers are expected to experience an overall decline in demand for their products, as architectural coating formulators increasingly switch their production to water-based technologies.

Downstream, commercial end-users of architectural coatings, including commercial painting contractors, are expected to face limited cost increases, to the extent that there are incremental increases in coating prices or modifications to the application equipment. This increased cost may be offset by reduced costs of thinning and cleaning products and safety equipment, as described in the benefits section below. It is expected that commercial painters would be able to pass some of the cost increases on to their customers (institutions, businesses and households).

For manufacturers, the incremental cost of meeting the requirements of the proposed Regulations includes the following elements:

- one-time cost to reformulate coatings to meet the VOC concentration requirements of the proposed Regulations;
- one-time new substance notification costs for new substances in low-VOC coating formulations;
- one-time cost to meet the proposed labelling requirements;
- other one-time costs including capital expenditures for new/upgraded storage facilities necessary for water-based coatings;
- annual, recurring administration cost; and
- annual, recurring raw materials cost.

In the table below, estimates of present values of costs are provided for general architectural, industrial maintenance and traffic marking coatings.

Table 2: Estimated Present Value of Incremental Manufacturer One-time and Recurring Costs, 2010 to 2034

Incremental Costs	General Architectural (Millions)	Industrial Maintenance (Millions)	Traffic Marking (Millions)

One-time			
Reformulation	$60.7	$33.6	
New substance notification	$3.0	$1.0	
Labelling	$11.2	$3.2	$0.004
Other one-time costs	$4.8	$1.6	
Recurring			
Administration	$12.8	$4.2	
Raw materials	$266.1	$161.6	
Present value of costs to manufacturers	$358.6	$205.2	$0.04

If manufacturers are unable to pass increased costs on to consumers, the resulting reduction in profitability may result in employment reductions and/or increased competitive pressures in the market. The proposed Regulations include a number of provisions intended to minimize the likelihood of negative impacts on vulnerable manufacturers, including a two-year sell-through period.

Compliant traffic marking coatings are already being manufactured, with no reformulation or new substance notification costs expected when the relevant prohibition becomes applicable to the manufacture and import of these coatings. Traffic marking coating manufacturers are expected to incur a present value of labelling costs of $41,000. The costs associated with the proposed Regulations with respect to traffic marking coatings are expected to be borne largely by consumers of these coatings, including contractors, municipalities, provinces and territories. These impacts are discussed below in the context of impact on consumers.

According to Statistics Canada2019;s Annual Survey of Manufactures and Logging, (see footnote 16) annual revenue in the paint and coating manufacturing sector was $2.3 billion in 2005. The background economic study estimates that architectural coatings account for approximately 55% of this sector2019;s revenues. The impact analysis of the proposed Regulations estimates that annual costs during the first ten years of the proposed Regulations, when one-time costs are being incurred in addition to recurring costs, would be approximately $46 million, or 3.6% of sector revenue. Following the one-time cost period, incremental costs would fall to approximately $30 million, and the impact of the proposed Regulations would fall to approximately 2% of sector revenue.

Impact on the federal government

The federal government would incur costs of compliance promotion in the regulated community, inspection and enforcement of the provisions of the proposed Regulations, and laboratory test development.

Compliance promotion

Government of Canada compliance promotion activities are intended to encourage the regulated community to achieve compliance. Compliance promotion costs would require an estimated annual budget of $69,000 during the first year following the first anniversary of the proposed Regulations. Compliance promotion activities could include mailing out the final Regulations, developing and distributing promotional materials (i.e. fact sheets, Web material), advertising in trade and association magazines, attending trade association conferences and presenting workshops/information sessions to explain the proposed Regulations. This might also include responding to and tracking inquiries in addition to contributing to the compliance promotion database.

In year two, compliance promotion costs would require an estimated annual budget of $18,000, as compliance promotion activities would likely decrease in intensity. Activities may include sending reminder letters and the publication of reminder fact sheets. Other activities may involve responding to and tracking inquiries and contributing to the compliance promotion database.

In years three and four, compliance promotion would require an estimated additional budget of $6,000 annually. Compliance promotion activities may be kept at a maintenance level and be limited to responding to and tracking inquiries in addition to contributing to the compliance promotion database. The required intensity and level of effort may change when compliance analyses are completed or if unforeseen challenges arise.

Enforcement

Government of Canada enforcement activities would secure compliance with the proposed Regulations. For the first year following the first anniversary of the proposed Regulations, an estimated one-time cost of $250,000 will be required for the training of enforcement officers.

In the first year following the delivery of the training, enforcement costs are estimated to require an annual budget of $130,000 for inspections (including salary and benefits, operations and maintenance, transportation and sampling costs), $14,000 for investigations and $5,000 for measures to deal with alleged violations (including environmental protection compliance orders and injunctions).

In subsequent years, enforcement costs are estimated to require an annual budget of $149,000, including $111,000 for inspections, $14,000 for investigations, $5,000 for measures to deal with alleged

violations and $18,000 for prosecutions.

Table 3: Present Values of Incremental Costs to Federal Government

Compliance promotion	Enforcement
$99,438	$2.3 million

In aggregate, the present value of costs to the federal government is estimated to be just over $2.4 million.

Impact on consumers

The proposed Regulations are expected to have limited impact on consumers, if coating manufacturers are able to 201C;pass on201D; the incremental costs, estimated above, by raising prices and reducing the negative impact on the manufacturers2019; net income.

Architectural coating manufacturers have expressed uncertainty over the degree to which costs could be passed on to consumers. Some expect most costs to be passed on, while others indicate that some would be borne by manufacturers. In general, the market for architectural coatings is competitive, and it is not expected that manufacturers would pass significant price increases on to consumers.

Consumers of traffic marking coatings include the traffic marking operations of provinces, territories, municipalities and contractors. It is expected that these users of traffic marking coatings would shift to water-based coatings and other alternatives to traditional solvent-based coatings, with compliance costs arising from changes in the process of applying these coatings to roads and surfaces. In addition to water-based coatings, compliant alternatives include low- and no-VOC products such as methyl-methacrylate, polyester, epoxy and thermoplastic paints or preformed tapes, permanent markers, etc. All have application processes and equipment that differ, to some extent, from those used for the application of solvent-based coatings.

Impacts on traffic marking coating users would arise from one-time costs associated with equipment replacement, retrofitting and training, possible increased operational costs due to a reduced painting season, and changes in paint or other recurring costs. Environment Canada conducted a survey of traffic marking end users in November 2005. The overall level of costs to traffic marking coating users is uncertain; however, survey results indicated that costs may accrue disproportionately to smaller municipalities and in areas where relatively humid or cold temperatures significantly impact the duration of the traffic marking season.

Environment Canada has been working with traffic marking stakeholders for several years to identify and resolve any issues arising from the proposed transition to compliant traffic marking coatings or non-coating alternatives. Some jurisdictions have already completed the transition, while others have delayed, notwithstanding the existence and availability of alternatives to traditional coatings.

