Agenda - Executive Policy Committee - December 4, 2002

Report - Standing Policy Committee on Public Works - November 19, 2002

2. Updated Status of Wastewater Related Pollution Prevention Plans in Preparation for Upcoming Clean Environment Commission Hearings
File WW-3 (Vol. 12)

STANDING COMMITTEE RECOMMENDATION:

On November 19, 2002, the Standing Policy Committee on Public Works recommended:

That the Administration be authorized to submit the following positions and information on the City's pollution control programs and systems at the Clean Environment Commission hearings in January of 2003;

1. Effluent Ammonia (NH_3) Reduction:

    a. That the discharges from the City's wastewater treatment plants be regulated on a site-specific basis consistent with the findings and recommendations of the City's study entitled "Red and Assiniboine Rivers Ammonia - Criteria Study, Final Technical Report, November 2002" prepared by TetrES Consulting Inc., in association with North/South Consultants Inc., and external advisors.
    b. That the program related to control of ammonia to protect the aquatic environment in the Red and Assiniboine Rivers include:
        i. Treatment of centrate at the North End Water Pollution Control Centre (NEWPCC),
        ii. Continued use of the polishing ponds at the West End Water Pollution Control Centre (WEWPCC),
        iii. No additional treatment works at the South End Water Pollution Control Centre (SEWPCC) for ammonia reduction with a review of the site-specific requirement for ammonia treatment at the SEWPCC in 10 years.
    c. That additional studies, monitoring programs and testing of ammonia toxicity to expand the site-specific knowledge on the effects of ammonia on local species be undertaken in cooperation with Manitoba Conservation.

2. Combined Sewer Overflow (CSO) Control:

    a. That a long-term CSO control program be adopted in principle as described in the City's study entitled "Combined Sewer Overflow Management Study, Final Report, November 2002" prepared by Wardrop Engineering Inc., in association with TetrES Consultants, CH2M Gore & Storrie, EMA Services, and external advisors. The report provides a long-term alternative that would reduce overflow

events on a citywide basis to an average of 4 events per summer recreation season (May 15 to Sept 30, inclusive) within about a 50-year timeframe.

3. Effluent Limits for the Water Pollution Control Centres (WPCCs)

    a. That effluent discharge limits for the Water Pollution Control Centres be recommended to the Clean Environment Commission based on the existing secondary treatment performance.
    b. That effluent discharge limits for fecal coliform be established to protect the Red and Assiniboine Rivers for recreational use during the summer recreation season.

4. Reduction of Nutrients in Effluent Discharges

    a. That it be recommended to the Clean Environment Commission that limits, which would entail tertiary treatment for nutrient reduction, not be established until the Province has completed their basin-wide Nutrient Management Study, and conducted stakeholder and public consultations.

5. Wastewater System Reliability

    a. That the Clean Environment Commission be advised that the City will undertake Risk/Criticality Assessments at the three WPCCs in 2003 subject to Council approval of capital funding therefore to assess the reliability and backup capability of treatment systems to prevent the discharge of untreated sewage.

6. That the Proper Officers of the City be authorized to do all things necessary to implement the intent of the foregoing, including the execution of any documents related thereto.

RE: UPDATED STATUS OF WASTEWATER RELATED POLLUTION PREVENTION PLANS IN PREPARATION FOR UPCOMING CLEAN ENVIRONMENT COMMISSION HEARINGS

For submission to: Standing Policy Committee on Public Works

Original report signed by: Barry D. MacBride, P.Eng.
Director
Water and Waste Department (WWD)

Report date: November 8, 2002

In camera item: No

Recommendation(s):
It is recommended that the Administration be authorized to submit the following positions and information on the City's pollution control programs and systems at the Clean Environment Commission hearings in January of 2003.

1. **Effluent Ammonia (NH_3) Reduction:**
   a. That the discharges from the City's wastewater treatment plants be regulated on a site-specific basis consistent with the findings and recommendations of the City's study entitled *"Red and Assiniboine Rivers Ammonia - Criteria Study, Final Technical Report, November 2002"* prepared by TetrES Consulting Inc., in association with North/South Consultants Inc., and external advisors.
   b. That the program related to control of ammonia to protect the aquatic environment in the Red and Assiniboine Rivers include:
      i. Treatment of centrate at the North End Water Pollution Control Centre (NEWPCC),
      ii. Continued use of the polishing ponds at the West End Water Pollution Control Centre (WEWPCC),
      iii. No additional treatment works at the South End Water Pollution Control Centre (SEWPCC) for ammonia reduction with a review of the site-specific requirement for ammonia treatment at the SEWPCC in 10 years.
   c. That additional studies, monitoring programs and testing of ammonia toxicity to expand the site-specific knowledge on the effects of ammonia on local species be undertaken in cooperation with Manitoba Conservation.
2. **Combined Sewer Overflow (CSO) Control:**
   a. That a long-term CSO control program be adopted in principle as described in the City's study entitled *"Combined Sewer Overflow Management Study, Final Report, November 2002"* prepared by Wardrop Engineering Inc., in association with TetrES Consultants, CH2M Gore &

