



Risk Management Strategy for Nonylphenol and its Ethoxylates Under CEPA (1999)

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Executive Summary

Issue and Background

Nonylphenol and its ethoxylates (NPEs) are high volume chemicals that have been used for more than 40 years in a variety of products such as detergents, emulsifiers, wetting agents and dispersing agents. It is estimated that annually 18,000 tons of NPEs are used in Canada, in many sectors such as:

- Cleaning products, degreasers, detergents for institutional and domestic use
- Textile processing
- Pest control products
- Pulp and paper processing

- Paints, resins and protective coatings
- Oil and gas recovery
- Steel manufacturing
- Power generation

On June 23rd, 2001 the Ministers of the Environment and of Health published their final decision on the assessment of NPEs in the Canada Gazette and notified the public that they recommended NPEs to be added to the List of Toxic Substances in Schedule 1 under the *Canadian Environmental Protection Act, 1999* (CEPA (1999)). Under subsection 91(1) of CEPA (1999), the Minister of the Environment must propose a regulation or instrument respecting preventive or control actions to manage NPEs no later than June 23rd, 2003. The instrument must then be finalized by December 23rd, 2004.

The final decision to declare NPEs toxic followed the publication of the draft *Priority Substances List Assessment Report for NPEs* in which it was concluded that NPEs were harmful to the environment. NPEs were not considered harmful to human health. The NPEs risk assessment revealed that environmentally harmful concentrations of NPEs could be found in municipal and industrial effluents that are untreated or followed only a primary treatment. These concentrations can exceed levels above which chronic effects are observed in aquatic organisms. The concentrations of NPEs found in effluents discharged by wastewater treatment plants using secondary or tertiary treatment are usually lower because NPEs biodegrade during treatment. However, some of the biodegradation by-products, such as lower ethoxylated products or nonylphenol itself, are more persistent and more toxic than the parent NPEs discharged to the treatment plant. NPEs have been reported to cause endocrine disruption in a variety of aquatic organisms. However, its significance is not currently well understood.

Recommended Risk Management Actions

Products containing NPEs: The risk management objective for products containing NPEs is to achieve a 50% reduction of NPEs by 2007 and a 95% reduction of NPEs by 2010 in soap and cleaning products, processing aids used in textile wet processing and pulp and paper processing aids. The 95% substitution of NPEs reflects the best available techniques economically achievable (BATEA) for these product categories. The main alternatives to NPEs, alcohol ethoxylates (AEs), have a more favourable environmental profile than NPEs. AEs are readily and ultimately biodegradable and their biodegradation intermediates are less toxic than the parent surfactant. In addition, neither AEs nor their biodegradation intermediates have been associated with the 'endocrine disruptor' issue. The risk management instrument proposed for products containing NPEs is pollution prevention planning under section 56 of CEPA (1999).

Pesticides: The Pesticide Management Regulatory Agency has begun an internal review and assessment process to investigate risk management options for NPEs in pesticides. NPEs in pesticides account for about 8% of NPE use in Canada.

Pulp and paper industry: In the past few years, the pulp and paper industry has voluntarily reduced the use of NPEs in their operations. To determine the extent of the reduction and understand the current use of NPEs by the pulp and paper industry, Environment Canada, in conjunction with the Forest Products Association of Canada, conducted a national survey at all the pulp and paper mills in Canada. According to the survey, a 99.8% reduction in the use of products containing NPEs is forecast by the end of 2003. The survey will also be used to determine if additional risk management action (other than what is proposed for products containing NPEs) is necessary.

Municipal wastewater effluents: NPEs found in wastewater effluents are associated primarily with the use and disposal of products containing NPEs and to a lesser extent, with the discharge of textile mill effluents to wastewater collection systems. Environment Canada is in the process of developing a broad risk management strategy that will include risk management actions needed to address, among other substances, NPEs in municipal wastewater effluents. Environment Canada intends to begin by addressing NPEs at the source, through the proposed risk management actions described above for products containing NPEs and for the textile industry.

The proposed risk management objectives and instruments for NPEs are in line with the current risk management activities in the European Union. So far the United States have established water quality criteria for NPEs and encourage reduction in NPEs use through voluntary programs.

