



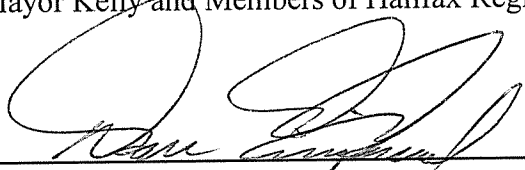
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Halifax, Nova Scotia  
B3J 3A5 Canada

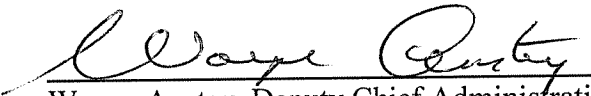
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**Halifax Regional Council  
Committee of the whole  
June 26, 2007**

**TO:** Mayor Kelly and Members of Halifax Regional Council

**SUBMITTED BY:**

  
\_\_\_\_\_  
Dan English, Chief Administrative Officer

  
\_\_\_\_\_  
Wayne Anstey, Deputy Chief Administrative Officer - Operations

**DATE:** June 26, 2007

**SUBJECT:** North Dartmouth Trunk Sewer

**ORIGIN**

Staff.

**RECOMMENDATION**

It is recommended that Regional Council:

1. Authorize staff to start the necessary processes in order to implement Option 3, a gravity sewer along the western shore of Lake Banook, as outlined in the Discussion section of this report.
2. Authorize staff to create easements in the name of the HRWC across any of the HRM lands over which the sewer is to be constructed, given that the HRWC will be the owners of the sewer once the merger is completed and the sewer constructed.

## **BACKGROUND**

The North Dartmouth Trunk Sewer has been contemplated to service the lands in the North Dartmouth area since the late 1960s/early 1970s. The Metropolitan Area of Halifax, Dartmouth and Halifax County - Regional Pollution Control Study, carried out by the Metropolitan Area Planning Commission (MAPC) in 1977, indicated that the sewage flows from lands in the North Dartmouth area be collected and directed towards Dartmouth Cove. A report on the conceptual design of the North Dartmouth Trunk Sewer was prepared for the City of Dartmouth by Interprovincial Engineering Ltd in June 1988. The North Dartmouth Planning Study prepared for the Burnside Industrial Park by Environmental Design and Management in April 1994 also makes reference to the need for the trunk sewer.

The original study area includes lands which were designated "Urban Settlement" under the recently completed HRM Regional Plan. This designation allows an area to be considered for a more detailed secondary planning process known as a "Master Plan", if the Municipality can afford the cost of providing municipal services.

The oldest and most downstream section of the North Dartmouth Trunk sewer presently ends on the western shore of Lake Banook, near Brookdale Crescent. This section is comprised of a 1200 mm concrete pipe installed in the late 1950s and early 1960s. Generally, the trunk sewer is located in the backyards of properties along Lake Banook, however, there are a few sections literally within the lake. From Lake Banook, the trunk sewer continues downstream across the former Starr Manufacturing property, and terminates at Dartmouth Cove. As part of the Harbour Solutions Project, flows up to four times average dry weather flow will be intercepted at Dartmouth Cove and will be delivered to the proposed Dartmouth Wastewater Treatment Facility.

A newer and upstream section of the North Dartmouth Trunk Sewer was constructed in the late 1990s in conjunction with the Lakeshore Park residential subdivision development. The limits of this section of the trunk sewer extend from Lakemist Court to the end of Lake Park Terrace. It is comprised of a 900 mm concrete pipe and has been sized to serve the ultimate sewershed. Currently, this section of the trunk sewer temporarily terminates at the Lake Park Terrace Pumping Station. This station was intended to be only an interim measure and was sized only to serve the MacCulloch lands.

Recently, the most upstream section of the North Dartmouth Trunk Sewer was constructed in conjunction with the Dartmouth Crossing development. This section of the trunk sewer extends from the end of Lake Park Terrace to Dartmouth Crossing. It is comprised of a 900 mm concrete pipe and has been sized to serve the ultimate sewershed.