Storrie, EMA Services, and external advisors. The report provides a long-term alternative that would reduce overflow events on a citywide basis to an average of 4 events per summer recreation season (May 15 to Sept 30, inclusive) within about a 50-year timeframe.

~~3.~~8. Effluent Limits for the Water Pollution Control Centres (WPCCs)

a. That effluent discharge limits for the Water Pollution Control Centres be recommended to the Clean Environment Commission based on the existing secondary treatment performance.

b. That effluent discharge limits for fecal coliform be established to protect the Red and Assiniboine Rivers for recreational use during the summer recreation season.

~~4.~~9. Reduction of Nutrients in Effluent Discharges

a. That it be recommended to the Clean Environment Commission that limits, which would entail tertiary treatment for nutrient reduction, not be established until the Province has completed their basin-wide Nutrient Management Study, and conducted stakeholder and public consultations.

~~5.~~10. Wastewater System Reliability

a. That the Clean Environment Commission be advised that the City will undertake Risk/Criticality Assessments at the three WPCCs in 2003 subject to Council approval of capital funding therefore to assess the reliability and backup capability of treatment systems to prevent the discharge of untreated sewage.

REPORT SUMMARY

Key Issues:

The Manitoba Clean Environment Commission (CEC) has been requested by the Minister of Conservation to convene a public hearing to review and receive public comments respecting the City of Winnipeg's wastewater collection and treatment systems. Originally, the Hearings were envisioned to be held in late-2003, however, after the malfunction at the NEWPCC, the Province has decided to accelerate the hearing process.

This report provides an overview of specific environmental and health risk issues related to wastewater collection and treatment that will be dealt with at the Hearings, and the recommended framework for implementation of programs to address these issues. The total cost for these programs is estimated to be $530 million.

Implications of the Recommendation(s):

General Implications

	None
X	For the organization overall and/or for other departments
X	For the community and/or organizations external to the City of Winnipeg
	Involves a multi-year contract

Comment:

- Public communication/consultation activities had been planned by the Department on the pollution control initiatives in accordance with Council's policy on consultation for major works. However, timing of the CEC Hearings tentatively scheduled for January 2003 will not permit adequate time for a comprehensive public consultation program.

Policy implications

	No
X	Yes

Comment:

- Recommendations of this report will establish a policy for a long-term program for dealing with CSO and ammonia control, which will be presented at Clean Environment Commission hearings in 2003.
- The Manitoba government will set pollution control requirements for the City of Winnipeg after these hearings through conditions in an Environmental Licence to be issued.

Financial Implications

	Within approved current and/or capital budget
X	Current and/or capital budget adjustment required

Comment:

- Programs being recommended by this report have long-term financial implications to the Sewer Utility, which will potentially involve rate increases.
- The proposed capital program will be financed by the Environmental Projects Reserve (EPR), which is funded by the sewer rate. The existing financial plan includes $7 million per year for environmental program and can finance the proposed capital program for the next ten years. After ten years, an increase to the Environmental Projects Reserve will be necessary.

- Additional requirements or accelerated implementation timeframes recommended by the CEC and/or imposed by Manitoba Conservation following the hearing process will impact near and far-term funding requirements would require a separate increase to the sewer rate and modification to the ten year financial plan.

REPORT

RECOMMENDATION(S):
It is recommended that the Administration be authorized to submit the following positions and information on the City's pollution control programs and systems at the Clean Environment Commission hearings in January of 2003.

