

--	--

TO:	CHAIR AND MEMBERS PLANNING AND ENVIRONMENT COMMITTEE MEETING ON FEBRUARY 27, 2012
FROM:	JOHN BRAAM, P.ENG. ACTING EXECUTIVE DIRECTOR, PLANNING, ENVIRONMENTAL & ENGINEERING SERVICES & CITY ENGINEER
SUBJECT:	FOREST CITY INDUSTRIAL STORMWATER MANAGEMENT FACILITY AND WESTMINSTER WETLAND COMPLEX

RECOMMENDATION

That, on the recommendation of the Acting Executive Director Planning, Environmental and Engineering Services and City Engineer, the following actions **BE TAKEN** with respect to the Forest City Industrial Stormwater Management Facility and Westminster Wetland Complex:

- (a) the Forest City Stormwater Management Facility Westminster Wetland Complex Assessment of Reported Die-back report **BE ACCEPTED**; it being noted that the assessment concluded that there was no evidence that the contribution of stormwater from the Forest City SWM facility is causing stress or tree mortality within the Westminster Wetland Complex.

PREVIOUS REPORTS PERTINENT TO THIS MATTER
--

None

BACKGROUND

Purpose:

The purpose of this report is to recommend that the Forest City Stormwater Management Facility Westminster Wetland Complex Assessment of Reported Die-back report be accepted which identifies that there was no evidence that the contribution of stormwater from the Forest City SWM facility is causing stress or tree mortality within the Westminster Wetland Complex.

Context:

The City completed a Forest City Industrial Park SWM Works Municipal Class Environmental Assessment (EA) Study, Schedule 'B' and an Addendum to this Class EA study in 2002 that was accepted by the public, City Council and all approval agencies. The Forest City No. 1 SWM Facility that services the Forest City Industrial Park Phases 1 and 2 lands was constructed during 2002-2005.

The Forest City Industrial SWM system (map attached) consists of:

- an existing wet SWM Facility No. 1 (north of Wilton Grove Road) that provides quality and erosion/quantity control storages that outlets through the Wilton Grove storm sewers/culverts to the existing local wetland;
- an existing constructed wetland SWM Facility located south of the Wilton Grove Road on City's lands that provides the remaining required erosion/quantity control storages that outlets into the Westminster Wetland Complex;
- a berm located south of the Wilton Grove Road; and
- a future wet SWM Facility No. 2 that will be constructed to service the land development located south of Wilton Grove by providing the required quality and erosion/quantity control storages.

Agenda Item #	Page #

In addition to the EA, Earth Tech (now AECOM) completed an Environmental Impact Study (EIS) for the quantity control component of the Forest City Industrial Park Stormwater works. The EIS was prepared on December 10, 2002 to assess the potential impacts on the adjacent wetland. The objective was to provide i) a description of the existing environmental conditions, ii) an assessment of significance, iii) determination of development constraints, and iv) a detailed environmental management plan. The study area involved a number of significant natural heritage areas such as:

- Tenant's Pond Environmentally Significant Area (ESA)
- Provincially Significant Westminster Wetland Complex (PSW)
- Locally Significant Elliot-Laidlaw Wetland Complex (LSW)
- Dingman Creek

In the EIS report, the subject wetland area was classified as a Maple Mineral Deciduous Swamp community. This community was considered to be the dominant wetland community within the wetland complex. The dominant tree species identified within this community was silver maple (*Acer saccharinum*).

It was determined that provided that the Environmental Management Plan and its recommendations were adhered to, the proposed stormwater works project would positively benefit the surrounding features and functions of Westminster-Wetland Complex and Tenant's Pond. The recommendations included:

- Construction of mitigation measures
- Planting recommendations
- Environmental Management Plan
- Environmental monitoring

It should be noted that the assessment was primarily concerned with the wetland communities within the detention pond area and immediately downstream of the SWM discharge.

