Cyclotetrasiloxane, octamethyl- (siloxane D4) proposed Notice for Pollution Prevention Plans for industrial effluent: Responding to *Canada Gazette*, Part I, Notices and Regulations, Vol. 145, No. 3 — January 15, 2011

Submitted to:

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INTRODUCTION

The following is a joint submission by the Canadian Environmental Law Association (CELA) (www.cela.ca) and Chemical Sensitivities Manitoba (CSM) in response to the 60-day public comment period published in the ***Canada Gazette*, Part I, Notices and Regulations, Vol. 145, No. 3 — January 15, 2011 on the "Proposed notice requiring the preparation and implementation of pollution prevention plans in respect of Cyclotetrasiloxane, octamethyl- (siloxane D4) in industrial effluents."**

Since 2010, CELA and CSM have prepared various submissions in response to proposed notices for the preparation and implementation of pollution prevention plans for a number of CEPA toxic chemicals identified in the Industry Challenge of the Chemicals Management Plan. These substances are: Toluene diisocyanates (TDI) in August 2010; Phenol, 4, 4′ -(1-methylethylidene)bis- (bisphenol A) in December 2010, and 1,3-butadiene, 2 methyl- (Isoprene) on March 2, 2011.

Our comments below reiterate several of the comments and issues raised in these previous submissions because they continue to be relevant in our efforts towards the improvement of the scope and requirements of pollution prevention plans under the *Canadian Environmental Protection Act, 1999* (CEPA 1999).

FINAL SCREENING ASSESSMENT - DECISION UNDER CEPA 1999

Based on the information presented in final screening assessment on Cyclotetrasiloxane, octamethyl- (siloxane D4), the substance has the potential to cause ecological harm. D4 was found to be "entering or may be entering the environment in a quantity or concentration or under conditions that have or may have an immediate or long-term harmful effect on the environment or its biological diversity." Therefore, it is concluded that D4 meets the definition of toxic as set out in paragraph s. 64(a) of CEPA 1999.

Based on the final screening assessment, it was also concluded that D4 meets the criteria for persistence as set out in the *Persistence and Bioaccumulation Regulations*. However, a conclusion of bioaccumulation for D4 was not possible based on the conflicting evidence presented in this screening assessment report.[1]

[1] Environment Canada and Health Canada. Screening Assessment for the Challenge Octamethylcyclotetrasiloxane (D4) Chemical Abstracts Service Registry Number 556-67-2. November 2008. See: http://www.ec.gc.ca/ese-ees/default.asp?lang=En&n=2481B508-1#a1.

Comment

The conclusions of the screening assessment should determine the scope of management measures necessary to address the toxicity of D4. It is essential that the government makes a conclusion on the bioaccumulation of D4 as that will impact whether control measures or virtual elimination should be applied. In the absence of a decision on bioaccumulation and in the presence of uncertainty, the government should take the strongest measure under CEPA 1999 to manage D4. In this situation, D4 should be on the track for virtual elimination. The best option to achieve virtual elimination is through a regulatory measure that achieves the ultimate elimination or phase out of D4.

RISK MANAGEMENT OF SILOXANE D4

In the document, *Proposed Risk Management Approach for cyclotetrasiloxane, octamethyl- (D4) Chemical Abstracts Service Registry Number (CAS RN) 556-67-2 and cyclopentasiloxane, decamethyl- (D5) Chemical Abstracts Service Registry Number (CAS RN) 541-02-6*, the government's proposed environmental objective for D4 is to prevent or minimize releases of D4 and D5 to the aquatic environment. This objective would be achieved with the proposed risk management measures to ensure the lowest level of release of D4 to water that is technically and economically feasible.[2]

In order to achieve the risk management objective, the Government of Canada will consider imposing regulations to:

- limit the quantity or concentration of D4 and D5 that may be contained in certain personal care products and, where appropriate, in other consumer products that are manufactured in and imported into Canada; and
- prevent or minimize releases to the environment from industrial users of these substances.[3]

The government provided consideration to the following:

1) Products – consideration of a regulation that limits the quantity or concentration of these substances in certain personal care products and, where appropriate, in consumer products that are manufactured in and imported into Canada.
2) Industrial effluents - a regulation to prevent or minimize releases to the aquatic environment. The regulation would establish allowable maximum D4 and D5 concentrations in effluents; and require the implementation of a

[2] Environment Canada and Health Canada. January 2009. *Proposed Risk Management Approach For Cyclotetrasiloxane, octamethyl- (D4)Chemical Abstracts Service Registry Number (CAS RN) 556-67-2 Cyclopentasiloxane, decamethyl-(D5) Chemical Abstracts Service Registry Number (CAS RN) 541-02-6. http://www.ec.gc.ca/ese-ees/default.asp?lang=En&n=7026FB59-1.*
[3] Ibid.

management system to ensure that best management practices are adopted at facilities where D4 and D5 are used.

