Appendix H. Regional Storm Analysis

Regional Storm Analysis and Impact of Spill from MWDC

Upon request from Conservation Halton, the impact of the regional storm, combined with the spill from the Morrison-Wedgewood Diversion Channel (MWDC) on stormwater quantity control, was analyzed. Three scenarios were evaluated, including existing conditions, proposed-uncontrolled and proposed-controlled. The 100-year spill from the MWDC was not assessed due to the limited impact of the 100-year spill on lands south of the QEW.

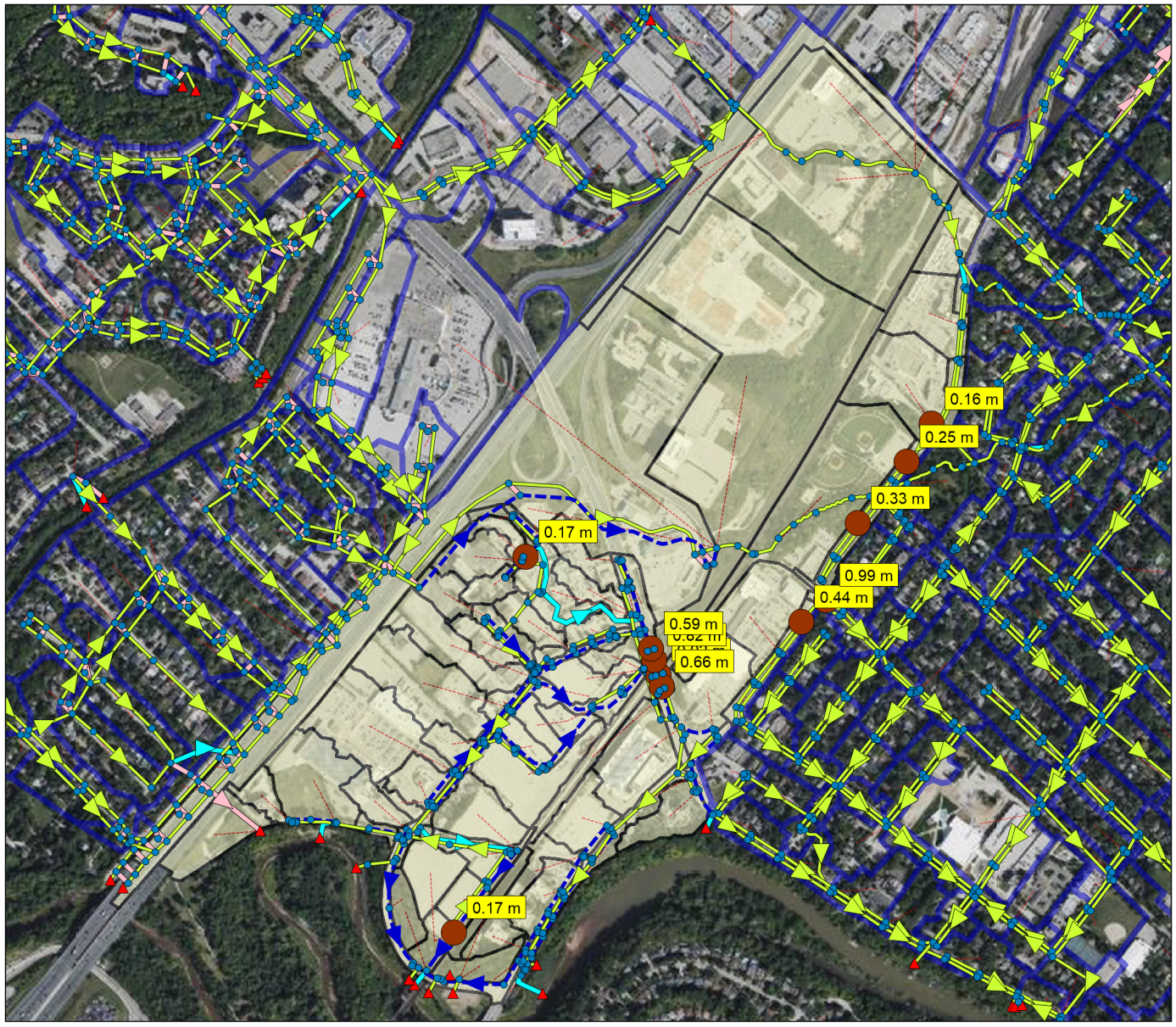
The regional storm event was modeled in PCSWMM and the effectiveness of the dual-drainage system under existing and future development scenarios was investigated. The regional storm event (Hurricane Hazel with 12-hour duration) was simulated using parameters from Design Chart 1.03 of the MTO Drainage Management Manual.

