5
CONSTRUCTED WETLANDS

The Transportation and Works Committee recommends the adoption of the recommendations contained in the following report, June 7, 2005, from the Commissioner of Transportation and Works:

1. RECOMMENDATIONS

It is recommended that:

1. Staff be authorized to conduct a preliminary investigation into the feasibility of constructed wetlands at Regional Lagoon sites as outlined in this report.

2. The Region enter into a contract with CH2M Hill in respect of a preliminary investigation in the amount of $80,000 pursuant to the sole source provisions of the Purchasing By-law.

3. The Commissioner of Transportation and Works be authorized to execute a contract subsequent to recommendation 2, subject to the prior review of Legal Services.

2. PURPOSE

This report seeks Council approval to conduct a preliminary investigation into the feasibility of constructed wetlands at Regional lagoon sites and approval to engage CH2M Hill at an upset limit of $80,000. The report provides Council with an overview of constructed wetlands including how they function and what benefits they provide. It also illustrates how constructed wetlands can help realize some of the goals of vision 2026 and the York Region Greening Strategy.

3. BACKGROUND

3.1 General

The Water and Wastewater Branch operates four sanitary sewage treatment lagoons that have been or will be taken out of service in the near future. These sites are at Schomberg, Holland Landing, Sutton, and Mount Albert. The lagoons have or are being replaced with a connection to the trunk sewer system (YDSS) or with a mechanical treatment plant. Alternatives for the decommissioning and restoration of the sites must be considered and an alternative includes the potential conversion of the lagoons to constructed wetlands.

Table 1
Approximate Area of Property and Lagoons

Site	Property Size		Lagoon Size	
	Sq. Meters	Acres	Sq. Meters	Acres
Holland Landing	439000	108	150900	37
Mount Albert	199000	49	18500	5
Sutton	201000	50	55400	14
Schomberg	263000	65	76800	19

In keeping with Vision 2026 and the York Greening Strategy, constructed wetlands achieve Regional goals and objectives. Constructed wetlands are an excellent re-naturalization project, promoting conservation, community education and enhancing wildlife habitat. These actions help foster York Region's image as a leader in environmental strategies.

Staff investigated concepts of constructed wetlands including contacting experts in the application to wastewater treatment. CH2M Hill provided a presentation to staff on their experience including representative project details. CH2M Hill provided a proposal to assist staff in the development of design concepts at each of the four sites including presentations to the public for educational and feedback purposes.

3.2 What are Constructed Wetlands?

Constructed wetlands are engineered wetlands designed to emulate the functions of natural wetlands. They are complex, integrated ecosystems in which plants, animals, micro-organisms and the environment interact. Constructed Wetlands can be used as a part of the treatment system for a community's wastewater. They provide a natural habitat for wetland animals, help to conserve the natural environment and can be used to improve the quality of waste water effluent with minimal environmental impacts.

3.3 Overview of the Use of Constructed Wetlands

A side stream of wastewater effluent would be used to sustain the wetland system and may be considered to partially offset the total flow from the community. Constructed wetlands are being used all over the world to help meet the demand for water quality improvement and to compensate for the loss of natural wetland habitat.
They have been used in Canada for more than 35 years for intentionally polishing wastewater and storm water. In the early 1980's, the Ontario Ministry of the Environment realized the potential of this technology and proceeded with an intensive four-year pilot program to determine the applicability of this technology especially as it pertains to cold-climate regions. The studies show that properly sized for contaminates of concern, a wetland will meet regulated (permit) objectives on an ongoing basis.

Constructed wetlands have been used throughout Ontario not only for water quality improvement but for their environmental and community benefits as well. Environmentally, constructed wetlands are beneficial to local species of birds, mammals, and plants, along with a myriad of other living organisms. The public can enjoy constructed wetlands for viewing wildlife and for educational and research purposes.

The use of wetlands as the primary treatment method at the Regional sites is not feasible due to the volume of flow and high treatment levels required. However, it is proposed that their primary use would be to serve as a habitat for wetland plants and animals.