1. **Effluent Ammonia (NH_3) Reduction:**
    a. That the discharges from the City's wastewater treatment plants be regulated on a site-specific basis consistent with the findings and recommendations of the City's study entitled *"Red and Assiniboine Rivers Ammonia - Criteria Study, Final Technical Report, November 2002"* prepared by TetrES Consulting Inc., in association with North/South Consultants Inc., and external advisors.
    b. That the program related to control of ammonia to protect the aquatic environment in the Red and Assiniboine Rivers include:
        i. Treatment of centrate at the North End Water Pollution Control Centre (NEWPCC),
        ii. Continued use of the polishing ponds at the West End Water Pollution Control Centre (WEWPCC),
        iii. No additional treatment works at the South End Water Pollution Control Centre (SEWPCC) for ammonia reduction with a review of the site-specific requirement for ammonia treatment at the SEWPCC in 10 years.
    c. That additional studies, monitoring programs and testing of ammonia toxicity to expand the site-specific knowledge on the effects of ammonia on local species be undertaken in cooperation with Manitoba Conservation.
2. **Combined Sewer Overflow (CSO) Control:**
    a. That a long-term CSO control program be adopted in principle as described in the City's study entitled *"Combined Sewer Overflow Management Study, Final Report, November 2002"* prepared by Wardrop Engineering Inc., in association with TetrES Consultants, CH2M Gore & Storrie, EMA Services, and external advisors. The report provides a long-term alternative that would reduce overflow events on a citywide basis to an average of 4 events per summer recreation season (May 15 to Sept 30, inclusive) within about a 50-year timeframe.
3. **Effluent Limits for the Water Pollution Control Centres (WPCCs)**
    a. That effluent discharge limits for the Water Pollution Control Centres be recommended to the Clean Environment Commission based on the existing secondary treatment performance.
    b. That effluent discharge limits for fecal coliform be established to protect the Red and Assiniboine Rivers for recreational use during the summer recreation season.

4. **Reduction of Nutrients in Effluent Discharges**
    a. That it be recommended to the Clean Environment Commission that limits, which would entail tertiary treatment for nutrient reduction, not be established until the Province has completed their basin-wide Nutrient Management Study, and conducted stakeholder and public consultations.
5. **Wastewater System Reliability**
    a. That the Clean Environment Commission be advised that the City will undertake Risk/Criticality Assessments at the three WPCCs in 2003 subject to Council approval of capital funding therefore to assess the reliability and backup capability of treatment systems to prevent the discharge of untreated sewage.

REASON FOR THE REPORT:

To authorize the position of the City to be advanced before the Clean Environment Commission Hearings on Pollution Prevention Plans and wastewater treatment plant licensing issues as prescribed by the terms of reference in the letter of instruction issued by the Minister of Conservation on October 3, 2002 to the chairman of the Clean Environment Commission.

HISTORY:

1991 to 2002 Over this period, Council approved funds in the Capital budget totalling $ 9,120,000 for Combined Sewer Overflow (CSO) Management.

1992 to 99 Over this period, Council approved funds in the Capital budget totalling $3,031,000 for Ammonia ($NH_3$)/Nitrification Studies.

1993 11 The Minister of Environment accepted the Clean Environment Commission's recommendations evolving from the former 1991/92 hearing process, which required the City to undertake detailed studies of its combined sewer overflows and site-specific effluent ammonia toxicity impacts.

1994 02 Engineering Services were assigned to Wardrop Engineering Inc., in association with TetrES Consultants, CH2M Gore & Storrie, EMA Services, and external advisors to undertake the CSO Management Study.

1998 11 Engineering Services were assigned to TetrES Consultants Inc., in association with North/South Consultants Inc., and external advisors to undertake the Ammonia (NH_3) Study.

1999 07 Disinfection of effluent from the South End Water Pollution Control Centre (SEWPCC) was initiated at a capital cost of approximately $4.5 million.

2001 02 27 Capital funding in the amount of $6.48 million was approved by Council for disinfection of effluent from the North End Water Pollution Control Centre (NEWPCC).

2002 02 11 Capital funding in the amount of $8.52 million was approved by Council for disinfection of effluent from the NEWPCC.

2002 09 10 The Standing Policy Committee on Public Works received as information the Water and Waste Department report entitled "STATUS OF WASTEWATER RELATED POLLUTION PREVENTION PLANS"

2002 09 16 Pumping of raw wastewater at the NEWPCC was interrupted due to a major malfunction, which consequently resulted in the spilling of raw wastewater to the Red River from about 5:00 p.m. on September 16, 2002 to approximately 2:00 a.m. on September 19, 2002.

2002 10 03 The Minister of Conservation issued instructions to the Clean Environment Commission pursuant to clause 6(5)(b) of The Environment Act to convene public hearings on the City of Winnipeg's wastewater collection and treatment systems.