Environment Canada continues to work with stakeholders to identify and share information regarding the testing and availability of alternatives to solvent-based traffic marking coatings. This work shows that viable, cost-effective alternatives exist, that some products function well in cold climates2014;and indeed may provide superior performance to solvent-based coatings2014;and that the transition should not result in any impact on traffic safety if the transition process is planned efficiently. In order to provide sufficient time for a full and cost-effective transition from traditional solvent-based traffic marking coatings to compliant alternatives, Environment Canada has extended the proposed timeline for traffic marking coatings to three years after the Regulations come into force. Estimates of costs to traffic-marking coating consumers are currently not available. The feasibility of this transition is supported by cost data collected on available alternatives and by the fact that some Canadian and U.S. jurisdictions have already transitioned to compliant alternatives.

Other costs

Other costs may be incurred as a result of the proposed Regulations. Preliminary estimates suggested that manufacturers would bear costs associated with disposal of non-compliant coating volumes after the proposed limits become effective. The proposed Regulations include a two-year sell-through period during which manufacturers and retailers would be able to continue to market and sell non-compliant volumes produced prior to the effective dates. Notwithstanding this allowance, it is expected that limited disposal costs would still need to be incurred following expiry of the sell-through period, as firms recycle or dispose of the limited remaining non-compliant coating volumes.

Benefits

Environment Canada has estimated that the cumulative incremental VOC emission reductions resulting from the proposed Regulations would be 506 kilotonnes between 2010 and 2035, with an average annual reduction (see footnote 17) of approximately 28% per year.

These reductions, combined with other VOC emission reduction initiatives proposed under the Government of Canada2019;s Regulatory Framework, are expected to result in an incremental reduction in human and environmental exposure to O_3 and PM. These would result in benefits to

- Human health2014;reduced incidence of premature death, hospital admissions, doctor visits, emergency room visits, lost work and school days, etc.;
- Agriculture and forestry2014;improved yields; and
- Environment2014;reduced damage to the ecosystems.

It is currently not possible to quantify and monetize with confidence the benefits directly associated with the reduction of a tonne of VOC from architectural coatings in Canada. The expected magnitude of VOC emission reductions from the proposed Regulations alone do not allow existing models to accurately detect or measure the impact on air quality, human health and the environment. The

interrelationships between different pollutants are non-linear and complex, and it is therefore impossible to isolate the impact of VOC emission reductions from specific sources on air quality and ground-level ozone.

In the United States, the EPA and CARB have been unable to precisely isolate and assess potential impacts associated with reductions in VOC emissions alone, despite a consensus that these impacts exist. Average estimates of the benefits from more broadly defined VOC sources, reported by the U.S. EPA, (see footnote 18) range from $6,800 to $18,800 per tonne (see footnote 19) of VOC emission reductions. More recently, the U.S. Office of Management and Budget (OMB) (see footnote 20) has published estimates of benefits associated with VOC reductions ranging from approximately $850 to $3,840 per tonne. The E.U. has also estimated the monetized benefits of reductions for its directive to reduce VOC emissions from paints. (see footnote 21) Benefit estimates for E.U. member states range from $800 to $11,600 per tonne of reduced VOC emissions. (see footnote 22) However, differences in weather patterns, product use, land use, population, population density, architectural value and socio-economic conditions require caution in applying these estimates to the Canadian context.

The estimated low, high and average benefits from the E.U. and U.S. studies provide evidence of the order of magnitude of potential benefits from reducing VOC emissions.

Table 4: Estimated Benefits from VOC Emission Reductions (in 2006$/tonne)

Estimate Source	Low	Average	High
U.S. OMB	$850	$2,345	$3,840
E.U.	$800	$3,400	$11,600
U.S. EPA	$6,800	$12,800	$18,800

Although the quantified benefits of VOC reductions from architectural coatings alone are difficult to assess, the overall VOC emission reductions expected from all sources identified in the Regulatory Framework would contribute to health and environmental benefits. The benefits of reduced emissions of VOCs are expected to manifest themselves predominantly in urban areas and, in particular, in regions with persistently low air quality. Reduced human health risks would also translate into lower health care costs to governments across Canada.

In addition to these direct benefits, the proposed Regulations represent an important step by the Government of Canada towards meeting Canada2019;s commitments under the Ozone Annex. Meeting these commitments is critical to Canada2019;s long-term objective of reducing transboundary flows of air pollutants, with significant benefits to human and environmental health.

Other benefits

The transition to low-VOC coatings would likely mean a transition away from the use of solvent-based architectural coatings towards the use of water-based coatings. Application of water-based coatings can yield time and budget savings due to the relative speed and ease of equipment cleaning (e.g. for paint sprayers and brushes) and coating thinning, and reduced need for safety equipment (masks, gloves, goggles, etc.).

Evidence also suggests that, for certain architectural coating types, low-VOC formulations may have improved performance relative to traditional solvent-based, higher-VOC coatings. Some low-VOC coatings can contain more solid matter by volume and provide more opaque and even coverage with fewer coats.

These benefits are expected to accrue largely to commercial painting operations and may offset any price increases for architectural coatings.

Summary of impacts

The cost impacts presented in the preceding sections are summarized in the table below. In the absence of monetized benefit estimates, the calculation of net present value of the proposed Regulations is not possible. It is expected, however, that in light of the significant adverse health and environmental impacts of ground-level O_3, PM and smog, the benefit of meeting Canada2019;s international commitments under the Ozone Annex, and international estimates of the benefits of VOC reductions, the benefits would exceed the costs.

The table below estimates the sensitivity of the cost estimates to variations in the discount rate and provides a range of estimates of cost per tonne of reduced VOC emissions.

Table 5: Summary of Impacts

	$PV_{3\%}$	$PV_{5\%}$	$PV_{7\%}$
Costs to industry and consumers (million)	$667	$564	$486
Cost to government(million)	$2.9	$2.4	$2.1
Total cost (million)	$669.9	$566.4	$488.1
VOC reductions (kt)	506		
Cost per tonne	$1,324	$1,119	$965

The table above shows that estimates of cost per tonne range between $965 and $1,324. These estimates are below the benefit per tonne estimated in other jurisdictions, as shown in table 4. It is expected that estimated benefits per tonne of VOC emission reductions would be

comparable in Canada.

Competitiveness

The proposed Regulations may have competitiveness impacts for some firms in the architectural coatings sector. The analysis and consultation processes have indicated that some small- and medium-sized enterprises (SMEs) may be challenged to meet the one-time costs associated with the transition to low-VOC coatings. The proposed Regulations include a small container exemption for eight selected categories identified in the Schedule to the proposed Regulations. It is expected that this exemption would provide those small, niche coating manufacturers facing the highest one-time costs with the ability to continue to compete in the marketplace.

In the short term, Canadian firms manufacturing for the domestic and U.S. markets may be at a competitive disadvantage against U.S. firms that have already transitioned to low-VOC coatings. U.S. coatings imported into Canada may be available at a lower cost relative to comparable Canadian-manufactured coatings. In general, however, this impact is expected to be limited. A significant portion (about 80%) of Canadian architectural coatings is produced domestically, with limited imports from the United States. In addition, existing formal marketing relationships between manufacturers and retailers are expected to continue in the absence of a significant increase in coating prices.

