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1.0 Introduction

1.1 Background

In the fall of 2002, the City initiated the Biosolids and Residuals Master Planning process to prepare a long-term strategy for the management of the City's wastewater treatment biosolids and water treatment residuals processed at all its facilities up to the year 2025. The Biosolids and Residuals Master Plan was undertaken in accordance with the Class Environmental Assessment process as defined in the *Environmental Assessment Act*. Input was sought during the preparation of the Master Plan from a variety of affected stakeholders including the public, regulators, farming and rural organizations and other interest groups. Alternative biosolids and residuals management approaches were evaluated using a set of criteria that reflected environmental protection, minimizing impacts to the community and capital and operational costs.

The draft BRMP was completed in 2004 and was subsequently released for public review and comment. Due to concerns raised regarding the results of the draft Master Plan, City of Toronto Council endorsed a plan for an independent Peer Review of the draft Master Plan report, focusing on the evaluation methodology.

The Peer Review was undertaken in the fall of 2007 of which a report was issued that outlined a set of recommendations to be considered in the finalizing of the Master Plan that included:

- Enhancing the definition section for improved clarity
- Changing the planning horizon from 20 years to 50 years
- Reviewing criteria and criteria weightings in the decision making model and clearly documenting the steps taken in undertaking calculations and scoring so results could be easily replicated
- Utilizing a statistically valid survey tool to evaluate public opinion and preference
- Reviewing and updating industry best practices and viable biosolids management options

In consideration of the peer review comments, and the most recent biosolids industry practices and technologies, the City would like to update and finalize the Master Plan. This document presents the Terms of Reference for this assignment.

1.2 Intent of Project

The overall objective of this project is to update and finalize the Biosolids and Residuals Master Plan for the City of Toronto for a 50 year planning horizon that incorporates recommendations from the Peer Review Panel Report and reflects the most recent information available regarding biosolids management alternatives.

In preparing the final Master Plan, all technical information, public consultation materials and evaluation results will be used as a basis for developing the final Master Plan. Work that will be undertaken to finalize the Master Plan will include:

1. Updating technical information, including information on the City's wastewater treatment plants, available biosolids management technologies, practices, markets and disposal options, and to incorporate this information into the decision making process.

2. Confirming and documenting the water treatment residuals management approaches that have been implemented or are in the process of being implemented by the City.
3. Updating information on capital and operational costs, and completing full life-cycle costs analyses for every feasible biosolids management alternative.
4. Reviewing the decision-making model used in the draft Master Plan against other decision-making models and updating the decision-making process to reflect industry best practices for decision making, with a goal to balance environmental, social and economic impacts as per the Triple Bottom Line approach to achieve sustainability.
5. Extending the planning period of the Master Plan to 50 years.
6. Using the updated decision-making model to re-evaluate biosolids management options, select the options that best reflect the triple bottom line and to complete a sensitivity analysis to verify the results
7. Consulting with public with the intent to inform the public of the updated project and gain an understanding of public values and concerns so these can be reflected in the new evaluation of biosolids management alternatives.

The final Master Plan will be a stand-alone document that will represent Phases 1 and 2 of the Class EA process, fulfilling all Class Environmental Assessment requirements for Schedule A, A+ and B projects.

2.0 Scope of Work

2.1 Update Present Solids Handling Operations and Future Biosolids Generation Rates

The draft Master Plan was prepared based on biosolids projections to 2021. In this task, these projections will be updated for a 50 year planning period. This task will entail:

- Reviewing and consolidating plant raw wastewater flow and concentration data from 2004 to 2007, and using this data to update mass balances and biosolids generation rates for each treatment plant for both a 20 and a 50 year planning horizon.
- Obtaining and consolidating population and growth projections from City of Toronto staff for the 50 year planning period.
- Using this data to develop wastewater biosolids projections for each wastewater treatment plant service area, respectively.

2.2 Review and Update the Decision-Making Model Used in Ranking and Selecting Biosolids Management Options

The draft Master Plan used a two step decision-making model of criteria and weightings to complete a comparative evaluation of all available biosolids management options and to select the biosolids end use options that best fit the requirements of each wastewater treatment plant. The criteria and weights were developed with input from the Biosolids and Residuals Master Plan Advisory Committee (BRMPAC), members of the public who attended public meetings and City staff.

The Peer Review panel agreed that the decision-making model used was appropriate to the project. However, concerns were expressed that the scoring did not adequately represent the input from the public and stakeholders.

In order to address this concern, a review of the decision-making model will be completed with the goal to have a strategy for each treatment plant that is sustainable and reflects the balance of protecting and enhancing community, environment and economics, or a triple-bottom-line (TBL) approach.

To ensure the final Master Plan reflects this sustainability perspective, the decision making model will be compared to other decision making models available to determine the strengths and weaknesses of the current model. Recommendations will be made to determine what could be refined to balance and enhance the model to reflect the TBL approach.

The original criteria and criteria weightings will be assessed and updated as necessary and how those weightings were determined will be clearly documented.

In order to obtain input on how criteria should be scored, a statistically representative group from the public will be surveyed. This survey will be developed and completed under separate assignment by a specialized marketing firm and will consider using such tools as telephone surveys and focus groups as recommended by the Peer Review Panel in order to obtain information to assist in scoring biosolids management options and treatment plant strategies.

