

REGION OF OTTAWA-CARLETON  
RÉGION D'OTTAWA-CARLETON

REPORT  
RAPPORT

Our File/N/Réf.                    **50 00-00-0182-T/AA & 50 05-2000-0795-HS**  
Your File/V/Réf.

DATE                                19 April 2000

TO/DEST.                         Co-ordinator  
   Planning and Environment Committee

FROM/EXP.                        Director, Water Environment Protection Division

SUBJECT/OBJET                 ***CANADIAN ENVIRONMENTAL PROTECTION ACT***  
   **NATIONAL POLLUTANT RELEASE INVENTORY**  
   **PRIORITY SUBSTANCES LIST**  
   **LIST OF TOXIC SUBSTANCES**

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**DEPARTMENTAL RECOMMENDATION**

**That the Planning and Environment Committee recommend that Council approve:**

- 1. that staff continue to explore opportunities to proactively and cost-effectively monitor and identify impacts of changes resulting from the *Canadian Environmental Protection Act (CEPA)* and its regulations as they are developed and implemented by the Federal Government;**
- 2. the forwarding of this report to the "New City" for consideration in making decisions regarding service delivery.**

**PURPOSE**

The purpose of this report is to inform members of Council of the potential for impact on regional service delivery associated with the coming into law of the *Canadian Environmental Protection Act (CEPA)*. The fundamental basis of the revised legislation is preventing pollution at source through developing and implementing appropriate actions to reduce or eliminate substances that are deemed hazardous to health and the environment.

## BACKGROUND

On 31 March 2000, the *Canadian Environmental Protection Act, 1999* came into force. This Act repeals and replaces the former *Canadian Environmental Protection Act* which has been in force since June 1988.

Both the new and former laws provide for a number of lists to be maintained by the Federal Government. Three of these lists have or may have an impact upon the Region. They are:

1. National Pollutant Release Inventory (section 48),
2. Priority Substances List (section 76), and
3. List of Toxic Substances (section 90).

The following is a brief summary of the purposes of each of these lists.

### National Pollutant Release Inventory

The National Pollutant Release Inventory (NPRI) serves as the foundation document for the information-gathering process that is engaged upon by the Federal Ministry of the Environment. The Minister of the Environment is required by the *Act* to establish a national inventory of releases of pollutants. In order to be able to collect information, the Minister is entitled to publish a list of substances in the *Canada Gazette* for which the information requested must be provided to the Ministry. Failure to provide the requested information in the format identified by the Minister in the notice in the *Canada Gazette* is an offence.

In accordance with the list of substances contained in the NPRI and based on the quantities discharged that are subject to reporting, the Region has in the past reported on the following substances:

- ◇ Sulphuric Acid
- ◇ Chlorine
- ◇ Ammonia
- ◇ Manganese
- ◇ Zinc
- ◇ Nitrate ions in solution

### Priority Substances List

During the period 01 January 1984 to 31 December 1986, the Federal Minister of the Environment was required to prepare a list of all substances that:

- (a) were manufactured in or imported into Canada by any person in a quantity of not less than 100 kg. in any year, or
- (b) were used in Canadian commerce or used for commercial manufacturing purposes in Canada.

This list is known as the Domestic Substances List. By 14 September 2006, the Federal Ministers of the Environment and of Health are to categorize all of the substances on this list, of which there are estimated to be 23,000, with the object of determining those substances which:

- (i) may present to those in Canada the greatest potential for exposure, or
- (ii) are persistent or bioaccumulative and inherently toxic to human beings or to non-human organisms.

From the Domestic Substances List, the Ministers of Environment and of Health have compiled the Priority Substances List. This list is to specify those substances which the Ministers are satisfied that priority should be given to in assessing whether they are toxic or capable of becoming toxic. Should the Ministers be satisfied that the substance meets either of criteria (i) or (ii) above, then the Ministers may recommend that the substance be added to the List of Toxic Substances. The Ministers must recommend that the substance be added to the List of Toxic Substances if:

- (a) the substance may have a long-term harmful effect on the environment and is
  - (i) persistent and bioaccumulative, and
  - (ii) inherently toxic to human beings or non-human organisms; and
- (b) the presence of the substance in the environment results primarily from human activity.

