



2018

Effectiveness of Pollution Prevention Planning Notices

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SUMMARY

Since May 2003, the government of Canada has published 15 Pollution Prevention Planning Notices (P2 Notices) requiring the preparation and implementation of pollution prevention plans to reduce releases of toxic substances to the environment. The outcomes of these notices have been evaluated to determine if the risk management objectives¹ were achieved. This report summarizes the overall results based on information received from 10 completed P2 Notices². All together, these notices required 563 facilities across Canada to prepare and implement P2 plans to reduce releases of 21 toxic substances to the environment.

The information collected in the declarations revealed that 83% of the facilities subject to the 10 completed Notices implemented P2 plans. Of those that completed P2 plans, 95% were successful or partially successful in achieving the risk management objective. Many of these objectives were stringent. For example, certain P2 Notices specified reductions of releases by 95% and others specified reductions of uses or importation by 97%. Certain objectives were qualitative in nature and specified reductions of releases to the greatest extent practicable. Some facilities that achieved the objectives even went above and beyond the initial target of the P2 Notice.

As well, many of the facilities that did not meet the objectives were still able to achieve considerable reductions. These results helped contribute to the overall reduction of pollution into the environment since 2003. A total of 4 million kilograms of toxic substances were prevented from entering the environment, being imported into Canada or being used in products.

In conclusion, the majority of P2 Notices to date have been successful despite a minority of facilities that did not implement a P2 plan or were not successful in meeting the risk management objective. The analysis in this report demonstrates that P2 Notices can be effective at changing behavior and achieving results to help protect the environment and human health.

¹ The risk management objective sets quantitative or qualitative targets to be achieved.

² Note that four of the 10 completed Notices are still in effect although the initial persons subject have completed their obligations. This is further explained in the report.

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P2 PLANNING NOTICES

A P2 Planning Notice (P2 Notice) is a regulatory and enforceable instrument under the *Canadian Environmental Protection Act, 1999* (the Act) that requires persons subject, to prepare, implement and report on their pollution prevention plan (P2 plan). A Notice is published as a risk management action for certain toxic substances listed on the List of Toxic Substances (Schedule 1) of the Act. A P2 plan documents how a person will prevent or minimize the creation of pollution and waste in response to the Notice. The Notice stipulates a deadline for persons subject to prepare their P2 plan and a deadline to implement it. It also includes “factors to consider” that specify issues or activities that must be taken into account during the preparation and implementation of the P2 plan. These include the objective or targets for managing substances and may include sampling/modeling activities, best management practices, P2 methods, and other considerations such as avoiding certain alternatives to the toxic substance listed in the Notice.

Persons subject to P2 Notices have been owners or operators of companies or facilities and municipalities. When developing their P2 plan, they can determine its content as long as the plan addresses all the requirements stated in the notice. These requirements include proving they have taken into account all the “factors to consider”, preparing and implementing their P2 plan, and submitting all the reports within the required deadlines. P2 Notices are unique as facilities can determine how they implement the “factors to consider” and can choose cost-effective P2 methods that are adapted for their facility’s operations or specific circumstances. Compliance with the requirements is mandatory and there are penalties for companies who commit an offence. Penalties for offences can result, upon conviction (either summary conviction or indictment), in fines of not more than \$12 million, imprisonment for a term of not more than three years, or both. Although it is mandatory to consider all the “factors to consider”, the success or lack of success of the method chosen is not an offence under the Act.

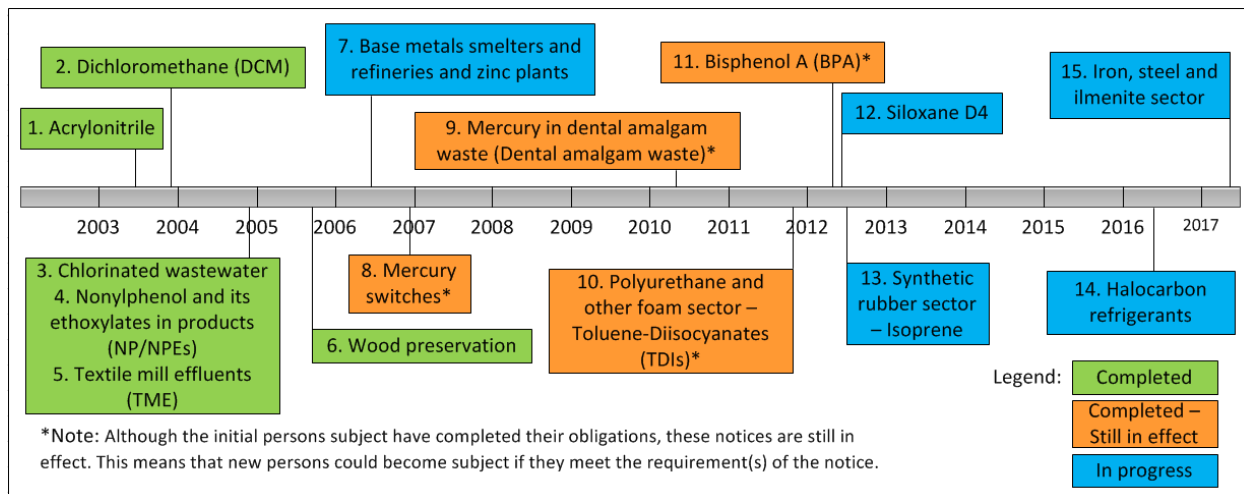
P2 Notices have been used as a stand-alone instrument or in combination with other risk management instruments in order to prevent or minimize pollution from toxic substances. For a general summary of the main design features of P2 Notices and general information on how these notices have been used, please refer to the Design Features report on this website: <https://www.canada.ca/en/environment-climate-change/services/pollution-prevention/planning-notices/design-features.html>.

