# Appendix U

Hydrology and Hydraulics Modeling

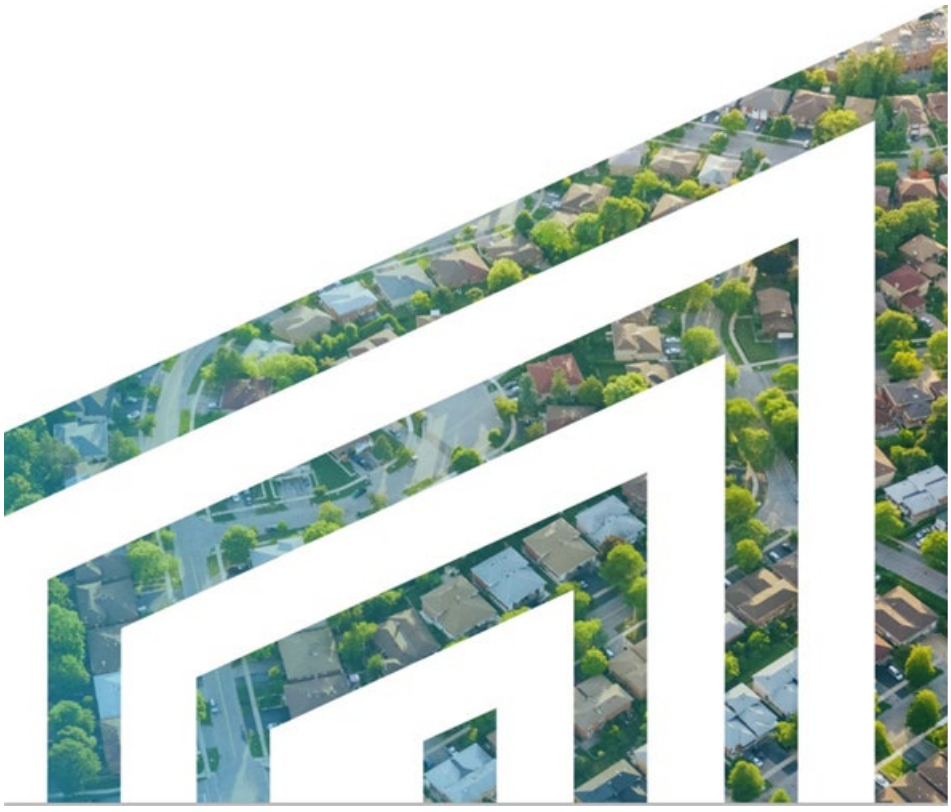
*Digital Files Only*

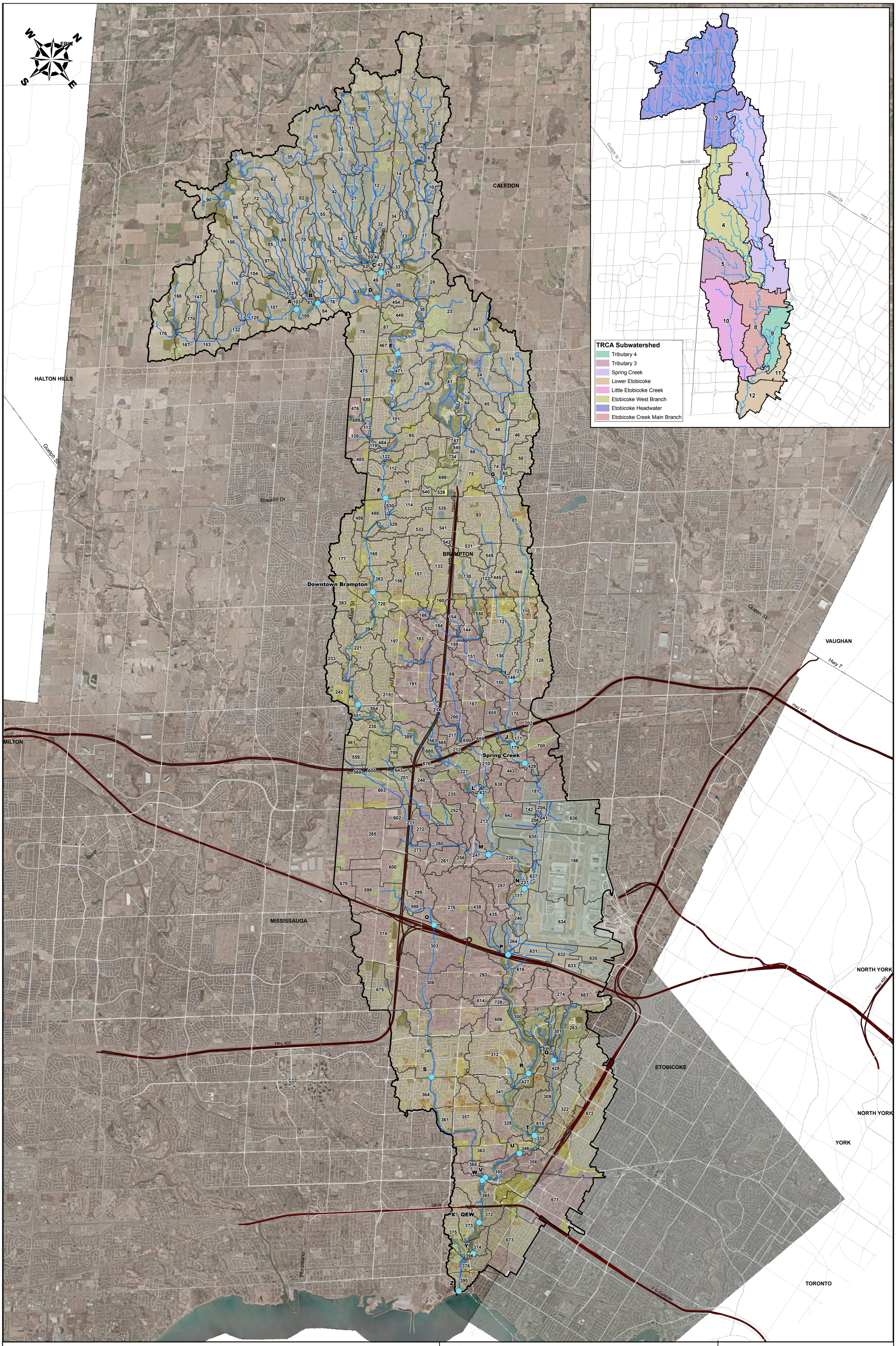
# Appendix V

## Etobicoke Creek SWM Targets

# APPENDIX B

## Etobicoke Creek SWM Targets






## Legend

- Watershed Boundary