The North Dartmouth Trunk Sewer is the sewer that has been proposed to service a large area of primarily undeveloped land in North Dartmouth. The size of the sewershed is approximately 1760 hectares and is shown on Figure 1 (shaded area). This area includes:

Private development immediately to the east of Burnside Industrial Park and City of lakes Business Park, known as Dartmouth Crossing;

HRM lands that are intended for future industrial development, and that are commonly referred to as Burnside North; and

Privately owned lands on the east side of Lake Charles that are designated Urban Settlement under the Regional Plan, known as Dartmouth East/Port Wallis Master Plan Area.

The original plan for the North Dartmouth Trunk Sewer involved a continuous gravity pipe system from the upper most reaches of the sewershed to its termination at Dartmouth Cove. However, the trunk sewer as it exists today has a missing link or gap. It is the section between the Lake Park Terrace Pumping Station to Brookdale Crescent.

## **DISCUSSION**

The North Dartmouth Trunk Sewer Study was completed in March, 2007. The study investigated the options available to bridge/fill in the missing link. Three options were identified:

1. New pumping station and forcemain
2. Deep gravity sewer along HRM street rights of way
3. Gravity sewer along the western shore of Lake Banook

### **Option 1 - New Pumping Station and Forcemain**

This option involves replacing the existing Lakeshore Park Terrace Pumping Station with a new and much bigger pumping station. Currently, upgrades to the pumping station are being implemented to increase capacity to the maximum extent possible. However, these measures are limited and provide only enough capacity to service the existing flows from the MacCulloch lands and the projected flows from Dartmouth Crossing up to January 2009.

In order to service the near future and ultimate development of the sewershed, an entirely new pumping station is necessary. The new station will be significantly larger, with an increase from the existing capacity of approximately 7.4 L/s to 1655 L/s. The work involved will also include constructing a large 900 mm diameter forcemain, up sizing local gravity sewers from 200 mm to 900 mm diameter to receive the higher flows, and a new building completed with odour control and back up power systems. The forcemains and gravity sewers would generally be installed within residential streets. If the proposed pumping station were to be constructed, it would be very large - the fifth largest pumping station in all of HRM. Finding space for a pumping station of this size will be a challenge and may require either a variance from HRM's Municipal Service Systems Guidelines and/or the acquisition of additional land.

### **Option 2 - Deep Gravity Sewer**

The furthest upstream section of the existing North Dartmouth Trunk Sewer between Lakemist Court and Dartmouth Crossing terminates at the Lakeshore Park Terrace Pumping Station. The lower, downstream end of the existing North Dartmouth Trunk Sewer is located along the western shoreline of Lake Banook near Brookdale Crescent. This option involves constructing a single section of deep gravity sewer generally along existing street rights of way between these two points. The sewer would vary in depth up to 15 m, which is well in excess of the 5 m required in HRM's Municipal Service Systems Guidelines.

### **Option 3 - Gravity Sewer Along Western Shore of Lake Banook**

Similar to option 2, this option involves constructing a section of gravity sewer in order to bridge the missing link. However, instead of a deep gravity sewer, this option would involve a gravity that would follow across land near Lakemist Court and then continue southward along the western side of Lake Banook. The near shore section of the trunk sewer would likely be constructed out of a continuous pipe material, thus eliminating pipe joints. There would also be few manholes or access points and these would be located at the far ends, so that the sewer would only be accessible from Lakemist Court and Brookdale Crescent. This will greatly reduce the risk of exfiltration from and/or infiltration into the trunk sewer.

The estimated capital and 100 year life cycle costs in 2007 dollars for the three options are as follows.

Options	Capital Cost (\$ millions)	Life Cycle Cost (\$ millions)
1. New Pumping Station and Forcemain	6.6	16.6
2. Deep Gravity Sewer	10.5	10.8
3. Gravity Sewer along Lake Banook	4.2	4.5

Option 3, a gravity sewer along the western shore of Lake Banook, is significantly less costly than the other options from a capital and life cycle cost perspective. This option provides for a more reliable and economic system from the perspective of maintenance, operation and rehabilitation. In addition, this option has a lower risk of wastewater overflows. Further, this option avoids the creation of the fifth largest pumping station in HRM. Pumping stations due to their nature typically represent capacity restrictions and points of wastewater overflow.

Lastly, a gravity sewer option has the benefit of requiring the least amount of energy for operation, which is reflected in the life cycle cost and has long term environmental benefits such as the reduction of greenhouses associated with consuming energy. The risks associated with this option are known and can be successfully managed.