Information summarizing a facility’s P2 plan is submitted to ECCC in reports called Declarations of Preparation, Interim Progress Reports and Declarations of Implementation. The information received is reviewed to evaluate the individual facility’s progress and results, as well as to gauge whether the P2 Notice was successful in meeting the risk management objectives. This information is also made available to the public. For detailed performance results on each P2 Notice, please refer to the individual performance results available on this website: <https://www.canada.ca/en/environment-climate-change/services/pollution-prevention/planning-notices/performance-results.html>.

Since May 2003, 15 P2 Notices have been published (see timeline in Figure 1) to address concerns from 33 toxic

substances. Of these, 10 notices are completed and 5 notices are in progress at various phases of implementation. A notice is considered completed when the persons subject to it have completed all their obligations (i.e. prepared and implemented their P2 plan and submitted all the required reports). A notice is considered in progress when the persons subject have prepared a P2 plan and are in the process of implementing the actions within their plan. Depending on the notice, the length of the implementation phase will vary and in some cases may be extended. This report provides information and analysis from the 10 completed P2 Notices which address concerns from 21 toxic substances. Annexe 1 provides a list of these substances, their acronyms and the corresponding environmental or health issue.

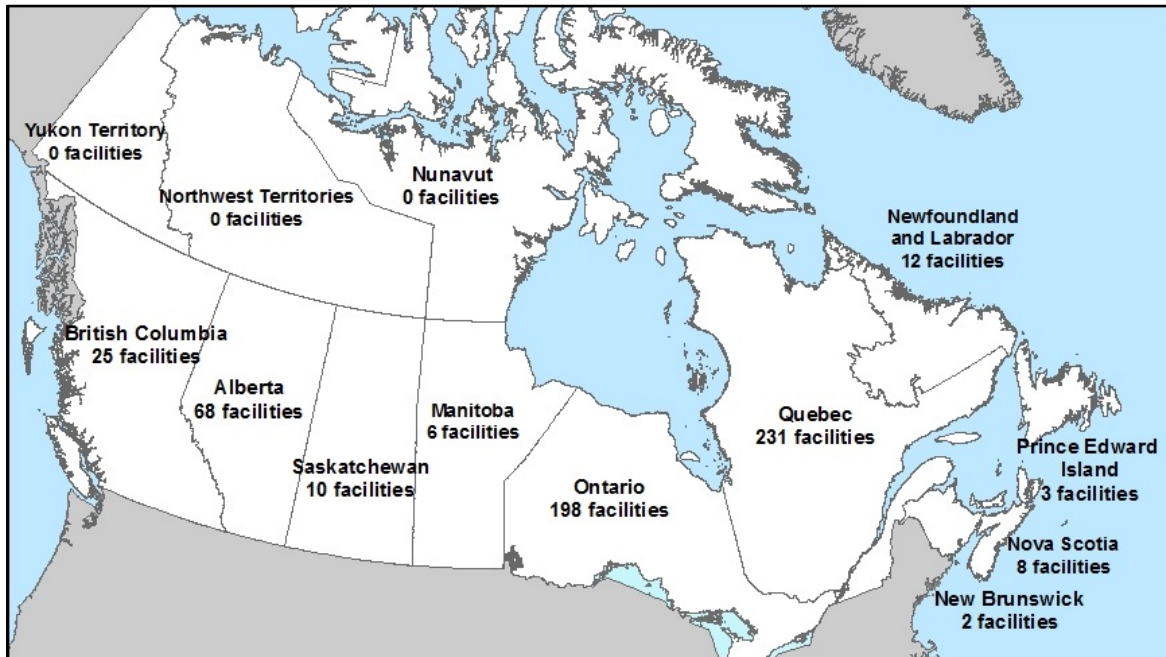
Figure 1: Timeline of P2 Notices published to date



PREPARING AND IMPLEMENTING A P2 PLAN

There were 563 facilities that prepared a P2 plan and started its implementation. Facilities were located across Canada in all provinces and none were located in the territories. Figure 2 below illustrates the distribution of facilities across Canada. Since P2 Notices primarily have captured facilities involved in manufacturing substances or products, the majority of the facilities were located in the provinces of Ontario and Québec where this type of activity is concentrated.

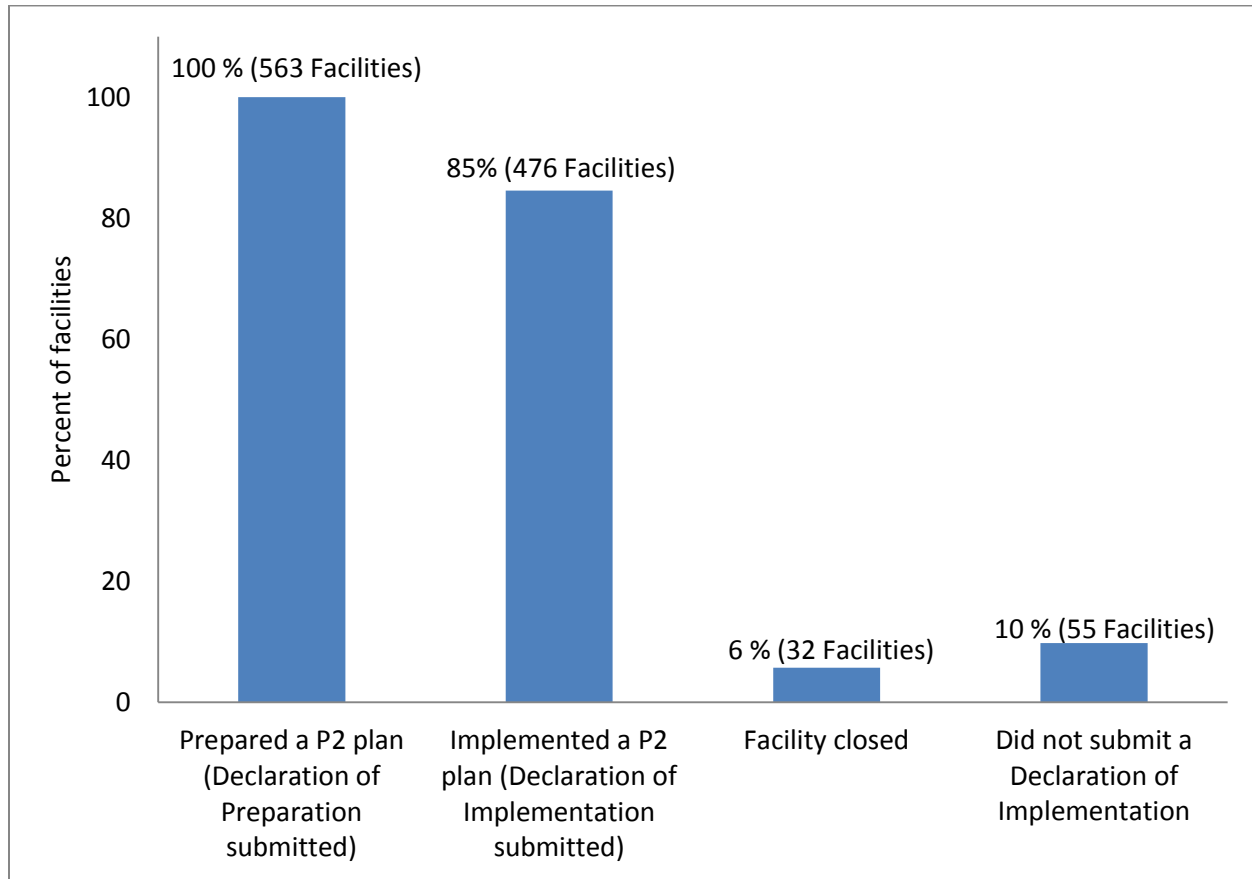
Figure 2: Distribution of facilities that prepared a P2 plan in response to the completed P2 Notices across Canada