- Municipal Boundaries
- Key Flow Nodes
- Watercourse
- Collector
- Expressway/Highway
- Freeway

0 750 1,500 3,000 4,500 6,000 Meters

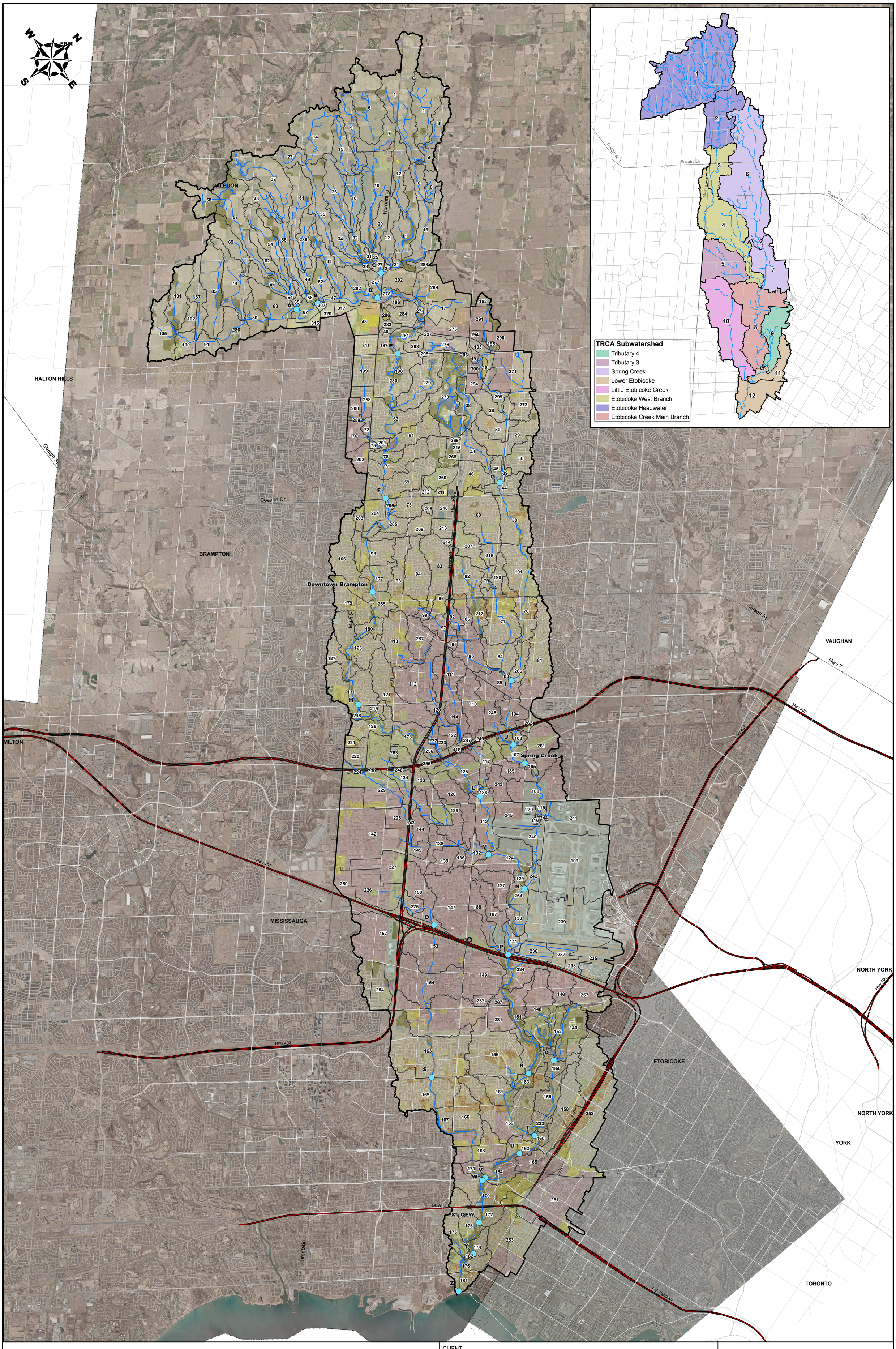
CLIENT
TORONTO AND REGION CONSERVATION AUTHORITY

