

TORONTO STAFF REPORT

September 1, 2006

To: Works Committee

From: Lou Di Gironimo, General Manager, Toronto Water

Subject: Don and Waterfront Interceptor Trunk Capacity and CSO Control Project
(Wards 19, 20, 26, 27, 28, 29, 30, 31, 32 and 35)

Purpose:

To report on undertaking a comprehensive Class Environmental Assessment study to: (a) address the twinning of the existing Coxwell Sanitary Trunk Sewer; (b) provide sufficient dry weather capacity within the Don Sanitary Trunk and Waterfront Interceptor Sewers to accommodate future growth projected in the City's new Official Plan and Waterfront Revitalization Plan; and (c) integrate the projects identified within the City's Wet Weather Flow Master Plan for the control of combined sewer overflow and stormwater discharges along the Inner Harbour and the Don River.

Financial Implications and Impact Statement:

Multi-year funding to undertake the Class Environmental Assessments for the: twinning of the Coxwell Sanitary Trunk Sewer; Don Sanitary Trunk and Waterfront Interceptor Trunk Sewer capacity upgrades; and the wet weather flow treatment strategy is available within Toronto Water's approved 2006 Capital Budget under Capital Project "SWM INA/EA" – Account No. CWW447.

The funding already approved for these projects would be redirected towards funding the estimated \$3 million Class Environmental Assessment study proposed in this report, and the necessary cashflow adjustments will be incorporated as part of Toronto Water's forthcoming 2007 Capital Budget submission. This funding advance the Environmental Assessment portions of the Wet Weather Flow Master Plan projects only. The capital funding to advance the implementation of these projects is not being requested at this time.

The Deputy City Manager and Chief Financial Officer has reviewed this report and concurs with the financial impact statement.

Recommendations:

It is recommended that:

1. The General Manager, Toronto Water, undertake the development of a comprehensive Class Environmental Assessment study which will address the following issues:
 - a) twinning of the Coxwell Sanitary Trunk Sewer;
 - b) identifying the system upgrades necessary to service future growth as anticipated in the City's new Official Plan, within the Don Sanitary Trunk Sewer system;
 - c) identifying the system upgrades necessary to service future growth as anticipated in the City's new Official Plan and Waterfront Revitalization Plan, within the Waterfront Interceptor Trunk Sewer system;
 - d) determining the ultimate configuration and design of the Lower Don River and Inner Harbour wet weather flow control storage systems identified in the WWFMP; and
 - e) developing a system-wide dewatering and treatment strategy for wet weather flows which will be intercepted by the various underground storage systems identified in the City's Wet Weather Flow Master Plan;
2. The General Manager, Toronto Water, upon completion of the Class Environmental Assessment study, report to Works Committee on the adjustments which may be necessary to the WWFMP implementation schedule and the implications for Toronto Water's Capital Program Planning and Budget; and
3. The appropriate City Officials be authorized and directed to take the necessary action to give effect thereto.

Background:

Don Sanitary Trunk Sewer

The Coxwell Sanitary Trunk Sewer is arguably the most critical trunk sewer section in the City, servicing about 35% of Toronto (approximately 750,000 residents) within the Don Sanitary Trunk Sewer system, conveying peak sanitary sewer flows of about 400 million litres per day.

The Coxwell Sanitary Trunk Sewer was constructed in the 1950s to depths reaching 40 metres,

with maintenance hole spacing extending to distances of about 1.5 km, well over today's design standards. Given the trunk sewer's depth, exceptionally long maintenance hole spacing, and high flow velocities, detailed inspections and condition assessments are not possible. This critical section of trunk sanitary sewer system has no redundancy to allow for re-routing of flows in the event of an emergency such as a structural failure or for routine maintenance purposes. Therefore, Toronto Water is planning to initiate a Class Environmental Assessment (Class EA) project in 2006 to advance the "twinning" of the Coxwell Sanitary Trunk Sewer (Figure 1) to provide redundancy and system security. The Class EA project will determine the optimum sizing and alignment of this new trunk sewer.

Further, in light of the recently approved Official Plan, there is also a need to assess the system upgrades required within the Don Sanitary Trunk Sewer system to support the population growth projected within the City's approved Official Plan. This assessment will also require undertaking a requisite Class EA project.