Source: Pollution Prevention Planning Reporting Tool. Data as of January 2017

The 563 facilities have the obligation to implement a P2 plan and submit a final report in the form of a Declaration of Implementation. The information collected shows that 85% of facilities, or 5 out of 6 facilities, are compliant with this requirement (Figure 3). This means that the majority of facilities implemented activities or actions to prevent pollution and reduce the release or use of toxic substances. The types of actions and whether these lead to the achievement of the objective of the P2 Notice will be discussed later in the report. Figure 3 also shows that 6% of facilities closed prior to finalizing the implementation of their P2 plan. It should not be implied that facility closures are attributed to the P2 Notice. Even though the closed facilities did not finish implementing their P2 plans, they are no longer releasing or using toxic substances.

Figure 3: Percentage and number of facilities who prepared and implemented a P2 plan, who closed and who did not submit a Declaration of Implementation



A small proportion of facilities (10%) did not submit a Declaration of Implementation. These facilities are mostly from the Dental amalgam waste and the Chlorinated wastewater P2 Notices. Annex 2 provides information on each notice separately.

For the Dental amalgam waste P2 Notice, it was originally estimated that between 1000 and 2500 dental facilities would be subject to that P2 Notice, however, only 256 facilities prepared a P2 plan. In response to the low participation rate, a voluntary survey of dental facilities across Canada was commissioned in 2012 by Environment and Climate Change Canada. The survey indicated that despite low compliance in terms of submitting the Declaration of Implementation, best management practices were implemented across Canada and the quantity of mercury being released from dental amalgam waste had been reduced.

In the case of the Chlorinated wastewater P2 Notice, facilities that were subject to this P2 Notice, later became subject to the *Wastewater Systems Effluent Regulations* in 2012. These regulations set mandatory effluent quality standards which include a standard for total residual chlorine concentration aligned with that of the P2 Notice. Therefore, even if a Declaration of Implementation was not received under the P2 Notice for these 12 wastewater treatment facilities, they were required to meet the concentration target by January 1, 2015 under the regulations.

OVERALL EFFECTIVENESS OF P2 NOTICES

To reduce the environmental and/or human health risks posed by the 21 toxic substances covered by the 10 completed P2 Notices, the notices included one or several objectives as a “factor to consider”. The objectives are the expected outcomes, targets or goals of a P2 Notice.

One of these goals is the risk management objective (RMO). The RMO sets quantitative or qualitative targets to be achieved. The majority of the RMOs of the completed notices required the reduction of uses or releases of the substance(s) to the environment (e.g. air or water). Certain objectives specified the activities, thresholds or methods to prevent pollution such as:

- the reduction in use or manufacturing of the substance;
- the reduction in importation;
- the implementation of best management practices; or
- the use of best available techniques economically achievable (BATEA).

There could be other objectives; however, this section of the report focuses only on the RMO.

ACHIEVEMENT OF THE RISK MANAGEMENT OBJECTIVES

The overall effectiveness of P2 Notices was measured by examining each facility’s success in achieving the RMO of the notice. The information available in the reports submitted by the facilities that implemented a P2 plan was aggregated across the 10 completed notices. The results were then classified into three main categories:

- Facilities who achieved or overachieved the RMO,
- Facilities who partially achieved the RMO (within 10% of target)³,
- Facilities who did not achieve the RMO.

As shown in Figure 4, 92% of facilities (436 of 476 that implemented a P2 plan) reported in their Declaration of Implementation that they actually achieved or over-achieved the RMO and an additional 3% came within 10% of the RMO. Therefore, across all completed notices, 95% of facilities that implemented a P2 plan are considered to have achieved or partially achieved the RMO. Six P2 Notices had an objective to reduce releases, uses or importation of toxic substances or products containing toxic substances. Prior to the P2 plans being implemented, the total quantities of toxic substances being released, used or imported was 4 196 355 kg. After the implementation of the P2 plans this quantity was reduced to 178 207 kg. Therefore, the

³ In order to determine if facilities partially achieved the objective, a 10% margin was calculated below the target. For example, if the target was to reduce releases by 85%, facilities are considered to have partially achieved the RMO if their results showed reductions between 76.5% and 84%. Those who achieved less than 76.5% reduction were considered to have failed the objective.

implementation of P2 plans prevented ~4 million kilograms of toxic substances from entering the environment, being imported into Canada or being used in products. Refer to Annex 3 for more detailed information.