Surface Ponding

Surface ponding across the Midtown area would be significantly worsened under the regional spill scenario when compared to existing conditions. This increase in urban flooding is particularly evident in areas adjacent to the junctions where spill hydrographs were introduced into the model. Additionally, the spill modeling results confirm that flow volumes at outfalls 91 (Sixteen Mile at Cross Avenue) and 149 (Sixteen Mile at Cornwall Road) are significantly influenced by spill contributions from the diversion channel, highlighting their impact on discharge points within the Midtown study are.

Peak Flows Comparison

The following summary table presents a comparison of peak flows at key flow nodes under the regional storm and regional with spill scenarios compared to the existing conditions scenario. Analysis of peak flow results indicates that while the future-controlled scenario achieves some reduction in peak flows and volumes compared to existing conditions at most outfalls, there are locations at which there is a substantial increase in volume. These preliminary results indicate that the proposed SWM control measures, on their own, may not be sufficient to fully mitigate spill impacts.



Existing Conditions
Regional Storm
Surface Ponding

Legend

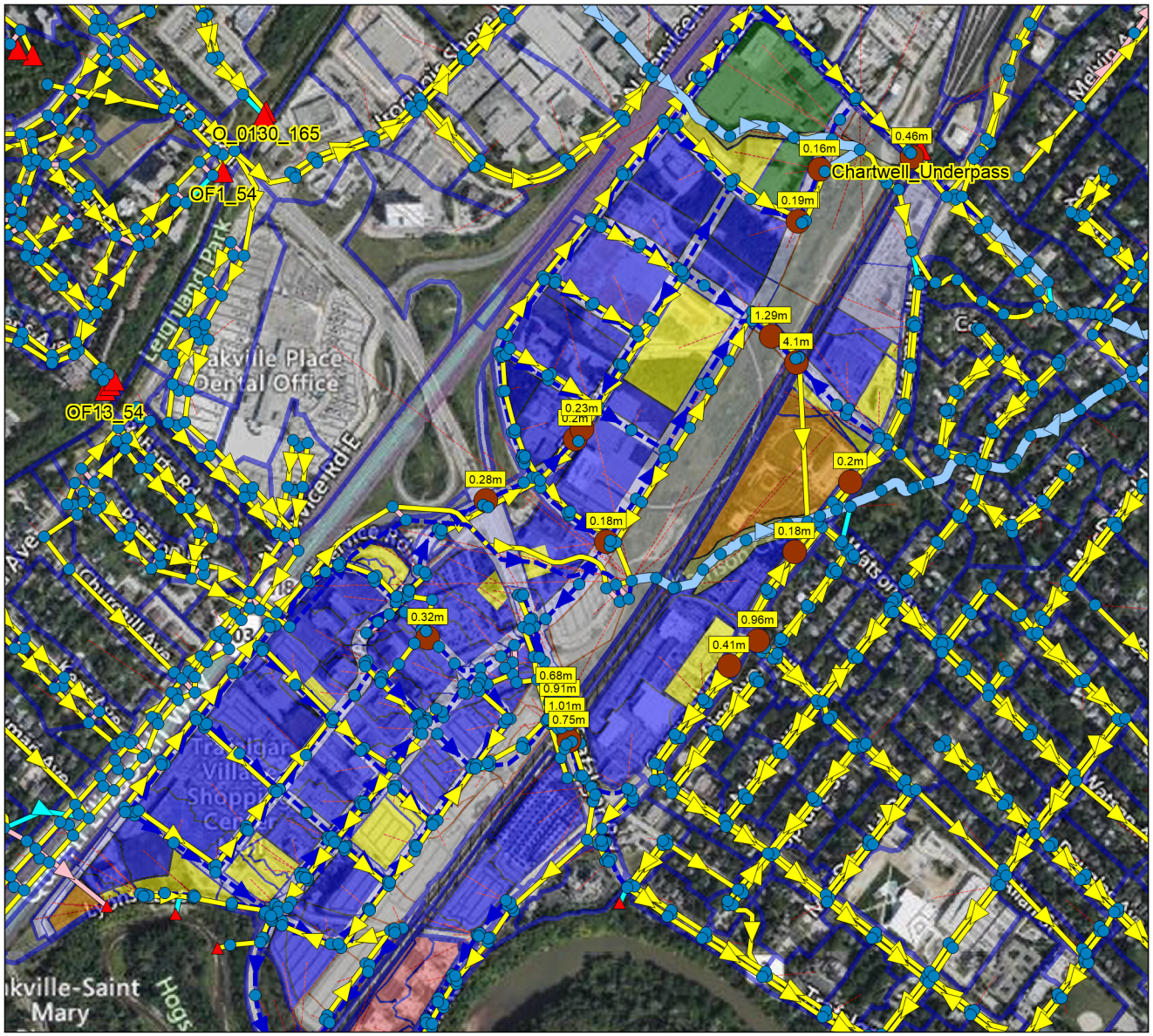
Junctions
- Junctions
- Surface Ponding >= 0.15 m
- Outfalls