2.3 Review and Update List of Biosolids Management Options and Technologies Available

Using the list of biosolids management options considered in the draft Master Plan, an updated list will be prepared with technologies and end use options that have emerged since the preparation of the draft Master Plan.

Detailed information for each management option will be prepared that will include but not be limited to:

- A description of the option (i.e., what it is, how it works and how it is used)
- Regulatory requirements surrounding its use
- Capital, Operating and life cycle costs
- Environmental and public health impacts
- Operational considerations
- Sustainability

This updated list of biosolids management options will be evaluated using the restructured decision making model framework to create a shortlist of biosolids options that can be considered in management strategies for each treatment plant.

2.4 Evaluate Updated List of Biosolids Management Options Using the Enhanced Decision Making Model

The updated decision making model will be used to evaluate the list of biosolids management options and identify the highest ranked management options. The evaluation approach will be similar to that used in the draft Master Plan, with the following refinements as recommended by the Peer Review:

- The scoring methodology for each criterion will be clearly documented, so that the rationale for scoring each alternative will be transparent and will allow the relative ranking of the performance of options for each criterion.
- Input from a statistically representative survey of the public will be used to support the scoring where public opinion is required.
- Updated costs, emission and greenhouse gas inventories will be used to develop scores for related criteria.

2.5 Evaluate and Identify Biosolids Management Strategies for Each Treatment Plant

Using the highest ranked biosolids management options identified, several biosolids management plant strategies will be formed and scored in a clearly defined method that is well documented using the decision making model for each of the four wastewater treatment plants. All treatment plant strategies will include a contingency management method should the primary management methods become unavailable.

2.6 Document Water Residuals Management Practices

Since the preparation of the draft Master Plan, the City has proceeded with implementation of preferred residuals management strategies for the R.L. Clark Filtration Plant (FP) and the R.C. Harris FP, and is in the process of implementing improvements to residuals management at the F.J. Horgan FP and North Toronto FP. Since these management practices were identified through studies, there is no need to further evaluate options for residuals management for the City. However, for completeness, the final Master Plan will include a summary of rationale for the adopted strategies, and a description of these strategies. In addition, the capacity of processes related to residuals management will be assessed against the 50 year planning period criteria, and recommendations will be developed with regard to when capacity will be reached and the strategies need to be updated.

2.7 Prepare an Implementation Plan for Each Wastewater Treatment Plant

An implementation plan will be prepared for each treatment plant with short, interim and long term goals in order to document the activities, studies and projects required to execute the preferred biosolids management strategies.

3.0 Public Consultation

Public consultation will play an integral role throughout the process of preparing the final Master Plan report. To that end, the public consultation program will include:

- A Notice of Project Commencement, to advise that the draft Master Plan is being updated, and to solicit interested members of the community for the mailing list.
- Newsletters to track study progress, summarize findings to date, indicate next steps for the benefit of the general public and other stakeholders and direct those interested to additional sources of project information. They will contain information about how to get onto the mailing list for future publications, and offer the location and dates for Public Information Sessions
- Two sets of Public Information Sessions at key milestones in the project, each to be held at up to 5 locations (4 in City, 1 in rural community)
 - The first set of Public Information Sessions will present information on the City's treatment facilities and current biosolids management programs and the goals and objectives of the Master Plan update and finalization.
 - The second set of Public Information Sessions will be used to present the results from the Master Plan.

In addition, as part of the update of the decision making model, a third party survey will be conducted of the public through the use of telephone canvassing and/or focus groups. Information obtained from these

surveys will be used in updating and weighing criteria used in the decision making model as necessary. Charge questions and selection of an appropriate survey panel will be done by a third party marketing firm after meeting with the City's project team to understand the scope of the project.

The general public and any interested stakeholders will have an opportunity to comment on the final Master Plan when project documentation is placed on the public record for a 30-day review period, as required by the Class EA process. The start of the 30-day review period will be announced by the Notice of Project Completion, which will be mailed to those on the project contact list, posted on the project web page and published in appropriate local media. The City will respond to written comments received during the 30-day review period. Following the review period, the final BRMP will be brought before the City's Public Works and Infrastructure Committee, and then Council, for approval.

All written comments received during the first 30 day public review period of the draft Master Plan will be answered during finalization of the Master Plan.

4.0 Deliverables

A series of technical memoranda will be prepared for the City at key milestones in the project.

Memorandum No. 1 will present the design criteria and the basis for their development for each wastewater treatment plant for a 50 year planning period.

Memorandum No. 2 will present the process of comparing the current decision making model to other available models.

Memorandum No. 3 will detail the public survey work undertaken, the results and how the results were incorporated into the decision making model.

Memorandum No. 3 will present how the decision making model and scoring methodology was refined and updated.

Memorandum No. 4 will provide detailed information of available biosolids management options and technologies that will be scored using the decision making model.

Memorandum No. 5 will present a step by step rationale for scoring the biosolids management options and outline possible strategies using the highest ranked management options for each of the City's wastewater treatment plants.

Memorandum No.6 will present a step by step rationale for scoring the biosolids management strategies for each of the four wastewater treatment plants and present the highest ranked strategy for each treatment plant.

Memorandum No. 7 will present a plan for each treatment plant on what is required to implement its preferred strategy in the short, interim and long term .