The competitiveness of the Canadian architectural coatings industry as a whole is expected to benefit in the long run from the proposed Regulations. As indicated above, the costs of the proposed Regulations are expected to be less than 4% of industry revenue while firms absorb the one-time costs of compliance and approximately 2% of revenue thereafter. Creation of a level playing field with major U.S. markets may, following absorption of these costs, lead to increased opportunities for Canadian architectural coating manufacturers who export their coatings to the United States.

Consultation

A discussion document was prepared in March 2005 for consultation with architectural coatings stakeholders. The document outlined the proposed elements for regulating the VOC concentration of architectural coatings and communicated key results of Environment Canada2019;s 2003 survey of manufacturers and importers of architectural coatings in Canada and of the 2004 report entitled *Technical Assessment of Categorization and VOC Content Limits for Architectural and Industrial Maintenance Coatings in Canada*.

Three formal public consultation meetings were held in Toronto, in April 2005, January 2006 and September 2006. These meetings included discussion of the March 2005 discussion document and subsequent updated proposals, the health effects of PM and ground-level O_3 exposure, the Canada-wide Standards (CWS) for PM and ozone, and an overview of estimated costs of the proposed Regulations. These multi-stakeholder meetings were well attended,

with representation from Canadian and U.S. associations of architectural coatings manufacturers, importers and professional applicators, and also from raw material suppliers, manufacturers, retailers and sellers of architectural coatings, environmental non-governmental organizations and federal, provincial and municipal governments. In May 2005, the CEPA National Advisory Committee (CEPA NAC) and relevant federal government departments were also consulted. No major concerns were raised by CEPA NAC or by the other departments.

Many stakeholders2019; comments included general information requests on subjects such as the rationale behind the selected approach to reduce VOC emissions from architectural coatings, jurisdictional comparison and compatibility, previous Canadian VOC initiatives, scientific foundations, policy background, etc. The architectural coatings Web site at www.ec.gc.ca/nopp/voc/en/secAIM.cfm and, in particular, the March 2005 Discussion Document found on the site, provide background information relating to these matters as well as definitions and details on the targeted coatings. Stakeholder comments and concerns are summarized below.

Sell-through period

Industry stakeholders expressed concern about the proposed one-year sell-through period and stated that this duration would not be sufficiently long to avoid the significant costs of disposal of non-compliant coating volumes.

In response to these concerns, Environment Canada is proposing a two-year sell-through period. This provision would provide industry with a reasonable amount of time to market and sell non-compliant coating volumes manufactured prior to the prohibitions applicable to the manufacture and import, while also preserving the integrity of the proposed Regulations through a sell-through period of limited duration and effective labelling requirements.

Implications of container labelling provisions

Stakeholders were concerned with proposed labelling provisions requiring that the VOC concentration and the manufacturing date be listed on the product label. Such labelling requirements could be costly for the industry and would leave short notice, from the time when the Regulations are registered, to reformulate non-compliant coatings or develop new ones and then to adapt the labels in order for these to include the VOC concentration.

In response to these stakeholder concerns, Environment Canada has simplified the labelling provisions. The proposed Regulations would not require the inclusion of the VOC concentration of the architectural coating in the labelling on the product container. The labelling of the manufacturing date is also required, but a manufacturing date code (e.g. a batch code) is allowed in place of the manufacturing date. Certain category-specific labelling requirements are also required for proper identification of the coating category, to ensure proper representation of the coatings and to allow sampling

and testing to confirm compliance.

Impact on small and medium enterprises (SMEs)

Stakeholders indicated that the compliance costs associated with the proposed Regulations would constitute a significant business expense and could result in the elimination of important niche product lines, staff layoffs and/or reductions in employment benefits.

Environment Canada recognizes that some companies would require assistance, including additional time, to comply with the proposed Regulations. The proposed implementation timeline for specific categories has been extended relative to earlier consultation proposals. Also, a small container exemption is being proposed, which would allow SME manufacturers to continue to manufacture some higher VOC niche products. As well, the proposed two-year sell-through period is expected to minimize disposal costs for all manufacturers, including SMEs.

Stringency of the proposed Regulations

Some stakeholders believe the proposed Regulations are not sufficiently stringent and claim that Canada lags behind other industrial countries on this issue.

The proposed VOC concentration limits are modeled on some of the most stringent requirements in the United States and in the world. In the OTC Model Rule, only a limited number of coating categories have VOC concentration limits that are more stringent than those in the proposed Regulations. Exceptions are provided for two categories of specialty industrial maintenance coatings with limited sales and emissions and for recycled coatings.

Expansion of the small container exemption to other categories

Some stakeholders requested that the small container exemption be expanded to additional coating categories.

Environment Canada confirms that a small container exemption would allow the continued manufacture of niche and specialty products. The proposed Regulations therefore provide a small container exemption for eight architectural coating categories. Technical information collected during the development of the proposed Regulations indicates that these categories contain niche products with low volumes of use and emissions and for which no compliant alternative formulations are believed to be available.

The OTC Model Rule includes a small container exemption that applies to all categories of architectural coatings. By limiting the proposed exemption to eight categories selected following stakeholder consultations, the proposed Regulations would account for the increased availability of the low-VOC technology since the OTC limits were adopted in 2000.

Stringency of limits for solvent-based floor enamels, interior wiping

stains and exterior deck stains

For specific coating subcategories, stakeholders requested additional time for reformulation, i.e. before the VOC concentration limits become effective, to extend the small container exemption to these subcategories, and/or to raise the VOC limits of these subcategories.

Environment Canada2019;s 2003 survey identified many existing coating products that meet the proposed limits indicating technical and economic feasibility as well as consumer acceptance. Reducing the stringency of requirements applicable to these coating subcategories was therefore considered unnecessary. However, the industry has agreed to provide data and further information supporting its request which will be considered prior to finalizing the proposed Regulations.

Exemption for tertiary butyl acetate (TBAc)

Stakeholders recommended that Environment Canada incorporate an exemption for TBAc, (see footnote 23) a substance that was excluded as a VOC by the U.S. EPA in November 2004 and several U.S. states thereafter and that could be used in certain types of coatings in order to comply with the VOC concentration limits.

Environment Canada is currently evaluating the contribution of TBAc to the formation of ground-level O_3. It is expected that the evaluation would be completed prior to finalization of the proposed Regulations, and the Department would therefore be in a position to make a final decision on an exemption for TBAc prior to publication in the *Canada Gazette*, Part II.

Reactivity-based methods for VOC concentration determination

Stakeholders recommended that Environment Canada develop a regulatory mechanism which builds or recognizes reactivity (see footnote 24) and, in turn, allows usage of reactivity-based methods for VOC concentration determination.

The proposed VOC concentration limits are based on the OTC Model Rule requirements which set mass-based VOC concentration limits, and VOC limits based on reactivity are not being considered at this time, as additional scientific development would be required.

Cost of product testing

One stakeholder commented that importers would be unable to exercise 201C;due diligence201D; when manufacturers claim proprietary info on their products and suggested that costs would be prohibitive for testing all products.