Consultations Approach

Because the consultations on products containing NPEs and on the textile industry involve many parties that have a stake in both risk management strategies, it is proposed that consultations be held simultaneously in June 2002. Invited stakeholders include NPE-based product manufacturers, importers and their suppliers, the textile industry and its

suppliers, municipalities, provincial governments and non-governmental environmental organizations. Previous to the consultations, the risk management strategy for NPEs was presented to the CEPA National Advisory Committee (CEPA NAC) on April 30th, 2002 as per Environment Canada's commitment to this committee.

In the pulp and paper industry, if risk management actions are needed, stakeholders will be consulted to obtain their views on the approach.

For municipal wastewater effluents, consultations will be carried out on the overall strategy in the fall of 2002 and will include the proposal from Environment Canada to tackle NPEs at the source through risk management actions on products containing NPEs and in the textile industry.

List of Acronyms

AEs: alcohol ethoxylates

APEs: alkylphenol and its ethoxylates

BATEA: best available techniques economically achievable

CEPA (1999): Canadian Environmental Protection Act, 1999

CEPA NAC CEPA (1999): National Advisory Committee

CCME: Canadian Council of Ministers of the Environment

NP TEQ: toxic equivalency units for nonylphenol

NPEs: nonylphenol and its ethoxylates

NPRI: National Pollutant Release Inventory

OPEs: octylphenol and its ethoxylates

OSPARCOM: Oslo and Paris Commission

P2: pollution prevention

US EPA: United States Environmental Protection Agency

1. Issue

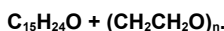
On June 23rd, 2001 the Ministers of the Environment and of Health published their final decision on the assessment of nonylphenol and its ethoxylates (NPEs) in the Canada Gazette and notified the public that they recommended NPEs to be added to the List of Toxic Substances in Schedule 1 under the Canadian Environmental Protection Act, 1999 (CEPA (1999)). The final decision to declare NPEs toxic followed the publication of the draft Priority Substances List Assessment Report for NPEs in which it was concluded that NPEs were harmful to the environment. NPEs were not considered harmful to human health.

Under subsection 91(1) of CEPA (1999), the Minister of the Environment must propose a regulation or instrument respecting preventive or control actions to manage NPEs no later than June 23rd, 2003. The instrument must then be finalized by December 23rd, 2004.

This risk management strategy outlines the risk management objectives, instruments and approaches proposed to reduce the environmental risks associated with NPEs. A stakeholder consultation approach is also proposed. The strategy covers four priority sectors for the management of NPEs: products containing NPEs, textile processing, municipal wastewater effluents, and pulp and paper processing.

2. Background

NPEs are a class of the broader group of compounds known as alkylphenol and its ethoxylates (APEs). NPEs have the following general formula:



NPEs are high volume chemicals that have been used for more than 40 years in a variety of products such as detergents, emulsifiers, wetting agents and dispersing agents. NPEs are used in many sectors such as:

- Cleaning products, degreasers, detergents for institutional and domestic use
- Textile processing
- Pest control products

- Pulp and paper processing
- Paints, resins and protective coatings
- Oil and gas recovery
- Steel manufacturing
- Power generation

The average amount of NPEs used was estimated at 18,000 tons¹ per year. An estimated 95% of NPEs released is from the use and disposal of products containing NPEs, 4% from the formulation and distribution of these products, and 1% from the production of NPEs.

Based on 1998 and 1999 averages, use of soap and cleaning products cause by far the biggest releases of NPEs, followed by the use of textile processing aids, agricultural products (pesticides), and pulp and paper processing aids.

The following table summarizes the estimated releases of NPEs due to each sector and products as percentages of the total estimated annual release of NPEs (values are rounded to the nearest percentage).

Based on 1998 and 1999 averages, use of soap and cleaning products cause by far the biggest releases of NPEs, followed by the use of textile processing aids, agricultural products (pesticides), and pulp and paper processing aids.

The following table summarizes the estimated releases of NPEs due to each sector and products as percentages of the total estimated annual release of NPEs (values are rounded to the nearest percentage).

Sectors and products	Percent of Total Release (%)
Soap and Cleaning Products	56
Textiles Production Products	18
Agricultural Products - Pesticides	8
Pulp and Paper Manufacturing Products	5
Other Products	4
Formulators and Distributors of Products	4
Plastic, Resins, Polymers Manufacturing Products	3
NP/NPEs Producers	1
Paints & Varnish	1
Toilet Preparations	<1
TOTAL	100

It is important to note that the above estimations of NPEs uses and releases are based on assumptions made using the information available at the time of the report.