Conduits
- Minor System
- Major System
- Orifices
- Weirs
- Outlets

Subcatchments
- Outside of Midtown Area
- Within Midtown Area

N

400 m



Future Uncontrolled Regional Storm Surface Ponding

Legend

Junctions

- Junctions
- Surface Ponding >= 0.15 m

Outfalls

- Outside of Midtown Area
- Within Midtown Area

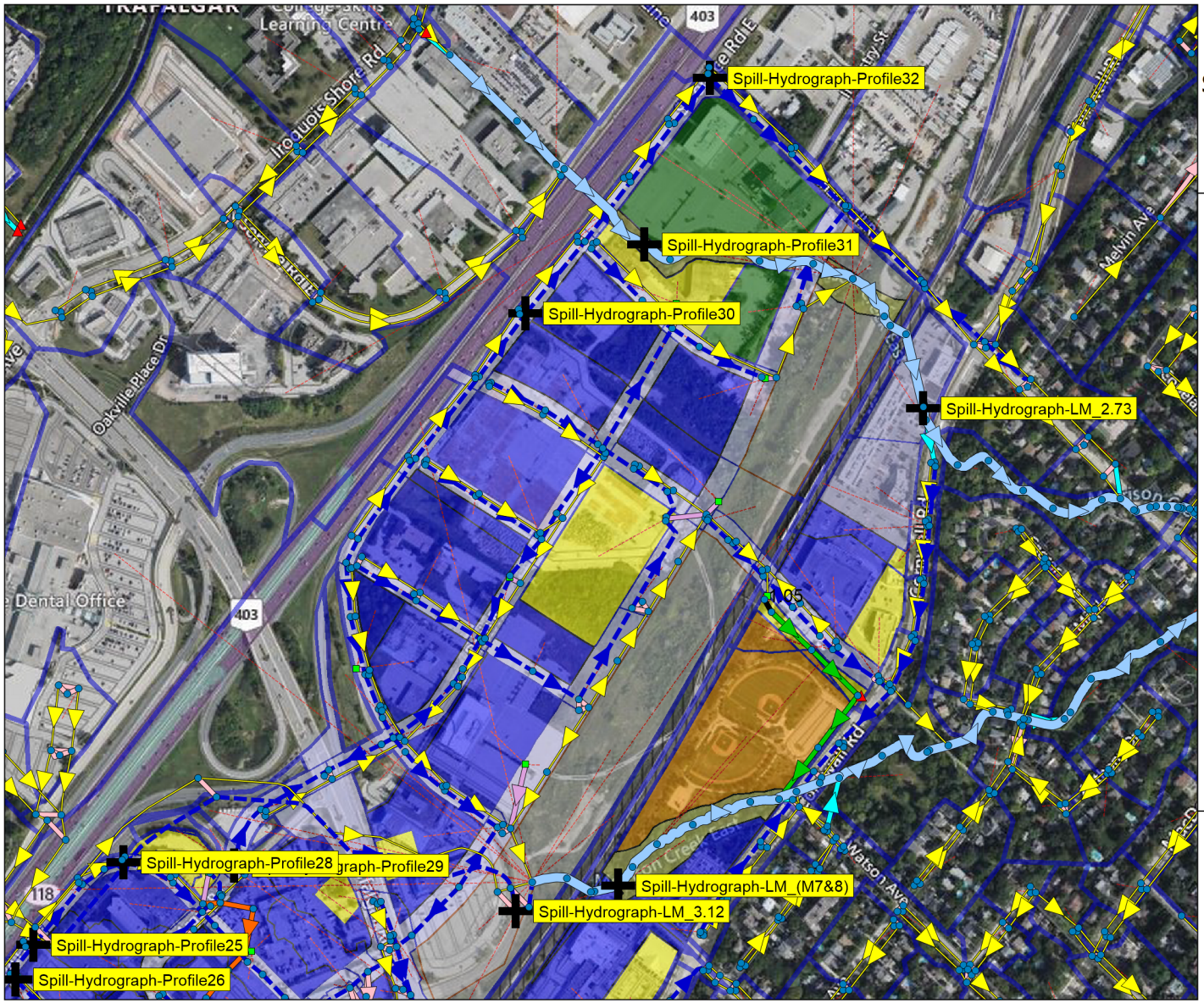
Conduits

- Minor System
- Major System
- Lower Morrison Creek (East and West)
- Orifices
- Weirs
- Outlets

N

350 m

		Existing Conditions				Proposed-uncontrolled Conditions				Proposed-controlled Condition
OF Name	OF Location	Regional		Regional with Spills		Regional		Regional with Spills		Regional (without spill)
		Peak Flow (m3/s)	Volume (ML)	Peak Flow (m3/s)	Volume (ML)	Peak Flow (m3/s)	Volume (ML)	Peak Flow (m3/s)	Volume (ML)	Peak Flow (m3/s)
OF11_54	Lyons Ln - 16 Mile Creek	0.882	23.967	0.882	23.967	0.882	23.935	0.881	23.935	0.882
108	Lyons Ln - 16 Mile Creek	0.449	5.793	0.449	5.793	0.27	3.421	0.27	3.421	0.27
91	Cross Ave - 16 Mile Creek	3.678	60.705	3.678	74.761	4.063	63.713	4.067	77.601	3.751
97	Cross Ave - 16 Mile Creek	0.067	1.164	0.067	1.164	0.074	1.166	0.074	1.166	0.135
10	Cross Ave - 16 Mile Creek	0.261	1.968	0.261	1.968	0.152	1.637	0.152	1.637	0.152
92	Cross Ave - 16 Mile Creek	0.241	2.179	0.241	2.179	0.268	2.273	0.268	2.273	0.098
