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Proposed Regulatory Framework for Wastewater

Consultation Document

October 2007

Disclaimer

In case of discrepancy between this document and any Acts of Parliament or regulations made thereunder, most notably the *Fisheries Act* and the *Canadian Environmental Protection Act, 1999*, the Acts or regulations take precedence.

Executive Summary

Wastewater in sewer systems is a mixture of liquid wastes, solids, debris and chemical pollutants discharged from residential, institutional, commercial and industrial sources. Environmental and health impacts of effluents from wastewater systems are clearly established in the scientific literature. The management of wastewater, and in particular wastewater effluents, has been a topic of discussion for many federal-provincial-territorial fora for a number of years. Interested parties have consistently indicated the need for all levels of government to develop a harmonized approach.

Over the last four years, Environment Canada has been working with provincial and territorial governments to develop a Canada-wide Strategy for wastewater effluents under the auspices of the Canadian Council of Ministers of the Environment (CCME). Over this same time period, Environment Canada has been providing general information to stakeholders and interested parties on its intention to develop regulations under the *Fisheries Act*. Environment Canada's objective in working with other jurisdictions is to establish a collectively agreed-to risk management approach within a harmonized regulatory framework.

Consultation activities are underway by federal, provincial and territorial governments on the CCME *Canada-wide Strategy for the Management of Municipal Wastewater Effluent*, Draft, September 2007¹. It is expected that the CCME Strategy's approach would be implemented through actions by all levels of governments. Provincial and territorial governments are expected to amend applicable policies and legislation.

This document outlines Environment Canada's proposed regulatory framework for wastewater as it relates to implementing the CCME Strategy. The proposed regulatory framework reflects core elements of the CCME Strategy and includes wastewater effluent regulations and other risk management actions. Specifically, Environment Canada is proposing to:

- A. Develop wastewater effluent regulations and administrative mechanisms under the authority of the *Fisheries Act*,
- B. Develop additional risk management actions for wastewater systems under federal government operations, or on federal land or on aboriginal land;² and,
- C. Develop risk management actions for sources of pollutants in wastewater.

Environment Canada will consider all of the feedback received from interested parties to finalize negotiations with provincial and territorial governments on the CCME Strategy and to finalize elements of its proposed regulatory framework for wastewater. Further opportunity for comment by interested parties would occur starting in December 2008 when proposed wastewater effluent regulations under the *Fisheries Act* are expected to be published in *Canada Gazette*, Part I.

¹ Canadian Council of Ministers of the Environment, *Canada-wide Strategy for the Management of Municipal Wastewater Effluent*, Draft, September 2007 (http://www.ccme.ca/ourwork/water.html?category_id=81)

² Specific definitions for federal government operations, federal land or aboriginal land can be obtained by referring to the *Canadian Environmental Protection Act, 1999* (<http://laws.justice.gc.ca/en/C-15.31/text.html>).

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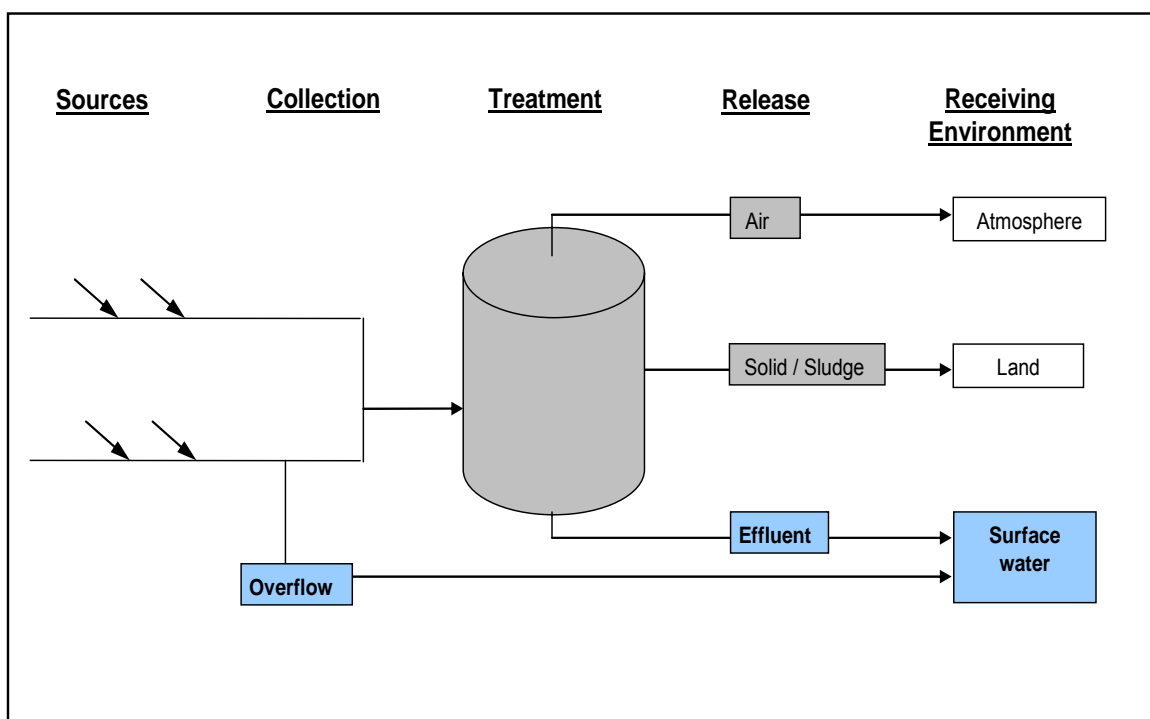
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1. Setting the Context

Wastewater

Wastewater in sewer systems is a mixture of liquid wastes, solids, debris and chemical pollutants discharged from residential, institutional, commercial and industrial sources. The effluents from wastewater systems released to water typically include discharges from treatment systems and collection systems, sanitary sewer overflows and combined sewer overflows. The term “stormwater” usually refers to effluent discharged from a separate storm sewer collection system that is designed to carry rainfall and surface runoff to the nearest water course.

