



Performance Report: Pollution Prevention Planning and Siloxane D4 (2013 to 2016)

Pollution Prevention (P2) Planning is a process by which organizations can improve their environmental performance by strategically planning to reduce or eliminate pollution before it is created.

Updated: June 2017

The facilities subject to the P2 Planning Notice in respect of siloxane D4 (D4) in industrial effluents have prepared their P2 plans and submitted their interim progress reports number 1, 2 and 3 (refer to the *Interim Progress Report* in Schedule 4 of the Notice). In addition, two facilities submitted their final declaration indicating that they have completed implementation of their P2 plans (refer to the *Declaration That a Pollution Prevention Plan Has Been Implemented* in Schedule 5 of the Notice).

This report summarizes the information obtained from 2013 to 2016 in the various documents that facilities are required to submit under the Notice, which are: their initial declaration that a P2 plan has been prepared and is being implemented (refer to the *Declaration That a Pollution Prevention Plan Has Been Prepared and Is Being Implemented* in Schedule 1 of the Notice), their three interim progress reports, as well as their final declaration (two facilities submitted it in 2015). The facilities subject to the Notice have stated that they plan to adopt or have adopted several measures to reduce emissions of D4 to the environment.

D4 was declared toxic to the environment under the *Canadian Environmental Protection Act, 1999*. A P2 Planning Notice was selected as the risk management instrument for this substance.

The risk management objective in the Notice is to reduce total D4 releases to the aquatic environment from the sum of all facilities subject to the Notice, by 80% from the P2 planning preparation year levels, by the end of the implementation period.

The reduction target for a facility subject to the Notice is to achieve and maintain either a total D4 concentration in its industrial effluents that is less than or equal

to 17.3 µg/L or a total quantity of D4 released in its industrial effluents that is less than or equal to 3 kg/year.

The facilities subject to the Notice were required to submit an initial declaration (Schedule 1 of the Notice) by July 1st, 2013. For the next three years, the facilities had to submit a yearly report on the progress made in implementing their P2 plan (Schedule 4 of the Notice). The facilities had until June 1st, 2016 to achieve the reduction target and must submit, by July 1st, 2017, a final declaration (Schedule 5 of the Notice), which summarizes the outcomes of the implemented P2 plan, including the sampling results obtained during the monitoring year that followed the deadline for achieving the reduction target.

Pollution Prevention Planning Notice Requirements

On June 2, 2012, the Minister of the Environment published a *Notice Requiring the Preparation and Implementation of Pollution Prevention Plans in Respect of Cyclotetrasiloxane, octamethyl- (Siloxane D4) in Industrial Effluents*.

The Notice applies to any person who owns or operates an industrial facility that, during the 2011 calendar year or any time thereafter, meets the following two criteria:

- (a) It manufactures or uses D4, or a mixture containing D4, where the total quantity of D4 manufactured or used is equal to or greater than 100 kg per calendar year; and
- (b) As a result of manufacture or use of D4 or a mixture containing D4, it releases an effluent containing D4 at any final discharge point of the facility.

The Notice also applies to any person who is the successor or assign of the persons referred to in the Notice. Some exceptions (set out in the Notice) apply.

Facilities subject to the Notice must prepare and implement a P2 plan considering the factors set out in the Notice, namely the reduction target and the sampling and analysis of industrial effluents. As stated above, three interim progress reports are required to be submitted to the Minister during the implementation of the P2 plans. These interim progress reports help assess the performance of the Notice in meeting the reduction target.

Summary of Interim Results

In 2013, seven facilities submitted a *Declaration that a Pollution Prevention Plan Has Been Prepared and Is Being Implemented*. Since then, one of these facilities has shut down its operations.

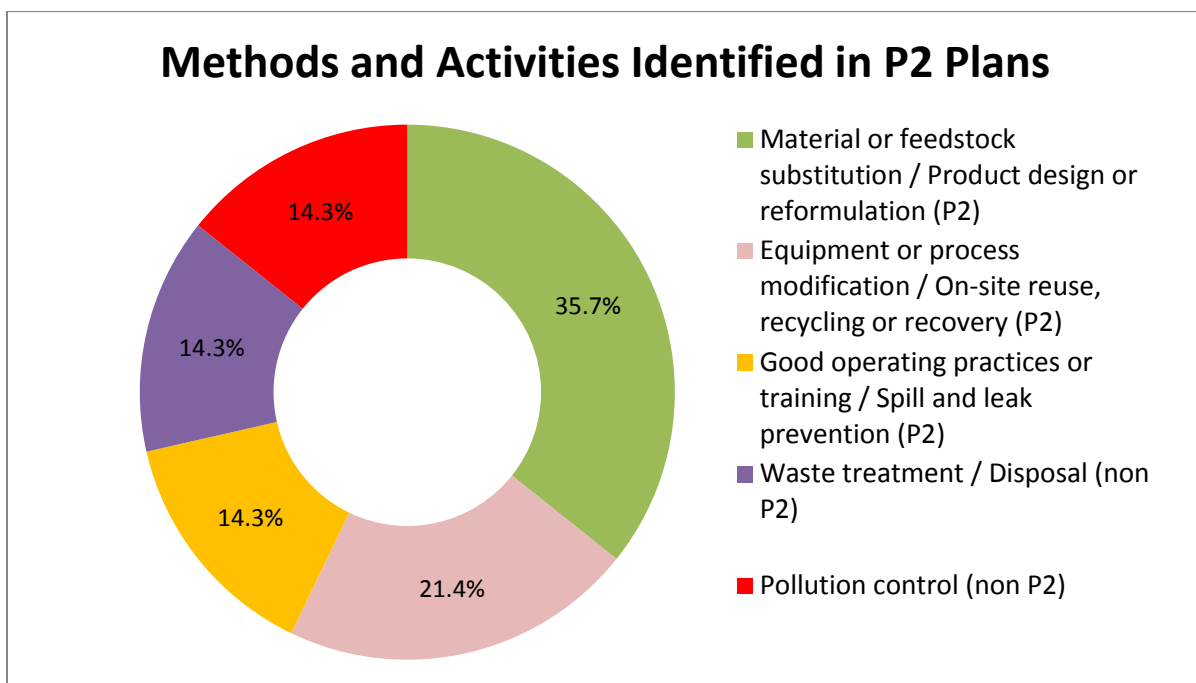
Table 1 presents information provided in interim progress reports and final declarations regarding actions planned or that have taken place as part of the P2 plans.