3. Why We Need Action on NPEs

The NPEs risk assessment report ² recommended that NPEs should be declared toxic under Section 64(a) of CEPA (1999), which means NPEs are 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.

The NPEs risk assessment revealed that environmentally harmful concentrations of NPEs could be found in municipal and industrial effluents that are untreated or followed only a primary treatment. These concentrations can exceed levels above which chronic effects are observed in aquatic organisms. The concentrations of NPEs found in effluents discharged by wastewater treatment plants using secondary or tertiary treatment are usually lower because NPEs biodegrade during treatment. However, some of the biodegradation by-products, such as lower ethoxylated products or nonylphenol itself, are more persistent and more toxic than the parent NPEs discharged to the treatment plant.

NPEs have been reported to cause endocrine disruption in a variety of aquatic organisms. Studies have shown that NPEs can bind to the estrogen receptor and subsequently act as endocrine disruptors by interfering with normal endocrine system function. The NPEs risk assessment examined the available information on the issue and determined that estrogenic responses occur at concentrations similar to those at which chronic toxicity occurs. However, the relative importance and significance of these estrogenic responses in aquatic organisms to the individual or population are not currently well understood.

Although the NPEs risk assessment concluded that reducing human exposure to NPEs was not considered a priority for investigation, Health Canada has adopted an interim screening approach for the assessment of risks to human health because the effects of NPEs on human health have not been adequately investigated. Research is ongoing to permit a more meaningful assessment of human exposure to NPEs from various consumer products.

NPEs are considered a "Track 2" substance as defined in the "Toxic Substances Management Policy", hence requiring a life cycle management to prevent or minimize their releases into the environment.

2 Environment Canada and Health Canada, Nonylphenol and its Ethoxylates - Priority Substance List Assessment Report, April 2001

4. Exposure Sources

NPEs and their degradation products are not produced naturally but are the result of human activities. The major route for the release of NPEs to the Canadian environment is through industrial and municipal discharges (effluents and sludge). The NPEs concentrations can differ considerably among the various effluents, depending on the source and the degree and type of wastewater treatment. The NPEs risk assessment report, which used data collected in 1995 and 1996 for industrial uses and releases, identified municipal wastewater effluents and textile mill effluents as major sources of NPEs to the environment. The release of NPEs is widespread across Canada.

Pulp and paper mills were identified in the risk assessment report as important users of NPEs, but there appears to be a recent decrease in uses of NPEs from pulp and paper mills through voluntary action on their part.

NPEs can also be found in municipal and industrial wastewater sludges, because some NPEs biodegradation by-products, particularly nonylphenol, tend to adsorb to sludge particles. NPEs in sludge are known to biodegrade. However, the extent and rate of this biodegradation will be influenced by several factors such as the chemistry of the specific NPEs in the sludge, sludge treatment conditions, final sludge disposal routes and whether conditions are anaerobic or aerobic.

When effluents containing NPEs are discharged to the receiving environment, NPEs degradation by-products are generally sorbed to sediments. According to the assessment report, the concentrations of nonylphenol (the most toxic of the NPEs) in Canadian sediments are generally low with the exception of industrial harbours and sites near the outfalls of municipal wastewater treatment plants.

The NPEs assessment report did not identify any data regarding concentrations of NPEs in Canadian air. However, detectable concentrations of nonylphenol in air have been reported in American studies. Based on limited information, NPEs are not expected to readily volatilize into air and are expected to degrade rapidly in the atmosphere.

5. Key Issues and Considerations

5.1 Variable Effectiveness of Wastewater Treatment on NPEs Releases

As previously mentioned, the level of wastewater treatment (primary, secondary or tertiary) greatly influences the concentrations of NPEs released to the environment. Untreated and primary-treated effluents may contain concentrations of NPEs above levels of concern for aquatic toxicity. However, effluents from well designed and well operated secondary and tertiary treatment plants are expected to have lower concentrations of NPEs.

Nevertheless, not all secondary or tertiary treatment plants are equally as effective at treating industrial wastewater. For example, wastewater treatment plants are effective at treating domestic wastewater, but are not designed to reduce or eliminate certain substances found in non-domestic discharges such as industrial effluents. The section on municipal wastewater effluent of Environment Canada's *State of the Environment Report*³ and the study entitled *Toxic Potential Assessment of Municipal Wastewater Treatment Plant Effluents in Quebec*⁴ under the St-Lawrence Vision 2000 program

stated that the quality of effluent from treatment plants providing the same level of treatment may vary considerably, depending on a variety of factors, including the plant's design, the skill of its operators, fluctuations in the flow level and the season of the year.