Environment Canada recognizes that some importers may face costs related to testing to ensure that their products are in compliance. Since the proposed Regulations do not prescribe the test method to use, the magnitude of the cost cannot be estimated. It is expected that importers would use the most cost-effective method to verify that their products meet the concentration limits as prescribed in the

proposed Regulations.

Low-VOC coating performance

A concern was voiced that reformulations may lead to coatings with less durability and/or poor performance, requiring more applications of the reformulated coatings in order to obtain results comparable to those obtained using non-compliant coatings.

Environment Canada2019;s background economic study indicated that, for all of the proposed categories and limits, there are already compliant coatings in the market that have acceptable performance attributes. In fact, compliant coatings represent a significant portion of the current supply in many of their respective categories, and in some categories may perform better than non-compliant alternatives. Environment Canada does not expect reduced performance from compliant architectural coatings.

Traffic marking coatings

Consultations specific to the traffic marking sub-sector were held in the fall of 2005 in Calgary, Toronto and Montr00E9;al, in response to traffic safety concerns regarding the proposed VOC concentration limit and the implementation timeline for traffic marking coatings. Traffic marking coatings for cold temperature application which comply with the proposed VOC limit of 150 g/L were not commonly applied nor approved for use in Canada at that time.

In response to these concerns, Environment Canada has extended the proposed effective timeline for traffic marking coatings by two additional years, compared to most other architectural coating categories. This would provide additional time to reformulate, test and approve traffic marking coatings for low-temperature application.

A working group (see footnote 25) was formed with the traffic marking sub-sector in 2006 in order to develop a *Strategic Plan for Implementing the Use of Low Volatile Organic Compound Traffic Marking Coatings* (the Strategic Plan). When finalized in 2008, the Strategic Plan will outline the timeframe and transition period to assist stakeholders (jurisdictions and application contractors) as they develop plans for the anticipated transition to low-VOC traffic marking products. The Strategic Plan also provides a list of alternatives that meet the proposed VOC concentration limit for traffic marking coatings, with advantages and disadvantages relative to traditional solvent-based traffic marking coatings, including availability, performance and durability, and cold climate application.

Compliance and enforcement

Since the proposed Regulations are made under CEPA 1999, enforcement officers will, when verifying compliance with the Regulations, apply the Compliance and Enforcement Policy for CEPA 1999. The policy also sets out the range of possible responses to alleged violations: warnings, directions, environmental protection compliance orders, ticketing, ministerial orders, injunctions,

prosecution, and environmental protection alternative measures (which are an alternative to a court trial after the laying of charges for a CEPA 1999 violation). In addition, the policy explains when Environment Canada will resort to civil suits by the Crown for costs recovery.

When, following an inspection or an investigation, an enforcement officer discovers an alleged violation, the officer will choose the appropriate enforcement action based on the following factors:

- *Nature of the alleged violation*: This includes consideration of the damage, the intent of the alleged violator, whether it is a repeat violation, and whether an attempt has been made to conceal information or otherwise subvert the objectives and requirements of the Act.
- *Effectiveness in achieving the desired result with the alleged violator*: The desired result is compliance within the shortest possible time and with no further repetition of the violation. Factors to be considered include the alleged violator2019;s history of compliance with the Act, willingness to cooperate with enforcement officers, and evidence of corrective action already taken.
- *Consistency*: Enforcement officers will consider how similar situations have been handled in determining the measures to be taken to enforce the Act.

Environment Canada will monitor VOC concentrations and compliance with the proposed Regulations and will review the control measure as necessary to determine whether further actions will be required to achieve additional VOC emissions reductions.

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PROPOSED REGULATORY TEXT

Notice is hereby given, pursuant to subsection 332(1) (see footnote a) of the *Canadian Environmental Protection Act, 1999* (see footnote b), that the Governor in Council proposes, pursuant to subsection 93(1) of that Act, to make the annexed *Volatile Organic Compound (VOC) Concentration Limits for Architectural Coatings Regulations*.

Any person may, within 60 days after the date of publication of this notice, file with the Minister of the Environment comments with respect to the proposed Regulations or a notice of objection requesting that a board of review be established under section 333 of that Act and stating the reasons for the objection. All comments and notices must cite the *Canada Gazette*, Part I, and the date of publication of this notice, and be sent to the Director, Products Division, Department of the Environment, Ottawa, Ontario K1A 0H3.

A person who provides information to the Minister may submit with the information a request for confidentiality under section 313 of that Act.

Ottawa, April 10, 2008

MARY PICHETTE
Assistant Clerk of the Privy Council

VOLATILE ORGANIC COMPOUND (VOC) CONCENTRATION LIMITS FOR ARCHITECTURAL COATINGS REGULATIONS

INTERPRETATION

Definitions	**1.** (1) The following definitions apply in these Regulations.
201C;architectural coating201D; 00AB; *rev00EA;tement architectural* 00BB;	201C;architectural coating201D; means a product to be applied onto or impregnated into a substrate for application to pavement, curbs, stationary structures, including temporary buildings, and their appurtenances 2014; whether installed or detached.
201C;BAAQMD201D; 00AB; *BAAQMD* 00BB;	201C;BAAQMD201D; means the Bay Area Air Quality Management District, a part of the California Air Resources Board.
201C;excluded compound201D; 00AB; *compos00E9;s exclus* 00BB;	201C;excluded compound201D; means a compound that is excluded under item 65 of Schedule 1 of the *Canadian Environmental Protection Act, 1999*.
201C;pigment201D; 00AB; *pigment* 00BB;	201C;pigment201D; means finely ground insoluble powder that provides an architectural coating with any of the following properties: colour, corrosion

inhibition, conductivity, opacity, sheen, gloss or improved mechanical properties.

201C;SCAQMD201D; 00AB; *SCAQMD* 00BB;

201C;SCAQMD201D; means the South Coast Air Quality Management District, a part of the California Air Resources Board.

201C;volatile organic compound201D; or 201C;VOC201D; 00AB; *compos00E9;s organiques volatils* 00BB; *ou* 00AB; *COV* 00BB;

201C;volatile organic compound201D; or 201C;VOC201D; means a compound that participates in atmospheric photochemical reactions that is not excluded under item 65 of Schedule 1 to the *Canadian Environmental Protection Act, 1999*.

Incorporation by reference

(2) Any regulation, standard or method that is incorporated by reference in these Regulations is incorporated as amended from time to time.

APPLICATION

Application

2. (1) These Regulations apply in respect of the architectural coatings set out in the schedule, except if they are

(*a*) for application to a product or a component of a product, in or on the premises of a factory or a shop, as part of a manufacturing, processing or repairing activity;

(*b*) for use in scientific research;

(*c*) for use as a laboratory analytical standard; or

(*d*) manufactured or imported

(i) for export only, or

(ii) for shipment to other manufacturers of architectural coatings for processing or repackaging.