DISCUSSION:

1) <u>Introduction</u>

Clean Environment Commission (CEC) Hearings have been called and have been advertised. As such, the City of Winnipeg Water and Waste Department (WWD) is compelled to provide positions on the recommended actions and discharge limits for the resolution of specific environmental or health issues associated with Winnipeg's wastewater collection and treatment systems. This report will specify positions recommended and implementation plans for:

- Effluent Ammonia Reduction;
- Combined Sewer Overflow (CSO) Control;
- Effluent Limits for the Water Pollution Control Centres (WPCCs);
- Reduction of Nutrients in Effluent Discharges; and
- Wastewater System Reliability Issues.

The recommended positions will be advanced through the hearing process, subject to Council authorization.

The original schedule submitted as part of the WWD's report considered by the Standing Policy Committee on Public Works on September 10, 2002, contemplated that

the hearings would not be held until autumn of 2003, and would have afforded ample opportunity for the City to undertake public communication and consultation activities on the pollution prevention initiatives under consideration. Due to the accelerated timeframe imposed by the Province, sufficient time does not exist for the City to undertake a public consultation program given that the Hearings will begin January 20, 2003.

2) Upcoming CEC Hearing Process

At the request of the Minister of Environment, the Clean Environment Commission (CEC) held public hearings in 1991/92 on the classification of the Red and Assiniboine Rivers in the Winnipeg area. These hearings were intended to define appropriate beneficial uses of the Rivers and associated water quality objectives, which would ultimately lead to the licensing of Winnipeg's Water Pollution Control Centres (WPCCs) under The Manitoba *Environment Act*. Procedurally it was always envisioned that a second stage of CEC hearings would be convened to consider the results of the foregoing studies and other environmental/health issues affecting the licensing of the City's wastewater operations.

After the 1991/92 hearings, the CEC submitted its report that identified several recommendations that related to the City of Winnipeg's wastewater collection and treatment systems to address specific environmental and health issues. To fulfill requirements of the CEC's recommendations, which were adopted by the then Minister of Environment, the WWD carried out multi-year comprehensive studies on the ammonia (NH_3) and CSO issues. In addition, the City has committed to implement wastewater disinfection of its effluents to comply with the designation of the Rivers for recreation use.

The Minister of Conservation has now requested that the CEC conduct public hearings to review the City of Winnipeg's wastewater collection and treatment systems and to receive public comments and concerns respecting the systems. The Terms of Reference for the CEC hearings as provided by the Minister of Conservation are included as Appendix A.

This report along with other supporting technical material and reports will be placed in the Public Registry by Manitoba Conservation and will be available for review by the general public on November 20, 2002. The material will also form the basis for the deliberations by the CEC. The reports to be submitted by the City for the Public Registry will include:

- The Red and Assiniboine Rivers Ammonia - Criteria Study, Final Technical Report, supporting appendices, and technical memorandums prepared by TetrES Consulting Inc., in association with North/South Consultants Inc., and external advisors, November 2002.

- The Combined Sewer Overflow Management Study, Final Report, Executive Summary, Technical Report, supporting appendices, and technical memorandums" prepared by Wardrop Engineering Inc., in association with TetrES Consultants, CH2M Gore & Storrie, EMA Services, and external advisors, November 2002.
- The Nitrification Technical Study, supporting appendices, and technical memorandums prepared by EARTH TEC (CANADA) INC., November 2002.
- Executive Summary: Ammonia Reduction in City of Winnipeg Wastewater Effluent, prepared by TetrES Consulting Inc., November 2002.
- Nutrient Characterization of Discharges from Winnipeg, by the Water and Waste Department (currently in preparation).
- Effluent Discharges Limits for Winnipeg's Water Pollution Control Centres, by the Water and Waste Department (currently in preparation).

The CEC will provide advice and recommendations to the Minister of Conservation by April 3, 2003 following the hearings. Manitoba Conservation will consider the CEC input for the licensing of certain City of Winnipeg wastewater operations under *The Environment Act*.

3) Pollution Prevention Plan

a) Overview of Plan

A near-term and long-term implementation plan has been developed to address the major environmental and health issues confronting the wastewater utility as shown in Table 1. The pollution prevention plan responds to environmental/health priorities, as we currently understand them. The plan does not include capital funding requirements for other system or treatment plant upgrades or rehabilitation that might be needed during the same timeframe that would not be supported by the Environmental Projects Reserve (EPR) Fund. In December 1993, Council established a River Quality Environmental Studies Reserve Fund to finance projects to improve river quality. The Reserve was renamed in January 1996 to the Environmental Projects Reserve (EPR) to better reflect the projects this Reserve was to support. The EPR is financed through transfers from the Sewage Disposal System Fund.