The majority of wastewater systems in Canada are owned and operated by municipalities³. It is also recognized that some wastewater systems are owned and operated by provinces, territories, federal departments, agencies and other entities. Public-private management arrangements also exist in Canada and they usually involve private sector operation and public sector ownership of wastewater systems. The following schematic representation⁴ illustrates the sequence of activities involved in the collection, treatment and release of wastewater.



Schematic representation of a wastewater collection and treatment system

³ The term “municipal wastewater effluents” is often used in reference to effluents from wastewater (sewage) systems since the majority of them in Canada are owned and operated by municipalities. For the purpose of this document the term “wastewater effluents” is used.

⁴ Canadian Council of Ministers of the Environment, *Options for a Canada-wide Strategy for the Management of Municipal Wastewater Effluent – Consultation Document*, adaptation, p. ii, October 2006 (http://www.ccme.ca/ourwork/water.html?category_id=81)

Issue

Environmental and health impacts of wastewater effluents are clearly established in the scientific literature, including the review by Chambers et al.⁵ The review suggests that actions need to be taken to address the direct harmful impact of wastewater effluent on the environment. The harmful impacts include negative effects on fish and wildlife populations, oxygen depletion, beach closures and other restrictions on recreational water use, restrictions on fish and shellfish harvesting and consumption, and restrictions on drinking water consumption. Emerging science indicates that other substances such as some pharmaceutical and personal care products, which primarily enter the environment in wastewater effluents, may also be posing threats to human health, aquatic life and wildlife. Also, on January 1, 2003, the Ministers of the Environment and Health published in the *Canada Gazette*, Part II⁶ the addition of Ammonia dissolved in water, Inorganic chloramines, Effluents from textile mills that use wet processing and Nonylphenol and its ethoxylates to the List of Toxic Substances, Schedule 1, under the *Canadian Environmental Protection Act, 1999*. On March 4, 1999, Chlorinated wastewater effluents was added to Schedule 1⁷ based on a previous risk assessment.

The management of wastewater involves all jurisdictions in Canada. Due to this shared jurisdiction, the existing regulatory structures need to be harmonized and in many cases updated. Effluents from wastewater systems in Canada must comply with all applicable federal legislation including the *Canadian Environmental Protection Act, 1999* and the *Fisheries Act*, as well as applicable provincial, territorial or water board legislation, permits or licenses. The Minister of the Environment has the responsibility for the administration and the enforcement of the pollution prevention provisions of the *Fisheries Act*. Subsection 36(3) of the pollution prevention provisions prohibits anyone from depositing or permitting the deposit of a deleterious substance of any type in water frequented by fish, or in any place under any conditions where the deleterious substance, or any other deleterious substance that results from the deposit of the deleterious substance, may enter any such water. The *Fisheries Act* allows for the establishment of federal regulations that would permit the discharge of deleterious substances to levels set out in the regulations.

The management of wastewater, and, in particular wastewater effluents, has been a topic of discussion for many federal-provincial-territorial fora for a number of years. Interested parties have consistently indicated for many years the need for all levels of government to work cooperatively to develop a harmonized approach. Working with other jurisdictions is a key element of Environment Canada's risk management strategy for wastewater.

⁵ Chambers, P.A. et al., *Impacts of Municipal Wastewater Effluents on Canadian Waters: a Review*. Water Quality Resources Journal of Canada, 1997, v32, No. 4, pp. 659-713.

⁶ Government of Canada, *Canada Gazette*, Part II, Vol. 137, No. 1, January 1, 2003 (<http://canadagazette.gc.ca/partII/2003/20030101/html/sor10-e.html>)

⁷ Government of Canada, *Canada Gazette*, Part II, Vol. 133, No. 6, pp. 688-689, March 4, 1999 (http://canada.gc.ca/gazette/hompar2-1999_e.html)

Environment Canada's Risk Management Strategy for Wastewater

Environment Canada's risk management strategy for wastewater effluents was presented to stakeholders during consultation sessions held in the fall 2002. Stakeholder feedback indicated strong support for a comprehensive management approach which included implementing preventive or control actions for pollutants and contaminants in wastewater and federal-provincial-territorial agreements on the management of wastewater effluents.

Environment Canada proposed a **long-term strategy for wastewater effluents** in 2003.⁸ The following Environment Canada principles for the long-term strategy were outlined:

- The vision is to ensure that the release of wastewater effluents does not pose unacceptable risks to ecosystem health, human health and fisheries resources. To achieve this vision, activities to deliver the following outcomes will be pursued:
 - Implementation of preventative and control actions for toxic substances and other pollutants from industrial, commercial and institutional sources, including government operations, that discharge those substances to wastewater collection systems and wastewater treatment systems;
 - Water conservation measures supported by water metering;
 - Wastewater treatment systems equivalent in performance to secondary treatment⁹ with additional treatment where required;
 - A sustainable approach to financing wastewater collection systems and wastewater treatment systems that will ensure ongoing operation, maintenance and upgrading;
 - Working with other levels of governments, and stakeholders as appropriate, to develop objectives for specific "CEPA-toxic" and deleterious substances released from wastewater systems; and
 - Reference to these objectives in future instruments¹⁰ and a regulation under the *Fisheries Act* with the desired outcome of a fair, consistent and predictable application of *Canadian Environmental Protection Act, 1999* and the *Fisheries Act*.

The *Canadian Environmental Protection Act, 1999* provides the regulatory framework for the implementation of the federal government's **Toxic Substances Management Policy**. The policy describes the approach to deal with "CEPA-toxic" substances that includes an open and transparent process with many opportunities for public input. The goal is to manage risk throughout the life cycle of a substance, except for persistent, bioaccumulative, and toxic substances that are present in the environment primarily due to human activity.

⁸ Government of Canada, *Canada Gazette*, Part I, Vol. 137, No. 23, p.1644, June 7, 2003. (<http://canadagazette.gc.ca/partI/2003/20030607/pdf/g1-13723.pdf>)

⁹ Secondary wastewater treatment typically includes physical and biological processes which remove about 85% of conventional pollutants. Secondary treatment also reduces other pollutants such as phosphorus and emerging pollutants in wastewater effluents such as pharmaceuticals, personal care products and surfactants.

¹⁰ Instruments can include a number of different preventive or control actions such as regulations and other risk management tools. (http://www.ec.gc.ca/CEPARRegistry/gene_info/fact_02.cfm).

