

Comments  
of the  
Alkylphenols & Ethoxylates Research Council  
on the  
Proposed Order Adding Toxic Substances to Schedule 1  
to the Canadian Environmental Protection Act, 1999  
in the  
*Canada Gazette*, Part I, June 23, 2001

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## GENERAL COMMENTS

The Alkylphenols & Ethoxylates (APE) Research Council submits these comments on the June 23, 2001 Notice in the *Canada Gazette*, Part I, pursuant to subsection 332(1) to the Canadian Environmental Protection Act (CEPA), 1999, that the Governor in Council, pursuant to subsection 90(1) of that Act, propose an *Order Adding Toxic Substances to Schedule 1 to the Canadian Environmental Protection Act, 1999*. In the Notice, the Ministers of Environment and Health recommend the addition of ammonia, nonylphenol (NP) and nonylphenol ethoxylates (NPE), Textile Mill Effluents (TMEs) and inorganic chloramines to the list of toxic substances under Schedule I of the Priority Substances List compiled pursuant to the CEPA.

The APE Research Council is an association of North American producers, processors and users of alkylphenols and alkylphenol ethoxylates, including NP and NPE.<sup>1</sup> The APE Research Council, and its member companies, has conducted extensive research on the fate, effects and exposure of NP and NPE in addition to working with various levels of government on issues related to these compounds. APE Research Council members and its customers have facilities throughout Canada and therefore have a significant interest in this proceeding.

The individual assessment reports for the proposed toxic substances in the June 23 Notice concluded that “ammonia, NP/NPE, inorganic chloramines and TMEs enter 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.” An important shared source of emissions for all four substances is municipal wastewater treatment plants. Thus, one of the components of the overall risk management strategy should be an improved, holistic approach to wastewater treatment. Infrastructure Canada, in cooperation with the Federation of Canadian Municipalities, is developing standards of best practices for municipal wastewater management. These advances are expected to reduce emissions of NP/NPE, ammonia, inorganic chloramines, TMEs, as well as other chemical and biological wastes to the aquatic environment. The APE Research Council

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<sup>1</sup> Members of the APERC include: Dover Chemical Corporation; GE Plastics; Huntsman Corporation; Mitsubishi Chemical Corporation; Rhodia Inc.; Rohm and Haas Company; Schenectady International, Inc.; Stepan Canada; Sunoco, Inc.; and, The Dow Chemical Company.

urges Environment Canada to emphasize adequate wastewater treatment in its consideration of risk management options for the listed compounds, including NP and NPE. Other pollution prevention strategies such as good environmental management practices and recycling should also be encouraged.

## NP/NPE SPECIFIC COMMENTS

These comments supplement extensive comments filed by the APE Research Council on the draft Priority Substance List (PSL) Assessment Report for Nonylphenol and its Ethoxylates on May 30, 2000. Those comments included extensive technical discussion regarding our concerns with the draft Assessment Report. The APE Research Council's comments on the draft Assessment Report can be obtained from its web site, <http://www.aperc.org/docs/psl2comments53000.pdf>.

While the APE Research Council still holds many of the same concerns noted in our comments on the draft Assessment Report for NP and NPE, we will not add any remarks on that subject in these comments; nor will we use these comments to object to the Proposed Order. Rather, our current comments will focus on the risk management process and recommendations associated with the Order adding NP and NPE to Schedule 1 of the CEPA, 1999.

- 1. The risk management process should focus on those geographic areas where environmental levels of NP, NPE or their degradation products exceed acceptable levels. In areas where environmental levels are below acceptable levels, risk management should be directed at ensuring that acceptable levels are maintained.**

The Assessment Report for NP and NPE presented a reasonably comprehensive and generally accurate summary of the extensive environmental effects, fate and exposure databases on these compounds. It is important to note that the Assessment Report conclusion, which was reiterated in the June 23, 2001 Notice in the *Canada Gazette* Part I, states, "the major route for the release of NP and NPEs to the Canadian environment is through discharge of effluents." Furthermore, the Assessment concludes "in a limited number of instances, NP and NPE concentrations in partially treated or untreated effluents from textile mills, pulp and paper mills and municipal wastewater treatment plants (MWWTPs) may exceed the acceptable chronic effect level calculated by Environment Canada."