Additionally, several of those facilities that achieved the RMO went above and beyond the initial target. For example, some facilities subject to the Chlorinated wastewater P2 Notice went beyond the requirements of the notice and addressed, in their P2 plan, other substances found to be toxic such as mercury and nonylphenol and its ethoxylates. One facility that was subject to the Acrylonitrile P2 Notice anticipated to reduce its on-site releases by 1690 kg and off-site disposal by 2000 kg. However, after implementing its P2 plan, the facility was actually able to achieve reductions beyond its initial targets. The facility reduced on-site releases by 5350 kg and completely eliminated off-site disposals.

Figure 4: Success rates in achieving the risk management objective across all P2 Notices for facilities that implemented a P2 plan

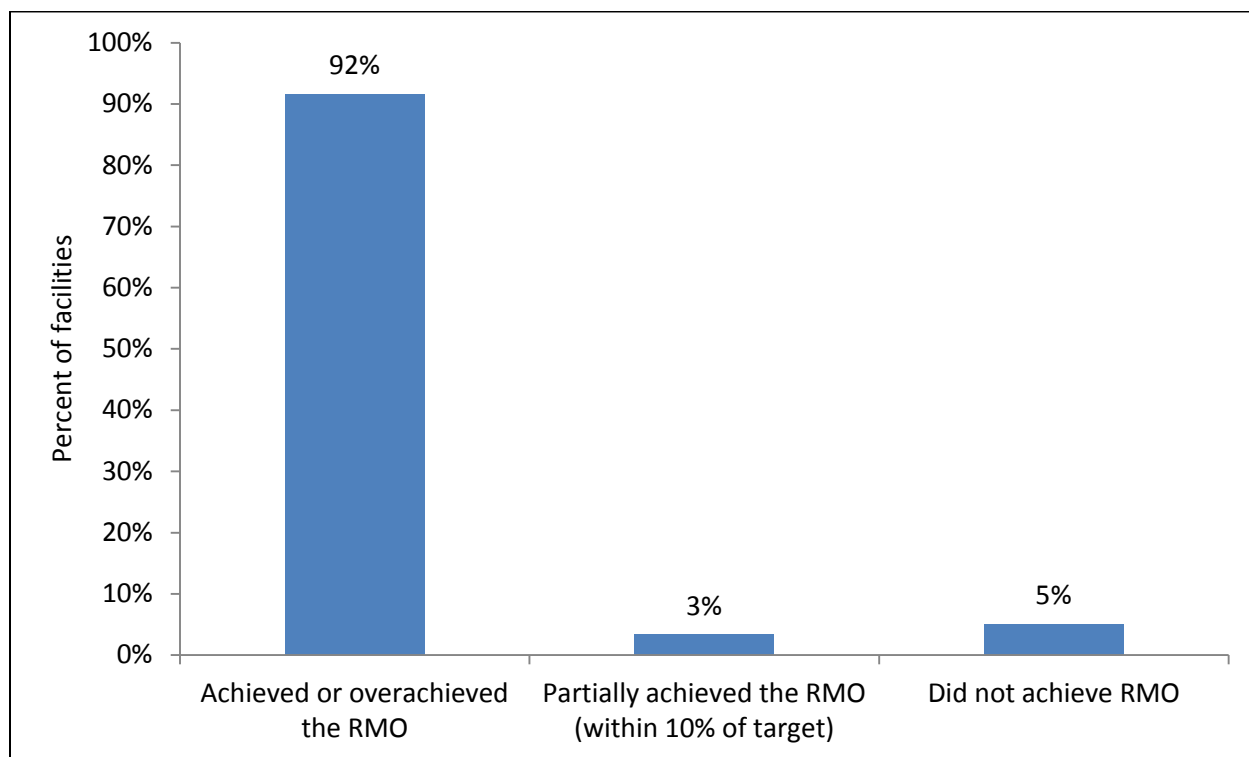


Figure 4 also shows that 5% of facilities, despite implementing actions within their P2 plans, were not able to achieve the RMO. These included facilities subject to the Chlorinated wastewater, Dichloromethane, Dental amalgam waste, Nonylphenol and its ethoxylates in products and the Textile mill effluents P2 Notices. The rationale given by facilities for not meeting the targets included:

- mechanical issues (e.g. problems with optimization of instruments),
- difficulties in substituting the substance,
- financial restrictions,
- customer demands, and
- increases in sales.

Although the objective was not met, more than half of these facilities were still able to reduce releases to the environment. Some achieved greater than 80% reductions. Therefore, when these reductions are added to the collective sum of all results, they help contribute to the overall effectiveness of the notices.

These results confirm that when facilities are subject to a P2 Notice and implement a P2 plan, they are highly successful in achieving the RMO. However, there is a small proportion of facilities that were not able to achieve the RMO or did not submit a Declaration of Implementation. This will be further discussed in the next section.

INDIVIDUAL P2 NOTICE EFFECTIVENESS

The previous sections showed that a majority of facilities implemented P2 plans and were successful in achieving the risk management objective. However, 55 facilities did not submit a declaration of implementation and certain facilities did not achieve the RMO. What impact did this have on the effectiveness of individual P2 Notices?

To assess the effectiveness of each P2 Notices, 3 aspects were considered:

1. How many facilities implemented a P2 plan compared to the number of persons that were subject to the P2 Notice?
2. How many facilities met the RMO compared to the number of persons that were subject to the P2 Notice?
3. What were the overall reductions and results achieved? Was the intent behind the P2 Notice met?

Note: Although facilities that closed were part of the initial list of persons subject to the P2 Notice, they were not included in the analysis since they are no longer using, importing or releasing toxic substances.

Table 1 summarizes the objective(s) and the results achieved for each P2 Notice. The majority of P2 Notices were effective in reaching their intended objectives. Although some facilities did not implement a P2 plan or did not meet the RMO, the overall reductions observed offset these deficiencies.