4. ANALYSIS AND OPTIONS

4.1 Alternative Use of Sites

Alternatives available for the use of the (abandoned) lagoons and property are site dependant but could include use as emergency overflow in case of treatment plant malfunction, restoration to grade (filling in) and available for future use, conversion for other treatment (operations) use or transfer to the local municipality for their use. To be accepted and successfully applied, constructed wetlands will require community and political acceptance and endorsement.

4.2 Relation to Regional Strategies

The use of these sites as constructed wetlands provides additional benefits to several other Regional environmental initiatives.

4.2.1 York Region Greening Strategy

The York Region Greening Strategy was developed to provide a context for Regional decision-making that affects the natural environment. Included in the Greening Strategy is an explicit goal to promote and implement naturalization projects such as wetland rehabilitation and meadow restorations. Advocating the development of constructed wetlands furthers the following Greening Strategy objectives:

- Creation of wetland habitat and additional green infrastructure.
- Community education.
- Increased forest cover.
- Research and monitoring.
- Sustainable development of the Region.
- Enhanced partnerships.

Ducks Unlimited, one of the Region's Greening partners, can be approached to assist in the development of these areas.

4.2.2 Corporate Clean Air Task Force

The Corporate Clean Air task force has been established to identify, develop and recommend corporate clean air actions. Constructed wetlands fit into several of the

ongoing and planned goals outlined in the action plan such as Energy and Environmental Management Systems (EEMS), water conservation, water and wastewater energy feasibility studies, carbon sequestration and the York Greening Strategy.

4.3 Feasibility Investigation

To investigate the feasibility of a constructed wetland, a plan is required to outline how the wetland would function at each site. This would include identifying any constraints and obtaining public and agency input. It is recommended to conduct the feasibility study within the framework of an environmental assessment so that in the event the proposal was to proceed, some preliminary approval requirements would have been met. At the conclusion of the feasibility stage the following will have been identified and achieved:

- Community education on the concepts of constructed wetlands.
- Community and agency input for each site.
- Design concept for each site.
- Constraints and stakeholder issues.
- Estimates on measurements of benefits to air and water quality.
- Preliminary estimates of cost of implementation.

It is proposed that the firm of CH2M Hill be engaged pursuant to the sole source provisions of the Purchasing By-law to assist in conducting the feasibility study at a cost of $80,000 exclusive of GST. CH2M Hill have considerable experience in the full range of services for constructed wetlands study, design, implementation and management having been involved in several hundred wetland projects in Canada, the U.S. and internationally.

4.4 Vision 2026

Vision 2026 supports and promotes the Region's leadership role in environmental strategies and conservation and to balance growth and environment. It also encourages the integration of nature into development in order to create well-designed and liveable communities.

Through Vision 2026 and the Greening Strategy, the Region has committed to enhance our environment by continuing to develop and build on greening strategies.

By giving staff authorization to conduct a preliminary investigation into the feasibility of constructed wetlands, this goal, along with many of the objectives outlined in the York Region Greening Strategy can be realized, including managing and balancing growth with the environment in York Region.

5. FINANCIAL IMPLICATIONS

Converting the lagoon sites to constructed wetlands provides a significant opportunity for York Region to continue to demonstrate leadership on environmental protection and enhancement. However, it will not be the lowest cost option. A conceptual estimate of costs for each site is in the order of $300,000 to $600,000 and is dependant on many factors. The value to the environment, including air and water quality improvement and wildlife habitat creation are not as easily quantified.

There are sufficient funds in the Transportation and Works 2005 budget for this investigation. Preliminary costs will be identified in the 2006 budget in the event that implementation is determined to be feasible.

Part of the consultant assignment will be to determine if funding or grants are available for this conversion including the potential for developer contributions.

6. LOCAL MUNICIPAL IMPACT

Should the project proceed to implementation, it would promote municipal and community education of our natural environment which will have many positive long term effects.

7. CONCLUSION

Authorizing a preliminary investigation into the feasibility of converting lagoon sites to constructed wetlands will enable the Region to promote environmental strategies and actions consistent with Vision 2026 and the York Region Greening Strategy. The investigation will identify issues and constraints with their implementation and determine community acceptance of their application.

The Senior Management Group has reviewed this report.