TITLE
ETOBICOKIE CREEK WATERSHED STUDY

# EXISTING CATCHMENTS

MMM GROUP

| Checked | Drawn |
|---|---|
| A.Z | S.Y |
| **Date** | **Proj. No.** |
| March 2013 | 14-11605-001-WR1 |
| **Scale** | **Drawing No.** |
| As Shown | **J-1** |




## Legend

- Future Watershed Boundary
- Future Catchments
- Municipal Boundaries
- Key Flow Nodes
- Watercourse
- Collector
- Expressway/Highway
- Freeway

0 750 1,500 3,000 4,500 6,000 Meters

CLIENT

TORONTO AND REGION CONSERVATION AUTHORITY

TITLE

ETOBICOKIE CREEK WATERSHED STUDY

# FUTURE DEVELOPMENT CATCHMENTS

MMM GROUP

| | |
|---|---|
| Checked: A.Z | Drawn: S.Y |
| Date: March 2013 | Proj. No.: 14-11605-001-WR1 |
| Scale: As Shown | Drawing No.: J-2 |

## ETOBICOKE WATERSHED QUANTITY CONTROL STRATEGY - UNIT FLOW RATES

**Basin 1 - Etobicoke Creek Headwater (Upstream) - Control to 60% of Existing Flows**

| Existing Catchment # | Unit Flow Rates ($m^3/s/ha$) | | | | | |
|---|---|---|---|---|---|---|
| | 2-Yr | 5-Yr | 10-Yr | 25-Yr | 50-Yr | 100-Yr |
| 1 | 0.00286 | 0.00506 | 0.00675 | 0.00909 | 0.01096 | 0.01291 |
| 2 | 0.00322 | 0.00578 | 0.00779 | 0.01056 | 0.01275 | 0.01506 |
| 3 | 0.00393 | 0.00713 | 0.00962 | 0.01304 | 0.01584 | 0.01878 |
| 6 | 0.00467 | 0.00830 | 0.01118 | 0.01516 | 0.01831 | 0.02164 |
| 7 | 0.00281 | 0.00507 | 0.00685 | 0.00932 | 0.01127 | 0.01334 |
| 8 | 0.00385 | 0.00722 | 0.00985 | 0.01350 | 0.01641 | 0.01955 |
| 9 | 0.00426 | 0.00745 | 0.00995 | 0.01338 | 0.01610 | 0.01895 |
| 10 | 0.00432 | 0.00768 | 0.01028 | 0.01395 | 0.01684 | 0.01990 |
| 11 | 0.00318 | 0.00567 | 0.00761 | 0.01024 | 0.01232 | 0.01452 |
| 12 | 0.00401 | 0.00696 | 0.00922 | 0.01227 | 0.01471 | 0.01728 |
| 13 | 0.00337 | 0.00604 | 0.00811 | 0.01095 | 0.01323 | 0.01565 |
| 14 | 0.00391 | 0.00682 | 0.00904 | 0.01205 | 0.01441 | 0.01689 |
| 17 | 0.00337 | 0.00595 | 0.00798 | 0.01078 | 0.01302 | 0.01538 |
| 18 | 0.00342 | 0.00599 | 0.00798 | 0.01075 | 0.01297 | 0.01530 |
| 20 | 0.00325 | 0.00589 | 0.00797 | 0.01087 | 0.01318 | 0.01562 |
| 21 | 0.00641 | 0.01082 | 0.01413 | 0.01857 | 0.02203 | 0.02561 |
| 32 | 0.00400 | 0.00709 | 0.00953 | 0.01289 | 0.01556 | 0.01836 |
| 33 | 0.00528 | 0.00961 | 0.01293 | 0.01749 | 0.02113 | 0.02490 |
| 34 | 0.00361 | 0.00632 | 0.00842 | 0.01129 | 0.01356 | 0.01593 |
| 35 | 0.00383 | 0.00696 | 0.00941 | 0.01278 | 0.01546 | 0.01827 |
| 37 | 0.00785 | 0.01364 | 0.01801 | 0.02398 | 0.02864 | 0.03343 |
| 40 | 0.00817 | 0.01412 | 0.01855 | 0.02461 | 0.02934 | 0.03429 |
| 42 | 0.00338 | 0.00597 | 0.00801 | 0.01080 | 0.01301 | 0.01533 |
| 43 | 0.00633 | 0.01143 | 0.01535 | 0.02074 | 0.02499 | 0.02943 |
