COUNCIL DIRECTION:

This Information Report is in follow-up to Council direction provided on April 10, 2013 to complete a further study as recommended in Report PED12182(a) assessing the drainage capacity through a hydrologic and hydraulic analysis of the minor (storm sewer) system under a five (5) year standard and the major (overland) system under a 100 year storm standard, and to establish potential contributing factors between the storm and sanitary conveyance systems.

Performance assessment results for the Upper Stoney Creek area will be submitted at a future Committee date, at which time the final report for both Binbrook and Upper Stoney Creek will be appended.

INFORMATION:

The storm drainage system in Binbrook has been numerically modelled and calibrated using actual rainfall and flow data gathered from August to November 2013. Using the calibrated hydrologic/hydraulic model both the minor (storm sewers) and the major (overland/roadway) systems’ performance was assessed with respect to a five (5) year and 100 year design event.
Minor system (storm sewers)

Appendix “A” to Report PED12182(b) - Figure 1 presents a summary of the simulated performance of the minor system under a five (5) year storm event. The assessment included consideration of the proposed development, Binbrook Heights Addition (2ST201109), located north of Fall Fair Way. It can be concluded the simulated minor system is generally performing to current municipal standards in that there is generally sufficient capacity in the storm sewers to convey the flows with the exception of some areas as highlighted in red on Figure 1 indicating surcharged conditions (ie. water levels would be above storm sewer overbets under pressure).

Various options are available to address the surcharged conditions on Fall Fair Way and Valiant Circle including on-site storage on the proposed Binbrook Heights Addition development, as well as inlet control devices (ICDs) or upsizing sewers. Based on the assessment of the site providing on-site storage would be considered the preferred means to eliminate the surcharged sewer condition, subject to detailed investigations.

Major system (overland/roadway)

Based on the integrated hydrologic/hydraulic assessment, the major system would perform satisfactorily for a 100 year storm event with the exception of Fall Fair Way and Valiant Circle as highlighted in red on Figure 2 (see Appendix “A” to Report PED12182(b)). The results indicate that the water depth on the road would be in excess of 250mm (relative to the gutter), exceeding City of Hamilton current criteria. Generally though, the flows would be contained within the municipal right-of-way (ROW) and present no direct surface flooding on private lands. There would be an opportunity to reduce surface water depths on the roadway through various techniques including storage on the Binbrook Heights Addition development or alternatively by directing surface water from the roadway into an area west of the roadway in the ROW/park using low impact development techniques in the form of infiltration galleries along Fall Fair Way. The details of the preferred mitigation would need to be assessed at the time of detailed design.

In addition to this hydraulic assessment, staff has also continued efforts to prevent unwanted entry of groundwater and stormwater into the sanitary sewer systems through flow monitoring, field inspection, and closed circuit television inspections. Points of entry identified have been substantially repaired/mitigated with additional in-pipe grouting programmed for 2014.

The original sanitary sewer design in the south-east quadrant, upstream from the sewage pump station contained provision in the case of emergency for sanitary flows to overflow into the storm sewer when the sanitary sewer surcharges. During the extreme storm event of July 22, 2012 this overflow did not function due to the storm sewer system being at full capacity. Staff are currently investigating the feasibility of...
constructing a dedicated storm outfall to ensure the functionality of the existing emergency sanitary overflow connection and is proceeding with the implementation starting in 2014, subject to detailed investigations.

Based on the above we recommend Council proceed with the approval of recommendations of Report PED12182 subject to further investigation of management options for Binbrook Heights Addition including consideration for on-site stormwater storage.

Appendices and Schedules Attached

Appendix A to Report PED12182(b) – Figure 1 – Minor System Performance Summary for 5-Year Storm Event and Figure 2 – Major System Performance Summary for 100-year Storm Event, prepared by AMEC Environment and Infrastructure

SYL/mah
FIGURE 1: MINOR SYSTEM PERFORMANCE SUMMARY FOR 5-YEAR STORM EVENT
FIGURE 2: MAJOR SYSTEM PERFORMANCE SUMMARY FOR
100-YEAR STORM EVENT