Non-application

(2) These Regulations do not apply in respect of the following coatings:

(*a*) adhesives;

(*b*) aerosol coatings 2014; pressurized coatings, containing pigments or resins, whose ingredients are dispensed by means of a propellant and are packaged in a

disposable can for either

(i) hand-held application, or

(ii) use in specialized equipment for traffic marking applications;

(*c*) antifouling coatings 2014; coatings for application to submerged stationary structures and their appurtenances, whether installed or detached, to prevent or reduce the attachment of marine or freshwater biological organisms, registered under the *Pest Control Products Act*;

(*d*) wood preservatives 2014; coatings to protect exposed wood from decay or insect attack, registered under the *Pest Control Products Act*.

Non-application 2014; 1 L or less

(3) These Regulations, except for section 19, do not apply in respect of the following architectural coatings set out in the schedule if their container has a volume of one litre or less:

(*a*) faux finish;

(*b*) any other high-temperature coating;

(*c*) any other lacquer, including lacquer sanding sealers;

(*d*) any other varnish;

(*e*) low solids coating;

(*f*) quick-dry enamel;

(*g*) stain; and

(*h*) rust preventive coating.

PROHIBITION

Manufacture or import

3. (1) No person shall manufacture or import any architectural coating set out in the schedule if its concentration of volatile organic compounds exceeds the limit set out in the schedule for that architectural coating unless dilution of the architectural coating is required before it is used, in accordance with the written instructions of the manufacturer, importer or seller, to a concentration equal to or less than that

limit and that coating is either labelled with or accompanied by those instructions in both official languages.

Effective date

(2) The prohibition takes effect in respect of each architectural coating beginning on the corresponding anniversary of the day on which these Regulations come into force as set out in column 3 of the schedule.

Sale or offer for sale

4. (1) No person shall sell or offer for sale any architectural coating set out in the schedule if its concentration of volatile organic compounds exceeds the limit set out in the schedule for that architectural coating unless dilution of the architectural coating is required before it is used, in accordance with the written instructions of the manufacturer, importer or seller, to a concentration equal to or less than that limit and that coating is either labelled with or accompanied by those instructions in both official languages.

Effective date

(2) The prohibition takes effect in respect of each architectural coating beginning two years after the corresponding anniversary of the day on which these Regulations come into force as set out in column 3 of the schedule.

Dilution instructions

5. The instructions referred to in sections 3 and 4 must not provide for dilution of the architectural coating to a VOC concentration greater than the limit set out in the schedule for that coating.

Combination of multiple components

6. (1) For greater certainty, if the written instructions of the manufacturer, importer or seller require the combination of multiple components before an architectural coating is to be used, the concentration of volatile organic compounds in the architectural coating resulting from the combination of the multiple components shall not exceed the VOC concentration limit set out in the schedule for that architectural coating.

Combination instructions

(2) If an architectural coating requires that components be combined, the manufacturer, importer or seller shall set out on the architectural coating2019;s label or in accompanying documentation the recommended combination instructions in

both official languages.

Lowest VOC concentration limit

7. (1) If anywhere on the container of an architectural coating set out in the schedule, or in any documentation supplied by the architectural coating2019;s manufacturer, importer or seller or anyone acting on their behalf, any representation is made that the architectural coating may be used as another architectural coating set out in the schedule, then the lowest VOC concentration limit applies.

Non-application

(2) Subsection (1) does not apply to the following architectural coatings:

(*a*) antenna coating;

(*b*) bituminous roof primer;

(*c*) calcimine recoater;

(*d*) fire retardant coating;

(*e*) flow coating;

(*f*) any other high-temperature coating;

(*g*) impacted immersion coating;

(*h*) any other industrial maintenance coating;

(*i*) lacquer, including lacquer sanding sealers;

(*j*) low-solids coating;

(*k*) metallic pigmented coating;

(*l*) nuclear coating;

(*m*) pre-treatment wash primer;

(*n*) shellac;

(*o*) specialty primer, sealer and undercoater;

(*p*) temperature-indicator safety coating; and

(*q*) thermoplastic rubber coating and mastic.

METHOD OF ANALYSIS

ACCREDITED LABORATORY

Accredited laboratory

8. Any laboratory that performs an analysis for the purposes of these Regulations shall be accredited under the International Organization for Standardization standard ISO/IEC 17025: 2005, entitled *General requirements for the competence of testing and calibration laboratories* and its accreditation shall include the analysis of the applicable parameter within its scope of testing.

DETERMINATION OF VOC CONCENTRATION

Method 24

9. (1) Subject to subsections (2) and (3), the elements of the formulae provided for in section 10 shall be determined in accordance with Method 24 of Appendix A-7, Part 60, Chapter I of Title 40 of the *Code of Federal Regulations* of the United States of America, entitled *Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings* except that the Method shall be read as follows:

(*a*) excluding Section 11.4 of that Method; and

(*b*) wherever the expression 201C;exempt solvent201D; is used in that Method, it shall have the same meaning as 201C;excluded compounds201D;.

Concentration of excluded compounds

(2) The concentration of excluded compounds shall be determined in accordance with one of the following methods:

(*a*) in the case of parachlorobenzotrifluoride (PCBTF), BAAQMD Method 41, entitled *Determination of Volatile Organic Compounds in Solvent Based Coatings and Related Materials Containing Parachlorobenzotrifluoride*, BAAQMD Manual of Procedures, Volume III, adopted December 20, 1995 except that wherever the expression 201C;exempt solvents201D; is used, it shall have the same meaning as

201C;excluded compounds201D;;

(*b*) in the case of compounds that are cyclic, branched, or linear, completely methylated siloxanes, BAAQMD Method 43, entitled *Determination of Volatile Methylsiloxanes in Solvent Based Coatings, Inks and Related Materials*, BAAQMD Manual of Procedures, Volume III, adopted November 6, 1996;

(*c*) in any other case, SCAQMD Method 303-91 (Revised February 1993), entitled *Determination of Exempt Compounds*, except that wherever the expression 201C;exempt compounds201D; is used, it shall have the same meaning as 201C;excluded compounds201D;.

Traffic marking coating

(3) The volatile organic compound concentration of methacrylate multicomponent coatings to be used as traffic marking coatings shall be determined in accordance with Appendix A, subpart D, Part 59, Chapter I of Title 40 of the *Code of Federal Regulations* of the United States of America, entitled *Determination of Volatile Matter Content of Methacrylate Multicomponent Coatings Used as Traffic Marking Coatings* excluding Table 1 entitled *Volatile Organic Compound (VOC), Content Limits for Architectural Coatings*.

General formula

10. (1) Subject to subsection (2), the volatile organic compound concentration of an architectural coating, diluted to the maximum recommendation of the manufacturer, importer or seller, excluding the volume of any water and excluded compounds, shall be determined using the following formula:

$$\text{VOC Concentration} = 00A0;\frac{Ws - Ww - Wec}{Vm - Vw - Vec}$$

where

VOC Concentration is the VOC concentration of an architectural coating, in grams of VOC per litre of coating,

Ws is the weight of volatiles, in grams,

Ww is the weight of water, in grams,

Wec is the weight of excluded compounds, in grams,

Vm is the volume of architectural coating, in litres,

Vw is the volume of water, in litres, and

Vec is the volume of excluded compounds, in litres.