Table 1: Summary of the objectives and results achieved for each P2 Notice

P2 Notice	Summary of main risk management objective(s)*	% of persons subject who implemented a P2 plan	% of persons subject who achieved the RMO	Summary of results achieved
Acrylonitrile	Reduce the release of Acrylonitrile from synthetic rubber manufacturing sources to the lowest achievable level by the application of best available techniques economically achievable (BATEA).	100%	100%	The Notice has been successful. Total releases reduced by 85 % Off-site disposal = -100% (-12 600 kg) Fugitive releases = -89% (-4150 kg) Storage and handling releases = -82% (-400 kg) Stack or point releases = +14% (+300 kg)
Dichloro-methane (DCM)	Reduce aggregate DCM releases by 85% from the 1995 base year levels by January 1, 2007. Note that five sectors had different targets specific to each sector.	94%	83%	The Notice has mostly been successful. Aggregate releases reduced by 93% (-842 642 kg) Although the overall objective was achieved, three of five industry sectors did not achieve their individual objectives.
Chlorinated wastewater	Achieve and maintain a concentration of total residual chlorine that is less than or equal to 0.02 mg/L in effluents released to surface water by December 15, 2009.	85%	80%	The Notice has mostly been successful. 80% of facilities met the objective. Residual chlorine concentration reduced by 85%. A third of facilities reported a 100% reduction in total residual chlorine. Even though the overall objective was met for this notice, some facilities either needed more time to implement, upgrade or build new wastewater treatment systems or they did not implement their P2 plan. Facilities that were subject to this Notice are now subject to the <i>Wastewater Systems Effluent Regulations</i> .

P2 Notice	Summary of main risk management objective(s)*	% of persons subject who implemented a P2 plan	% of persons subject who achieved the RMO	Summary of results achieved
Nonylphenol and its ethoxylates contained in products (NP/NPEs)	<p>Reduction of NP/NPEs in soap and cleaning products, processing aids used in textile wet processing, and pulp and paper processing aids manufactured in or imported into Canada:</p> <ul style="list-style-type: none"> Phase 1 : 50 % reduction from base year of the total mass (used or imported annually) Phase 2: 95% reduction from base year levels of the total mass (used or imported annually). 	92%	83%	<p>The Notice has been successful.</p> <p>Overall reduction of 96% in NP/NPEs used to manufacture products or imported in products.</p> <p>Manufacture: - 96% (-2 014 000 kg)</p> <p>Import: -96% (-823 000 kg)</p>
Textile Mill Effluents (TMEs)	<p>For NP/NPEs used in textile wet processing, reduce the annual use by at least 97% on a mass basis relative to annual use for the 1998 base year levels.</p> <p>For TMEs, achieve and maintain through means other than dilution, a maximum acute toxicity of 13% IC₅₀ (50 percent inhibiting concentration) for textile mill effluents discharged to an off-site wastewater treatment facility no later than 2009.</p>	95%	92%	<p>The Notice has been successful.</p> <p>Use of NP/NPEs was reduced by 99.99% (-207 049 kg)</p> <p>Effluent toxicity target was met or partially met by 92% of active mills. The government of Canada continues to monitor NP/NPEs for increases in use quantities and levels in the environment to determine the need to develop further measures.</p>

P2 Notice	Summary of main risk management objective(s)*	% of persons subject who implemented a P2 plan	% of persons subject who achieved the RMO	Summary of results achieved
Wood preservation	Reduce the release of targeted toxic substances (see Annex 1) during wood preservation processes to the lowest achievable levels by the application of or by achieving equivalence with best management practices.	100%	100%	<p>The Notice has been successful.</p> <p>Although compliance with the P2 Notice was difficult to achieve, three of four facilities eventually met their objectives. The other facility closed.</p> <p>Note that there were no reductions targets for this P2 Notice.</p>
Mercury switch	<p>Reduce releases of mercury to the environment through participation by vehicle manufacturers and steel mills in a mercury switch management program.</p> <p>Ultimate objective: achieve an annual mercury switch capture rate of 90% within the first 4 years of participation in program.</p>	100%	100%	<p>The Notice has been successful.</p> <p>All the vehicle manufacturers and steel mills subject to the notice participated in the mercury switch management program.</p> <p>A total of 413 328 mercury switches were collected and reported under the P2 Notice. However, the ultimate objective of achieving a capture rate of 90% within the first 4 years of the Program has not been achieved. The Switch Out program expanded nationally and switches are still being collected.</p>

P2 Notice	Summary of main risk management objective(s)*	% of persons subject who implemented a P2 plan	% of persons subject who achieved the RMO	Summary of results achieved
Dental amalgam waste	Contribute to a 95% national reduction in mercury releases to the environment from dental amalgam waste, from base year of 2000.	84%	84%	<p>The Notice has mostly been successful.</p> <p>The P2 Notice, coupled with other factors outside of the scope of the notice (e.g.: increased environmental awareness of mercury waste management among dental facilities, efforts from dental amalgam separators suppliers, and provincial and municipal initiatives) may have played an important role in implementing best management practices in managing mercury from dental amalgam waste. Furthermore, a 2012 follow up survey indicated that 97% of the 1250 facilities that responded had put in place best management practices and had installed an amalgam separator to collect mercury from waste. These factors contributed to the achievement of the objective.</p>
Polyurethane and other foam sector – Toluene diisocyanates (TDIs)	Reduce human exposure to TDIs through the reduction of industrial TDIs emissions to the environment to the greatest extent practicable, using best available techniques economically achievable (BATEA).	100%	100%	<p>The Notice has been successful.</p> <p>All facilities met the objective.</p> <p>Overall actual on-site releases of TDIs to air were reduced by 55% (-118 kg/year).</p> <p>The average predicted concentration of TDIs at the fence line was reduced by 94% for the three facilities that were above the concentration target of 0.2 µg/m³ (reduced from 0.804 to 0.0472 µg/m³).</p>