On December 4, 2004,¹¹ the Minister of the Environment required **pollution prevention planning** in accordance with subsection 91(1) of the *Canadian Environmental Protection Act, 1999*. These pollution prevention planning and implementation instruments were designed to manage the risks associated with specific pollutants identified as “toxic” under the Act (**Nonylphenol and its ethoxylates, Effluents from textile mills that use wet processing, Inorganic chloramines and Chlorinated wastewater effluents**). Under the authority of subsection 54(1) of the *Canadian Environmental Protection Act, 1999* the Minister also published a **guideline** to begin managing the risks posed by **ammonia dissolved in water**.

Wastewater system reporting requirements to the Minister of Environment for substances in the **National Pollutant Release Inventory (NPRI)** began in 2002 under subsection 46(1) of the *Canadian Environmental Protection Act, 1999*. Wastewater systems that meet certain criteria must report releases of designated substances. Generally wastewater systems subject to NPRI reporting are those that discharge treated or untreated effluent to surface waters with an annual average flow rate of 10, 000 cubic metres (m³) or more per day. Designated substances reported for wastewater effluents and wastewater solids include cadmium, chromium, lead, manganese, mercury, zinc, nitrate, ammonia and phosphorus. Particulate matter and volatile organic compounds (VOCs) are the designated substances often reported related to air emissions from wastewater systems.

The federal government has the responsibility for managing wastewater systems on federal and on aboriginal land and under the authority of federal departments, boards, agencies, federal works and undertakings and Crown Corporations.¹² Environment Canada is committed to the development of appropriate instruments that address management issues for these wastewater systems. Currently the **Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments** (EPS 1-EC-76-1, 1976) apply to all effluents discharged from land-based federal establishments. The Guidelines state that “Generally, secondary treatment or equivalent should be the minimum acceptable treatment” and includes wastewater effluent guidelines for specified pollutants. The Guidelines also cover issues related to the management of wastewater such as pre-treatment and discharge to a municipally-owned collection system, operation and maintenance, storm sewer discharges and the treatment and disposal of wastewater treatment sludge.

Federal, Provincial and Territorial Co-operation

Canada-wide Strategy for the Management of Municipal Wastewater Effluent

Over the last 4 years Environment Canada has been working with provincial and territorial governments to develop a *Canada-wide Strategy for the Management of Municipal Wastewater Effluent* through the Canadian Council of Ministers of the Environment (CCME). The CCME Strategy, once completed, will represent a consensus of the 14 federal, provincial and territorial jurisdictions to improve the

¹¹ Government of Canada, *Canada Gazette*, Part I, Vol. 138, No. 49, pp.3489-3579, December 4, 2004. (<http://canadagazette.gc.ca/partI/2004/20041204/pdf/q1-13849.pdf>)

¹² Specific definitions for federal government operations, federal land or aboriginal land can be obtained by referring to the *Canadian Environmental Protection Act, 1999* (<http://laws.justice.gc.ca/en/C-15.31/text.html>).

protection of environmental and human health and clarify the governance for wastewater effluents.

The CCME Strategy focuses on effluents released to surface water from wastewater treatment systems and overflows from sewer collection systems. It also includes linkages to preventing the entry of pollutants into wastewater systems. The CCME Strategy does not cover wastewater solids/sludge residuals, effluent reuse, effluent releases from separate storm water facilities, effluent releases from septic tanks to infiltration facilities or air emissions. It is expected that work for wastewater solids and residuals under the auspices of the CCME would begin after the completion of the CCME Strategy for wastewater effluent.

The CCME Strategy is structured around three outcomes:

- Environmental protection and human health protection are improved;
- Owners of wastewater systems have clarity about the way effluent is managed and regulated; and,
- Funding to improve treatment of wastewater is managed in an equitable and sustainable manner.

For wastewater effluents, the CCME Strategy is anchored by a comprehensive risk management approach (refer to Appendix I). The CCME Strategy also includes an approach for managing sources of pollutants discharged to wastewater sewer systems.

The following summarizes the main elements of the draft CCME Strategy:

Managing Wastewater Effluents

For performance requirements, the CCME Strategy includes national performance standards and other performance elements that provide a regulatory baseline. It also includes a consistent mechanism for establishing site-specific effluent standards to address site-specific situations. The CCME Strategy includes a risk-based approach for establishing implementation timelines that considers the characteristics of the effluent and the receiving environment.

For governance, the issues related to the roles and the responsibilities of the federal, provincial and territorial governments are included in the approach to establish a harmonized regulatory framework in CCME Strategy. The CCME Strategy indicates that the CCME national performance standards would be referenced in federal regulations under *Fisheries Act* and reflected in provincial and territorial regulatory instruments such as permits. References are also made in the CCME Strategy to a “one-window approach” through formal agreements with provinces, territories and other regulators.

Managing Sources of Pollutants Discharged to Wastewater Systems

The CCME Strategy includes a commitment that, effective immediately, jurisdictions will work to reduce substances at the source. Specifically, there is a deliverable that following the completion of site-specific environmental risk assessments, the need for national risk management instruments using the authority of the *Canadian Environmental Protection Act, 1999* to manage the

risks associated with chemicals that are not treatable, and to control the use of substances or products, will be determined. Jurisdictions will evaluate the applicability of these instruments on an on-going basis.

The CCME Strategy also notes that for sector-based approaches, some action has already been taken (e.g. CCME Canada-wide Standard for mercury discharged to sewer systems from the dental industry). Sectors will continue to be evaluated for sector-based approaches to reduce substances at their source.

A CCME model sewer use bylaw is included in the CCME Strategy to provide guidance to municipal governments, other regulators and owners of wastewater systems when implementing source control programs.

Science and Research

The CCME Strategy considers that it is imperative that policy development and research be coordinated and it proposes that a Canadian wastewater research body or wastewater task group be established. Such a group would focus its work on:

- Strengthening the links between municipal wastewater effluent and human and environmental health
- Reducing harmful pollutants in the environment
- Ensuring that effective infrastructure is planned and constructed
- Identifying and filling information gaps
- Addressing emerging issues

Options for such a group include a separate committee under CCME with links to the existing CCME task groups. Alternatively, another government or independent body could be encouraged to establish a standing national wastewater group.