| 49 | 0.00550 | 0.00987 | 0.01322 | 0.01781 | 0.02143 | 0.02523 |
| 50 | 0.00551 | 0.00996 | 0.01336 | 0.01822 | 0.02219 | 0.02623 |
| 52 | 0.00434 | 0.00771 | 0.01034 | 0.01401 | 0.01693 | 0.01999 |
| 53 | 0.00644 | 0.01168 | 0.01570 | 0.02124 | 0.02557 | 0.03010 |
| 54 | 0.00366 | 0.00649 | 0.00869 | 0.01174 | 0.01417 | 0.01670 |
| 55 | 0.00273 | 0.00493 | 0.00665 | 0.00903 | 0.01095 | 0.01296 |
| 62 | 0.00319 | 0.00558 | 0.00746 | 0.01005 | 0.01211 | 0.01428 |
| 63 | 0.00466 | 0.00824 | 0.01105 | 0.01490 | 0.01793 | 0.02111 |
| 70 | 0.00310 | 0.00565 | 0.00763 | 0.01036 | 0.01253 | 0.01481 |
| 71 | 0.00317 | 0.00565 | 0.00757 | 0.01025 | 0.01238 | 0.01463 |
| 72 | 0.00342 | 0.00618 | 0.00834 | 0.01131 | 0.01374 | 0.01629 |
| 76 | 0.00476 | 0.00878 | 0.01210 | 0.01672 | 0.02041 | 0.02433 |
| 80 | 0.00472 | 0.00837 | 0.01118 | 0.01503 | 0.01806 | 0.02125 |
| 82 | 0.00287 | 0.00511 | 0.00685 | 0.00923 | 0.01112 | 0.01313 |
| 83 | 0.00318 | 0.00579 | 0.00785 | 0.01069 | 0.01296 | 0.01536 |
| 84 | 0.00595 | 0.01042 | 0.01386 | 0.01851 | 0.02219 | 0.02603 |
| 85 | 0.00290 | 0.00516 | 0.00690 | 0.00930 | 0.01121 | 0.01324 |
| 86 | 0.00309 | 0.00556 | 0.00746 | 0.01013 | 0.01225 | 0.01449 |
| 87 | 0.00442 | 0.00819 | 0.01115 | 0.01524 | 0.01853 | 0.02197 |
| 89 | 0.00272 | 0.00483 | 0.00648 | 0.00877 | 0.01059 | 0.01255 |
| 90 | 0.00426 | 0.00761 | 0.01019 | 0.01384 | 0.01674 | 0.01979 |
| 97 | 0.00379 | 0.00666 | 0.00883 | 0.01179 | 0.01414 | 0.01661 |
| 102 | 0.00796 | 0.01336 | 0.01763 | 0.02360 | 0.02815 | 0.03270 |
| 103 | 0.00387 | 0.00700 | 0.00952 | 0.01304 | 0.01583 | 0.01878 |
| 104 | 0.00333 | 0.00605 | 0.00820 | 0.01117 | 0.01353 | 0.01601 |
| 105 | 0.00410 | 0.00764 | 0.01041 | 0.01422 | 0.01725 | 0.02042 |
| 107 | 0.00292 | 0.00525 | 0.00706 | 0.00960 | 0.01163 | 0.01378 |
| 108 | 0.00297 | 0.00542 | 0.00732 | 0.00998 | 0.01212 | 0.01435 |
| 118 | 0.00293 | 0.00526 | 0.00708 | 0.00958 | 0.01157 | 0.01365 |
| 125 | 0.00358 | 0.00655 | 0.00889 | 0.01217 | 0.01478 | 0.01752 |
| 132 | 0.00398 | 0.00720 | 0.00969 | 0.01310 | 0.01587 | 0.01880 |
| 140 | 0.00296 | 0.00527 | 0.00705 | 0.00949 | 0.01142 | 0.01348 |
| 147 | 0.00319 | 0.00565 | 0.00756 | 0.01018 | 0.01229 | 0.01451 |
| 153 | 0.00436 | 0.00794 | 0.01074 | 0.01457 | 0.01761 | 0.02079 |
| 167 | 0.00516 | 0.00912 | 0.01230 | 0.01664 | 0.02007 | 0.02367 |
| 168 | 0.00308 | 0.00553 | 0.00743 | 0.01002 | 0.01213 | 0.01434 |
| 170 | 0.00353 | 0.00630 | 0.00849 | 0.01151 | 0.01391 | 0.01642 |
| 176 | 0.00327 | 0.00581 | 0.00778 | 0.01049 | 0.01266 | 0.01494 |

