# SEWPCC Upgrading/Expansion
# Conceptual Design Report

## SECTION 2 - Regulatory Requirements

## Table of Contents

# 2.0 Regulatory Requirements

## 2.1 INTRODUCTION

The regulatory requirements for the upgrading / expansion of the SEWPCC are primarily based on the Environment Act License # 2716, issued originally by Manitoba Conservation – Environment Assessment and Licencing Branch. A detailed discussion on Regulatory Requirements including regulatory and framework issues, Manitoba Conservation requirements, wet weather bypass implications and license requirements in other jurisdictions was presented previously in Section 3 – Regulatory Framework of the Preliminary Design Report (PDR). This section summarizes the progress made in resolving outstanding issues since the submission of the PDR, and defines the outstanding regulatory issues.

## 2.2 MANITOBA CONSERVATION REVISIONS

The City received a letter from Manitoba Conservation dated June 25, 2007 confirming alteration to the SEWPCC licence as follows:

- Removal of the word "continuously" from Clause 19 c) which refers to leak detection.
- Confirmation that the effluent limits for $cBOD_5$, TSS, TP, TN and ammonia - nitrogen as stated in Clause 28 are applicable during periods when the wastewater influent flow is less than 300,000 $m^3/d$.
- Confirmation that the disinfection limits as defined by Clauses 28 c) and 28 d) for fecal coliform and E.Coli are applicable for flows less than 175,000 $m^3/d$.
- The effluent limits for $cBOD_5$ and TSS as defined by Clauses 28 a) and 28 b) be based on a "30-day rolling average".

In early 2008, the Province issued a “draft” revision to the License. The revision reflects the following changes / modifications to the proposed effluent criteria effective December 31, 2012:

- The requirement of 25 mg/L total suspended solids (TSS) on a 30-day rolling average instead of a 30 mg/L on a “never-to-exceed” basis.
- The imposition of a “never-to-exceed” 5-day carbonaceous biochemical oxygen demand ($cBOD_5$) limit of 30mg/L in addition to the 30 day rolling average limit of 25 mg/L.

No changes were made to the disinfection limits with reference to a maximum flow of 175,000 $m^3/d$ as indicated earlier in the letter dated June 25, 2007.

The City has expressed concern to Manitoba Conservation related to achieving a $cBOD_5$ limit of 30 mg/L on a “never-to-exceed” basis. The main concern is that secondary treatment facilities are typically designed for maximum month loadings (based on a 30-day rolling average of any calendar year) recognizing that the influent wastewater quality will vary daily as well as seasonally. The fluctuation of influent quality normally results in short term variations of $cBOD_5$ in the final effluent and makes it impractical and very costly to design the facility based on the anticipated worst day of the year ("never-to-exceed") to meet the stipulated clause.

The City met with Manitoba Conservation to discuss these concerns and possible proposed changes to the licence. At this meeting they presented data on plant design, operation and costs. The meeting was held on September 24, 2008 and addressed the following key issues:

- An update on the project status was provided.
- The City requested Manitoba Conservation review the issue of effluent quality versus cost benefit related to the inclusion of “never-to-exceed” 30 mg/L $cBOD_5$ limit and presented the following rationale:
  - Designing for the $cBOD_5$ limit of 30 mg/L on a “never-to-exceed” basis results in a very large facility. The oversized facility will operate in a very low load condition (DWF) for up to 50% of the year. BNR facilities are challenging to operate in very low load conditions and while it will produce effluent within the license limits, a smaller plant will produce much higher quality effluent in this condition. Unfortunately, the DWF period corresponds with the most sensitive receiving period. Additionally, it is easier to operate a BNR facility to provide higher quality effluent during an overload event than during a very low load event.
  - Provinces West of Manitoba typically regulate the $cBOD_5$ limits on a monthly average basis. The Red River is a robust river and Manitoba Conservation would be implementing similar standards to other jurisdictions if they imposed a 25 mg/L limit for $cBOD_5$ on a 30-day rolling average.
  - The capital cost implication to the City of the "never-to-exceed" $cBOD_5$ is approximately $60 M. This is based on designing a plant to meet the “never-to-exceed” basis for $263 M as compared to a 30-day rolling average basis for $203 M.
- Request revision to the clauses 28 d) and 28 e) which specifies the effluent fecal coliform and E.Coli to be applicable for flows up to 175 ML/d. When flows exceed 175 ML/d, that portion of the flow <u>in excess</u> of 175 ML/d will not require disinfection prior to discharge. The rationale for the request is based on the following:
  - Proposed UV disinfection facility will match secondary treatment capacity and treat <u>all</u> flows up to 175 ML/d.

- It is impractical to UV raw or primary effluent. The SEWPCC will be designed to handle a pumped flow of 415 ML/d during peak wet weather events and will bypass flows in excess of 175 ML/d. Bypassed effluent is estimated to have a TSS of between 40 and 80 mg/L.
- Disinfection implementing chlorination / dechlorination of the bypassed effluent will require chlorine doses in the order of 20 – 50 mg/L. Chlorine doses in this range will likely result in the formation of chlorinated byproducts, potentially including nitrosodimethylamine (NDMA).
- Bypasses in excess of 175 ML/d will be infrequent and represent a volume of non-disinfected effluent of less than 2% of annual flow.

The Conceptual Design Report (CDR) is based on meeting the effluent limit for $cBOD_5$ on a 30-day rolling average and having a UV facility that treats all secondary treated effluent up to 175 ML/d. **The City is still awaiting further resolution on these issues from Manitoba Conservation as of December 2008.**