Table 1

Component	Capital $ (Million)	Year Started	Year Completed
NEWPCC Disinfection	$ 15	2002	2004
CSO Control Program			
(Stage Ia)	$ 14	2002	2005
(Stage Ib)	$ 26	2005	2043
(Stage II)	$ 50	2028	2033
(Stage III)	$ 181	2033	2050
Centrate Ammonia Treatment at NEWPCC	$ 10	2002	2004
WEWPCC Disinfection	$ 3	2050	2051
Biosolids Program			
(Stage I)	$ 30	2007	2010
(Stage II)	$ 20	2012	2014
Effluent Nutrient Control			
NEWPCC	$ 127	2019	2022
SEWPCC	$ 47	2022	2025
WEWPCC	$ 7	2025	2026
Totals	$ 530		

NOTE: Costs shown are in 2002 dollars and no inflation allowance has been included to year of construction.

Derivation of the plan is based on the following assumptions:

- Disinfection of effluent and ammonia centrate reduction at the NEWPCC is a priority and acceptable to the Province regulator;
- Disinfection at the WEWPCC can be deferred indefinitely due to the satisfactory performance of the existing polishing lagoons;
- A long-term CSO control strategy to achieve a target of 4 overflows per summer recreation season will be supported by Provincial regulator;
- Allows for a new biosolids management system in case the current operation needs to be modified for technical, operating or regulatory reasons;
- The ultimate program, to be undertaken within about a 40 to 45 year period, must be flexible, in that there are significant uncertainties, which are expected to be resolved within the next 10 years.
- Additional research, environmental and engineering studies, monitoring, ongoing dialogue with the Provincial regulator, and public consultation will be need to be conducted over the next 10 years to better assess the needs, timing, and costs of future pollution prevention plan actions.

b) Financial Considerations

The following highlights the financial implications of expenditures listed in Table 1.

1. Capital requirements would be met from the EPR Fund preserving the "pay-as-you-go" philosophy to the extent practicable.

2. Sequencing and timing of wastewater pollution prevention initiatives within the next 10 years makes specific provision not to jeopardize plans and financing of the potable water treatment plant.

3. The current funding from the Sewer Rate to the EPR of $7 million per year will be maintained for the next 10 years. Current projections will require the EPR funding to increase to about $14 million after ten years, and increase again after twenty years to approximately $21 Million and be held relatively constant for the subsequent twenty years before sewer rates could be reduced. Table 2 presents the projected increase to the EPR. Depending on actual project costs experienced, amount of the annual EPR may require adjustment to meet the timeframes in preceding Table 1.

Table 2

Annual EPR (Millions)	Timeframe (Years)
$ 7.0	2003 to 2012
$ 14.0	2013 to 2022
$ 21.0	2023 to 2032

Additional details on specific elements of the programs are discussed in the following sections.

4) <u>Effluent Ammonia (NH_3) Reduction</u>

The concern with NH_3 relates to whether the concentrations in the river approach levels that could cause chronic toxicity effects on aquatic life (e.g., fish tissue damage, reduced reproductivity of fish, not fish kills). Conventional secondary treatment at the NEWPCC and SEWPCC do not reduce NH_3 significantly and would require tertiary treatment to accomplish NH_3 reduction on a year-round basis. The existing polishing lagoons at the WEWPCC significantly remove NH_3 during the summer months.

Toxicity of NH_3 is very complex and requires site-specific information for appropriate protection of aquatic life in the local rivers. Based on the results of extensive City studies, WWD recommends that site-specific regulation of NH_3 in the urban reaches of the Red and Assiniboine rivers is an appropriate position to be taken at the CEC

hearings. A 10-year program has been developed that reduces ammonia in final effluent discharges and resolves key areas of uncertainty.

The first stage of ammonia reduction will involve centrate control at the NEWPCC at an estimated capital cost of $10 Million. This will reduce ammonia discharge by about 30 percent. If Manitoba Conservation agrees to the proposed site-specific approach, NH_3 control will not be required at the SEWPCC until 2020. It is unlikely that NH_3 control will ever be required at the WEWPCC because the existing polishing ponds effectively reduce NH_3 concentrations.