*Regulatory Approvals*

All three options will require regulatory approvals to a varying degree. Due to location of the proposed trunk sewer in option 3, it will involve a detailed review process. Staff have conducted preliminary discussions with the various regulators, however, before any further progress can be made, detailed design information must be developed. The regulatory review and permitting process can be time consuming and may involve a HADD which is a mitigative process for the "harmful alteration, disruption or destruction" of fish habitat under the Federal Fisheries Act.

*Budget*

The location of the proposed trunk sewer in option 3 poses a number of challenges with respect to construction. The sensitivity of the environment, strict regulations and close public scrutiny are factors that may pose risks with respect to costs. In addition, it is likely option 3 will be the subject of a HADD. Under this process it may result in a payment in lieu of destruction of fish habitat or some other form such restoration of habitat at another location. It is unknown at this time what the outcome will be given the level information available and that only preliminary discussions have taken place.

*Schedule and Implementation*

There are scheduling and implementation challenges and risks associated with option 3. The hosting of the 2008 national and 2009 world canoe championships creates very tight time restrictions on the project. Scheduling the work around National and International Canoeing Events and the limited environmental window will indeed be a challenge.

Due to location of the proposed trunk sewer in option 3 being near the start line for the 1000 m race course and the time required to complete the construction, the first and only opportunity to complete the work will be through the fall and winter of 2008.

Considering the above and time restrictions, it may mean the project will be sensitive to delays associated with weather impeding work. The preferred season to complete the work would be summer through to fall.

The proposed works must be completed in the dry due its location and strict regulatory requirements. This means either the lake level must be lowered or a coffer dam surrounding the area must be built. Using a coffer dam technique may increase the capital cost and will increase the time required to complete the work.

A major advantage to lowering the lake is that all other in-water/near water work can be carried out at the same time. Some of this work is required by private landowners and others are required by canoe clubs and the Municipality. One significant project is the reconstruction of the 200 Waverley Road Pumping Station. Based on the Capital Project Priority Rating process approved by Council, this pumping station project is rated as a Priority One project.

Another significant project is the dredging of the nose of a shoal which protrudes into the race course, and creates drag on boats in lanes 9, 8 and 7. In addition to the coordination opportunities, it is likely that lowering the lake will reduce the capital costs involved in the 200 Waverley Road Pumping Station project.

Disadvantageous to lowering the lake include risks involved in not having enough time or sufficient weather to recharge the lake to normal levels prior to the 2009 world canoe championships. This means that the lake would be lowered immediately following the 2008 national canoe championships and construction would take place through the fall and winter with the lake levels allowed to rise in the late winter and spring. Calculations are being carried out to ensure that adequate waters would be available and that the lake levels could be managed. It is possible to offset this risk by using Lake Mic Mac and/or Lake Charles as storage and possibly elevating the levels to provide extra insurance that Banook Lake could be sufficiently recharged. A detailed analysis of this measure would be included in the detailed design of the trunk sewer.

### ***Integration with Sullivans Pond Banook Masterplan***

This spring, HRM has been carrying out a masterplanning exercise for the public lands and amenities surrounding Sullivans Pond and Lake Banook. This will result in recommendations as to how these lands may be improved to meet the needs of the community and how Lake Banook as a world class paddling basin may better accommodate international, national and local athletes. A series of public meetings are being held as well as multiple focus group workshops. A stakeholder advisory committee is providing regular input and review on behalf of a cross section of public interests. These interests include local residents, the paddling community, first nations, and wildlife groups.

The preliminary results of the Dartmouth Trunk Sewer Study were known just prior to commencing the masterplan. An exploration of how option 3 would impact the lake was incorporated into the exercise. The masterplan is in its draft stage it is presently going through final public reviews.

As it pertains to Option 3, discussions have been held and some of the issues and their associated mitigative measures have been explored. They include the following and are discussed in detail in appendix A.