P2 Notice	Summary of main risk management objective(s)*	% of persons subject who implemented a P2 plan	% of persons subject who achieved the RMO	Summary of results achieved
Bisphenol A (BPA)	Achieve and maintain the lowest total BPA concentration that is economically and technically feasible and is less than 1.75 µg/L in effluent released.	100%	50%	<p>The Notice has somewhat been successful even though 2 of the 4 facilities did not achieve the RMO. Despite the shift to non-BPA products, the substance is still present in effluents above the target for those two facilities. They have agreed to pursue sampling twice a year until the achievement of the RMO.</p> <p>There has been an overall 99% reduction in the amount of BPA used.</p> <p>An overall reduction of 94% of BPA sent to off-site wastewater systems was achieved.</p> <p>An overall reduction of 83% has been achieved to date for the average concentration of BPA in effluents.</p>

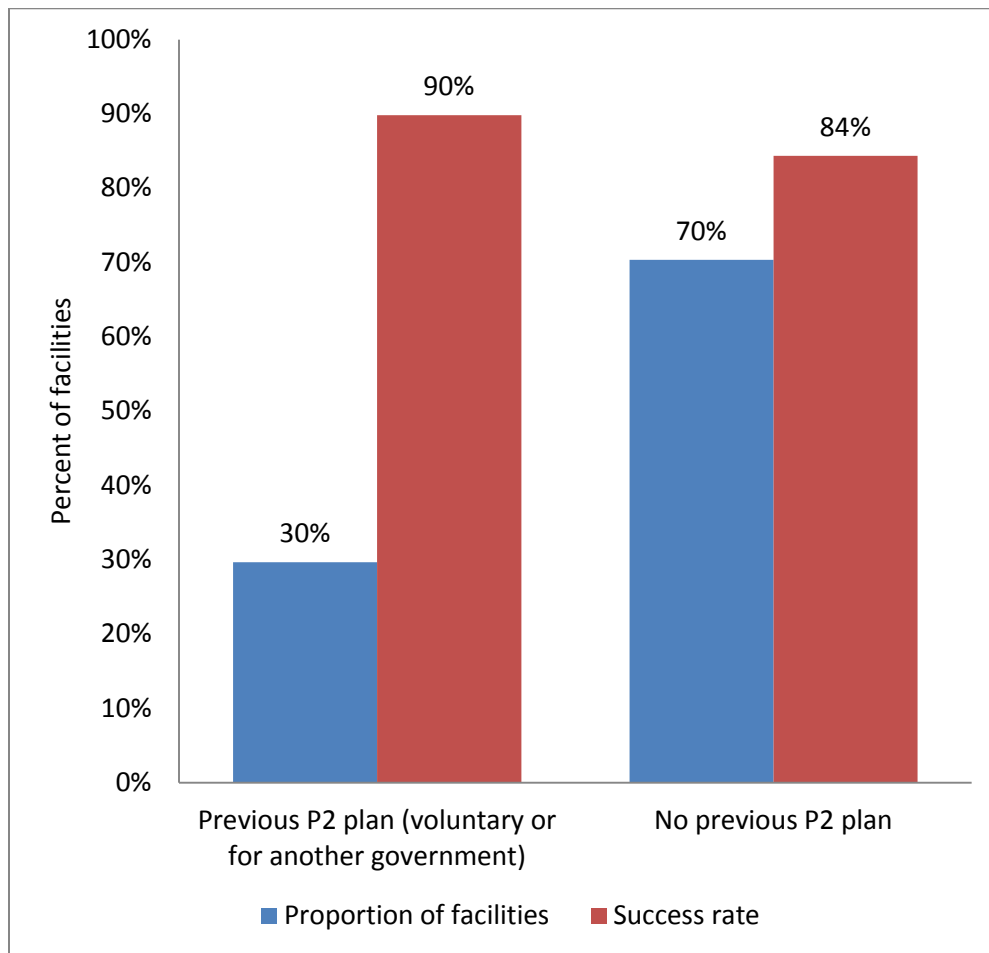
*For the complete definition of the objectives, refer to the corresponding P2 Notice publication in the *Canada Gazette* accessible via the Government of Canada website: <https://www.canada.ca/en/environment-climate-change/services/pollution-prevention/planning-notice/list.html>

USE OF EXISTING P2 PLANS

Facilities have the option to use an existing P2 plan prepared for another purpose. The use of an existing P2 plan can reduce administrative burden since it would only need to be updated to meet the requirements of the P2 Notice. According to information submitted, 30% of facilities had previously prepared a P2 plan either voluntarily or prepared for another government requirement.

Figure 5 demonstrates that regardless of whether facilities had an existing P2 plan or not, the majority of facilities were able to achieve the risk management objective. The facilities that had an existing P2 plan performed slightly better.

Figure 5: Proportion of facilities with and without existing P2 plans and their success in achieving the risk management objective



ACTIONS TAKEN TO ACHIEVE THE OBJECTIVES

The majority of the objectives of the completed notices required the reduction of releases of the substance(s) to the environment (e.g. air or water). Certain objectives specified the activities, thresholds or methods to

prevent pollution such as the reduction in use or manufacturing of the substance, reduction in importation, use of best management practices (BMPs) or use of best available techniques economically available (BATEA).

Facilities identified and implemented activities, actions or methods in their P2 plan that contributed to meeting the objective(s). This section will examine the types of actions taken in P2 plans.

PRIORITY TO POLLUTION PREVENTION

Pollution prevention focuses on avoiding the creation of pollution rather than trying to manage it after it has been created. Pollution prevention is one of the most effective means of protecting the environment and/or human health by promoting sustainable development and eliminating waste that leads to costly remediation/removal. As a “factor to consider” in preparing their P2 plans, facilities were asked to give priority to pollution prevention methods. Across completed notices, all facilities implemented such methods. To a lesser extent, some facilities implemented a combination of both P2 methods and other environmental protection methods. The other methods are activities that control or manage the pollution at the end of the process, once it has already been created.