Finally, for sewer systems combining storm water and sanitary wastewater (including non-domestic wastewater), the discharge of untreated effluent through overflows is frequent at times of heavy rains. *The State of Municipal Wastewater Effluents in Canada* report also identified combined sewer overflows as an important source of pollution in the Canadian environment ⁵.

5.2 Existing Canadian Legislation, Regulations and Guidelines

There are no federal regulations which directly govern the use or release of NPEs. However, subsection 36(3) of the *Fisheries Act*, prohibits any deposit of a deleterious substance (that is harmful to fish, fish habitat or the use by man of fish) into waters frequented by fish. Subsection 36(3) applies to industrial and municipal wastewater effluents.

The draft *Canadian Water Quality Guidelines* from the Task Group of the Canadian Council of Ministers of the Environment (CCME) has established guidelines for NPEs. For the protection of aquatic life, the draft Canadian guidelines recommend an ambient concentration of 1.0 µg/L in freshwater and 0.7 µg/L for marine waters, as expressed in toxic equivalency units for nonylphenol (NP TEQ) ⁶.

Together with expanded reporting for NPEs there will be expanded data collected through the National Pollutant Release Inventory (NPRI) for wastewater treatment facilities. NPRI reporting requirements typically depend on the number of employees at the facility. Due to the unique nature of wastewater treatment facilities, NPRI reporting starting in 2002 will require reporting for any wastewater treatment facility that discharges effluents with a flow greater than 10,000 m³ per day.

The Pest Management Regulatory Agency of Health Canada is committed to establishing a risk management plan for NPEs used in pesticides that would be managed under the *Pest Control Products Act*. They have begun an internal review and assessment process to investigate the best possible means of achieving the plan. They are contributing to the risk management process for NPEs through the Safe Environments Directorate of Health Canada.

Similar to the federal level, there are no provincial regulations specifically addressing the release of NPEs, apart from general prohibitions similar to the ones included in the *Fisheries Act*. However, the provinces of Quebec and Ontario have adopted water quality guidelines for NPEs based on the draft Canadian guidelines ⁷. The Quebec guidelines are more permissive than the draft Canadian guidelines while the Ontario guideline, which is limited to nonylphenol, is 0.4 µg/L.

The City of Toronto recently enacted a revised sewer use by-law that includes discharge limits for all non-domestic users of the sewer system. The discharge limit for NPEs for sanitary, combined and storm sewers is 10 µg/L and the discharge limit for nonylphenol is 1 µg/L ⁸. To comply with these limits, it almost implies eliminating the use of NPEs. The City of Toronto by-law also requires specific industrial, commercial and institutional sectors such as health care facilities and textile mills to prepare and implement a pollution prevention plan. In the case of textile mill sector, the pollution prevention plan includes NPEs. The City of Kingston also recently revised their sewer use by-law and to include the same NPEs and nonylphenol discharge limits ⁹ as the City of Toronto. Other Ontario municipalities are contemplating similar revisions to their sewer use by-laws. For example, the City of North Bay recently concluded consultations on proposed revisions to their sewer use by-law which includes discharge limits for NPEs and nonylphenol ¹⁰.

5.3 American and European Legislation

The United States Environmental Protection Agency (US EPA) is presently considering national water quality criteria for nonylphenol (the water quality criteria are for the receiving environment like the draft Canadian guidelines). The criteria proposed for freshwater are a four-day average concentration of 5.9 µg/L of nonylphenol, not exceeded more than once every three years; and, a one-hour average concentration of 27.9 µg/L for nonylphenol, not exceeded more than once every three years. Respective criteria for marine discharges are 1.4 µg/L and 6.7 µg/L. Voluntary efforts through the US EPA Design for the Environment program are currently underway with formulators of detergents to eliminate NPEs from product formulations.

European efforts to restrict or phase out the use of NPEs have been driven in large part by the Oslo and Paris Commission (OSPARCOM), the marine convention for the protection of the northeast Atlantic. Concerns with endocrine disruption strongly motivated action in Europe. Virtually all domestic uses of NPEs-based cleaning products have been phased out by nine Member States of the European Union (Belgium, Denmark, Finland, Germany, the Netherlands, Norway, Sweden, Spain and the UK) either through voluntary initiatives or regulations. In Germany and the UK, the producers of textile and leather auxiliaries and the wool industry, along with other industrial sectors, have committed themselves to voluntarily phasing out the use of NPEs.