Several substances associated with service delivery at the Region are on the Priority Substances List. Examples include chloramines, aluminium salts, road salts, ammonia in the aquatic environment and N-Nitrosodimethylamine (NDMA). Staff understand that a review of several of these substances to determine whether they should be added to the List of Toxic Substances has already taken place and is due to be complete by spring/summer 2000. Following the release of the draft assessment reports for each of these substances, there will be a 60-day period during which comments of a scientific nature may be submitted; and once those comments have been considered, final recommendations will be made as to whether the substances should be added to the List of Toxic Substances.

#### List Of Toxic Substances

Once a substance has been added to the List of Toxic Substances, the *Canadian Environmental Protection Act, 1999 (CEPA)* grants to the Federal Cabinet broad regulation-making authority. Such powers include the authority to ban the use of the substance entirely or, where the substance is not banned, to regulate every aspect of its use. Before any regulation is enacted with respect to a substance contained within the List of Toxic Substances, the Ministers of the Environment and of Health are required to grant to the National Advisory Committee the opportunity to advise them. This Committee is to be composed of 18 members, being:

- (i) one representative for each of the Ministers of the Environment and of Health;
- (ii) one representative for each of the provincial governments;
- (iii) six representatives for the aboriginal peoples of Canada.

In addition, the new *CEPA* includes provisions for management of toxic substances that could require Pollution Prevention Plans and/or Environmental Emergency Plans to be in place for toxic substances.

Not covered in the legislation but of great concern to municipalities is the question of a possible increase in civil liability should a substance used by municipalities be added to the List of Toxic Substances. It is possible that if a compound were added to the list, those using such compound would be held to the standard of proof enunciated in the case of Rylands v. Fletcher. This would mean that rather than the onus of proof being on the person who asserts that they suffered damage by the Region's use of the compound in question, the onus of proof would fall on the Region to show that the Region had not been negligent nor had it intentionally permitted the discharge of the substance.

## OPERATIONAL CONSIDERATIONS

As previously indicated, several NPRI and Priority Substance List substances are substances with an association to municipal service delivery.

In some cases these substances are directly utilized by a municipality or are a direct by-product associated with the use of another product in the delivery of service. These substances include road salt, aluminium salt and chloramines. Where alternatives do exist, however, it is important that in making product/process decisions, the costs, benefits and impacts or risks associated with each product are considered. The final decision must be based on risk management analysis to identify options which provide the greatest level of health and environmental protection at acceptable cost. In the meantime, the Region must be able to demonstrate that it exercises appropriate diligence in the use of these products.

Other substances in municipal services are by-products of the service provided. In particular, NDMA and ammonia in the water environment would fall into this category.

The following sections will provide a brief description of how substances currently included in either the NPRI or the Priority Substance List are used or associated with municipal service delivery.

### Drinking Water

The NPRI and the Priority Substance List refer to chlorine, aluminium salts and sulphuric acid, all of which are used at the Region's water purification plants. A discussion on the water purification process, and these specific substances, is provided to familiarize you with the issues.

Water drawn from the environment is never pure. There will always be some chemical or microbial presence in the water which may require treatment to remove or reduce it. Microbial hazards arise from all living creatures whose bodily wastes end up, naturally or by intent, in water bodies. Disinfectants are required to meet public health objectives established by federal and provincial public health and environmental agencies. Drinking water is disinfected to minimize the incidence of waterborne disease. Health officials are unanimous in their assertion that the effectiveness of water disinfection not be compromised, even in the face of danger from disinfection by-products. Regulators are calling for greater effectiveness in disinfection or in the physical removal of organisms to deal with the threat from protozoans. The primary methods of disinfection in use today employ chlorine in one form or another

(chlorine gas, chlorine dioxide, sodium hypochlorite and chloramines). Ozone and UV radiation are potential alternative disinfectants and are gaining prominence. Membrane filtration is a non-chemical treatment technology, but its use is still not common and it remains economical only for smaller communities.