The primary P2 methods used to achieve the objectives are:

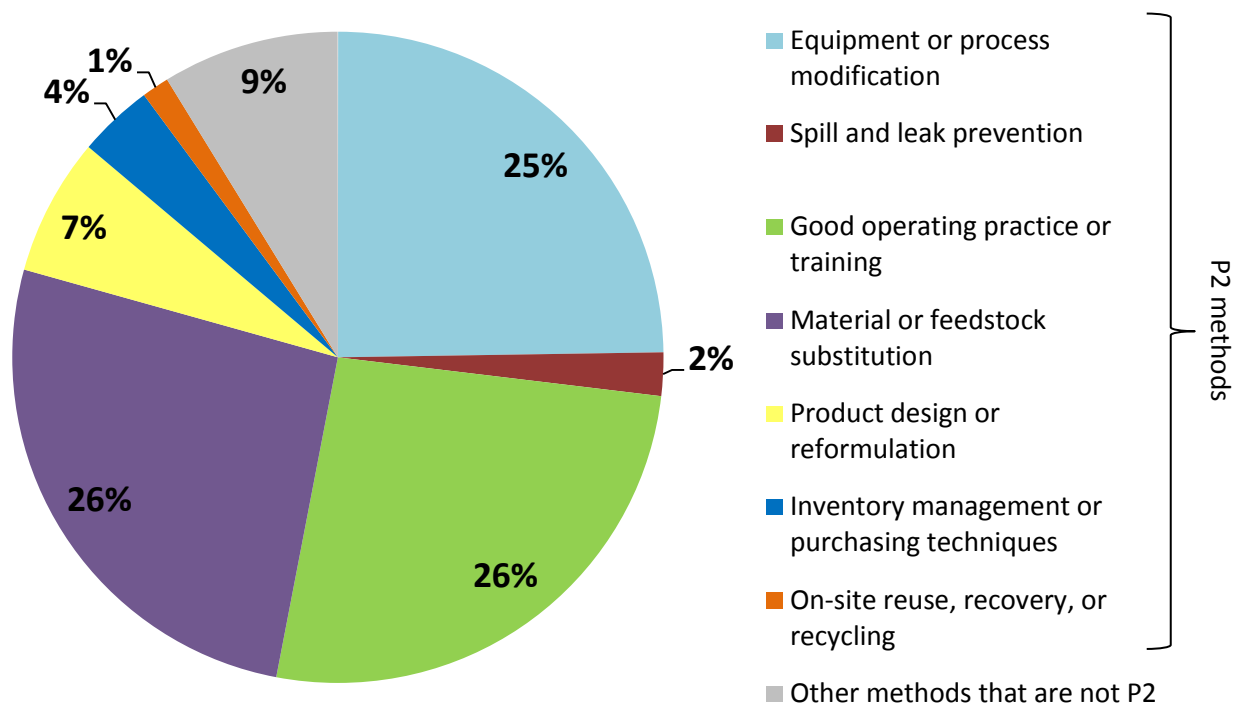
- Material or feedstock substitution (270 facilities), for example:
 - Replaced nonylphenol and its ethoxylates (NP/NPEs) in the manufacturing of products with alcohol ethoxylates
 - Discontinued use of polyester cationic dye
 - Replaced dichloromethane as a preliminary cleaner of distillation equipment
- Good operating practice or training (268 facilities), for example:
 - A preventive maintenance program was put in place for all equipment used in the processing of dichloromethane (DCM) to ensure that it is effectively removed from the air stream
 - Personnel underwent training in application of DCM which has aided in the reduction of DCM usage
 - Staff was trained on the best management practices to reduce the amount of amalgam waste generated in their office
- Equipment or process modification (254 facilities) for example:
 - Completed replacement of chlorine disinfection systems with Ultraviolet Disinfection Systems
 - Implemented measures to improve the operation of the monomer recovery section of the process to minimize the release of acrylonitrile from the rubber producing facility
 - Installed a new, more efficient Jet dye machine, which in turn reduced the quantity of chemicals put into the waste disposal

The other primary environmental protection methods used to achieve the objectives are:

- Pollution control methods (33 facilities), for example:
 - Installation of a new dechlorinating system using sodium bisulphite agent
 - Extension of stacks at an increased height
 - Installation of a carbon adsorption unit on storage tank vent (this action captured emissions from storage tank filling)
 - DCM vapours were condensed and removed from the air stream prior to releasing it to the atmosphere
- Other methods (17 facilities), for example:
 - Met with suppliers to confirm the composition of chemical products
 - Started a pilot project of biological treatment of effluents to reduce the Biological Oxygen Demand (BOD) and total solid content before release to the sewer
- Energy recovery (13 facilities), for example:
 - Installed a new, more efficient, Waste Water Heat Recovery System
 - Installed an International Organization for Standardization (ISO) certified amalgam separator

Refer to Figure 6 below for additional examples of P2 methods and other environmental protection methods used.

Figure 6: P2 and other environmental protection methods used to achieve the objectives



OBSERVATIONS AND LESSONS LEARNED

P2 Notices have been successful when persons subject adopted pollution prevention actions as shown in Figure 6 and implemented P2 plans that addressed the risk management objectives. In particular, the facility subject to the Acrylonitrile P2 Notice implemented a P2 plan that was able to significantly reduce the release and disposal of the substance through examining their processes and finding opportunities and actions that resulted in eliminating the pollution at the source. In the case of the NP/NPEs P2 Notice, a majority of facilities were able to eliminate NP/NPEs in their products.

As material or feedstock substitution is one of the most popular actions used by facilities to prevent pollution, the success of P2 Notices is dependent on the availability of a safer alternative chemical to replace the toxic substance. The success will also depend on the market and customer demands for the toxic substance or products containing the substance. For example, although the DCM P2 Notice was successful, certain sectors did not perform as well as others. Some facilities reported they had issues finding a suitable replacement for DCM in their products or did not substitute due to customer demands while others mentioned increases in sales.