within Alloa Secondary Plan Area

minimum target unit flow rate

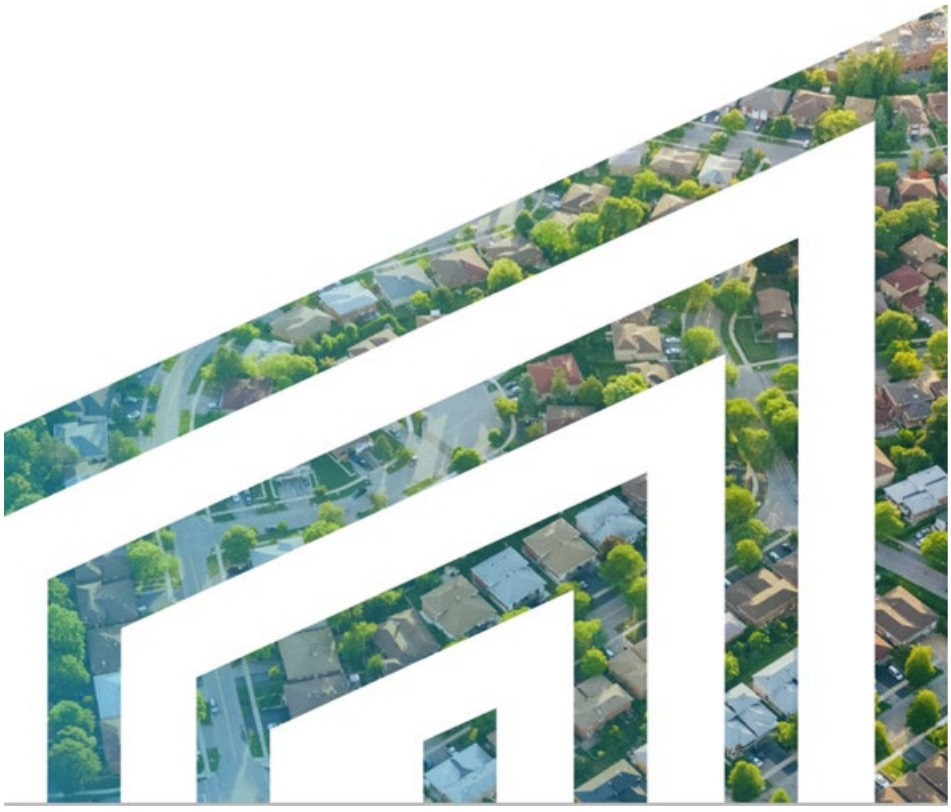
**ETOBICOKE WATERSHED QUANTITY CONTROL STRATEGY - UNIT FLOW RATES**
**REGIONAL CONTROL**

**Basin 1 - Etobicoke Creek Headwater (Upstream) - Exclusive Mayfields Area - Control to 60% of Future Flows**
**Basin 1 - Etobicoke Creek Headwater (Upstream) - Mayfields Area - Control to 100% of Future Flows**

| Future Catchment # | Unit Flow Rates ($m^3/s/ha$) |
|---|---|
| | Regional |
| 1 | 0.04963 |
| 2 | 0.05656 |
| 3 | 0.06398 |
| 6 | 0.06738 |
| 7 | 0.05335 |
| 8 | 0.06661 |
| 9 | 0.06233 |
| 10 | 0.06465 |
| 11 | 0.05388 |
| 12 | 0.05831 |
| 13 | 0.05788 |
| 14 | 0.05750 |
| 18 | 0.05727 |
| 20 | 0.05905 |
| 21 | 0.06765 |
| 32 | 0.06216 |
| 34 | 0.05646 |
| 35 | 0.06343 |
| 40 | 0.08108 |
| 42 | 0.05565 |
| 43 | 0.07767 |
| 49 | 0.07040 |
| 50 | 0.07417 |
| 52 | 0.06475 |
| 53 | 0.07923 |
| 54 | 0.05880 |
| 55 | 0.05233 |
| 62 | 0.05457 |
| 70 | 0.05731 |
| 71 | 0.05509 |
| 72 | 0.06139 |
| 76 | 0.07829 |
| 80 | 0.06449 |
| 82 | 0.05135 |
| 83 | 0.06047 |
| 84 | 0.07681 |
| 85 | 0.05155 |
| 86 | 0.05504 |
| 87 | 0.07126 |
| 89 | 0.05333 |
| 90 | 0.06224 |
| 97 | 0.05427 |
| 102 | 0.08161 |
| 103 | 0.06452 |
| 104 | 0.05990 |
| 105 | 0.06942 |
| 107 | 0.05577 |
| 108 | 0.05479 |
| 118 | 0.05386 |
| 125 | 0.06194 |
| 132 | 0.06388 |
| 140 | 0.05130 |
| 147 | 0.05498 |
| 153 | 0.06647 |
| 167 | 0.06852 |
| 168 | 0.05447 |
| 170 | 0.05938 |
| 176 | 0.05475 |
| 743 | 0.06956 |
| 746 | 0.07996 |
| 747 | 0.07726 |
| 63998 | 0.06533 |
| 744, 63999, 105105, 8484 (Mayfields Area) | 0.14209 |