3) Pest Control Products Sector - the Pest Management Registration Agency will utilize information from the screening assessments conducted for the Challenge substances under the Chemicals Management Plan as well as additional information available on bioaccumulation potential, to determine whether reduction of concentrations of D4 and D5 in pest control products beyond current levels is required; and
4) Monitoring – The government planned to monitor for D4 and D5 in air starting in 2008.[4]

Comments

CELA and CSM provided substantial comments in response to the above proposed risk management measures under consideration in 2009: *A Response to the Proposed Risk Management Approach for Chemicals Management Plan Industry Challenge Batch 2 Substances Published in Canada Gazette Part I, Vol. 143, No. 5 — January 31, 2009*. The joint submission is attached to this submission.[5] In this 2009 submission, we noted that the proposed risk measures may not adequately protect the environment or human health from exposure to D4. The risk assessment gave consideration for regulatory measures to address D4, but our organizations indicated that a substantial action plan committed to a timeframe to reduce and eliminate the use of D4 was required. The proposed list of regulatory measures to date does not guarantee there would be a reduction of D4 to the environment.

Our organizations have emphasized the need to shift the focus from controlling releases of D4 to the environment to a regulatory approach that seeks the reduction with ultimate phase out of releases for D4 through changes in manufacturing processes as well as the use of safe substitutes. At this point, there have been no substantial efforts to indicate that these proposals are intended to achieve reduction or elimination of D4 in consumer products or industrial applications.

The proposed risk management above did not include the requirement and implementation of pollution prevention plans to address releases of D4 from industrial effluents. While we strongly support the concept of pollution prevention of toxic chemicals, which can be effectively achieved through prevention at the source, the use of pollution prevention plans for a number of chemicals found toxic under CEPA 1999 are limited in their scope and detail. We have on-going concerns as these P2 plans have not focused on pollution prevention at the source and we consider them not to be fully protective of the environment or human health.

[4] Ibid.
[5] See; http://www.cela.ca/sites/cela.ca/files/648%20RA%20Batch%202-1.pdf.

In the case of D4, our concerns regarding P2 plans are substantial. There is new evidence suggesting that D4 may be bioaccumulative.[6] This finding would support that D4 is persistent and bioaccumulative according to the *Persistence and Bioaccumulation Regulations* under CEPA 1999. Therefore, we conclude that the use of P2 plans and the proposed measures above may not be adequate to address D4.

Since the determination of bioccumulation for D4 was considered uncertain in the final screening assessment, the measures proposed were primarily focused on identifying an acceptable concentration limit for release to the environment. With potentially less uncertainty for the bioaccumulation potential for D4, this finding should steer the decision making process on the risk management of D4 in a different path. In fact, the management of D4 should include an increase commitment for regulatory measures on its use and shift from control measures that focus on releases of D4 to the environment.

Based on the new bioaccumulation evidence, we urge the government to shift its management strategy for D4 away from applying P2 plans to a regulatory framework that aims to reduce and eliminate the use of D4 within the coming years.

RECOMMENDATION: The government should accept the finding of new data that confirms the bioaccumulation potential of D4.

RECOMMENDATION: Based on the new evidence on the bioaccumulation potential for D4, we urge the government to shift its approach from using P2 plans for D4 to regulatory measures for the reduction and elimination of the use of D4.

Specific Elements of Proposed Pollution Prevention Plan

Below, we have noted a number of issues that weaken the approach in utilizing P2 plans to achieve the reduction and elimination of the use of D4 in the Canadian market.

1) Establishing Targets for Reduction and Elimination

Proposed notice for P2 plans for D4 do not include any estimates for the overall reduction in use for D4 so it is unclear, whether any reduction or elimination of the use of D4 at the point source will be achieved. Currently, the primary focus of the P2 plans is to establish a concentration level for releases of D4 to water.

[6] Mark Bonnell. January 2011. Bioaccumulation and Biomagnification of Octamethylcyclotetrasiloxane (D4) and Decamethylcyclopentasiloxane (D5): State of the Science (Draft). Prepared for Environment Canada.

2) Facilities requiring Pollution Prevention Plans

The emphasis of the P2 plans for D4 is on industrial effluents to water. However, measures to address D4 should target all sources of D4 including industrial and consumer products. It is unclear how many facilities will be required to meet the requirements for P2 plans. In addition, there is concern that the focus on water releases could result in a failure to require facilities that release to other environmental media, such as air or disposal of D4 to landfill, to address D4 releases. This may result in facilities shifting releases from one environmental media to another.