In November 2001, the European Union published a Commission Recommendation on the results of the risk evaluation and the risk reduction strategies for NPEs¹¹. This document recommends that more research be conducted on the effects of NPEs on human health. It also recommends that marketing and use restrictions be considered at the Union level. The textile and pulp and paper industries, as well as soap and cleaning products are among the key sectors to be considered.

5.4 NPEs Substitutes

The NPEs risk assessment report cautions against the possible replacement or substitution of NPEs with other alkylphenols and their ethoxylates (APEs) such as octylphenol and its ethoxylates (OPEs) which have similar chemical properties. Unfortunately, OPEs also have similar toxicological properties and greater estrogenic properties, such that a simple replacement of NPEs by other APEs, such as OPEs, might not reduce the risk to the environment.

When choosing NPEs substitutes, special care must be taken to ensure that environmental risks are reduced. A study examining NPEs alternatives¹² conducted for Environment Canada revealed that the main substitute for NPEs, alcohol ethoxylates (AEs), have more favorable environmental profiles than NPEs¹³. AEs are readily and ultimately biodegradable and their biodegradation intermediates are less toxic than the parent compound. In addition, neither AEs nor their breakdown products have been associated with the 'endocrine disrupter' issue. Despite these characteristics, effluents containing AEs that are discharged to wastewater treatment collection systems still require treatment prior to release to the environment. The alternative AEs-based products are generally as effective as NPEs-based products, but they may be more expensive depending on the product category. In Europe, where many countries are phasing out NPEs, AEs have been the main alternatives used. An important effort in research and development has been taking place in Europe to develop alternative products. Canada can build on these efforts.

Regarding the availability of AEs as replacements for NPEs, one of the main concerns raised is that the world's supply of AEs has been limited in recent years. Recent expansions in AEs supply that will be completed in 2002 are expected to alleviate the current tight supply of detergent grade alcohols. Hence, the availability of detergent grade alcohols should not be a constraint to increased use of AEs as replacements for NPEs.

3 Environment Canada, The State of Municipal Wastewater Effluents in Canada (State of the Environment Report), 2001, p. 16.

4 Ministère de l'Environnement du Québec and Environment Canada, Toxic Potential Assessment of Municipal Wastewater Treatment Plant Effluents in Quebec - Final Report, 2001, section 4.4.

5 Environment Canada, The State of Municipal Wastewater Effluents in Canada (State of the Environment Report), 2001, p. 10-12.

6 Environment Canada. Canadian Environmental Quality Guidelines for nonylphenol and its ethoxylates (water, sediment and soil). Scientific Supporting Document. 7 National Guidelines and Standards Office, Environmental Quality Branch, Environment Canada. Ottawa. 2001. Unpublished draft.

Environment Canada, Use of Canadian Water Quality Guidelines in the Risk Management of Nonylphenol Ethoxylates, National Guidelines and Standards Office, Environmental Quality Branch.

8 City of Toronto Municipal Code, Part II General By-laws No. 457-2000, Article I, Sewers 681-2 Sanitary and Combined Sewer Requirements.

9 City of Kingston By-law No. 2000-263, Consolidated sewer use by-law for sanitary, combined and storm sewers: October 10, 2000. Section 2, Table 1 - Limits for sanitary and combined sewers discharge and Section 3, Table 2 - Limits for storm sewer discharge. (http://www.city.kingston.on.ca/pdf/bylaws/bl_2000-263.pdf).

10 City of North Bay proposed sewer use by-law, December 2001.

(<http://www.city.north-bay.on.ca/vch/>)

11 Official Journal of the European Communities, Commission Recommendations of 7 November 2001 (notified under document number C(2001) 3380).

12 ToxEcology Environmental Consulting Ltd. Alternatives to Nonylphenol Ethoxylates: Review of Toxicity, Biodegradation, & Technical-Economic Aspects. Final Report March 14th, 2002 Prepared for Environment Canada. 77 p.

13 The study mentioned of other alternative surfactants, some for specific applications. Examples of other alternatives are glucose-based surfactants or blends of alternative non ionic surfactants.