5) Combined Sewer Overflow (CSO) Control

Combined sewers were built in Winnipeg between 1880 and 1960. They serve an area of approximately 8,700 hectares or about 30% of the currently developed area. These sewers carry wastewater only, during dry weather, and stormwater plus wastewater during rainstorms. Over the long term, CSOs occur on average of about 18 times per year during the summer recreation season (May 15 to September 30). The key findings of the CSO study include the following:

- During and following a rainfall event, CSOs cause a significant short-term increase in fecal coliform concentrations. These elevated concentrations typically “die-off” in three to four days at which time the concentrations return to levels observed during normal dry weather conditions.
- Disinfection of the effluent from the NEWPCC will have the most significant benefit in terms of reducing fecal coliform concentrations in the river, in that these discharges are continuous during dry and wet weather conditions. Beyond disinfection of the WPCC effluent, additional CSO control provides minor incremental benefit with respect to improved compliance with microbiological limits.
- CSO control should not be considered a significant public health issue in the conventional context of avoiding disease. The extent of CSO control that is appropriate and acceptable to the community is fundamentally a public policy and a regulatory compliance issue.
- CSO control is very costly and benefits difficult to measure
- Alternatives for CSO control include complete separation of all combined sewers at a cost of approximately $1.5 Billion, or reduction of CSOs to an average of about 4 events per recreation season at a cost of about $270 Million.
- For Winnipeg, the most cost-effective means to gain greater CSO control is to maximize the use of available sewer system storage supplemented as required by future underground storage to achieve an average of about 4 overflow events per recreation season at an estimated cost of approximately $270 Million.

As such, the following CSO control plan is recommended for presentation to the CEC. The plan is staged long-term, a 40 to 45 year undertaking, which enables steady progress on CSO mitigation while preserving funds for other evolving priorities.

ear	Activity	ost Millions)
002 - 05	Implement a supervisory control and data acquisition system, raise interception weirs, conduct an in-line storage demonstration project and additional engineering studies	14
005 - 43	Integration with basement flooding relief and sewer rehabilitation programs	26
028 - 33	Access existing latent and available in-line storage	50
034 - 50	Develop additional storage to meet long-term CSO control target of 4 CSOs per recreation season	180

The above program is conceptual even within the first 10 years. It is anticipated that it would be subject to ongoing review and adaptation depending on the evolution of other environmental issues.

6) <u>Effluent Limits Discharge for Water Pollution Control Centres (WPCCs)</u>

The City's three WPCCs have not been licensed in their entirety under *The Environment Act.* Part of the CEC hearing process to be convened will be to establish appropriate discharge limits for licensing purposes. The effluent constituents of concern were identified as:

- 5-day Carbonaceous Biochemical Oxygen Demand ($CBOD_5$) associated with the carbonaceous component of wastewater. Biodegradation of carbonaceous matter remaining in final effluent discharges can negatively impact the dissolved oxygen (DO) levels in the receiving stream.

- Total suspended solids (TSS). Concentrations above a certain concentration can impair the ability of fish and other organisms to respire sufficient levels of oxygen from the water column to sustain life.

- Bacterial contamination, as measured by the fecal coliform indicator organism, to protect the recreational use of the Rivers.

The City's WPCCs provide the best practicable secondary treatment to adequately protect the river environment. Disinfection is essentially complete at the SEWPCC and WEWPCC, and the NEWPCC will be completed in 2004, which will satisfy compliance with microbiological objectives.

7) Reduction of Nutrients in Effluent Discharges

The Province believes it has evidence of increasing concentrations of nutrients, that is nitrogen (N) and phosphorous (P), in the surface waters of southern Manitoba. The enrichment of surface waters by these nutrients can adversely affect water quality and lead to such problems as excessive algal and aquatic weed growth. Manitoba Conservation has embarked on a Provincial Nutrient Management Study to examine these effects and develop an implementation strategy to minimize nutrient loading from both point and non-point sources. Much technical work is still to be done and significant public consultation by the Province is expected. As a result, an implementation strategy is 2 to 3 years away.

The concern expressed by Manitoba Conservation is founded on the possible trend towards the eutrophication of Lake Winnipeg, and the overloading of the Red and Assiniboine Rivers by nutrients (N and P) from point and non-point sources and need to limit and/or reduce the loading from these sources. There are major uncertainties associated with the need for nutrient control by the City.