Low solids coating

(2) The volatile organic compound concentration of a low solids coating, diluted to the maximum recommendation of the manufacturer, importer or seller, including the volume of any water and excluded compounds, shall be determined using the following formula:

$$\text{VOC Concentration}_{ls} = 00A0;\frac{Ws - Ww - Wec}{Vm}$$

where

$\text{VOC Concentration}_{ls}$ is the VOC concentration of a low solids coating, in grams of VOC per litre of coating,

Ws is the weight of volatiles, in grams,

Ww is the weight of water, in grams,

Wec is the weight of excluded compounds, in grams, and

Vm is the volume of architectural coating, in litres.

Colourant

(3) The volatile organic compound concentration of an architectural coating shall be determined without colourant that is added after the tint base is manufactured or imported, as the case may be, and packaged for sale.

OTHER TEST METHODS

Flame Spread Index

Fire retardant coating

11. The flame spread index of a fire retardant coating shall be determined in

accordance with ASTM E 84-07, entitled *Standard Test Method for Surface Burning Characteristics of Building Materials*.

Fire Resistance Rating

Fire resistive coating

12. The fire resistance rating of a fire resistive coating shall be determined in accordance with ASTM E 119-07a, entitled *Standard Test Methods for Fire Tests of Building Construction Materials*.

Gloss

Gloss determination

13. The gloss of the following architectural coatings, set out in the schedule, shall be determined in accordance with ASTM D 523-89 (Reapproved 1999), entitled *Standard Test Method for Specular Gloss*:

(*a*) calcimine recoater;

(*b*) quick-dry enamel;

(*c*) any other flat coating;

(*d*) any other non-flat coating; and

(*e*) any other high-gloss coating.

Metallic Content

Metallic pigmented coating

14. The metallic concentration of a metallic pigmented coating shall be determined in accordance with SCAQMD Method 318-95, entitled *Determination of Weight Percent Elemental Metal in Coatings by X-Ray Diffraction*.

Drying Times

Quick-dry enamel

15. The set-to-touch, tack-free and dry-hard times of a quick-dry enamel shall be determined in accordance with ASTM D 1640-03, entitled *Standard Test Methods for Drying, Curing, or Film Formation of Organic Coatings at Room Temperature* except that the Method shall be read excluding references to any agreement between the purchaser and the seller.

Surface Chalkiness

Specialty primer, sealer

16. The chalkiness of a surface to be

or undercoater

conditioned by the application of a specialty primer, sealer or undercoater shall be determined in accordance with ASTM D 4214-07, entitled *Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films*.

Radiation Resistance

Nuclear coating

17. The radiation resistance of a nuclear coating shall be determined in accordance with ASTM D 4082-02, entitled *Standard Test Method for Effects of Gamma Radiation on Coatings for Use in Light-Water Nuclear Power Plants*.

Chemical Resistance

Nuclear coating

18. The chemical resistance of a nuclear coating shall be determined in accordance with ASTM D 3912-95 (Reapproved 2001), entitled *Standard Test Method for Chemical Resistance of Coatings Used in Light-Water Nuclear Power Plants*.

LABELLING

Required information

19. (1) Every person that manufactures, imports, sells or offers for sale an architectural coating set out in the schedule shall set out, at the following location on the container in which the architectural coating is to be sold, the following information:

(*a*) on the container2019;s label, lid or bottom, the date on which the architectural coating was manufactured or a code representing that date;

(*b*) on the container2019;s label or lid, the recommendations regarding dilution of the architectural coating with solvents other than water or, if dilution of the architectural coating prior to use is not necessary, a statement to that effect;

(*c*) in the case of an industrial maintenance coating, on the container2019;s label or lid, one or more of the following statements:

(i) 201C;For industrial use only201D;,

(ii) 201C;For professional use only201D;,

(iii) 201C;Not for residential use201D;, or

(iv) 201C;Not intended for residential use201D;;

(*d*) in the case of a clear brushing lacquer, on the container2019;s label or lid, the statement 201C;For brush application only201D; and either

(i) 201C;This product must not be diluted or sprayed201D;, or

(ii) 201C;This product must not be thinned or sprayed201D;;

(*e*) in the case of a rust preventive coating, on the container2019;s label or lid, one of the following statements:

(i) 201C;For metal surfaces only201D;, or

(ii) 201C;For metal substrates only201D;;

(*f*) in the case of a specialty primer, sealer or undercoater, on the container2019;s label or lid, one or more of the following statements:

(i) 201C;For blocking stains201D;,

(ii) 201C;For fire-damaged surfaces201D; or 201C;For fire-damaged substrates201D;,

(iii) 201C;For smoke-damaged surfaces201D; or 201C;For smoke-damaged substrates201D;,

(iv) 201C;For water-damaged surfaces201D; or 201C;For water-damaged substrates201D;, or

(v) 201C;For excessively chalky surfaces201D; or 201C;For excessively chalky substrates201D;;

(*g*) in the case of a quick-dry enamel, on the container2019;s label or lid, the dry hard time and the words 201C;Quick dry201D;; and

(*h*) in the case of a high-gloss coating, on the container2019;s label, the words 201C;High gloss201D;.

Effective date

(2) Subsection (1) takes effect in respect of

each architectural coating

(*a*) for the manufacturer or the importer, on the corresponding anniversary of the day on which these Regulations come into force as set out in column 3 of the schedule; or

(*b*) for the seller or the person offering for sale, two years after the corresponding anniversary of the day on which these Regulations come into force as set out in column 3 of the schedule.

Readability

(3) The information shall be displayed in both official languages, in the same manner, and in a manner that ensures that the information is legible and prominently displayed.

Date code

(4) Every manufacturer or importer of an architectural coating set out in the schedule shall provide to the Minister, upon request, an explanation of any date code used on the label affixed to the coating2019;s container to represent the date of manufacture.

RECORD KEEPING

Required information

20. (1) Every person that manufactures or imports an architectural coating set out in the schedule shall keep a record including the results of any analysis conducted in accordance with these Regulations, the name and civic address of the laboratory that performed the analysis and any supporting documents related to the analysis for a period of at least five years, beginning on the date of the analysis.

Place

(2) The record shall be kept at the person2019;s principal place of business in Canada or at any other place in Canada where the information, results and supporting documents can be inspected. If the record is kept at any place other than the person2019;s principal place of business, the person shall provide the Minister with the civic address of the place where it is kept.

COMING INTO FORCE

Registration

21. These Regulations come into force on

the day on which they are registered.

SCHEDULE

(Subsections 2(1) and (3), sections 3 to 5, subsections 6(1) and 7(1), section 13 and subsections 19(1), (2) and (4), and 20(1))

ARCHITECTURAL COATINGS AND THEIR VOC CONCENTRATION LIMITS

INTERPRETATION

Definitions

1. (1) The following definitions apply in this schedule.

201C;high-temperature coating201D; 00AB; *rev00EA;tement haute temp00E9;rature* 00BB;

201C;high-temperature coating201D; means an architectural coating for application to surfaces exposed continuously or intermittently to temperatures above 20400B0;C.