3) Use/Producer/Import Thresholds

The requirement for P2 plans only apply to facilities that use, produce or import D4 in quantities greater than 100 kg per year. A threshold for users, producers or importers should not be applied. All facilities that use, produce, release, import or dispose of D4 should be required to manage D4 through P2 plans.

RECOMMENDATION: The government should establish a reduction of D4 by 75% within 2 years with its eventual elimination within 3 years.

RECOMMENDATION: All facilities that use, produce, release, or dispose of D4 should be required to implement pollution prevention strategies on D4.

RECOMMENDATION: We urge the government to eliminate the use/producer/import threshold of 100 kg for D4.

RECOMMENDATION: The focus on releases of D4 to water is too limited. We urge the government to ensure that releases of D4 to all environmental media (air, water, sediment, land) be targeted for management measures.

ADDITIONAL COMMENTS AND RECOMMENDATIONS ON SPECIFIC SECTIONS OF PROPOSED NOTICE

We provide the following commentary and recommendation on specific sections of the proposed notice.(Refer to Table 1) We recommend a government management approach that aims to achieve overall reduction in D4 use through effective prevention strategies.

Table 1: Comments and recommendations to specific sections of proposed notice for P2 plans for D4

Specific Section of Proposed Notice for Pollution Prevention Plans for D4[7]	Response to Specific Sections	Recommendations
S. 2(1)(a) (b)	P2 plans apply to the following: ➢ a) Manufacture or use of D4 or a mixture containing D4 where the total quantity of D4 manufactured or used is equal or greater than 100 kg per calendar year; and b) as a result of manufacturing or use of D4 or a mixture containing D4, releases an effluent containing D4 at the final discharge point of the facility. ➢ Criteria for facilities are too narrow and do not ensure that all facilities are required to meet the obligations of pollution prevention. See comments in previous section.	See above.
S. 2(3)(a)(b)	➢ The exemption to mixtures that contain D4 in concentrations of less than 1% is limited in that it does not consider situations where larger amounts of these mixtures could be used or the frequency of use of D4. ➢ The concentration of D4 in the effluent remains unknown with the use of mixtures. ➢ The exemptions for use of D4 "in any solid material…" is unacceptable and unfounded. No evidence has been presented in the assessment to indicate that D4 could not leach out of a material over time and enter the environment. ➢ Finally, the rationale for choosing the 1% limit of D4 in a mixture has not been explained.	Rec.: The exemptions on mixtures containing D4 in concentrations less than 1% or used in solid material should be eliminated.
S. 4(3) The specific risk management objective….: (a) 2.3 ug/L for effluents released directly in surface water or in wastewater system	It is important to acknowledge that there are jurisdictions across Canada that have no waste water treatment systems, the percentage of which was not indicated. A D4 effluent concentration level has been proposed for direct release to surface water or in wastewater without a treatment. This proposal is problematic for the following reasons:	Rec.: We do not support the proposed concentration limits as outlined in S. 4(3) of the Proposed Notice for P2 plans. A preferred approach should aim to reduce the loading of D4 at the source in order to achieve the reduction or

[7] Environment Canada. January 2011. *Canada Gazette.* Vol 145, No. 3. January 15, 2011. Proposed Notice requiring the preparation and implementation of pollution prevention plans in respect of cyclotetrasiloxane, octamethyl- (Siloxane D4) in industrial effluents. See; http://www.gazette.gc.ca/rp-pr/p1/2011/2011-01-15/html/sup1-eng.html.