Economic Implications

For wastewater effluents, a preliminary estimate of the cost to upgrade treatment to the level proposed in the CCME Strategy is estimated at between \$10 and \$13 billion for infrastructure development, excluding combined sewer overflow and collection system construction upgrades. One-time jurisdictional costs such as environmental risk assessments are also estimated at approximately \$500 million. Infrastructure funding would need to be prioritized, equitable, and aimed to reduce risks over the next 20 to 30 years.

The responsibility for implementing the CCME Strategy rests with each jurisdiction and the respective elected governments. The next section of this document outlines a proposed regulatory framework for wastewater which is the federal government's implementation of the CCME Strategy. It should be noted that Environment Canada's proposed regulatory framework for wastewater reflects core elements of the CCME Strategy.

2. Proposed Regulatory Framework for Wastewater

Environment Canada is committed to taking action to implement the CCME Strategy. For wastewater effluents, Environment Canada's principal instrument to implement the CCME Strategy for wastewater effluents would be regulations under the *Fisheries Act*. The regulations would reflect the CCME Strategy's national performance standards, other performance elements such as reporting and implementation timelines.

A. Wastewater Effluent Regulations under the *Fisheries Act*

Note: Unless otherwise noted, all of the proposed elements of the wastewater effluent regulations under the Fisheries Act represent the performance elements of the CCME Strategy.¹³

Application

The regulations would be applicable to all land-based wastewater systems¹⁴ under municipal, provincial or federal government operation and those on federal land or on aboriginal land that discharge effluent to surface water.

Deleterious Substances and Effluent Discharge Levels

The regulations would define deleterious substances and authorize effluent discharge levels of these substances:

- define biochemical oxygen demanding matter and suspended solids as deleterious substances
 - authorize maximum effluent discharge levels of 25 mg/L¹⁵
- define residual chlorine as a deleterious substance
 - authorize a maximum effluent discharge level of 0.02 mg/L
- define acutely toxic effluent as a deleterious substance
 - authorize a discharge of a non-acutely toxic¹⁶ effluent
 - include specific requirements and timelines to identify and reduce toxicity in cases of acute toxicity test failure

¹³ Canadian Council of Ministers of the Environment, *Canada-wide Strategy for the Management of Municipal Wastewater Effluent*, Draft, September 2007 (http://www.ccme.ca/ourwork/water.html?category_id=81)

¹⁴ Environment Canada is considering minimum flow of 10 cubic metres (m³) per day for the regulations. Wastewater systems owned by "private-entities" are also being considered for application by Environment Canada.

¹⁵ Maximum effluent discharge levels for biochemical oxygen demanding matter and suspended solids would be based on a periodic average.

¹⁶ Test method would be: Department of the Environment (Environment Canada), *Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout*, EPS 1/RM/13, Second Edition – December 2000. For wastewater systems with a flow of < 2500 cubic metres per day (m³/day) the acute toxicity effluent discharge level requirements would not apply. The other effluent discharge levels would remain for biochemical oxygen demanding matter, suspended solids and residual chlorine. It is thought that the acute lethality test method presents unreasonable costs and could create challenges to secure laboratory testing capacity.

- define ammonia as a deleterious substance
 - include specific requirements if acute toxicity test failure is due to ammonia that would authorize discharge of ammonia in effluent based on receiving environment considerations

The effluent discharge levels for biochemical oxygen demanding matter and suspended solids represent “secondary” wastewater treatment or equivalent.¹⁷ This level of treatment typically includes physical and biological processes removing about 85% of pollutants such as biochemical oxygen demanding matter and suspended solids. Secondary treatment also reduces the release of substances such as phosphorus and nitrogen and other pollutants in wastewater effluents such as pharmaceuticals, personal care products and surfactants.

Effluent Monitoring

Wastewater system size categories would be used in the regulations for requirements such as monitoring and reporting frequencies. The size categories are defined in **Table 1** below.

Table 1 - Wastewater system size categories

Size	Flow (m ³ /day)	Estimated Population
Very Small ^{ab}	≤ 500	≤ 1,000
Small ^a	> 500 – 2,500	>1,000 – 5,000
Medium	>2,500 – 17,500	>5,000 – 35,000
Large	>17,500 – 50,000	>35,000 – 100,000
Very Large	> 50,000	> 100,000

Notes:

a. Very small and small wastewater systems which have industrial inputs are to be treated as medium size. Industrial input would be defined as non-domestic process water from industry categories specified that together exceeds 5% of total dry weather effluent flow. The industry categories are: resource exploration and development, manufacturing/fabrication, processing (including food), marine or transport, landfill leachate, hospitals and laboratories (but not nursing stations).

b. Environment Canada is considering a minimum flow of 10 m³/day for the very small wastewater system size category.

¹⁷ It is recognized that there exists a variety of available technologies and wastewater treatment designs that are capable of achieving the effluent discharge levels for deleterious substances.

Effective once the regulations are promulgated, effluent monitoring requirements for all wastewater systems would be conducted according to **Table 2**. Effluent monitoring frequency requirements for wastewater systems with non-continuous discharges (e.g. lagoons) would be adjusted accordingly in the regulations.

Table 2 - Effluent Monitoring Frequency Based on Size Category

Effluent Monitoring	Monitoring Frequency Based on Size Category				
	Very Small	Small	Medium	Large	Very Large
Biochemical oxygen demand (CBOD ₅) Suspended solids (TSS)	monthly	monthly	every 2 weeks	weekly	daily
Chlorine (total residual)	daily	daily	daily	2 per day	3 per day
Acute toxicity ¹⁸	— ¹⁹	— ¹⁹	quarterly	quarterly	monthly

Receiving Environment Monitoring

Receiving environment monitoring involves conducting studies of the potential effects of effluent on the fish populations, on fish tissue and on the benthic invertebrate community. The scope of the studies should be based on risk while considering elements such as sensitivity of the receiving environment, size and composition of the effluent release. It is recognized that these studies would provide useful information. Requirements for receiving environment monitoring studies in the regulations would be developed based on risk.