201C;industrial maintenance coating201D; 00AB; *rev00EA;tement d2019;entretien industriel* 00BB;

201C;industrial maintenance coating201D; means an architectural coating for application to substrates exposed to any of the following conditions:

(*a*) immersion in water, wastewater or chemical solutions or chronic exposure of interior surfaces to moisture condensation;

(*b*) acute or chronic exposure to corrosive, caustic or acidic agents or to chemicals, chemical fumes or chemical mixtures or solutions;

(*c*) repeated exposure to temperatures above 12100B0;C;

(*d*) repeated, frequent, heavy abrasion, including mechanical wear and scrubbing with industrial solvents, cleansers or scouring agents; or

(*e*) exterior exposure of metal structures and structural components.

201C;primer201D; 00AB; *appr00EA;t* 00BB;

201C;primer201D; means an architectural coating to be applied to a substrate to provide a firm bond between the substrate and architectural coatings subsequently applied.

201C;sanding sealer201D; 00AB; *enduit 00E0; poncer* 00BB;	201C;sanding sealer201D; means a clear or semi-transparent architectural coating for application to bare wood to seal the wood and to provide a coat that can be sanded to create a smooth surface for architectural coatings subsequently applied.
201C;sealer201D; 00AB; *produit de scellement* 00BB;	201C;sealer201D; means an architectural coating to be applied to a substrate to prevent architectural coatings subsequently applied from being absorbed by the substrate or to prevent them from being harmed by materials in the substrate.
201C;shellac201D; 00AB; *gomme-laque* 00BB;	201C;shellac201D; means an architectural coating formulated solely with the resinous secretions of the lac beetle (*Laccifer lacca*), diluted with alcohol and formulated to dry by evaporation without a chemical reaction.
201C;stain201D; 00AB; *teinture* 00BB;	201C;stain201D; means an architectural coating formulated to change the colour of a surface but not to conceal its grain pattern or texture.
201C;undercoater201D; 00AB; *souscouche* 00BB;	201C;undercoater201D; means an architectural coating to provide a smooth surface for architectural coatings subsequently applied.
201C;varnish201D; 00AB; *vernis* 00BB;	201C;varnish201D; means a clear or semi-transparent architectural coating, excluding lacquers, formulated to dry by chemical reaction. Varnishes may contain small amounts of pigment to colour a surface or to control the final sheen or gloss of the finish.
Overview	(2) The table to this subsection sets out architectural coatings and their applicable VOC concentration limit. The table is divided into three columns. The first sets out the architectural coating subject to the VOC concentration limit, the second sets out the VOC concentration limit applicable to that architectural coating and the third sets out the anniversary of the day on which these Regulations come into force from which the effective dates of the prohibitions set out in sections 3 and 4 of these Regulations are determined.

TABLE

Item	Column 1 Architectural Coating	Column 2 VOC Concentration Limit (g/L)	Column 3 Anniversary of the Day on which these Regulations Come into Force
1.	Antenna coating, including coatings for an antenna2019;s associated structural appurtenances	530	1st
2.	Thermoplastic rubber coating and mastic, incorporating no less than 40% by weight of thermoplastic rubbers in its total resin solids, for application to roofing or other structural surfaces	550	1st
3.	Metallic pigmented coating, containing at least 48 g of elemental metallic pigment per litre of coating as applied	500	1st
4.	Bituminous roof primer	350	3rd
5.	Any other bituminous roof coating	300	3rd
6.	Non-bituminous roof coating, for application to roofs to prevent penetration of the substrate by water or to reflect heat and ultraviolet radiation	250	1st
7.	Calcimine recoater, flat solvent-borne coating for re-coating calcimine-painted surfaces	475	1st
8.	Bond breaker, for application between layers of concrete	350	1st
9.	Concrete curing compound, for application to freshly poured concrete to retard the evaporation of water	350	1st
10.	Concrete surface retarder,	780	1st

	mixture of retarding ingredients that interact chemically with the cement to prevent hardening on the surface where the retarder is applied, allowing the retarded mix of cement and sand at the surface to be washed away to create an exposed aggregate finish		
11.	Form release compound, for application to concrete formwork	250	3rd
12.	Dry fog coating, for spray application such that overspray droplets dry before subsequent contact with surfaces in the vicinity of the coating activity	400	1st
13.	Extreme high durability coating, an air dry coating, including fluoropolymer-based coatings, for touch-up of precoated architectural aluminium extrusions and panels	800	1st
14.	Faux finish, for use as a stain or glaze to create artistic effects including dirt, old age, smoke damage and simulated marble and wood grain	350	1st
15.	Fire resistive coating, opaque, for protecting the structural integrity by increasing the fire endurance of interior or exterior steel and other structural materials	350	1st
16.	Fire retardant coating, clear	650	1st
17.	Fire retardant coating, opaque	350	1st
18.	Floor coating, opaque, for application to surfaces that may be subject to foot traffic	250	1st
19.	Flow coating, for maintaining the protective coating on utility transformer units	650	1st
20.	Graphic arts coating, for application with a brush or roller	500	1st

	to signs, excluding their structural components, and murals including lettering enamels, poster colours, copy blockers, and bulletin enamels		
21.	Temperature-indicator safety coating, a high-temperature coating that changes colour to indicate a change in temperature	550	1st
22.	Any other high-temperature coating	420	1st
23.	Impacted immersion coating, for application to steel structures subject to immersion in turbulent or ice or debris-laden water	780	1st
24.	Any other industrial maintenance coating	340	1st
25.	Shellac, clear	730	1st
26.	Shellac, opaque	550	1st
27.	Clear brushing lacquer, a wood coating formulated with cellulosic or synthetic resins to dry by evaporation without chemical reaction and to provide a solid, protective film, excluding clear lacquer sanding sealers and lacquer stains	680	1st
28.	Any other lacquer, including lacquer sanding sealers	550	1st
29.	Any other sanding sealer	350	1st
30.	Conversion varnish, clear acid curing coating with an alkyd or other resin blended with amino resins and supplied as a single component or two-component product, for application to wood flooring	725	1st
31.	Any other varnish	350	1st
32.	Low solids coating, containing 0.12 kg or less of solids per litre	120	1st

	of coating		
33.	Mastic texture coating, to be applied in a single coat of at least 0.254 mm dry film thickness to cover holes and minor cracks and to conceal surface irregularities	300	1st
34.	Multi-coloured coating, packaged in a single container and exhibits more than one colour when applied in a single coat	250	1st
35.	Nuclear coating, a protective coating to seal porous surfaces subject to intrusion by radioactive materials and resistant to chemicals and long-term, cumulative radiation exposure and easy to decontaminate	450	1st
36.	Pre-treatment wash primer, a primer that contains a minimum of 0.5% acid, by weight and that is to be applied directly to bare metal substrates to provide corrosion resistance	420	1st
37.	Specialty primer, sealer or undercoater, a coating to be applied to a substrate to (*a*) seal fire, smoke or water damage; (*b*) condition a surface having a chalk rating of four or less as determined in accordance with the test method referred in section 16 of these Regulations; or (*c*) block stains.	350	1st
38.	Waterproofing sealer for concrete or masonry, a clear or pigmented, film-forming coating that provides resistance against water, alkalis, acids, ultraviolet light and staining	400	1st