6. Proposed Risk Management Action

The following section describes risk management actions proposed or in development to reduce the environmental risks associated with the use and release of NPEs.

All risk management actions have the same environmental objective, or long term goal, which is to achieve ambient concentrations in Canadian waters that do not exceed the draft *Canadian Water Quality Guidelines* of 1.0 µg/L NP TEQ

for freshwater and 0.7 µg/L NP TEQ for marine waters, such that no adverse effects are likely to occur in the resident aquatic biota.

As mentioned in Section 5.4, there are available alternatives to NPEs that have a preferable environmental profile and that would reduce the environmental risks associated with NPEs. Many countries of the European Union have been favouring these alternatives.

Substitution of NPEs is in line with the Federal Government's *Pollution Prevention Strategy*¹⁴ and CEPA (1999) which state that pollution prevention is the priority approach to environmental protection. In addition, in accordance with the Toxic Substances Management Policy, Environment Canada intends to use the life cycle management concept to prevent or minimize the release of NPEs into the environment¹⁵. NPEs primarily enter the Canadian environment through the discharge of industrial and municipal wastewater effluents, therefore the overall risk management strategy for NPEs will focus on reducing NPEs in these effluents. The use and disposal of soap and cleaning products, textile processing aids, and pulp and paper processing aids cause NPEs to be present in these effluents, therefore, the overall risk management strategy focuses on these main areas.

6.1 Products Containing NPEs

6.1.1 Risk Management Objective

The risk management objective is to achieve a 95% reduction of NPEs in the formulation of soap and cleaning products, processing aids used in textile wet processing and pulp and paper processing aids for use in Canada. The 95% reduction target reflects the best available techniques economically achievable (BATEA) in order to reduce the environmental risks associated with these products that contain NPEs. This translates into product reformulation; either substitution of NPEs with an alternative showing a better toxicity profile or, in cases where better alternatives are not available, using only the minimum quantity of NPEs necessary to achieve the desired result. The three products addressed by the risk management objective covers the most significant product categories representing approximately 80% of the total NPEs use in Canada.

The risk management objective for products containing NPEs was revised to reflect comments received during consultations. Specifically, In order to provide some flexibility to companies that may have difficulty reformulating all of their products, Environment Canada reduced the proposed Phase 2 reduction target from 100% to 95%. The revised risk management objective is as follows:

	Persons subject to the Notice on the date of publication in the <i>Canada Gazette</i>	Persons subject to the Notice after the date of publication in the <i>Canada Gazette</i>
Phase 1	A 50% reduction from 1998 levels, of the total mass of NPEs used or imported annually by 2007.	A 50% reduction from base year levels, of the total mass of NPEs used or imported annually by the year after the year in which the person became subject to the Notice.
Phase 2	A 95% reduction from 1998 levels, of the total mass of NPEs used or imported annually by 2010	A 95% reduction from base year levels, of the total mass of NPEs used or imported annually by 2 years after the year in which the person became subject to the Notice

6.1.2 Proposed Risk Management Instrument

A qualitative assessment of relevant risk management instruments was performed to identify the most promising instruments. This study recommended a number of single instruments and combinations of instruments that could effectively manage the risks posed by NPEs in products. Based on this study and other background information that has been obtained, the following risk management actions are proposed. They are divided into four stages, to be implemented over a number of years.

Stage 1 - Pollution Prevention Planning: Pollution prevention (P2) plans would be required from producers and importers of products containing NPEs that a) exceed an annual threshold of 2,000 kg of total NPEs used, accumulated based on NPEs concentrations in products and the annual amount of products produced or imported; and b) manufacture or import products specifically for use in the soap and cleaning, textile, and pulp and paper industries. The 2,000 kg threshold was determined during consultations such that the majority of products containing NPEs would be subject to the requirements of the P2 plans while excluding companies using or importing small quantities of NPEs.

Other less significant product categories are not included in the requirement as the three sectors targeted account for

almost 80% of the estimated total of NPEs releases. It should be noted that use of pesticides causes an additional 8% of the estimated total of NPEs releases and it is expected that the Pest Management Regulatory Agency will manage these releases. As well, according to available data, substitution of NPEs is feasible both from a technical and cost perspective in most products used in the three targeted sectors. It is expected that if the risk management objective is achieved for products in these sectors, the environmental objective should be met at most sites.