Numerous studies have shown that NPE undergoes rapid biodegradation in wastewater treatment and continues to degrade in the environment.<sup>2</sup> Studies of the degradation of

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<sup>2</sup> Maguire, R.J. 1999. Review of the persistence of nonylphenol and nonylphenol ethoxylates in aquatic environments. *Water Qual Res J Canada* 34: 37-78; Staples, C.A., J.B. Williams, R.L. Blessing, and P.T. Varineau. 1999. Measuring the biodegradability of nonylphenol ether carboxylates, octylphenol ether carboxylates, and nonylphenol. *Chemosphere* 38: 2029-2039; Staples, C.A., C.G. Naylor, J.B. Williams, and W.E. Gledhill. 2001. Ultimate biodegradation of alkylphenol ethoxylate surfactants and their biodegradation intermediates. *Environ Toxicol Chem* 20 (11): in press.

NPE in MWWTPs, of NP and NPE in receiving waters, and of NP in sludges, show high rates of NPE degradation during treatment. In addition, low ppb or non-detectable levels of NP and NPE are found downstream of MWWTPs, and studies<sup>3</sup> have shown that these compounds continue to degrade in soils and the aquatic environment.

Indeed, Environment Canada recognized in the Assessment Report, that NPEs are treated adequately in well-functioning wastewater treatment plants. The fact that only a limited number of sites, with inadequate or inefficient wastewater treatment, were found to have effluent levels of NP and NPE that may exceed the chronic effect level, is evidence that most NP and NPE is handled responsibly. The Assessment Report further documents that residual amounts of these compounds entering the Canadian environment, following adequate wastewater treatment, do not exceed acceptable levels and that any residuals that enter the environment continue to biodegrade to innocuous compounds. Therefore, in most situations, existing handling practices and wastewater treatment are adequate to ensure good emission control and acceptable levels of NP, NPE and their degradation products in the environment.

Where treatment is not present or is inadequate, levels of NP and low mole NPE in wastewater and receiving streams near wastewater outfalls may exceed effect levels for sensitive aquatic species. In our view, the remedy to such situations is not the elimination of NPEs but rather upgrading the wastewater treatment facility. Experience shows that in instances where there is inadequate treatment, the effluent from wastewater treatment facilities contains numerous substances that may present toxicity to the environment and merely eliminating the NP/NPE will not solve the toxicity problems. As discussed further below, the potential substitutes for NPE will also be toxic to the aquatic environment unless they are managed in an effective treatment system. For this reason, the APE Research Council believes that significant effort should be devoted to enhancing the wastewater treatment facilities rather than promoting product substitution.

**2. The goal of the CEPA process should be to ensure acceptable levels of NP/NPE in the environment. Environment Canada should work with all levels of government to promote good wastewater treatment and responsible environmental management practices as the preferred methods, among a hierarchy of risk management instruments, for achieving this environmental goal.**

Environment Canada has drafted Environmental Quality Guidelines for determining safe levels of NP and NPE in the environment. The Assessment Report on NP/NPE finds that discharges of these compounds at levels of environmental concern are primarily associated with a limited number of sites within certain industries with untreated or partially treated wastewater. This finding is consistent with other risk assessments in

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<sup>3</sup> Hughes, *et al*; Bennie and Webber paper at SETAC 2000; Soap and Detergent Association monograph "Alkylphenol Ethoxylate," SDA, New York, 1999; Bennie, D.T. 1999. Review of the environmental occurrence of alkylphenols and alkylphenol ethoxylates. *Water Qual Res J Canada* 34: 79-122.

North America.<sup>4</sup> In areas where environmental levels of NP/NPE do not exceed acceptable levels, additional risk management measures – including reduction in use – are not necessary.

Risk management efforts for NP and NPE should be focused on those areas where environmental concentrations exceed levels of concern. No risk management option should be precluded to address the limited numbers of sites with untreated or partially treated wastewater within the industries of concern. Indeed, the Assessment Report for TMEs, which Environment Canada has indicated are likely to contain NP/NPE as well as numerous other chemicals, did not exhibit toxicity when treated with secondary treatment methods. Improved wastewater treatment will not only reduce effluent concentrations of NP and NPE, but also that of other effluent constituents as well. Product substitution should be considered only if treatment and other environmental management options are infeasible or inadequate.