Some flexibility exists for the disinfection methods used in the multiple stages of drinking water treatment. However, no matter what method is used to initially disinfect the water, it has been found that chlorine, added directly or in the form of chloramines, must be used to ensure that water in the distribution system remains disinfected and safe to drink.

In Ottawa-Carleton, there is a two-step disinfection process prior to the distribution of the drinking water to our customers. The pre-disinfection process includes the addition of chlorine to the source water (Ottawa River) prior to the full treatment processes (coagulation, flocculation, sedimentation and filtration). The post-disinfection process includes the addition of chloramines as the drinking water leaves the water purification plants. The post-disinfection process is required to maintain the water quality in the water distribution system.

Staff are currently looking at process changes to delay or eliminate the pre-disinfection process step. This would only be proposed to Council if it can be shown that there would be an improvement to the overall water quality. Regardless of this possible pre-disinfection change, the post-disinfection addition of chloramines must continue. There are currently NO alternatives to the addition of chlorine or chloramines for the post-disinfection treatment process.

Aluminium salts (aluminium sulphate) are used in the treatment process to help coagulate and flocculate the natural organic matter, bacteria, parasites, etc., in the river water, thereby allowing the particles to become of sufficient mass to allow them to settle in the settling tanks, or to become captured on the filter beds. Alternates to Aluminium salts are currently being researched for process improvement options (not because of *CEPA* requirements).

Sulphuric Acid is also used in the water treatment process to reduce the pH of the incoming river water to provide the most efficient treatment process. The nature of the Ottawa River requires that the water be at a pH of 5.9 to 6.1 for best organic removal.

It should be noted that although these substances are on the NPRI or the Priority Substances List, their use allows the Region to supply our water customers with drinking water of the highest quality which is better than all federal and provincial health standards.

### Wastewater

Regulators routinely require the disinfection of wastewater effluents to minimize the incidence of waterborne disease through exposure to microbial hazards found in the effluent. The primary issue associated with chlorinated effluent is that free and combined chlorine in the effluents can be toxic in aquatic ecosystems, causing acute lethality in fish and changes in community structure (e.g., reductions in diversity, shifts in species composition). The impact of discharges to water bodies is affected by factors

such as the nature of the mixing zone and how quickly chlorine residuals may be dissipated through dilution or reaction with organic materials in the receiving water body. In 1997, the Ministry of Environment granted approval to disinfect effluent seasonally from the Robert O. Pickard Environmental Centre (ROPEC) from 16 May to 15 November rather than continuously year round, thus reducing the chlorine residual entering the Ottawa River. Alternative disinfection methods such as those listed for water treatment in addition to the use of wetlands or ponds and de-chlorination technologies are available for wastewater authorities. De-chlorination is the physical or chemical removal of the traces of residual chlorine remaining after the disinfection process and may involve the use of other chemicals such as sulfur dioxide. Authorities in some provinces require the de-chlorination of effluents or the use of alternative methods of disinfection based on the receiving stream characteristics.

Ammonia is not used or generated at ROPEC but is present in the plant influent. Discharge of ammonia to the Ottawa River is not restricted under the present wastewater treatment plant Certificate of Approval. Ammonia is discharged to the Ottawa River as a constituent of the wastewater treatment plant effluent. Various methods of ammonia removal exist but the most commonly employed method for wastewater treatment is a biological process. Staff have completed a high-level evaluation of options for nitrogen (ammonia) removal and have concluded that nitrogen removal is possible at ROPEC with a capital investment of \$1-1.5 million and an incremental operating expense of \$450,000 annually. Staff are presently reviewing other operational enhancements which have potential for both long-term economic benefits and nutrient removal, including nitrogen.