- Impact upon the Paddling Course
- Impact Upon immediately Adjacent Landowners
- Impact upon Landowners around the Lake
- Impact Upon Public Park Users
- Impact Upon Habitat
- Cultural Assets

***Public Consultation***

Staff feels that public consultation is vital to the successful implementation of whichever option Council chooses to pursue. At this point the schedule will not support a protracted consultation process that leaves all of the options on the table. Staff feel that a good amount of concerns regarding option 3 have been discussed and a set of general principles and practices to mitigate concerns and in some cases improve the area where the pipe will be laid has been developed. Therefore, staff are recommending that any further public consultation be tied to the option which council directs staff to pursue and those consultations follow the recommended course as outlined below.

General comment can be gathered as part of the review of the Banook/Sullivans Pond Masterplan. Focus group sessions will be held to disseminate information and gather feedback from stakeholder groups including but not limited to landowners around Lake Banook, the paddling community, first nations and the Dartmouth Lakes Advisory Board and Shubenacadie Canal Commission.

Additional opportunity for public input will result as part of the regulatory approval process required for a project such as this. For example, it is likely that a stage one environmental assessment process will be required as part of the Federal Fisheries approval, the public and other stakeholders will be able to make comment through that process and will provide valuable feedback for staff as they go through the permitting process.

Based on public feedback to date, staff are comfortable with moving forward with detailed design. In conjunction with moving forward, staff are cognizant of the need for attention to details and making park, lake and environmental issues a primary component of the project. This will result in the mitigation of concerns and provide an opportunity for an overall improvement of lands and the lake for public use. Guiding principles for this process includes but is not limited to;

- Staying close to shore to minimize disturbance into the lake and to the existing shoreline tree stands.
- Reestablishment of a natural shoreline with reinstated habitat in areas where the pipe runs under the lake bottom.
- Minimize construction impact upon the tree stands where the pipe runs under land.
- Replant those areas which are disturbed as required for construction but not those areas required for maintenance access and public pathway
- Creation of a new public pathway connecting to existing trails and forming a loop around the lake as part of the overall masterplan.
- Work with adjacent land owners to address their concerns.

- Coordinate all other in water work (both public and private) to take advantage of lower lake levels should it be decided to lower the lake during the trunk sewer construction period.
- Conducting a archeological survey of the pipe path for cultural assets

### **BUDGET IMPLICATIONS**

There are no direct budget implications arising from this report. Should Regional Council approve the staff recommendations, preparations will commence immediately to start the design and construction process.

Pending final approval of the transfer of HRM Wastewater Services to the HRWC by the NSUARB, this project will be funded and executed by the HRWC subject to the approval of the NSUARB. Funding for this project has been identified in the HRWC Two Year (2007/8 and 2008/9) Stormwater and Wastewater Business Plan.

If the Banook Shore option is selected, most of the estimated capital cost of \$5.2M (\$4.2M capital plus a very conservative \$1.0M for HADD) may be recoverable from new development in the long term if a master plan is initiated and successfully completed for Dartmouth East/Port Wallis lands. Essentially there are three developments in the North Dartmouth Trunk Sewershed that will potentially contribute capital cost contributions: Dartmouth Crossing (North American Developments), Dartmouth East/Port Wallis, and Burnside North (HRM Business Parks). Calculation of the capital cost contribution (CCC) share for each of these developments is progressing. The CCC share required from HRM Business Parks for Burnside North, roughly estimated at \$2.1M and yet to be confirmed, will need to be budgeted in the 2008/9 HRM Business Plan. Given the uncertainty of recoveries from the Dartmouth East/Port Wallis lands at this time, the HRWC will likely have to cover this 'over-sizing' share initially and recover the funds from future development when and if it occurs.

Should Regional Council wish to proceed with either of the other project approaches, deep sewer or the pumping station, significant additional capital funds will be required up front and, therefore, both the HRWC Two Year Stormwater/Wastewater Business Plan and the HRM Business Plan will need to be revisited by staff to ensure adequate funding is available through reallocation.

### **FINANCIAL MANAGEMENT POLICIES / BUSINESS PLAN**

This report complies with the Municipality's Multi-Year Financial Strategy, the approved Operating, Capital and Reserve budgets, policies and procedures regarding withdrawals from the utilization of Capital and Operating reserves, as well as any relevant legislation.