A P2 plan notice will be prepared according to Environment Canada Guidelines¹⁶ and will reference, under the “Factors to Consider” section, a reduction plan including targets and timelines as mentioned in the risk management objective described above. Compliance promotion will be key to the success of the P2 planning requirements. A compliance promotion plan and an enforcement strategy will be drafted. P2 plans are beneficial because they encourage industry to be pro-active and allow for both government and industry flexibility.

Stage 2 - Monitoring: A monitoring plan will be used to estimate the amount of NPEs being released into the environment. The data collected will be used to determine the effectiveness of the P2 plans in reducing environmental releases of NPEs. Several monitoring schemes are considered, such as:

- The National Pollutant Release Inventory (NPRI),
- Reports submitted as part of P2 planning requirements,
- Monitoring at municipal wastewater treatment plants, and
- Monitoring of various surface waters.

Stage 3 - Evaluation: This will include using the monitoring program to measure the effectiveness of the risk management strategy. In doing this, both the risk management and the environmental objectives should be revisited and it should be determined whether they have been met, or, if it is likely that they will be met in a reasonable amount of time.

Stage 4 - Subsequent Action: If, in the evaluation phase, it is determined that the environmental and risk management objectives have been met or are being adequately approached, there will be no need for subsequent action. However, if it is determined that the objectives are not being met and are not likely to be met, other options for action can be taken, such as expanding the sectors subject to the P2 plans or regulating.

6.2 Textile Industry

The risk management objective and instrument described below are part of the broader Textile Industry Risk Management Strategy which includes textile mill effluents and NPEs.

6.2.1 Risk Management Objective

Similar to the risk management objective for products containing NPEs, the objective for NPEs used and released in the textile industry is the reduction of NPEs use to levels that reflect the best available techniques economically achievable (BATEA) in order to reduce environmental risks associated with NPEs. According to a study of the BATEA in the textile industry conducted for Environment Canada, 97% substitution could be achieved in the near future at modest cost to the industry (\$6,500 for a medium-sized mill). This is also confirmed by the success of phasing out NPEs in European textile industries. Timelines to achieve the risk management objective will be in line with the timelines proposed for products containing NPEs in the textile industry.

6.2.2 Proposed Risk Management Instrument

As part of the development of the Textile Industry Risk Management Strategy, a qualitative assessment of relevant risk management instruments was conducted using a screening tool developed by Environment Canada. The objective of the qualitative assessment was to identify the most promising risk management instruments to meet the proposed risk management objectives for textile mill effluents and NPEs. The assessment criteria included effectiveness of the instrument, impacts on governments, impacts on the private sector and public acceptability. Both CEPA (1999) and non-CEPA (1999) risk management instruments were assessed.

Regulations, pollution prevention planning, technology transfer and reporting were identified as the most promising instruments for the management of NPEs in the textile industry. A cost-benefit analysis was conducted to examine two combinations of instruments with regulations and P2 planning as their core instruments.

The P2 planning combination, which includes technology transfer and reporting as part of the broader textile industry strategy, was chosen because it:

- Provides flexibility,
- Allows for early action, and
- Minimizes potential incompatibilities with existing or future provincial or municipal regulations.

The P2 planning requirement for textile mills is complementary to the risk management instrument for products containing NPEs, as NPEs in textile mill effluents may not be captured by the import threshold included in the P2 planning for products containing NPEs. The effectiveness of the P2 planning will be assessed with the monitoring activities proposed for products containing NPEs. If P2 planning is determined not to have met the risk management or environmental objectives, subsequent action will be needed. The options include regulation of the use or release of NPEs in the textile industry.

6.3 Municipal Wastewater Effluents

NPEs that are found in wastewater effluents (treated and untreated) and wastewater treatment plant sludges are associated primarily with the use and disposal of products containing NPEs (soaps, detergents, emulsifiers and wetting agents) and to a lesser extent, with the discharge of textile mill effluents to wastewater collection systems. In parallel with their final decision on the assessment of NPEs, the Ministers of the Environment and of Health published a decision on June 23rd, 2001 for other substances found in wastewater effluents (ammonia, inorganic chloramines and textile mills effluents) in the *Canada Gazette* and similarly to NPEs, notified the public that they recommended to add these substances to the List of Toxic Substances in schedule 1 under CEPA (1999).