**3. Environment Canada should not promote a reduction in the use of NP/NPE as is suggested in the Assessment Report and in the *Canada Gazette* Notice before considering all available options.**

The June 23 Notice states “Risk management of NP/NPEs should lead to a **reduction in the use** and release of these compounds in the processing of textiles and pulp and paper, thereby reducing environmental exposure.” This language suggests “reduction in use” has already been determined to be the single most appropriate risk management tool. The APE Research Council cautions against recommending specific risk management options prior to undertaking a full and complete consideration of the different options as part of the risk management process. The risk management process requires that a range of management options be analyzed and considered as possible preventative or control actions from the substance.

The Risk Management process should:

- Establish goals (*i.e.*, safe environmental levels) based on Environment Canada’s Environmental Quality Guidelines;
- Consider all risk management instruments;
- Promote the use of a risk management hierarchy;
- Promote product substitution as a last resort in the risk management hierarchy;
- Consider socioeconomic and technical feasibility of risk management instruments in cooperation with affected stakeholders; and,
- Allow industry and other stakeholders to control emissions using the risk management instrument or instruments that are most appropriate for their business or operation.

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<sup>4</sup> US EPA. 1996. RM-1 Document and Meeting Summary for Nonylphenol. Prepared by D. Rodier, CSRAD, US Environmental Protection Agency.

**4. Substitution, as a default option, does not solve problems in environmental management practice or inadequate treatment and can result in unnecessary economic burden and greater environmental harm.**

As already noted, the goal of the CEPA risk management process should be to achieve safe environmental levels of listed compounds, including NP and NPE, and not necessarily a reduction in their use. A mandate to achieve safe environmental levels permits a range of treatment, use and other risk management options to attain this goal. It does not limit the risk management tools that may be considered. Environment Canada should consider product substitution only if other risk management options are inadequate to achieve safe environmental levels. Due to its risks and limitations, substitution is generally considered to be the lowest priority risk management tool. Thus, Environment Canada should give careful consideration, in consultation with affected stakeholders, to the implications of recommending a reduction in product use.

In particular, Environment Canada should consider that “reduction in use” mandates could result in greater environmental toxicity when product substitution is promoted without an environmental impact analysis. All surfactants exhibit aquatic toxicity when discharged without adequate wastewater treatment. Furthermore, the inferior technical performance of alternate surfactants can result in higher use levels and/or the use of additional performance additives. This can cause higher bioloadings of unevaluated chemicals, which may result greater toxicity in the environment.

Reduction in use mandates can also cause economic impact without correcting treatment problems. Product substitution is not generally a simple “drop in” endeavor. Product reformulation and process redesign requires product development investments and product requalifications – sometimes at several steps beyond the original reformulation. The use of some alternate surfactants can significantly increase product cost and in some cases may require capital investments to facilitate their handling. The use of substitute surfactants also may require the use of additional additives to ensure technical efficacy, further adding to product cost. These issues should be fully considered before recommending product substitution.

**5. The APE Research Council has developed a voluntary NPE Environmental Management Program to promote the responsible use, treatment and disposal of NP/NPE-based products. We encourage Environment Canada to include such voluntary risk management instruments among those developed for NP and NPE.**

APE Research Council member companies share Environment Canada’s goal of achieving safe levels of NP and NPE in the environment and have committed to promote the responsible environmental management of these products through a voluntary NPE Environmental Management Program. The NPE Environmental Management Program was developed by the APE Research Council to support the continued responsible use and disposal of NP and NPE, thereby achieving acceptable levels of these compounds in the environment. Through its Environmental Management Program, the APE Research

Council is developing pollution prevention and environmental management guidelines for the handling of NP and NPE. The APE Research Council also offers environmental monitoring guidance. Guidelines and best practices are being developed in cooperation with affected industry stakeholders. Elements of the NPE Environmental Management Program include:

- Analytical method development;
- Environmental and site monitoring;
- Environmental management guideline development; and,
- Cooperatively developed industry-specific best practices.

The APE Research Council has already briefed Environment Canada on its NPE Environmental Management Program and welcomes the opportunity of working with the appropriate Environment Canada staff so that this program can be included as one of the acceptable risk management instruments to address NP and NPE.