Waterfront Interceptor Trunk Sewers

A preliminary assessment of the existing Low Level, High Level and Mid-Toronto Interceptor systems which services the Downtown and Waterfront areas, has determined that there is sufficient capacity to service the immediate developments (East Bay Front and West Don Lands). However, additional dry weather capacity upgrades will be necessary to provide servicing for the ultimate build-out of the waterfront. This Waterfront Interceptor Trunk Sewer system also provides for limited wet weather flow control to the Inner Harbour. Therefore, Toronto Water is planning to initiate a Class EA project in 2006 to determine the system upgrades necessary to service the future growth anticipated for the City's Waterfront projects.

Combined Sewer Overflow Control and Treatment

Don River Watershed

The City of Toronto's Wet Weather Flow Master Plan (WWFMP) identified a series of underground storage facilities to intercept the flow from 27 combined sewer overflows and 19 stormwater discharges along the lower reaches of the Don River (Figure 2) and 13 combined sewer overflows and 6 stormwater discharges along Taylor-Massey Creek during wet weather. These include the Taylor-Massey Creek tunnel, the Stan Wadlow Park storage tank, East York Cardona/North Toronto Treatment Plant (NTTP) tunnel and the Lower Don tunnel (Figure 3). The implementation of these projects would also require the completion of separate Class EA's.

Inner Harbour

The Wet Weather Flow Master Plan identified two underground storage tunnels, the West Inner Harbour Tunnel (west of the Don River) and the East Inner Harbour Tunnel (east of the Don River) (Figure 3), along the waterfront to intercept wet weather flows from 11 combined sewer overflows and 16 stormwater discharges along the Inner Harbour (Figure 2). This too requires the completion of one or more Class EA projects.

It should be noted that the Inner Harbour storage tunnels proposed in the WWFMP, while providing wet weather flow relief for the Waterfront Interceptor Trunk Sewer system, will also free up system capacity to service future growth.

In addition to the wet weather flow storage tunnels proposed along the lower Don River and the Inner Harbour, the WWFMP also identified a need to provide treatment works for the contained flows, recognizing that when all the storage facilities are filled, the total flows released during the dewatering of these facilities can significantly strain existing collection systems and treatment facilities. For example, under present average daily flow conditions, about 70 to 80% of the available Ashbridges Bay Treatment Plant capacity is already utilized and there are no immediate plans to re-rate the treatment plant to higher capacity. A treatment strategy for the contained wet weather flows is therefore required. Toronto Water is preparing to initiate a Class EA project in 2006 to develop a system-wide dewatering and treatment strategy for the wet weather flow storage facilities identified above.

Comments:

There is an immediate need to proceed with: (a) the twinning of the Coxwell Sanitary Trunk Sewer; (b) determining the upgrades necessary on the Don Sanitary Trunk Sewer and Waterfront Interceptor Trunk Sewer systems to provide the necessary dry weather capacity to service the future growth projected through the City's new Official Plan and Waterfront Revitalization Plan; and (c) developing a system-wide dewatering and treatment strategy for wet weather flows which will be intercepted by the various underground storage systems identified in the City's Wet Weather Flow Master Plan.

Currently these projects are proceeding on a stand-alone basis. However, the noted sanitary trunk sewer elements are interconnected to the corresponding proposed wet weather flow control projects, within their respective service areas. For example, a series of underground storage elements have been identified in the Wet Weather Flow Master Plan along the Don River to intercept flows from existing combined sewer overflow and storm sewer discharges. As a result of constructing the noted underground storage elements, capacity is freed up within the existing Don Sanitary Trunk Sewer system to service future growth. A similar situation would exist between the existing Waterfront Interceptor Trunk Sewer systems and the underground control storage systems identified in the Wet Weather Flow Master Plan along the Inner Harbour.

Undertaking these projects as one Class EA Study presents opportunities to consider options which would not likely have been considered if the projects were to proceed independently. For example, through a combined Class EA process, one option which may be pursued in the twinning of the Coxwell Sanitary Trunk Sewer is to design the system such that the twinned sewer provides the necessary system redundancy, additional dry weather servicing capacity, and the requisite wet weather flow control to the lower Don River.

Although the implementation of the Lower Don River and Inner Harbour wet weather flow control storage tunnels were not considered a first priority in the WWFMP (as these flows do not directly impact waterfront beaches), these projects would provide significant water quality

improvements to the Inner Harbour as well as possibly eliminating the need to build additional dry weather capacity for the Don Sanitary Trunk and Waterfront Interceptor Trunk Sewer systems or constructing a separate tunnel to twin the Coxwell Sanitary Trunk Sewer (i.e. a new twinned Coxwell Trunk sanitary sewer and the lower Don River wet weather storage tunnels may be the same facility).