Reporting

Effective once the regulations are promulgated, there would be requirements for reporting of effluent monitoring results. The regulations would also include reporting related to wet-weather overflows from combined sewers and wastewater treatment system bypasses.

The regulations would include requirements for the submission of an effluent monitoring report annually for small and very small wastewater systems, quarterly for medium wastewater systems, and monthly for large and very large wastewater systems.

¹⁸ Department of the Environment (Environment Canada), Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout, EPS 1/RM/13, Second Edition – December 2000.

¹⁹ For very small and small wastewater systems (flow of < 2500 m³/day) the acute toxicity effluent discharge level requirements would not apply. The other effluent discharge levels would remain for biochemical oxygen demanding matter, suspended solids and residual chlorine. It is thought that the acute lethality test method presents unreasonable costs and could create challenges to secure laboratory testing capacity.

For an existing wastewater system that does not meet the effluent discharge levels in the regulations, initial reporting would be required to include the calculation of timeline to achieve the effluent discharge levels. (The framework to calculate the timeline is described below).

In the case of acute toxicity monitoring, there would be specific reporting requirements. (Refer to the acute toxicity requirements on page 13).

Reports on the frequency and volume of overflows from combined sewers and sanitary sewers would be required to be submitted annually commencing in 2012, for the year 2011. This report could be combined with the effluent monitoring report.

All reporting would be publicly available.

Timelines to Achieve Effluent Discharge Levels

Determination of Timeline to Achieve Effluent Discharge Levels

For all new and upgraded wastewater systems, the requirements of the regulations would be applicable immediately, including meeting the effluent discharge levels.

For existing wastewater systems that already meet the effluent discharge levels for deleterious substances, maintaining performance for effluent discharge levels would be applicable immediately.

For all other wastewater systems, the timelines to achieve effluent discharge levels is determined by referring to **Table 3**. The risk points reflect effluent quality and type of receiving environment. The risk points are calculated by referring to **Table 4** (next page). In addition, factors associated with the presence of combined sewers can also influence the timeline to achieve effluent discharge levels.

Table 3: Timelines to achieve effluent discharge levels in regulations

Risk Level	Risk Points	Timeline
High	65 and greater	10 years
Medium	50-64	20 years
Low	49 and less	30 years

Note that for discussion purposes if a 20 year implementation period was adopted, the timelines to achieve effluent discharge levels in the regulations would be:

Risk Level	Risk Points	Timeline
High	65 and greater	7 years
Medium	50-64	13 years
Low	49 and less	20 years

Table 4: Level of Risk

Risk type	Description	Risk points
Size (flow m ³ /day)	Very small ^a (≤ 500 m ³ /day)	5 points
	Small ^a ($> 500 - 2,500$ m ³ /day)	10 points
	Medium ($>2,500 - 17,500$ m ³ /day)	15 points
	Large ($>17,500 - 50,000$ m ³ /day)	25 points
	Very large ($> 50,000$ m ³ /day)	35 points
Biochemical oxygen demand (CBOD ₅) / Suspended solids (TSS)	$>150/100$ mg/L	35 points
	50/50 to 150/100 mg/L	20 points
	25/25 mg/L to $<50/50$ mg/L	5 points
	$<25/25$ mg/L	0 points
Chlorine (total residual)	Total residual chlorine >0.02 mg/L	10 points
Ammonia	20 points if the effluent ammonia concentration (ammonia expressed as nitrogen) - pH data point falls above the threshold acute concentration curve of ammonia vs. pH: <div data-bbox="505 919 1201 1428" data-label="Figure"> <p style="text-align: center;">Threshold Acute Concentration of Ammonia versus pH</p> </div>	20 points
Receiving Environment	Open marine	5 points
	Lake, reservoir,	20 points
	Enclosed bay, estuary	20 points
	River with bulk flow ratio >100	15 points
	River with bulk flow ratio $10 - 100$	20 points
	River with bulk flow ratio <10	25 points

Note:

a. Very small and small wastewater systems which have industrial input to wastewater are to be treated as medium size. Industrial input would be defined as non-domestic process water from industry categories specified that together exceeds 5% of total dry weather flow. The industry categories are: resource exploration and development, manufacturing/fabrication, processing (including food), marine or transport, landfill leachate, hospitals and laboratories (but not nursing stations).

Timeline to achieve residual chlorine effluent discharge level for wastewater systems already subject to the pollution prevention planning and implementation requirements for chlorine under the Canadian Environmental Protection Act, 1999

Where a wastewater system is subject²⁰ to the *Notice Requiring the Preparation and Implementation of Pollution Prevention Plans for Inorganic Chloramines and Chlorinated Wastewater Effluents* under the *Canadian Environmental Protection Act, 1999*, the timeline to achieve an effluent discharge level of 0.02 mg/L total residual chlorine for the regulations would be December 31, 2010. Mechanisms for time extensions related to the Notice would be developed.

Timeline to achieve effluent discharge levels for wastewater systems with combined sewers

For a wastewater system with combined sewers, the timeline to achieve effluent discharge levels could be modified if it is determined that the risks associated with the combined sewers is greater than the risk associated with the “main” wastewater effluent. If the risk points associated with overflows from combined sewers is higher than the risk points for the main effluent, an action plan would be developed addressing how overflows from the combined sewers would be managed and reduced along with achieving the effluent discharge levels within a 30 year timeline. Submission of the action plan to the regulators would be required in the regulations.

Two approaches are being considered to determine the risk points for overflows from combined sewers versus the “main” wastewater effluent for a wastewater system. One of these approaches would be incorporated in the regulations.

- The first approach consists of assigning risk points to every overflow from a combined sewer overflow individually and determining which ones should be dealt with first, based on the risk points, prior to addressing the main effluent.
- The second approach consists of assigning risk points for all overflows from all combined sewers for an entire wastewater system to determine if the overall risk points are greater than the risk level for the main effluent.

²⁰ Any person who owns a wastewater system where in 2004 or 2005 the effluent released to surface water is greater than or equal to 5 000 m³ per day, based on an annual average, and where the concentration of total residual chlorine in the effluent exceeds 0.02 mg/L in any sample.