39.	Any other waterproofing sealer	250	1st
40.	Any other primer, sealer or undercoater	200	1st
41.	Quick-dry enamel, a high-gloss coating that has the following characteristics: (*a*) it is able to be applied directly from the container with ambient temperatures between 16 and 2700B0;C; (*b*) it sets to touch in 2 hours or less, is tack free in 4 hours or less, and dries hard in 8 hours or less by the test method referred in section 15 of these Regulations; and (*c*) it has a dried film gloss of 70 or above on a 6000B0; meter.	250	1st
42.	Recycled coating, the total weight of which consists of not less than 50% of secondary and post-consumer coating and not less than 10% of the total weight consisting of post-consumer coating. A secondary coating is a finished coating originating from a manufacturing process.	350	5th
43.	Rust preventive coating, exclusively for non-industrial use and does not include those for use in the construction or maintenance of (*a*) facilities used in the manufacturing of goods; (*b*) transportation infrastructure, including highways, bridges, airports and railroads; (*c*) facilities used in mining activities and petroleum extraction; or (*d*) utilities infrastructure, including power generation	400	1st

	and distribution and water treatment and distribution systems.		
44.	Stain, including lacquer stains	250	1st
45.	Swimming pool coating, for application to the interior surfaces of a swimming pool and resistant to swimming pool chemicals	340	1st
46.	Traffic marking coating, for marking and striping streets, highways or other traffic surfaces including curbs, berms, driveways, parking lots, sidewalks and airport runways	150	3rd
47.	Any other flat coating, that registers a gloss of less than 15 on an 8500B0; meter or less than 5 on a 6000B0; meter	100	1st
48.	Any other non-flat coating, that registers a gloss of 15 or greater on an 8500B0; meter or 5 or greater and less than 70 on a 6000B0; meter	150	1st
49.	Any other high-gloss coating, that registers a gloss of 70 or above on a 6000B0; meter	250	1st

[17-1-o]

Footnote 1
www.ec.gc.ca/pdb/cac/Emissions1990-2015/EmissionsSummaries/VOC_e.cfm

Footnote 2
OTC member states include Connecticut, Delaware, the District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and Virginia.

Footnote 3
Chemical reaction activated by sunlight.

Footnote 4
Krewski, D.; Burnett, R.; Jerrett, M.; Pope, C. A.; Rainham, D.; Calle, E.; Thurston, G., and Thun, M. 201C;Mortality and long-term exposure to ambient air pollution: ongoing analyses based on the American Cancer Society cohort.201D; *J Toxicol Environ Health A*.

2005 Jul 9-2005 Jul 23; 68(13-14): 1093-109

Footnote 5
Krewski, D.; Burnett, R. T.; Goldberg, M.; Hoover, K.; Siemiatycki, J.; Abrahamowicz, M.; Villeneuve, P. J., and White, W. 201C;Reanalysis of the Harvard Six Cities Study, part II: sensitivity analysis.201D; *Inhal Toxicol*. 2005 Jun-2005 Jul 31; 17(7-8): 343-53

Footnote 6
U.S. Environmental Protection Agency, Fact Sheet, EPA2019;s Revised Ozone Standard, July 17, 1997 (www.epa.gov/ttn/oarpg/naaqsfin/o3fact.html)

Footnote 7
As per section 64 of CEPA 1999, VOCs were found to be toxic, as they were entering the environment in a quantity or concentration, or under conditions, that (*a*) have or may have an immediate or long-term harmful effect on the environment or its biological diversity, and (*c*) constitute a danger in Canada to human life or health.

Footnote 8
For further information, visit the Web site at www.ec.gc.ca/nopp/DOCS/notices/voc/en/index.cfm.

Footnote 9
For further information, visit the Web site at www.ec.gc.ca/doc/media/m_124/report_eng.pdf.

Footnote 10
For further information, visit the Web site at http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=6a92a7c05f08fae1c5d0fda4bb8e3570&rgn=div5&view=text&node=40:5.0.1.1.7&idno=40

Footnote 11
In 2003, Environment Canada commissioned a study of the paint and coating sector using 2002 data. This analysis has been supplemented with a cost study and economic study conducted in 2005. Cheminfo Services Inc., 201C;Background Eco-nomic Study of the Architectural and Industrial Maintenance (AIM) Coatings Sector,201D; February 2005.

Footnote 12
Ibid.00A0;

Footnote 13
Ibid.00A0;

Footnote 14
See background on Environment Canada2019;s Web pages on related VOC initiatives at www.ec.gc.ca/nopp/voc/en/secAIM.cfm.00A0;

Footnote 15
Cheminfo Services Inc., 201C;Background Economic Study of the Architectural and Industrial Maintenance (AIM) Coatings

Sector,201D; February 200500A0;

Footnote 16
Statistics Canada, CANSIM Table 301-000600A0;

Footnote 17
For each year analysed, dividing the projected total emissions under the proposed Regulations by the projected baseline emissions yields the annual reduction in emissions.00A0;

Footnote 18
U.S. EPA, 201C;Marginal Damage Estimates for Air Pollutants,201D; original source: *Federal Purchasing Categories Ranked by Upstream Environmental Burden: An Input/Output Screening Analysis of Federal Purchasing*, 1998

Footnote 19
All values in 2006 Canadian dollars per metric tonne00A0;

Footnote 20
U.S. Office of Management and Budget, 201C;Informing Regulatory Decisions: 2004 Draft Report to Congress on the Costs and Benefits of Federal Regulations and Unfunded Mandates on State, Local, and Tribal Entities,201D; December 2004, p. 34

Footnote 21
European Union, 201C;The Costs and Benefits the Reduction of Volatile Organic Compounds from Paints, Final Draft,201D; May 2, 2002

Footnote 22
E.U. benefit estimates have been converted from 2002 Euros to 2006 Canadian dollars using the average 2002 exchange rate of $1.4832 and the Consumer Price Index of 2.14% to reflect the benefits in 2006 Canadian dollar values.

Footnote 23
TBAc is an organic solvent on the list of exclusions from the CEPA 1999 VOC definition. It may serve as a substitute to VOC solvents and facilitate reformulation to lower VOC concentrations.

Footnote 24
Currently, VOCs that participate in atmospheric photochemical reactions are considered VOCs, with the exception of compounds listed in item 65 of Schedule 1 of CEPA 1999. Therefore, compounds are not rated by their potential for ground-level O_3 formation.

Reactivity-based methods theoretically could allow the replacement of high-reactivity index VOCs with low-reactivity index VOCs and still obtain significant reductions of ground-level O_3 and smog.

Footnote 25
The working group members include representatives from the paint and coatings sector, provinces, municipalities, private application contractors, the Transportation Association of Canada and environmental non-governmental organizations.

Footnote a
S.C. 2004, c. 15, s. 31

Footnote b
S.C. 1999, c. 33