NDMA has been identified by the American Water and Wastewater Association (AWWA) as a substance potentially present in wastewater. The draft Assessment Report for NDMA is now available for a 60-day public comment period; the public comment period having begun on 19 February 2000 and scheduled to end on 19 April 2000. The draft Assessment Report recommends inclusion of NDMA in the List of Toxic Substances. This compound has not been quantified in the wastewater characterization study; however, staff are presently arranging to quantify the presence of NDMA in the treatment plant influent, effluent and biosolids. Monitoring of the biosolids for NDMA concentrations will be considered in the Biosolids Management Plan.

Other parameters that were subject to NPRI reporting in the past, including manganese, zinc and nitrate ions in solution, are not part of the wastewater treatment process but are found in enough concentration in the raw sewage to the treatment plant to warrant reporting. Discharge limits for some of these substances are specified in the Sewer Use By-law.

Given that overall environmental and public health impact is closely linked to the receiving water characteristics, staff are completing environmental effects monitoring (EEM) of the wastewater effluent on the Ottawa River. This analysis will provide a comprehensive understanding of the toxicity of the effluent as well as its impact on the receiving water and the lifeforms within that water. Additional testing and analysis will be conducted in 2000, at which point recommendations will be finalized. Preliminary results of the EEM testing and analysis does not suggest immediate actions are required associated with ammonia discharges to the Ottawa River. Based on interim results related to the chlorinated effluent, staff will identify a scope of work for a project to review the use of alternatives to chlorine in the treatment process at ROPEC.

## Road Maintenance

The Region has made de-icing its primary means of combating the effects of winter on the public rights of way. The process of de-icing involves the application of chemicals whose performance characteristics are sensitive to both temperature and concentration. The application of road salt is the primary chemical in use by the Region in its efforts to maintain a road system which is free of ice. The application of road salt has been proven time and time again to save lives through minimizing the number of accidents associated with winter driving conditions. In recognition of the close link between the effectiveness of the de-icing chemical and the temperature and concentration on the pavement surface, the Region has been developing a system of planned deployment which relies on real-time temperature and concentration information to effectively deploy de-icing application equipment. This system has and will continue to ensure cost-effective winter maintenance services which achieve control objectives. Road Weather Information Systems (RWIS) is the technology in place in the field to support this decision-making system. RWIS are micro weather stations which relay real-time information to a central control through the use of pavement sensors. Deeper pavement sensors enable temperature trends to be produced which provide the operator with insight into the need for different chemicals, concentrations, times of application, etc. Existing chloride concentrations are provided through surface sensors and as a result provide the operator with advice as to need for additional de-icer application. Onboard controllers in each piece of equipment ensure that these chemicals are deployed at the rates necessary to achieve optimum de-icing performance. Through this approach, significant reductions in road salt use per event have been achieved for this community.

## CONSULTATION

The issue of toxicity analysis for substances appearing on the Priority Substances List, including chloramine, ammonia, aluminium salt, NDMA and road salt, is of interest to all communities in Canada. As a result, many agencies of which the Region is a member have been active in preparing and presenting information on behalf of their memberships. These presentations have focused on the use of these substances and the impacts of deeming these substances toxic with subsequent restrictions on their use. Such agencies include the Transportation Association of Canada (TAC), Canadian Water and Wastewater Association (CWWA), Ontario Good Roads Association (OGRA) and Canadian Public Works Association (CPWA). A representative listing of documents is attached for your reference as Appendix A.

Staff, as representatives of the Board of Directors of the CWWA, participated in the presentation to Parliament on the *CEPA*. CWWA requested at that time that municipal representatives be included on the National Advisory Committee for Toxic Substances, but the request was turned down.

Staff will continue to work with these agencies and others as appropriate to ensure that the municipal voice is presented on issues directly affecting service delivery in this community.