The subject lands where the die-back of trees is found is designated as Provincially Significant Wetland and a private agricultural drain tile provides the storm outlet from this land. Mr. James R. Keron raised concerns that tree stress and die-back within the portion of the Westminster Wetland Complex situated on his family property at 1741 Wilton Grove Road in London was a result of the discharges from the Forest City No. 1 Stormwater Management (SWM) Facility. Based on the discussion with Mr. Keron and SWM Unit staff in August and November 2010, and City staff visits to the subject lands in 2002, 2004, 2006, 2008, 2009, 2010 and 2011, Mr. Keron is of opinion that this drain has not been functioning well and is not operating adequately.

Mr. Keron suggested that the City should consider constructing a waterway/channel to drain through this Provincially Significant Wetland however it is the opinion of the SWM Unit that this will negatively impact the functionality of this system's baseflow conditions and water balance.

SWM Unit staff informed Mr. Keron on numerous site visits and by letter that, in accordance with the City practices and requirements, the City is not responsible to maintain private drains and it is the responsibility of the private landowners to ensure that they are functioning adequately. Based on site observations of the Forest City SWM system, staff are of the opinion that this SWM system is functioning in accordance with the Ministry of the Environment Certificate of Approval.

Further to the SWM Unit's investigations Bonnie Bergsma, Ecologist for the City of London conducted field investigations on November 23, 2010 in response to concerns from Mr. Keron. The purpose of Ms. Bergsma's visit was to confirm the predicted outcome of the EIS for no negative effects. The affected area which has been classified as a Provincially Significant Wetland was described as a silver maple swamp with standing water during wet periods of the year. The inspection stated that the former silver maple deciduous swamp had been converted to a meadow marsh due to increased hydrological levels. This system is predominately inhabited by common reed (*Phragmites australis*), which is known to be an aggressive non-native perennial grass. Ms. Bergsma suggests that the change in vegetation community can be related to the increase in hydrological components being directed to the wetland from the Forest City Industrial Park. It is said that the absence of a direct channel from the SWM outlet to the Dingman's Creek constrains the flow of water to the creek. The increased hydro period is having direct negative effects on the deciduous swamp forest, as the particular components of the tree are not tolerant to prolonged saturation. Ms. Bergsma concludes that the changes in

Agenda Item #	Page #

communities are directly related to hydrological changes which began post construction of the storm water works for the Forest City Industrial Park.

However, in order to evaluate the performance of the Forest City SWM system and provide the resident with the re-assurance of the accepted performance of this SWM system, in June, 2011 the City engaged the Consultant - AECOM to undertake the stormwater quality and quantity monitoring program to monitor the performance of Forest City SWM system and discharges into the subject lands and assess the stress and tree mortality on the subject lands. The costs associated with this monitoring program were approximately \$48,000.

Discussion:

The finalized monitoring and assessment report was issued to the City for review in December 2011. This report was provided to the Mr. Keron in January 2012 and in February 2012 the report was updated based on City comments.

Based on the assessment AECOM was able to draw the following findings with regards to the wetland community within the subject lands:

1. There is an area of the Maple Mineral Deciduous Swamp community within the Westminster Wetland Complex that is experiencing stress. The total area identified as being under stress is approximately 10.35 hectares.
2. The degree of stress and potential die-back of trees could not be accurately determined given the time of year during which this assessment was conducted.
3. Given that aerial photographs for the period 2002 to 2010 are showing little to no dieback of early spring canopy cover, any die-back of trees or their relative canopy cover may be recent or may be occurring as early leaf loss in the summer of recent years.
4. In 2009, the Ministry of Natural Resources completed a re-evaluation of the Westminster Wetland Complex. The 2009 wetland evaluation indicates no dead tree cover within the wetland complex. By that time the SWM facility had been in operation for approximately 4 years (end of 2004/beginning of 2005).
5. Compositional changes within the wetland communities cannot be accurately determined as there have been no pre versus post monitoring plots established. General comparisons of observations made in 2011 to the observations that were made during the 2002 EIS investigations are not particularly useful as the previous characterization was general and not intended for monitoring purposes.
6. It is possible that an alteration to the hydroperiod in conjunction with the lack of maintenance of the outlet system within the wetland could be having an impact on trees within the wetland. It is widely recognized that silver maple swamps typically require a period of draw-down in water levels and an opportunity for soils to dry as part of a regular hydroperiod. The analysis of precipitation patterns over the past 10 years and in particular the past 3 years supports the suggestion that the difference in hydroperiod is due to a change in precipitation patterns. However, without more detailed information AECOM could not conclusively state that an alteration to the hydroperiod within the wetland is causing an impact within the wetland.