Acute Toxicity Requirements

Wastewater systems that are medium, large or very large would be required in the regulations to conduct effluent acute toxicity tests. For medium and large size categories, acute toxicity testing would be quarterly (4/year). For very large, monthly (12/year) acute toxicity testing would be required.

If an acute toxicity test failure occurs, identification and correction of the cause of the toxicity would be required in the regulations. An action plan would be required within 60 days of the acute toxicity test failure. The action plan would include steps to identify the cause(s) of the acute toxicity (within one year) and the steps to correct the cause(s) (within two years).

For acute toxicity test failures where the effluent discharge levels are achieved for biochemical oxygen demanding matter, suspended solids and residual chlorine and it is demonstrated that the cause of acute toxicity is due to ammonia, then receiving environment considerations would determine if reduction of ammonia in the effluent would be required.²¹ Requirements to this outcome would be specified in the regulations. In the regulations, within the scenario described above, it would be specified that if an ammonia concentration exceeds the chronic toxicity concentration at the edge of the defined mixing zone, reductions of the ammonia in the effluent would be required such that there is no chronic toxicity at the edge of the mixing zone. If the ammonia concentration does not exceed the chronic toxicity at the edge of the defined mixing zone, no further effluent ammonia reduction would be specified in the regulations. Establishing chronic toxicity at the edge of the defined mixing zone would utilize the Canadian Environmental Quality Guidelines²² or other available science-based guidelines.

In 2008, Environment Canada would publish in *Canada Gazette*, Part I, proposed amendments to the *Guideline for the Release of Ammonia Dissolved in Water Found in Wastewater Effluents (Canadian Environmental Protection Act, 1999)*. The publication of the proposed amendments for a 60-day comment period would coincide with pH stabilization procedures for the acute toxicity testing²³ of wastewater effluents. Environment Canada would also consider using the authority under *Canadian Environmental Protection Act, 1999* for developing regulations for ammonia.

²¹ For ammonia the scientific evidence indicates the need to focus on longer-term and sublethal effects and its ecological consequences. Government of Canada, [Canada Gazette](#), Part I, Vol. 135, No. 25, pp. 2256-2257, June 23, 2001. *Canadian Environmental Protection Act, 1999, Priority Substances List Assessment Report, Ammonia in the Aquatic Environment*, March 2001.

²² Canadian Council of Ministers of the Environment (CCME) establishes water quality guidelines in the *Canadian Environmental Quality Guidelines*. The guidelines protect all plants and animals that live in our lakes, rivers, and oceans by establishing acceptable levels for substances or conditions that affect water quality such as toxic chemicals, temperature and acidity. As long as conditions are within the levels established by the guidelines, one would not expect to see negative effects in the environment.

²³ Department of the Environment (Environment Canada), *Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout*, EPS 1/RM/13, Second Edition – December 2000.

Requirements for Wastewater Systems in the Arctic

It is recognized that certain wastewater systems have constraints to meet the effluent discharge levels of the regulations due to the extreme climatic conditions and remoteness of Canada's arctic. Alternative effluent discharge levels and timelines are being considered and would be proposed for these wastewater systems by 2013. Defining the arctic for this purpose is being considered. Conceptually the approach would use a climatic definition which would typically cover Nunavut, northern parts of Northwest Territories, northern Québec and northern Labrador.

For Arctic wastewater systems monitoring and reporting would be applicable immediately in the regulations as described in **Table 2** (page 9).

Site-Specific Effluent Discharge Requirements for Wastewater Systems under Federal Government Operation, or on Federal Land or on Aboriginal Land

The regulations would include site-specific effluent requirements for land-based wastewater systems on federal land or aboriginal land that discharge effluent to surface water. These requirements are in addition to the other requirements of the regulations previously described. For these wastewater systems the regulations would require the following activities:

- establish a list of substances of potential concern;
- prepare and execute an initial effluent characterization program;
- establish effluent discharge objectives aligned with other jurisdictions; and
- monitor effluent and submit reports.

Initial characterization of the effluent would be required in the regulations to be completed within 2 years. Effluent monitoring for a list of substances²⁴ would be over a period of one year. Previous effluent monitoring data could be used under certain conditions. The frequency of effluent monitoring for initial characterization would be based on the wastewater system size categories previously described.

Results of the initial characterization would be required to be reported within six months of the completion of the monitoring. This report would include the list of substances used for initial characterization, location of effluent sample collection, list of test methods, and the analytical results.

Within 5 years, the regulations would require that effluent discharge objectives be established using specified methods including mixing zone and water quality guideline variables. Monitoring of the effluent discharge objectives and reporting on the results would also be required.

Characterization of effluent and re-evaluation of the effluent discharge objectives would be required within specified frequencies in the regulations.

²⁴ List of substances would vary depending on wastewater system size. For small and very small, the list of substances would be: Total Suspended Solids (TSS), Biochemical Oxygen Demand (CBOD₅), Residual Chlorine (TRC), Nitrate, Nitrite, Ammonia, Phosphorus (TP), pH, Temperature and *Escherichia coli* (*E. coli*).

The regulations would not include the site-specific effluent requirements for wastewater systems under provincial or territorial jurisdiction. It is expected that these requirements would be established within the respective jurisdictions over similar timelines.

Interdepartmental and Intergovernmental Co-operation

Harmonizing the regulatory requirements would result in greater regulatory clarity for the wastewater sector by defining the roles and responsibilities of all parties engaged in the management of wastewater. For the wastewater effluent regulations under the *Fisheries Act*, formal agreements would be negotiated between the federal and provincial governments and the federal government and Yukon. In the Northwest Territories and Nunavut, an agreement would be developed between the jurisdictions and the federal government, taking into account the regulatory role of the various water boards and Indian and Northern Affairs Canada.

The formal agreements would be developed at the same time as the wastewater effluent regulations under the *Fisheries Act*. They would address one-window reporting, compliance promotion and enforcement elements and a co-ordination mechanism for the site-specific effluent discharge requirements. The formal agreements would be similar to existing administrative agreements between the Government of Canada and some provinces under the *Fisheries Act*.