All P2 Notices describe the persons who are required to prepare and implement a plan. Some Notices list persons subject by name while other notices describe the activities they are involved in. When the person's name is not specified in the notice, the government reaches out to stakeholders who are thought to be subject to make them aware of their obligations. This can be difficult for notices that capture non-industrial businesses that are not typically regulated by the federal government (i.e. Dental offices) or sectors with a large number of facilities. In the case of the Dental amalgam waste P2 Notice, an additional challenge was that the target community was defined as 'offices that had not yet implemented best management practices prior to the publication of the notice'. This information was difficult to obtain, thereby making compliance/non-compliance rates challenging to confirm given the large number of dental offices across Canada. Although, it was originally estimated that between 1000 and 2500 dental facilities would be subject to that P2 Notice, only 256 dental offices prepared a P2 plan.

Compliance with P2 Notices has also been less successful in situations when the notice targeted poor performers of another previous voluntary program or initiative. For example, certain wood preservation facilities were not performing under a Best Management Practice initiative⁴. When the Wood preservation P2 Notice came into force as a mandatory instrument targeting the non-performers, the persons subject took a long time to comply with the requirements of the P2 Notice.

Finally, it was noted that small or micro-sized facilities do not always have the expertise to implement complex and costly actions such as sampling effluents using standard protocols (i.e. textile mills). Therefore, the stakeholder barriers in implementing the "factors to consider" need to be taken into account when designing

⁴ These best management practices were published by the federal government in a guidance manual entitled: [Recommendations for the Design and Operation of Wood Preservation Facilities, 2004](#)

the P2 Notice.

CONCLUSION

The analysis of the 10 completed P2 Notices reveals that a majority of them have been successful in achieving their objective(s). Although the risk management objective of P2 Notices is not enforceable, facilities who implement P2 plans have been highly successful in achieving it. These results help contribute to the overall reduction of toxic substances in the environment. Ensuring facilities understand the goal of the notice, and monitoring of the results obtained throughout the implementation period can ensure the success of P2 Notices. Environment and Climate Change Canada (ECCC) continues to monitor the releases of the 21 toxic chemicals that were addressed by the 10 completed P2 Notices, notably via the National Pollutant Release Inventory, to determine if further risk management is warranted. As well, the P2 Notices that remain in progress continue to be monitored and measured for their effectiveness in individual performance reports which are published on the Government of Canada's website at the following address: <https://www.canada.ca/en/environment-climate-change/services/pollution-prevention/planning-notices/performance-results.html>. Lessons learned from existing P2 Notices will also help inform the design of future P2 Notices.

ANNEX 1

The following table lists the substances captured by the 10 completed P2 Notices and the corresponding health and/or environmental issue.

Substance(s)	P2 Notice(s)	Issue
Acrylonitrile	Acrylonitrile	Human health: potential carcinogen
Dichloromethane	Dichloromethane (DCM)	Environment: adverse effects on aquatic organisms Human health: potential carcinogen
Inorganic chloramines and Chlorinated wastewater effluents	Inorganic chloramines and chlorinated wastewater effluents (Chlorinated wastewater)	Environment: adverse effects on aquatic organisms
Nonylphenol and its ethoxylates	Nonylphenol and its ethoxylates (NP/NPEs) contained in products	Environment: adverse chronic effects on aquatic organisms
Textile Mill Effluents	Nonylphenol and its ethoxylates (NP/NPEs) used in wet processing + Textile Mills that use wet processing (TME)	Environment: adverse acute and chronic effects on aquatic organisms
- Inorganic arsenic compounds - Hexavalent chromium compounds - Polychlorinated dibenzodioxins - Polychlorinated dibenzofurans - Hexachlorobenzene	Wood preservation	Environment (substances have shown some or all of these characteristics): persistent, bioaccumulative, adverse effects on aquatic and terrestrial organisms Human health: carcinogen
Mercury	Mercury released from mercury switches in end-of-life vehicles (Mercury switch) + Dental Amalgam Waste	Environment: neurotoxic to organisms, bioaccumulative, persistent Human health: neurotoxic
Toluene Diisocyanates	Polyurethane and other foam sector – Toluene Diisocyanates (TDIs)	Human health: carcinogen
Bisphenol A	Bisphenol A (BPA)	Environment: toxic to aquatic organisms, adverse effects on growth/development of aquatic and terrestrial species Human health: potential reproductive and developmental toxicity

ANNEX 2

Following is a breakdown of the number of facilities that prepared and implemented a P2 plan as well as those who closed or did not submit a Declaration of Implementation for each P2 Notice.

P2 Notice	Number of facilities that prepared a P2 plan and submitted a Declaration of Preparation	Number of facilities that implemented a P2 plan and submitted a Declaration of Implementation	Number of facilities that closed	Number of facilities that did not submit a Declaration of Implementation
Acrylonitrile	1	1	0	0
Dichloromethane	37	33	2	2
Chlorinated wastewater	84	70	2	12
Nonylphenol and its ethoxylates (NP/NPEs) contained in products	75	66	4	5
Textile Mill Effluents	64	41	21	2
Wood preservation	4	3	1	0
Mercury switch	24	23	1	0
Dental Amalgam Waste	256	221	1	34
Polyurethane and other foam sector – Toluene diisocyanates (TDIs)	14	14	0	0
Bisphenol A	4	4	0	0
Total	563	476	32	55

ANNEX 3

The following table details the reductions achieved by six P2 Notices where the risk management objective was a reduction of uses, imports or releases.

P2 Notice	Type of reduction identified in the risk management objective	Baseline Quantity Released (kg)	Quantity released after implementation of P2 plan (kg)
Acrylonitrile	Releases	21 150	3 200
Dichloromethane	Releases	903 518	60 876
Nonylphenol and its ethoxylates (NP/NPEs) contained in Products	Uses Imports	2 950 000	113 000
Textile Mill Effluents	Uses	207 069	20
Polyurethane and other foam sector – Toluene diisocyanates (TDIs)	Releases	213	95
Bisphenol A	Uses Releases	114 405	1 016
Total		4 196 355	178 207
Total reductions			4 018 148