In view of this, Environment Canada is developing an overall strategy for municipal wastewater which will describe immediate and future actions proposed for these substances and for chlorinated wastewater effluents. It will also explain how these actions are integrated with the approach for broader municipal wastewater issues. On one hand, a first preventive or control instrument is proposed to address inorganic chloramines, ammonia and chlorinated wastewater effluents. On the other hand, Environment Canada proposes to start addressing NPEs and textile mills effluents at the source, through the proposed risk management actions described above for products containing NPEs and for the textile industry (in Sections 6.1 and 6.2 respectively). The implementation results of these risk management actions will be monitored and if necessary, further actions will be taken under the overall strategy for municipal wastewater.

6.4 Pulp and Paper Industry

The NPEs risk assessment report stated that the pulp and paper industry had reduced its use of NPEs-based products, but there was very little data available at the time of the assessment to indicate to what extent. Around 1998, while NPEs were being assessed, a number of pulp and paper mills took voluntary measures to replace NPEs-based products for substitutes that do not contain NPEs.

Since 1999, companies using, producing, or manufacturing more than 10 tons/year of NPEs, have been required to report certain NPEs compounds to the NPRI. In 1999, ten mills reported to the NPRI as having NPEs releases to the environment, and eight reported in 2000. Between 1999 and 2000, there has been a 50% reduction of reported NPEs releases from pulp and paper mills. Furthermore, four out of the eight mills that reported in 2000, indicated that they had already reduced their use of NPEs-based products during that year, or were planning such action. Based on those comments, we can expect a further 40 % reduction in 2001 compared to the 2000 releases.

To determine the extent of the reduction and understand the current use of NPEs by the pulp and paper industry, Environment Canada, in conjunction with the Forest Products Association of Canada, conducted a national survey at all the pulp and paper mills in Canada. According to the survey, a 99.8% reduction in the use of products containing NPEs is forecast by the end of 2003. The survey will also be used to determine if additional risk management action (other than what is proposed for products containing NPEs) is necessary. If risk management actions are needed, stakeholders will be consulted to obtain their views on the proposed approach.

14 Environment Canada, Pollution Prevention - A Federal Strategy for Action, 2000

15 Environment Canada, Toxic Substances Management Policy, June 1995

16 Environment Canada, Guidelines for the Impelementation of the Pollution Prevention Planning Provisions to Part 4 of the *Canadian Environmental Protection Act, 1999* (CEPA (1999)), 2001

7. Proposed Consultation Approach

7.1 Products Containing NPEs and the Textile Industry

Because the consultations on products containing NPEs and on the textile industry involve many parties that have a stake in both risk management strategies, consultations will be held simultaneously in June 2002.

However, before the multi-stakeholder consultations are held, the risk management strategy for NPEs was presented on April 29th, 2002 to the CEPA National Advisory Committee (CEPA NAC), composed of members from the federal, provincial and recognized aboriginal governments, as per Environment Canada's commitment to this committee. CEPA NAC members were invited to designate a representative to participate in the multi-stakeholder consultations.

Invited stakeholders include, but are not limited to, NPEs-based product manufacturers, importers and their suppliers, the textile industry and its suppliers, other users, municipalities with textile mills on their territory, associations, provincial governments and non-governmental environmental organizations.

The consultations will include, for information purposes, presentations on the risk assessment results, the risk management process, pollution prevention planning and NPEs alternatives. Environment Canada will then seek advice and comments on the proposed risk management objectives and risk management instruments.

7.2 Municipal Wastewater Effluents

Consultations will be carried out on the overall strategy on municipal wastewater effluents and will include the proposal of Environment Canada to tackle NPEs at the source through risk management actions on products containing NPEs and in the textile industry.

Already, CEPA NAC has been consulted on Environment Canada's early thinking for municipal wastewater effluents. Ongoing consultations will continue.

Consultation sessions on municipal wastewater effluents are planned across Canada for August and November 2002. The invited stakeholders include but are not limited to: provincial, territorial and municipal government representatives, municipal government associations, national, provincial and local water and wastewater associations, industrial, commercial and institutional sectors that discharge wastewater to municipal sewer systems, business associations and environmental non-governmental organizations. An associated consultation process is being planned for interested stakeholders related to wastewater collection and treatment systems located on federal and aboriginal lands.

7.3 Pulp and Paper Industry

The results of the 2001 NPEs use survey will be used to determine if additional risk management action (other than what is proposed for products containing NPEs) is necessary. If risk management actions are needed, stakeholders will be consulted to obtain their views on the proposed approach.