204	Cross Ave - 16 Mile Creek	0	0	0	0	0	0	0	0	0
16	Cross Ave - 16 Mile Creek	0.247	2.875	0.247	2.875	0.254	3.094	0.254	3.094	0.254
217	Cornwall Rd - 16 Mile Creek	0.008	0.109	0.008	0.109	0.008	0.109	0.008	0.109	0.008
149	Cornwall Rd - 16 Mile Creek	3.782	58.198	3.782	84.626	3.734	61.605	3.735	75.618	3.431
OF2_37	Trafalgar Rd - 16 Mile Creek	0	0	0	0	0	0	0	0	0
Tee15_LMC	West Tributary	16.488	NA	25.088	NA	14.871	NA	22.963	NA	10.824
J2353.323	West Tributary south of Maple	18.768	NA	25.146	NA	17.171	NA	22.805	NA	13.007
J165	East Tributary	16.482	NA	29.436	NA	16.334	NA	24.117	NA	12.83
Tee8_LMC	Main Branch west of Morrison Heights Dr	36.532	NA	46.947	NA	38.852	NA	39.266	NA	28.698
J867.2666	Main Branch at the Confluence (Morrison Rd)	39.139	NA	46.528	NA	37.479	NA	39.276	NA	31.632
J482.2199	Main Branch between Morrison Rd and Lakeshore Rd E	39.66	NA	46.323	NA	37.987	NA	39.726	NA	32.254
J74.93881	Main Branch between Lakeshore Rd E and Lake Ontario	40.499	NA	45.948	NA	39.013	NA	41.652	NA	33.631



Spill Hydrograph Time Series Input Locations

Legend

Junctions

- Visible
- Spill Hydrograph Locations

- Outfalls
- Storages

Conduits

- Minor System
- Major System
- Proposed Underground Superpipes
- Forcemain
- Proposed Pipe Upsizing
- Lower Morrison Creek (East and West)
- Proposed Channel

N

200 m

Spill Hydrographs (m3/s)