# APPENDIX B

## Huttonville and Fletcher's Creeks SWM Targets



MAYFIELD ROAD

MCLAUGHLIN ROAD

WANLESS DRIVE

MISSISSAUGA ROAD

CREDITVIEW ROAD

CHINGUACOUSY ROAD

HURONTARIO STREET

SANDALWOOD PKWY

JAMES POTTER ROAD

BOVAIRD DRIVE WEST

HERITAGE ROAD

Transit Spine Collector Road

CreditView Road Park

Fletchers Creek

FUTURE WEST HUTTONVILLE DEVELOPMENT

H1 NODE 508

H2 NODE 540

H3 NODE 503

F1 NODE 614

F2 NODE 699

F3 NODE 631

F4 NODE 634

F5

220.55 / 230.56

359.33 / 342.08

163.93 / 135.62

288.74 / 315.78

52.38 / 88.98

75.49 / 90.24

935.40 / 923.42

1813.59 / 1788.07

LEGEND:

- WATERSHED BOUNDARY
- EXISTING DRAINAGE AREA BOUNDARY
- PROPOSED DRAINAGE AREA BOUNDARY
- EXISTING DRAINAGE AREA (Ha) 315.91
- PROPOSED DRAINAGE AREA (HA) 290.72
- F5 H3 DRAINAGE NODES (Modeling Nodes)
- WEST HUTTONVILLE DEVELOPMENT AREA

NORTHWEST BRAMPTON LSA AND SUBWATERSHED STUDY

CITY OF BRAMPTON

DRAINAGE AREAS TO COMPARISON POINTS PRE- VS POST-DEVELOPMENT

amec

Scale 1:25,000

Consultant File No. 106123

Figure No. 3G HYDROLOGY 3

Dec 14/10 – ana-maria.tr

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| Table 2.7. Erosion Control Storage Requirements | | | |
|---|---|---|---|
| **Scenario** | **Site/Node** | **Storage ($m^3$/imp. ha)** | **Critical Erosion Flow Rate ($m^3$/s/ha)** |
| Conventional | F1 | 250 | 0.00052 (Case 1)<br>0.00025 (Case 2) |
| | F2 | 250 | 0.00052 (Case 1)<br>0.00025 (Case 2) |
| | F3 | 250 | 0.00052 (Case 1)<br>0.00025 (Case 2) |
| | F4 | 250 | 0.00052 (Case 1)<br>0.00025 (Case 2) |
| | HW | 325 | 0.00052 |
| | HE | 200 | 0.00052 |
| SWM with LID[1.] | F1 | 150 for Impervious Areas to LID BMPs<br>250 for Impervious Areas without LID BMPs | 0.00052 (Case 1)<br>0.00025 (Case 2) |
| | F2 | 150 for Impervious Areas to LID BMPs<br>250 for Impervious Areas without LID BMPs | 0.00052 (Case 1)<br>0.00025 (Case 2) |
| | F3 | 150 for Impervious Areas to LID BMPs<br>250 for Impervious Areas without LID BMPs | 0.00052 (Case 1)<br>0.00025 (Case 2) |
| | F4 | 150 for Impervious Areas to LID BMPs<br>250 for Impervious Areas without LID BMPs | 0.00052 (Case 1)<br>0.00025 (Case 2) |
| | HW | 200 for Impervious Areas to LID BMPs<br>325 for Impervious Areas without LID BMPs | 0.00052 |
| | HE | 150 for Impervious Areas to LID BMPs<br>200 for Impervious Areas without LID BMPs | 0.00052 |

1. Storage values represent volumetric requirements for areas without and with LID BMPs.

### *Water Budget*

The LID BMP capture although demonstrated to be able to reduce erosion control volumes, also benefits the overall water budget. As documented within the Phase 2 Impact Assessment, surface runoff would be marginally above existing volumes for East Huttonville Creek at Bovaird at 3% and a similar 2% increase for Fletcher's Creek at the limits of the Mount Pleasant development area.

Water budgets to existing natural features will be assessed as part of the Block Plan EIR Stage to establish an appropriate hydroperiod with respect to wetland conservation, restoration and enhancement efforts. It has been proposed that roof drain collection systems for shallow features and both roof drain and foundation drain systems for deeper features be considered for managing the overall ecological water budget for these features.