With respect to relative contributions of water to the wetland the following statements were concluded:

7. The Forest City Industrial Park Stormwater Management Facility is one of numerous sources of water input to the Westminster Wetland Complex.
8. The Forest City Industrial Park Stormwater Management Facility is meeting design criteria with respect to both water quality and quantity.
9. Aerial photographs and anecdotal evidence suggest that inundation of the wetland and the adjacent property has occurred for many years, including years prior to the construction of the SWM facility.
10. During site investigations, no clear outlet was found for the wetland area north of Dingman Creek (the subject area). The lack of an outlet may be contributing to prolonged water inundation within the wetland.
11. In addition to the SWM facility and surrounding land run-off input to the wetland, other contributions to ponding within the wetland may include: back-up water from Dingman Creek during flood events, groundwater contributions (as evidenced by the presence of watercress within the wetland), and changes in precipitation patterns (i.e. greater rainfall during historically drier months July-September). AECOM's review of precipitation patterns indicates that there has been a significant increase in rainfall during historically drier periods. This increase in precipitation would appear to be a principal factor in the changes to the wetlands' hydroperiod.

Agenda Item #	Page #

12. There is no evidence that the contribution of stormwater from the Forest City SWM facility is causing stress or tree mortality within the Westminster Wetland Complex.

Conclusions:



The assessment of the Forest City SWM Facility and Westminster Wetland Complex confirmed that the SWM system is functioning in accordance with the Ministry of the Environment Certificate of Approval for this sewerage works and there is no evidence that the contribution of stormwater from the Forest City SWM facility is causing stress or tree mortality within the Westminster Wetland Complex. Based on the assessment a lack of maintenance of the outlet of the wetland and changes in precipitation patterns appear to be the principal factors that led to changes to the wetlands' hydroperiod and resulting stress and tree mortality.

Next Steps:

As stress and tree mortality is taking place within the Westminster Wetland Complex (a portion of which is on City lands) Council may consider undertaking additional investigation in the spring such that recommendations with respect to sustaining the features and functions of the Westminster Wetland Complex may be made.

Acknowledgements:

This report was prepared within the Planning, Environmental Engineering Services Department within the Stormwater Management Unit by Billy Haklander, Environmental Services Engineer.

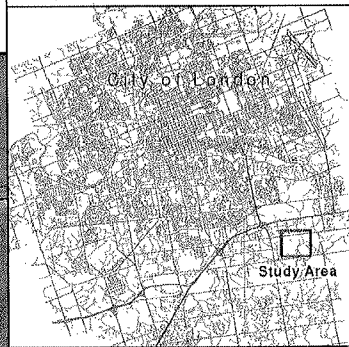
SUBMITTED BY:	RECOMMENDED BY:
	
BERTA KRICKER, M.ENG., F.E.C., P.ENG. MANAGER OF STORMWATER STORMWATER MANAGEMENT UNIT	JOHN BRAAM, P.ENG. ACTING EXECUTIVE DIRECTOR, PLANNING, ENVIRONMENTAL & ENGINEERING SERVICES & CITY ENGINEER

February 16, 2012

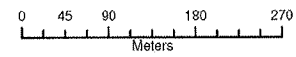
/BH

Attach: Appendix "A" – Location Map

Cc: John Braam – Acting Executive Director Planning, Environmental and Engineering Services and City Engineer



- Legend**
- Watercourse
 - Roads
 - ▭ Wetland Boundary
 - ▭ Area Showing Signs of Stress
 - ▭ Property Fabric



City of London	
Forest City SWMF and Westminster Wetland Complex	
Datum: NAD 83, Zone 17 Source: City of London	Appendix A
PR: 00220140 1/4" 001	
February 2012	AECOM
1:5,000	
<small>This drawing has been prepared for the use of AECOM's client and it is not to be used, copied, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.</small>	

APPENDIX 'A'

--	--

Agenda Item # _____ Page # _____