that does not have a treatment; or b) 17.3 ug/L for effluent released into wastewater system that does have a treatment.	➢ The overall impact for ecologically vulnerable regions such as the Great Lakes is unclear because there may be a combination of releases from wastewater treatment systems and releases directly to surface water where WWT systems are absent. ➢ There is no prescribed concentration level for final effluent discharge to surface water from effluents released to wastewater treatment systems. ➢ It assumes that all jurisdictions that have wastewater treatment systems will have equal capacity to capture D4 before the final effluent is released. ➢ There has been no mention of the presence of D4 in sludge that may result from the waste water treatment plants. ➢ In the July 2010 consultation document for D4, there was mention of industrial effluent being discharged to an off-site wastewater treatment plant with a proposed D4 release limit of 5.2ug/L. It appears that this has not been captured in the two proposed limits and there is uncertainty as to how this scenario will be regulated.	elimination of D4 releases to the environment.
S.4(4)	➢ The sampling regimes for D4 concentration levels are inadequate as they do not account for potential cumulative impacts of D4 in regions where there may be several sources of releases of D4. ➢ Sampling regimes should include situations which are not considered “normal operating conditions” so that they can demonstrate the range of concentrations that are possible by facilities releasing D4 in effluents. ➢ Continuous processes: A frequency of 4 grab samples per year with a minimum time of 60 days between sampling is proposed. Such a low sampling frequency would not adequately represent changes in production levels including those that are seasonal or daily. This sampling frequency would not be representative of the busy production periods when more D4 releases are expected. ➢ The time period between sampling would also be problematic for the same reasons. Therefore, the 60 day period between sampling currently proposed should be reduced to provide more frequent sampling. ➢ Batch processes: The proposal requires one grab sample for each batch produced within a calendar year. If more than four batches are produced within a calendar year, four grab samples should be collected. It has been proposed that samples should be collected when there is a potential for D4 release. Apart from the	Rec.: We urge the government to significantly expand the sampling regime for the continuous process to accommodate for periods of increased production as well as seasonal and daily variations. As a result, we also suggest that the proposed time of 60 days between sampling should be reduced to accommodate an increase in the frequency of testing. Rec.: For the batch process, we urge the government to require multiple sampling for every batch rather than 1 grab sample per batch. In addition, sampling times should be determined based on the volume of production and duration of the batch process. Similarly, a minimum time between each sampling event should be included.

	expectation of D4 releases, there are no other criteria to determine which four batches would be selected for monitoring or how would the facility determine if releases of D4 to water are expected. As a result, all batches should be monitored. The duration of batch processing and the volume of individual batches could be quite variable. This would provide some rationale that there be multiple monitoring samples for each batch at a facility as the current proposal is considered inadequate.	
S.4(5)	➢ The focus on pollution prevention strategies should be made an explicit requirement for P2 plans rather than "to give priority to pollution prevention activities…" Specifically, strategies that would aim to avoid the creation of pollutants would make significant progress towards the protection of the environment.	Rec.: We urge the government to use pollution prevention strategies as outlined, in a mandatory and explicit manner in this notice.
S.4(6)	➢ The use of alternatives for D4 is an important element in the P2 plans for D4. It has not received a significant focus in this proposed notice. In the proposed notice, it stated that alternatives "should be considered". There is no explicit requirement for the consideration of alternatives in the process of preparing pollution prevention plans. ➢ The use of the word "similar" is unacceptable with respect to the consideration of D4 alternatives and their ability to "cause ***similar*** environmental effects". Alternatives to D4 should be considered acceptable only when the alternative does not cause ***any*** harm to the environment or human health. We do not want alternatives that may cause different but still damaging effects to the environment or human health.	Rec.: The use of alternatives to D4 should be made explicit and mandatory in the preparation of P2 plans for D4. Rec.: The word "similar" should be deleted. This word should be replaced by the phrase "*any proven environmental or human health effects*."
S.4(8)	➢ We have provided our comments on the frequency of sampling in response to s. 4(4). ➢ The proposal to require only 1 year of monitoring for measuring D4 in effluent is considered insufficient. This monitoring requirement may not fully reflect the operations of the facility in situations where there may be yearly changes in production processes involving D4. However, the implementation timeframe is proposed for 60 months from the date of publication of the Notice. There was no rationale provided for the time required for implementation of the P2 plans. The proposed monitoring period and the duration of the implementation framework would appear to be out of sync. We suggest the implementation timeframe be shortened and the monitoring regime be extended. ➢ One element of the monitoring regime should	Rec.: The government should expand the scope and quality of the monitoring regime The one year monitoring requirement should be extended. Rec.: The monitoring regime should be consistent with an implementation timeframe to promote accountability by facilities. Additional consideration for an on-going monitoring regime should be designed beyond the implementation timeframe. Rec.: Require third party

	include a third party verification requirement to promote accountability by facilities towards prevention strategies.	verification as an element of the monitoring regime of the P2 plans.
S.5(1)	➢ We consider the timeframe of 12 months given from the date of Notice to prepare P2 Plans acceptable. However, no rationale was given for the selection of this timeframe. Considering that "60 months from the date of publication of the Notice" is the time frame for implementation, it appears that facilities will be given more time than needed to complete the implementation efforts. Substantial reductions to the implementation framework are required (see comments in s. 6(1)(2).	Rec.: We support the timeframes proposed for the preparation of P2 plans.
s.6(1)(2)	See comments for s.5(1). ➢ It is unclear why 60 months for complete implementation of the P2 plans is proposed for facilities subject "to the Notice on the date of publication." It is our view that this timeframe is too long. A more effective measure would be to apply regulatory measures to achieve target concentrations.	Rec.: We do not support the timeframes proposed for implementation of P2 plans. The timeframe for implementation should be reduced from 60 to 24 months.

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