Other benefits of one overall inclusive Class EA Study rather than proceeding with a minimum of six separate EA studies for both dry weather capacity upgrades and wet weather flow controls include:

1. A more cost effective and expedient undertaking;
2. Lower construction costs over a shorter construction schedule if dry weather and wet weather flow control elements are merged as single projects;
3. Consistency in study approach, design, and construction;
4. An opportunity to optimize the performance of sanitary trunk collection and wet weather flow control systems through Real Time Control to further reduce size requirements and costs;
5. Provide for the control of most of the City's remaining combined sewer overflow discharges and together these projects lead to improvements in water quality in the Don River and along the waterfront, with the ultimate goal of de-listing the City of Toronto as an Area of Concern in the Great Lakes Basin; and
6. These projects support the commitments made, by the Federal and Provincial Governments, for the cleanup of the Areas of Concern (including Toronto) through the Canada-Ontario Agreement and the Federal Government's commitment through the Bi-National Great Lakes Water Quality Agreement.

The ultimate solution, including the upper reaches of the Don Sanitary Trunk Sewer system, will be costly to implement. The capital cost of twinning the Coxwell Sanitary Trunk Sewer alone has been estimated at over \$50 million. The capital cost for the Waterfront and Lower Don River tunnels for wet weather flow control has been estimated at close to \$400 million, but detailed design and construction can be phased in over time.

As indicated above, one overall Class EA may result in the merging of different dry weather and wet weather flow control projects into single projects. This will require revising the WWFMP implementation schedule approved by Council to advance the wet weather flow control projects noted above. As the wet weather flow control projects planned for the Inner Harbour and the Don River did not directly benefit any of the waterfront beaches, they were scheduled for implementation much later in the Plan.

At this time, it is not possible to assess the impact on the WWFMP implementation schedule or Toronto Water's Capital Budget. This will depend on the efficiencies identified in the overall

system design, the urgency of system upgrade needs identified, and the availability of funding from senior levels of government. Upon completion of the Class EA project, a report will be submitted to Works Committee on the adjustments which may be necessary to the WWFMP implementation schedule and the implications for Toronto Water's Capital Budget.

The Class EA study for the Don and Waterfront Trunk Capacity and CSO Control Project is planned to be initiated in 2007 and is estimated to cost \$3,000,000. It is anticipated the Class EA will be completed over a 24 month period following the Notice of Commencement.

Conclusions:

There is an immediate need to proceed with: twinning of the Coxwell Sanitary Trunk Sewer; planning the upgrades to the existing Don Sanitary Trunk and the Waterfront Interceptor Trunk Sewer systems necessary to provide sufficient capacity to service the future growth projected in the City's new Official Plan and Waterfront Revitalization Plan; and developing a system-wide dewatering and treatment strategy for wet weather flows which will be intercepted by the various underground storage systems identified in the City's Wet Weather Flow Master Plan.

Currently these projects are proceeding on a stand-alone basis. However, the noted trunk sanitary sewer elements are interconnected to wet weather flow control projects identified within the Wet Weather Flow Master Plan, within their respective service areas. Wherein, construction of the proposed underground storage elements to intercept flows from existing combined sewer overflow and storm sewer discharges, along the Don River and Waterfront, respectively, frees up capacity within the existing Trunk Sanitary Sewer systems, to service future growth. Although the implementation of the Lower Don River and Inner Harbour wet weather flow control storage tunnels were not considered a first priority in the WWFMP (as these flows do not directly impact waterfront beaches), these projects would provide significant water quality improvements to the Inner Harbour, as well as possibly eliminating the need to build additional dry weather capacity for the Trunk Sanitary Sewer systems or constructing a separate tunnel to twin the Coxwell Sanitary Trunk Sewer.

While the WWFMP implementation schedule, approved by Council in 2003, will have to be advanced for the above-noted wet weather flow control projects, a number of benefits including lower costs and shortened implementation schedules have been identified, if these issues were addressed through one comprehensive Class Environmental Assessment project.