## ALTERNATIVES

The other two options or the status quo. A new pumping station and forcemain has the greatest life cycle cost and is the least reliable system from an operational point of view. Pumping Stations by their nature can create capacity restrictions and pose a high risk to overflowing wastewater. If the pumping station were to overflow, it would represent a significant environmental impact to Lake Mic Mac and Banook. A deep gravity sewer has the greatest capital cost and would pose significant challenges to maintain, operate and rehabilitate because of its depth. Leaving the North Dartmouth Trunk Sewer system as is would create a capacity limitation. The current system is limited by the maximum capacity of the Lake Park Terrace Pumping Station which is projected to provide capacity for new growth up to January 2009. Therefore, staff do not recommend any of these alternatives.

## ATTACHMENTS

Appendix A - Map of North Dartmouth Trunk Sewer

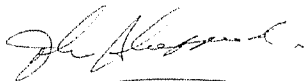
Appendix B - Public Consultation Issues and Associated Mitigative Measures

A copy of this report can be obtained online at <http://www.halifax.ca/council/agendasc/agenda.html> then choose the appropriate meeting date, or by contacting the Office of the Municipal Clerk at 490-4210, or Fax 490-4208.

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Report Prepared by: Ian Guppy, P.Eng., Sr. Environmental Engineer, 490-5212

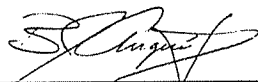
Report Approved by:



John P. Sheppard, P.Eng., Manager, Environmental Engineering Services, 490-6958

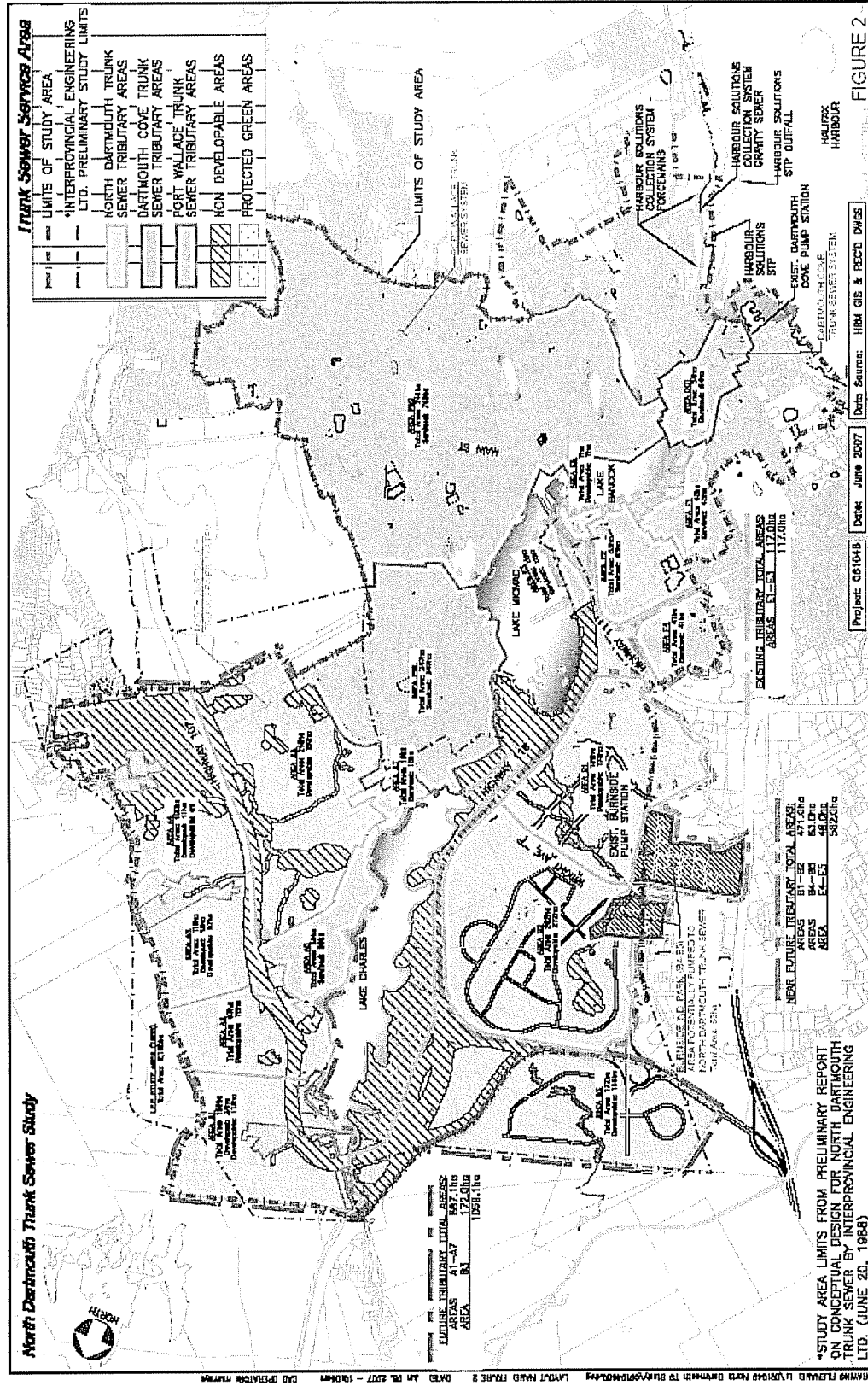
Financial Approval by:

Catherine Sanderson, Senior Manager, Financial Services, 490-1562



Report Approved by: Brad Anguish, P.Eng., Director, Environmental Management Services, 490-4825

# Appendix A



## Appendix B

### Public Consultation Issues and Associated Mitigative Measures

#### *Paddling Course*

1) Wind - As a premiere paddling basin changes to buildings and major tree stands can affect wind direction and predictability on the course. This can effect particular segments of the course and/or particular lanes. International competitions strive for as much consistency as is reasonable possible to ensure the fair competitions. The in water route chosen seeks to lessen the possibility for wind alteration by choosing to affect trees only on the backside of three drumlins along the course and pulling back from the race course at the south end of the pipe alignment. Of the total route of 500 metres approximately 90 m impact woodlands. Efforts are being made to find ways to further reduce any potential wind impact by reducing the swath width required for the construction from 10 m to 6 m and even less in places. Wind consultants are being employed to predict the effect of various scenarios upon the race course.

2) Wash - Boat wash reflected off the shoreline and back onto the course can create chop, and thereby impact individual paddlers during a race. Option 3 requires alterations to the shoreline which has the potential to impact the race course in this fashion. To mitigate this, the current thinking is to recreate a natural shoreline with a shallow shoreline slope to reduce reflection. The creation of an in water shelf for aquatic plants and shoreline planting of willow and dogwood will serve to absorb wash.

#### *Adjacent Landowners*

Preliminary analysis of the former Y property at the north end of the lake has established HRM's intent to turn the shore line along the Y property into a public park and trail system.

#### *Public Park Users*

Currently these park lands are as simple woodlands with no formal uses. At public meetings regarding the Sullivans Pond/Banook masterplan participants expressed a strong desire for a secondary trail on the west side of Banook to form a loop around the lake with the existing active transportation trail on the east side. The intention was to put a trail through this area (on land) anyway. Using the trunk sewer route to accommodate a trail helps to achieve this objective and actually produces a better trail. It also provide new spectator areas for the race course.

A second public desire falling from the masterplan was to leave this area as natural as possible. The proposed routing for the third option results in a natural shoreline and a treed area which is left relatively intact.

### *Habitat Protection*

The public also expressed a desire to ensure that both aquatic and terrestrial habitat remained on the west side of the lake as well as other areas. Replacement of trees to the side of the path and reinstatement of shoreline plants. A study of the existing conditions would be required to ensure that the area could be reinstated to support if not enhance the present ecosystem. This may include stockpiling and reuse of existing shoreline materials.

The project is going to result in a HADD. The masterplan has identified the effect of storm water with elevated temperatures running off of asphalt parking lots and roads into the lake is having an effect upon the water quality of the lake. The masterplan proposes to create deep water cooling ponds for municipal storm water prior to entering the lake. These improvements are candidates for HADD.

### *Cultural Assets*

It is known that this area has a long history of settlement and that the present near shore area of lake Banook was habitable dry land prior to the lake level being raised in the 1800s. Artifacts have been found when the lake levels were dropped in the past. Any work in the area, both on shore and in water would require a archaeological survey prior to construction.