### *2.2.3. Surface Water Quality*

The stormwater quality management strategy has been established based on using generic LID infiltration best management practices and conventional stormwater management facilities that would provide Level 1 (Enhanced) quality control. The combination of LID BMPs and conventional stormwater quality management would in effect provide a level of water quality control for Total Suspended Solids above the current MOE Level 1 requirements for stormwater management. Stormwater management facility sizing has been provided within Table 2.8.

| Table 2.3 Summary of Stormwater Management Requirements for Flood Control[2] | | | | | |
|---|---|---|---|---|---|
| Stormwater Management Scenario | Drainage Outlet | 25-Year | | 100-Year | |
| | | Unitary Storage Volume ($m^3$/Impervious ha) | Unitary Discharge ($m^3$/s/ha) | Unitary Storage Volume ($m^3$/Impervious ha) | Unitary Discharge ($m^3$/s/ha) |
| Conventional | HW | 675 | 0.0068 | 1200 | 0.025 |
| | HE | 550 | 0.0068 | 975 | 0.025 |
| | F1[1.] | 800 | 0.0072 | 1055 | 0.025 |
| | F2 | 500 | 0.0083 | 850 | 0.025 |
| | F3 | 700 | 0.0083 | 900 | 0.026 |
| | F4 | 1100 | 0.0069 | 1500 | 0.019 |
| LID | HW | 550 | 0.0068 | 1100 | 0.025 |
| | HE | 475 | 0.0068 | 975 | 0.025 |
| | F1[1.] | 750 | 0.0072 | 1055 | 0.025 |
| | F2 | 400 | 0.0083 | 850 | 0.025 |
| | F3 | 625 | 0.0083 | 850 | 0.026 |
| | F4 | 1000 | 0.0069 | 1450 | 0.019 |

1. F1 Node located at Sugarhill Drive and Crown Victoria Drive just east of Creditview Road.

To mitigate the increase in Regional Storm peak flows, Flood Control Storage would also have to be provided at strategic locations within East Huttonville Creek and Fletcher's Creek. Regional Storm storage as cited in Table 2.3 has been determined based on locating Regional Storm flood control storage in the East Huttonville Creek and F2 stream corridor discounting the attenuative influence of the tableland stormwater management facilities designed for the 100 year control rate. For F1 and F4, since there is not stream corridor Regional Storm , flood control has been accommodated in the off-line facilities inherently including all storage volumes, up to and including the Regional Storm event.

It should be noted that the flow comparison node for F1 is not Creditview Road (for post- to pre-) but rather a confluence point just downstream (east) of Creditview Road (ref. Footnote 4), due to combined drainage to this point. From the F1 confluence upstream to Creditview Road, the system is enclosed and not regulated by CVC, hence the standard for management reverts to City of Brampton criteria for major system design (100 year). From the F1 confluence downstream to Sandalwood Road, the system is open and hence regulated, therefore the Regional Storm criteria applies.

Additional investigations have taken place for F4 as well, to determine whether there may be potential to reduce F4 Regional Storm flood control storage by retrofitting/optimizing the existing stormwater management facilities east of McLaughlin Road, north of Wanless Drive. Based on initial investigations this has been determined to have potential, hence should be examined further as part of the EIR.

[2] The application of LID BMPs is currently not to result in a reduction of the quantity management requirements to be achieved by stormwater management facilities.

| Table 2.4 Regional Storm Event Flood Storage | | | |
|---|---|---|---|
| **Total Storage ($m^3$)** | **Storage Type** | **Storage ($m^3$/imp.ha)** | **Total Storage ($m^3$)** |
| HE[2.] | On-line SWM | 841 | 125,000 |
| F1[3., 4.] | Off-line SWM | 910 | 37,000 |
| F2[2.] | On-line SWM | 446 | 42,000 |
| F3[1.] | NA | 0 | 0 |
| F4[3.] | Off-line SWM | 1178 | 38,500 |

1. 100 year governs.
2. Storages do not include 100 year offline facility storage.
3. Storages determined with 100 year off-line facility in-place, but are considered in addition to the required 100 year storage.
4. F1 Node located at Sugarhill Drive and Crown Victoria Drive just east of Creditview Road.

All structures supporting Regional Storm on-line storage will need to be designed and managed appropriately (i.e. designed to meet functional stability, Canadian Highway Bridge Design Codes (CHBD Codes), . In addition, appropriate risk assessment tools should be considered for use such as a dam break analysis to ensure appropriate flood management measures are implemented upstream and downstream of proposed control structures.

### *Hydraulics*

Regional Storm on-line storage would be provided within the Regulatory channel corridors, which have been assessed for flood hydraulics and stream morphology along with required setbacks. Accordingly Table 2.5 provides the required channel corridor widths.