Table 1: Methods and Actions Identified by Facilities to Reduce Releases of D4 in Their Effluents	
Methods	Planned Actions
Materials or feedstock substitution / Product design or reformulation	<p>Gradual elimination of D4 in manufactured goods.</p> <p>Identification of alternatives to D4 in order to stop using it.</p> <p>Use of a mixture with a lower D4 concentration when manufacturing products.</p>
Equipment or process modification / On-site reuse, recycling or recovery	<p>Improvement of reactor cleaning methods in order to decrease water use and effluent volume.</p> <p>Recycling of silicone (containing D4) collected through the rinsing of tanks.</p>
Good operating practices or training / Spill and leak prevention	<p>Implementation of better practices for operation and maintenance of systems.</p> <p>Employees given training in how to limit D4 releases into wastewater.</p>
Pollution control	<p>Use of an activated carbon filter.</p> <p>Use of a combined flocculation/activated carbon treatment system.</p>
Waste treatment / Disposal	<p>Prevention of silicone releases (containing D4) into drains by pumping it into barrels, the contents of which will be destroyed using an appropriate method.</p> <p>Disposal of D4-containing raw materials in stock.</p>

Actions planned or implemented by facilities to meet the reduction target

Pollution prevention is about anticipating and preventing pollution instead of reacting to it after the fact. Pollution prevention does not stand alone; it is part of an ongoing pollution management approach that comprises prevention, control and clean-up. Pollution prevention focuses on not creating pollutants rather than on trying to manage them after they have been created. The federal government believes that pollution prevention is the most effective means of protecting our environment, avoiding costly waste and promoting sustainable development. Pollution prevention actions were selected by 71% of affected facilities (it should be noted that the facilities have planned to implement or have implemented a number of measures).

Figure 1: Distribution of Methods and Activities Identified by the Facilities Subject to the Notice to Reduce Releases of D4



In 2015, two of the six facilities completed the implementation of planned measures and submitted their final declaration (i.e. Schedule 5). One facility implemented pollution prevention measures, while the other implemented

pollution control measures. The two facilities met the reduction target set out in the Notice.

In 2016, four facilities were still implementing the Plan and have submitted their interim progress report number 3, as required in the Notice.

As of June 1st, 2016, two thirds of the facilities had stated that, as a result of implementing their P2 plan, they had met the reduction target and either had completed or were going to start carrying out one year of monitoring (i.e. sampling and analysis at the final discharge points for one year after the reduction target is achieved).

Two facilities have indicated that they have nearly fully implemented their P2 plan; however, despite making significant reductions in D4 releases, they do not anticipate meeting the risk management objective of the Notice. These two facilities are the two biggest D4 users and, because of this, the overall risk management objective of the Notice will not likely be met.

Environment and Climate Change Canada has followed up with these two facilities to obtain further information explaining the non-attainment of the target and will continue to work together with them to examine the possible further measures that can be undertaken to reduce their D4 releases.

Background

What is D4?

D4 is an industrial chemical that is currently imported into Canada. It is mainly used in the manufacture of silicone polymers and copolymers. D4 is also used in personal care products and can be found in a variety of other products including defoamers, lubricants, cleaning products, adhesives, sealants and coatings.

D4: Why is pollution prevention important?

D4 was declared toxic under the *Canadian Environmental Protection Act, 1999*. The final Screening Assessment Report concluded that D4 meets the criteria for persistence as set out in the *Persistence and Bioaccumulation Regulations*. D4 was assessed for all environmental media including air, water and soil, and it was determined that the presence of this substance in the aquatic environment is a source of concern.

Sources

- Pollution prevention information
<http://ec.gc.ca/p2/Default.asp?lang=En&n=88D8B369-1>
- Text of the P2 Planning Notice in respect of Siloxane D4
www.gazette.gc.ca/rp-pr/p1/2012/2012-06-02/html/sup2-eng.html
- Information on declarations submitted by facilities
www.ec.gc.ca/cepap2/r001/m001/s004.cfm?chks2=27&chks3=35&provID=0&cfL64=Y2l0eT0mcG9zdGFsX2NvZGU9&localpost=local&chkss=1&uL=E
- Screening Assessment Report for Siloxane D4
www.ec.gc.ca/ese-ees/default.asp?lang=En&n=4996570F-1

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