Contacts:

Patrick Chessie, P.Eng.
Manager, Sewer Asset Planning
Water Infrastructure Management
Toronto Water
Tel: 416-392-8847
Fax: 416-338-2828
E-mail: pchessie@toronto.ca

Michael D'Andrea, P.Eng.
Director,
Water Infrastructure Management
Toronto Water
Tel: 416-397-4997
Fax: 416-338-2828
E-mail: mdandre@toronto.ca

Lou Di Gironimo
General Manager
Toronto Water

List of Attachments:

Appendix 1: Figure 1 – Don Trunk Sewers and Waterfront Interceptors
Appendix 2: Figure 2 – Lower Don River and Inner Harbour CSO and Storm Outfalls
Appendix 3: Figure 3 – Don and Waterfront Trunk Capacity and CSO Control Project

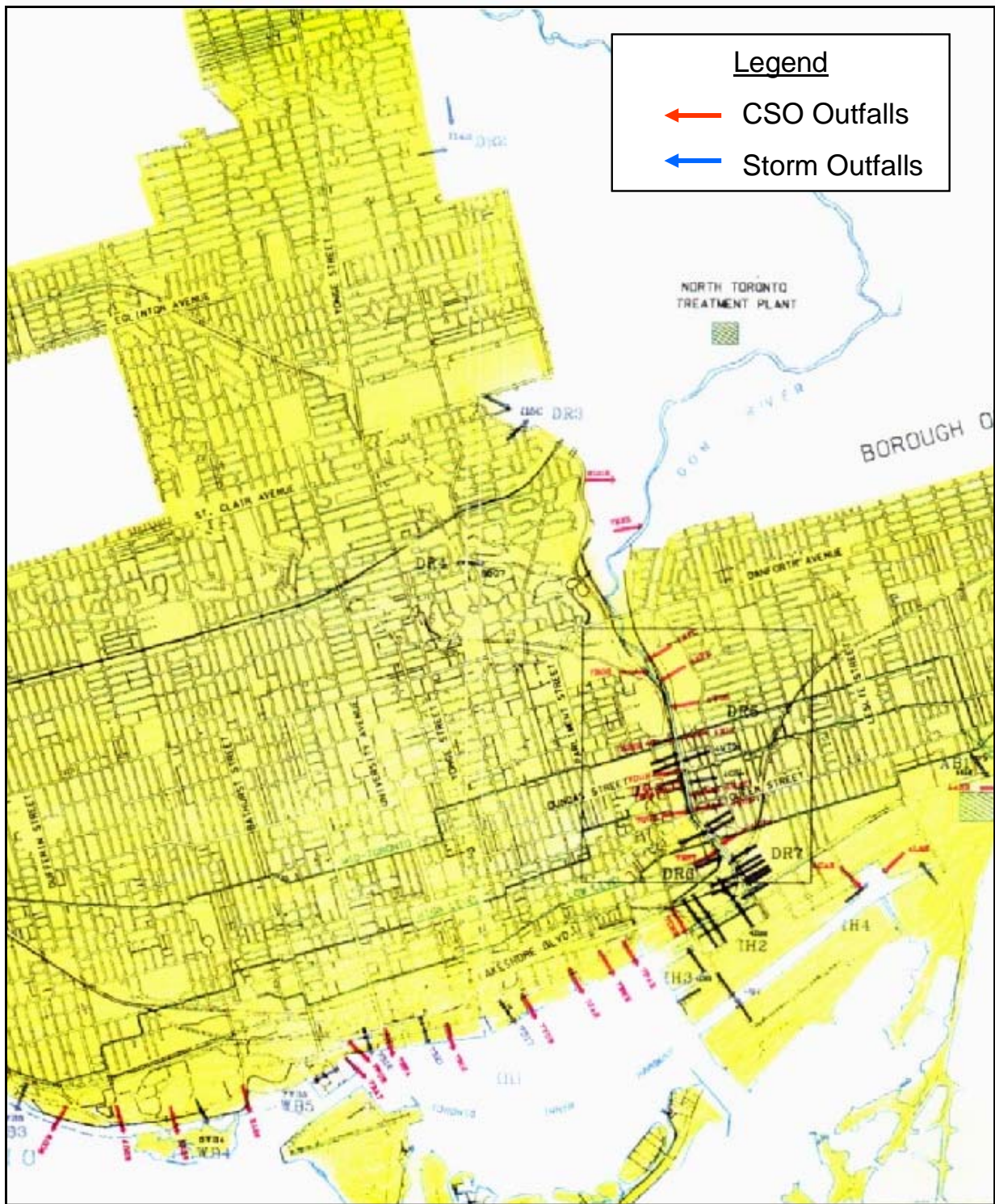
(p:\2006\wes\www\wc06052)

Appendix 1

Figure 1 Don Trunk Sewers and Waterfront Interceptors



Appendix 2
Figure 2 - Lower Don River and Inner Harbour CSO and Storm Outfalls



Appendix 3

Figure 3 Don and Waterfront Trunk Capacity and CSO Control Project