The *Fisheries Act* has a number of compliance, enforcement and penalty elements. Failure to meet any of the requirements set out by the *Fisheries Act* or its relevant regulations, is an offence. The *Compliance and Enforcement Policy for the Habitat Protection and Pollution Prevention Provisions of the Fisheries Act*²⁵ lays out general principles for application of the habitat protection and pollution prevention provisions. It is a national policy which applies to all those who exercise regulatory authority, from federal Ministers to enforcement personnel. The policy explains measures that will be used to achieve compliance and it sets out principles of fair, predictable, and consistent enforcement that govern application of the law, and responses by enforcement personnel to alleged violations. The Policy would form the basis for the compliance and enforcement aspects of the formal agreements for the wastewater effluent regulations under the *Fisheries Act*.

²⁵Environment Canada, [Compliance and Enforcement Policy for the Habitat Protection and Pollution Prevention Provisions of the Fisheries Act](#), November 2001.

For **discussion purposes**, assuming the wastewater effluent regulations under the *Fisheries Act* would be finalized in 2010, the key performance requirements and timelines are summarized below:

2010	<p>All wastewater systems:</p> <ul style="list-style-type: none"> • establish risk level, high, medium or low • monitor effluent • report <p>New and upgraded wastewater systems and systems already meeting the effluent discharge levels:</p> <ul style="list-style-type: none"> • maintain achievement of effluent discharge levels • respond to acute toxicity testing failure <p>Wastewater systems under federal government operation, or on federal land or on aboriginal land:</p> <ul style="list-style-type: none"> • work initiated to establish effluent discharge objectives
December 31, 2010	<p>Wastewater systems subject²⁶ to the <i>Notice Requiring the Preparation and Implementation of Pollution Prevention Plans for Inorganic Chloramines and Chlorinated Wastewater Effluents</i> under the <i>Canadian Environmental Protection Act, 1999</i>:</p> <ul style="list-style-type: none"> • achieve and maintain residual chlorine effluent discharge level of 0.02 mg/L
2013	Effluent discharge levels established for Arctic wastewater systems
2015	<p>Site-specific effluent requirements for wastewater systems under federal government operation, or on federal land or on aboriginal land:</p> <ul style="list-style-type: none"> • effluent discharge objectives established • monitor and report
2020	<p>High risk existing wastewater systems:</p> <ul style="list-style-type: none"> • achieve and maintain effluent discharge levels • respond to acute toxicity testing failure
2030	<p>Medium risk existing wastewater systems:</p> <ul style="list-style-type: none"> • achieve and maintain effluent discharge levels • respond to acute toxicity testing failure
2040	<p>Low risk existing wastewater systems:</p> <ul style="list-style-type: none"> • achieve and maintain effluent discharge levels • respond to acute toxicity testing failure

²⁶ Any person who owns a wastewater facility where in 2004 or 2005 the effluent released to surface water is greater than or equal to 5 000 m³ per day, based on an annual average, and where the concentration of total residual chlorine in the effluent exceeds 0.02 mg/L in any sample.

B. Additional Risk Management Actions for Wastewater Systems under Federal Government Operation or on Federal Land or on Aboriginal Land

The *Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments* (EPS 1-EC-76-1, 1976) apply to all effluents discharged from land-based federal establishments. The Guidelines state that “Generally, secondary treatment or equivalent should be the minimum acceptable treatment” and include wastewater effluent guidelines for specified pollutants. The Guidelines also provide guidance for issues related to the management of wastewater such as pre-treatment and discharge to a municipally-owned collection system, operation and maintenance, storm sewer discharges and the treatment and disposal of wastewater treatment sludge.

For wastewater effluents, the *Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments* would be replaced by the wastewater effluent regulations under the *Fisheries Act*.

For other issues related to the management of wastewater not related to effluents, Environment Canada would update the Guidelines or develop other instruments at the same time the wastewater effluent regulations under the *Fisheries Act* would be finalized.

For wastewater systems under federal government operation, or on federal land or on aboriginal land, Environment Canada would administer reporting, compliance and enforcement elements associated with the wastewater effluent regulations under the *Fisheries Act*.

All phases of consultation and regulatory instrument development by Environment Canada will take into consideration Indian and Northern Affairs Canada’s activities for the management of drinking water and wastewater on First Nation reserves south of 60° to ensure complementary actions and to avoid duplication. Consultation activities and regulatory instrument development activities of the two federal departments will be coordinated to the fullest extent possible; however, these initiatives are distinct.

C. Risk Management Actions for Sources of Pollutants in Wastewater

The need for national risk management actions to manage pollutants at their source will be determined based on the result of the site-specific environmental risk assessments. Appropriate action will be taken by the relevant regulators.

The Government of Canada's Chemicals Management Plan is a key element of Environment Canada's commitment to reduce pollutants at their source. Initiated in December of 2006, a number of substances have been identified as high priorities for action under the Chemicals Management Plan. Manufacturers, importers and industrial users of high-priority substances are required to provide Environment Canada and Health Canada with information on substances that have been screened with regard to their potential toxicity, bioaccumulation and persistence. The Chemicals Management Plan includes regulations and risk management actions under the *Canadian Environmental Protection Act, 1999*, the *Pest Control Products Act*, and the *Food and Drugs Act*.

3. Next Steps

Environment Canada will review and take into consideration all feedback received from interested parties. Based on a target publication date of December 2008 for the proposed wastewater effluent regulations under the *Fisheries Act*, the key regulatory development timelines are summarized below.