The nutrient discharges from Winnipeg are a small proportion of the nutrient load to Lake Winnipeg. All dry and wet weather discharges from Winnipeg represents about 10.5 percent of the total annual phosphorus load and 7.9 percent of the total annual nitrogen load to the south basin of Lake Winnipeg. Wet weather nutrient loading alone from CSOs and land drainage represent about 1.0 percent of the total annual nitrogen and phosphorus load to Lake Winnipeg. Nutrient control of N and P at the three WPCCs, considered as point discharge sources, is estimated to cost $181 Million. Since nutrient control is a basin-wide issue, the requirement for Winnipeg to implement nutrient reduction at the WPCCs cannot be determined until Manitoba Conservation has completed their Nutrient Management study and public consultation program. Further, if it is decided that nutrient control of Winnipeg plants is cost effective, the cost should be borne by all lands contributing nutrients on a proportional basis.

8) Wastewater System Reliability

Part of the CEC deliberations will be to consider the reliability and backup capacity of the City's collection and treatment systems.

Under normal circumstances, all wastewater flows generated during dry weather conditions in the sewer districts tributary to the North End Water Pollution Control Centre (NEWPCC) receive fully secondary treatment before being discharged to the Red River.

At approximately 1:15 p.m. on September 16, 2002, pumping of all raw sewage at the North End Water Pollution Control Centre (NEWPCC) was interrupted. Analysis of the NEWPCC surge well records and corresponding river levels found that overflow to the Red River started at about 5:00 p.m. on September 16, 2002 and ceased at approximately 2:00 a.m. on September 19, 2002. Based on a review of system records and conditions, the full duration of the overflow event was estimated at about 57 hours and resulted in approximately 427 ML (427,000 m^3) of untreated wastewater to be spilled to the Red River. The nature of such an event is that any impact would be small and short lived.

Design of permanent works to isolate all three pump wells is currently underway. Concurrently, a second program was initiated to allow the safe extraction of the defective valve. The extraction is extremely difficult and requires careful planning and execution under a controlled situation. It is anticipated that the valve extraction and examination of the valve failure mechanism will be completed by early-December 2002.

The WWD has an ongoing capital improvement and asset management process to identify works required to maintain the wastewater collection and treatment system operating safely, reliably and cost effectively. The actions to be undertaken subject to Council approval of funding include:

- Risk and Criticality Assessment of WPCCs, starting in 2003
- NEWPCC Surgewell-Main Pump Condition Assessment and Upgrading starting in 2003
- Condition Assessment of River Crossings, Forcemains and Pumping Stations, starting in 2003
- Reliability Upgrades at the WPCCs, starting in 2003
- Various Interceptor Condition Assessment and Sewer Rehabilitation Works, starting 2004.

9) Other Relevant Environmental Issue - Biosolids Management

The solids residual from wastewater treatment after digestion and dewatering is referred to as to biosolids. While not included in the Terms of Reference for the CEC at the planned hearings, future regulatory review processes will engage a review of the City's biosolids land application program. A major study is currently underway reviewing the City's biosolids land application practices including review of metals loading on soils, nutrient application rates, and winter spreading operations. The study is also investigating and other management options and costs.

Evolving regulations and practices elsewhere suggest that modifications to the current practice may be required to produce a product that has alternative end uses other than land application. Early indications are that modifications could involve capital expenditures of up to $50 Million. The potential for the need to expend $50 million has

been included in the Pollution Prevention Plan. Results of the Biosolids Management Study will be reported to Council in 2003.

FINANCIAL IMPACT:

The following financial impact statement for this project has been prepared in accordance with the recommendation adopted by Council on December 13, 2000.

Financial Impact Statement

Date: November 1, 2002

Project Name:

First Year of Program **2003**

Updated Status of Wastewater Related Pollution Prevention plans in Preparation for Upcoming Clean Environment Commission Hearings