### FINANCIAL IMPLICATIONS

Several substances currently used or associated with the delivery of municipal services have been identified for toxicity assessment by the Federal Government. The listing of a substance as a toxic substance will lead to a higher duty of care for municipal governments in the use of these substances. This would undoubtedly result in increased costs. In some cases, alternatives which are more costly will be necessitated as a result of virtual elimination targets established by the Federal Government. In other cases onerous reporting and monitoring to demonstrate responsible use of these products could result in additional direct operating costs.

### GOVERNANCE

The "New City" will be required to comply with the *CEPA* in delivering its services. It is recommended that the Environmental Code as adopted by Regional Council be forwarded to the New City for consideration in setting up the organization and its programs. Meeting or exceeding legislated requirements is stated as a basic principle of the Code. It is, therefore, recommended that this report also be forwarded to the New City for consideration.

### CONCLUSION

Staff support decision-making relating to service delivery that balances the social, economic, environmental and public health impacts of those decisions. This approach is consistent with the community Vision and Official Plan for Ottawa-Carleton. Council's continued support of the initiatives referred to above will ensure responsible use of substances in service delivery and will ensure that this corporation is well placed to adapt to changes which may be required as a result of the *CEPA* toxicity assessment results for these substances.

Proactive monitoring of new and emerging environmental and health legislation is key to enabling sound decision-making with respect to any upcoming changes. To date, staff have relied on various agencies as well as our own Legal Department to provide a monitoring service and co-ordination of comments during review periods. Legal staff do not have all the operational knowledge required to provide full service in this area. Relying on agencies to understand and provide advice on operational impacts without a firm commitment respecting service delivery could result in issues not being proactively identified. Staff recommend adopting a proactive approach to monitoring and identifying impacts resulting from changes in legislation in the area of environment and health protection. Given that all municipalities will be facing similar impacts in this area, staff have made preliminary contact with such



agencies as the Federation of Canadian Municipalities (FCM) and the Association of Municipalities of Ontario (AMO) to explore their willingness to enhance membership services in this area.

In conclusion, the use of chloramine and salt have and will continue to save lives in Ottawa-Carleton. Staff will continue with the initiatives mentioned above while monitoring and researching the use of alternative products and processes to increase the available tools in support of cost-effective service that protects both public health and the environment.

*Approved by M. Trudeau on behalf of  
Nancy Schepers, P. Eng.*

NBS/AP/TM/lS

Attach: (1)

## APPENDIX A

### Reference Material

10 Jan. 2000. Review of CEPA Priority Substances List Assessment Report - Ammonia in the Aquatic Environment, 3rd Draft (8 December 1999).

23 Dec. 1999. "Letter to the Federal Ministers of Health and of Environment on the Assessment of CEPA Priority Substances - Chloramines."

15 Dec. 1999. "Communiqué to Members - Proposed Changes to the NPRI."

9 Dec. 1999. "Comments of the Canadian Water and Wastewater Association on the Third Report of the National Pollutant Release Inventory Ad Hoc Working Group on Substances" (hexachlorobenzenes, dioxins and furans, mercury and employee thresholds).

10 Nov. 1999. A Brief to the Standing Committee on Environment and Sustainable Development, Parliament of Canada, on the Study of Pesticides (use of chlorine in water and wastewater disinfection).

1 Sept. 1999. Brief to the Senate Committee on Energy, Environment and Natural Resources on Certain Provisions of CEPA, 1999.

29 Dec. 1998. "Letter to Federal Minister of Environment: Chlorinated Municipal Effluents - Addition to the List of Toxic Substances."

19 Aug. 1998. Bill C-32 the Canadian Environmental Protection Act, 1998 - Provisions of the Bill and Analysis.

26 May 1998. Order Adding Toxic Substances to Schedule I of the Canadian Environmental Protection Act - Notice of Objection to Addition of Chlorinated Wastewater Effluents.

Road Salt Guide, Transportation Association of Canada.