January 31, 2008	Interested parties are welcome to provide feedback on the <i>Proposed Regulatory Framework for Wastewater</i> to Environment Canada before January 31, 2008 (refer to the additional information about providing feedback on next page).
Spring 2008	Proposed amendments to the <i>Guideline for the Release of Ammonia Dissolved in Water Found in Wastewater Effluents (Canadian Environmental Protection Act, 1999)</i> published in <i>Canada Gazette</i> , Part I. The publication of the proposed amendments for a 60-day comment period would coincide with the publication of pH stabilization procedures for acute toxicity testing. ²⁷
December 2008	<p>Proposed wastewater effluent regulations under the <i>Fisheries Act</i> published in <i>Canada Gazette</i>, Part I for a comment period.</p> <ul style="list-style-type: none"> Includes a <i>Regulatory Impact Analysis Statement (RIAS)</i> with a cost-benefit analysis forecasting the impact of proposed regulations. <p>Final amendments to the <i>Guideline for the Release of Ammonia Dissolved in Water Found in Wastewater Effluents (Canadian Environmental Protection Act, 1999)</i> published in <i>Canada Gazette</i>, Part I.</p> <p>Proposed amendments to the <i>Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments</i> published in <i>Canada Gazette</i>, Part I for a comment period.</p>
2009	<p>Negotiations for the formal agreements between the Government of Canada and provinces, territories and other regulators.</p> <p>Revision of wastewater effluent regulations under the <i>Fisheries Act</i>. Revision of <i>Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments</i></p>
December 2009	<p>Final wastewater effluent regulations under the <i>Fisheries Act</i> published in <i>Canada Gazette</i>, Part II.</p> <p>Final <i>Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments</i> published in <i>Canada Gazette</i>, Part I.</p>
2010	<p>Implementation of wastewater effluent regulations under the <i>Fisheries Act</i>:</p> <ul style="list-style-type: none"> through other regulators via a formal agreement; directly by Environment Canada where there is no formal agreement in place; or directly by Environment Canada for wastewater systems under federal government operation or on federal land or on aboriginal land

²⁷ Department of the Environment (Environment Canada), *Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout*, [EPS 1/RM/13](#), Second Edition – December 2000.

4. Providing Feedback

Interested parties can provide feedback in writing to:

Claude Fortin
Environment Canada
Place Vincent Massey
351 St. Joseph Blvd, 18th Floor
Gatineau, Québec K1A 0H3

Alternatively, feedback can be provided to the above noted Environment Canada official through email or by facsimile:

E-mail: wastewater@ec.gc.ca

Fax number: (819) 953-7253

For further information, refer to Environment Canada's website at:

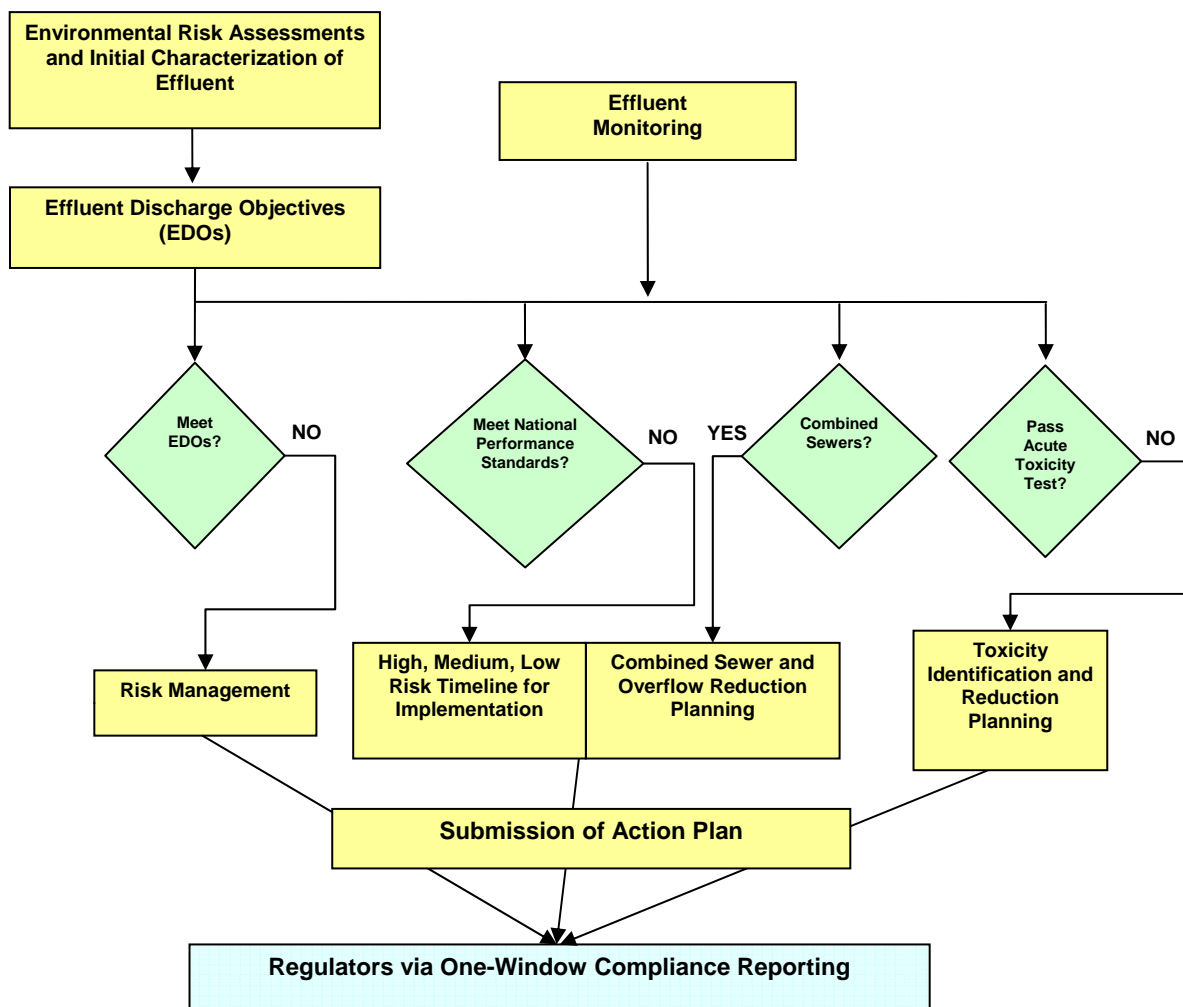
<http://www.ec.gc.ca/wastewater> or telephone: (819) 953-8074.

All interested parties are encouraged to review the documentation for the CCME *Canada-wide Strategy for the Management of Municipal Wastewater Effluent*. Further information about the CCME Strategy can be obtained at the CCME's website: <http://www.ccme.ca/ourwork/water.html>. The CCME comment period ends January 31, 2008.

The CCME Strategy is expected to be presented to the Environment Ministers for approval in spring 2008.

Appendix I

The CCME Strategy's figure below conceptually integrates the various performance elements for wastewater effluents in a sequence of actions for a given wastewater system.



Integrated view of the performance requirements of the CCME Strategy