	2003	2004	2005	2006	2007
Capital					
Capital Expenditures Required	$ 10,820,000	$ 19,250,000	$ 15,400,000	$ 1,500,000	$ 1,500,000
Less: Existing Budgeted Costs	10,820,000	19,250,000	15,400,000	1,500,000	1,500,000
Additional Capital Budget Required	$ -	$ -	$ -	$ -	$ -
Funding Sources:					
Debt - Internal	$ -	$ -	$ -	$ -	$ -
Debt - External	-	-	-	-	-
Grants (Enter Description Here)	-	-	-	-	-
Reserves, Equity, Surplus	10,820,000	19,250,000	15,400,000	1,500,000	1,500,000
Other - Enter Description Here	-	-	-	-	-
Total Funding	$ 10,820,000	$ 19,250,000	$ 15,400,000	$ 1,500,000	$ 1,500,000
Total Additional Capital Budget Required	$ -				
Total Additional Debt Required	$ -				
Current Expenditures/Revenues					
Direct Costs	$ -	$ -	$ -	$ -	$ -
Less: Incremental Revenue/Recovery	-	-	-	-	-
Net Cost/(Benefit)	$ -	$ -	$ -	$ -	$ -
Less: Existing Budget Amounts	-	-	-	-	-
Net Budget Adjustment Required	$ -	$ -	$ -	$ -	$ -

Additional Comments: Financial Impact based on cash flow projections. Funding provided from The Environmental Projects Reserve (EPR). This is the first five years of a 50 year plan as described in this report. Expenditures in 2006 and 2007 have been reduced to allow contributions to the EPR to accumulate which will be utilized to fund biosolids disposal program improvements projected to be required in 2007 to 2010.

Moira L. Geer C.A.

In preparing the report, there was consultation with and concurrence by:

- Not applicable

This Report Submitted By:

Department: Water and Waste
Division: Engineering
Prepared by: M. A. Shkolny, P. Eng. and N. T. Szoke, P. Eng.
File No. 020-17-01-01-00 and 020-17-08-01-00

Appendix A – Terms of Reference for CEC Hearings

Public Hearings - City of Winnipeg Wastewater Collection and Treatment Systems

On October 3, 2002 the Minister of Conservation, the Honourable Steve Ashton, requested that the Commission convene public hearings to review and provide advice and recommendations respecting the City of Winnipeg's wastewater collection and treatment systems.
The Commission has responded by scheduling the hearing as follows:

Winnipeg - Winnipeg Convention Centre, 375 York Avenue, Winnipeg

- January 20, 21 and, if necessary, 22, 2003
- 13:00 - 17:00 and 19:00 - 22:00 (January 20 and 21)
- 09:00 (January 22)

Selkirk - Selkirk Banquet and Conference Centre, 168 Main Street, Selkirk

- January 27 and, if necessary, 28, 2003
- 13:00 - 17:00 and 19:00 - 22:00 (January 27)
- 09:00 (January 28)

Public Hearing Notice

Background

In June of 1992, the Clean Environment Commission issued a report entitled, "Report on Public hearings. Application of Water Quality Objectives for the Watershed Classification of the Red and Assiniboine Rivers and Tributaries Within and Downstream of the City of Winnipeg." That report contained a number of recommendations that related to the City of Winnipeg's wastewater collection and treatment systems. The Manitoba government accepted those recommendations. Subsequently, the City, in consultation with Manitoba Conservation and the scientific community, has implemented upgrades, undertaken studies and prepared plans to improve its systems.

A serious malfunction occurred at the North End Sewage Treatment Plant on Sept. 16, 2002 resulting in the discharge of untreated wastewater into the Red River raising concerns with respect to the backup capability of the systems.

Mandate of the Hearings

The Clean Environment Commission shall, pursuant to clause 6(5)(b) of The Environment Act, conduct public hearings to review the City of Winnipeg's wastewater

collection and treatment systems and to receive public comments and concerns respecting the systems.

Following the hearings, the Commission shall provide a report, with advice and recommendations, to the Minister in accordance with subsection 7(3) of The Environment Act.

The Commission shall provide the report within 6 months of the date of the Minister's request to hold hearings.

The Commission may at any time request that the Minister of Conservation review or clarify these Terms of Reference.

Scope of the Review

The Clean Environment Commission shall review the City of Winnipeg's wastewater collection and treatment systems and related public concerns and provide advice and recommendations on:

- The reliability of The City's systems, especially the backup capability of the systems to prevent a discharge of inadequately treated sewage to the rivers during malfunctions.

- The appropriate ammonia, nutrient, combined sewer overflow and microbiological limits on effluent from the City's systems necessary to protect the aquatic environment and recreational activities, including in Lake Winnipeg.

- The current and planned effectiveness of the City's systems in treating wastewater to achieve the discharge limits.

- The adequacy of the City's plans and schedule for upgrading its systems.

- The adequacy of processes being followed in reviewing those plans and schedules.

In doing so, the CEC should consider the applicable recommendations in the 1992 Commission report and the recently updated Manitoba Water Quality Standards, Objectives and Guidelines.