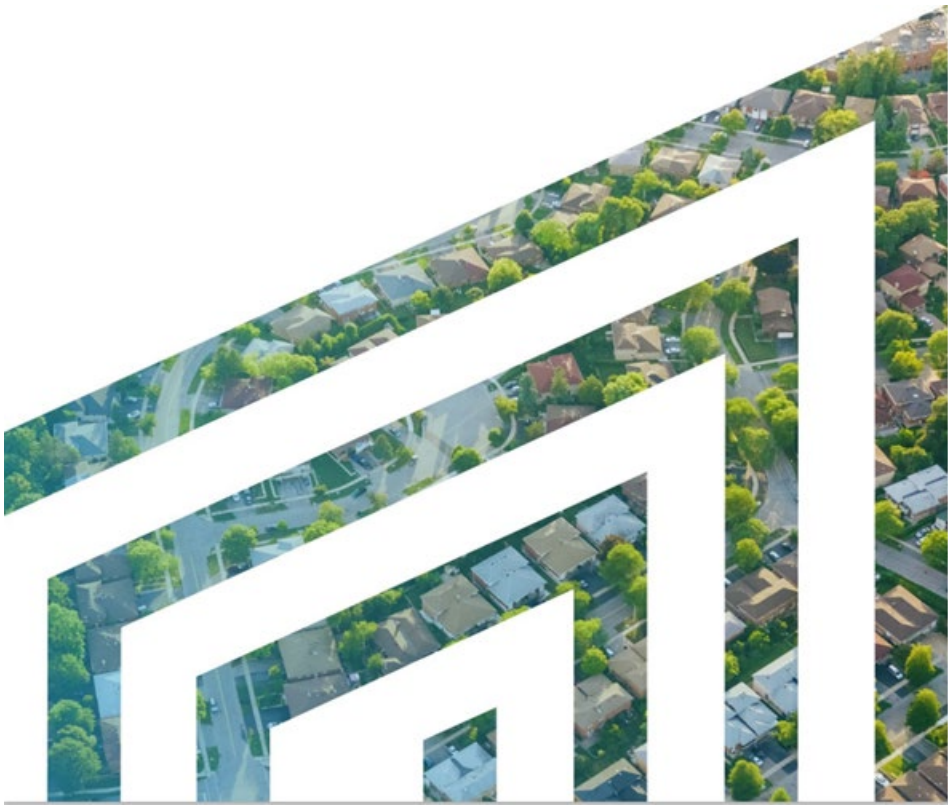
| Table 2.5. Minimum Watercourse Channel Block Width Requirements (m) | | | | | |
|---|---|---|---|---|---|
| **Creek Location** | | **Stream Meander Belt** | **Flood Control** | **Buffer/Setback** | **Total[1.]** |
| East Huttonville | South of CNR (ref. Reach HV 18, Fig. 1.1) | 30 | 60 | 10 | 70 |
| | North of CNR to TCPL (ref. Reaches HV 19, Fig. 1.1) | 31-50 | 55 +/- | 10 | 70 +/- |
| | TCPL to Wanless (ref. Reaches HV20-25), Fig. 1.1) | 15-20 | 40 +/- | 10 | 50 +/- |
| | North of Wanless to Woods (ref. Reaches HV 26, Fig. 1.1) | 15-20 | 35 +/- | 10 | 45 +/- |
| | North of Wanless, Woods to Mayfield (ref. Reaches HV 27-29, Fig. 1.1) | 15-20 | 35 +/- | 10 | 45 +/- |
| Fletcher's | West and Central Eastern Corridors (ref. Reaches F04, Fig. 1.1) | 31-40<br>21-30 | 50 +/-<br>45 +/- | 10 | 62.5 +/-<br>55 +/- |
| | Central Western Corridor (ref. reaches F 07-F08, Fig. 1.1) | 15-20 | 45 +/- | 10 | 55 +/- |
| | Eastern Corridor (ref. Reaches F15 – F17, Fig. 1.1) | 21-30 | 45 +/- | 10 | 55 +/- |
| | Mayfield/ McLaughlin Corridor (ref. Reach F22, Fig. 1.1) | 21-30 | 45+/- | 10 | 55 +/- |

Note: "The implementation of this buffer/setback can be variable/flexible as it relates to its application to the corridor, e.g. if its 10 m, it might be split 5 m on either side, or used as 6 metres on one side to facilitate the City trail and 4 m on other side."

1. Actual watercourse corridors can be greater based on SPNHS principles.
2. This buffer/setback may be variable/flexible as applied from top-of-bank (e.g. 5 m per side).

# APPENDIX B

## Settlement Area Boundary Expansion (SABE) SWM Targets



| **Subwatershed: Upper Etobicoke Creek Subwatershed** | |
|---|---|
| Subwatershed Characterization: | |
| Total Subwatershed Drainage Area: | 9978 ha |
| Predominant Soil Group: | Clay Loam |
| Predominant Grades: | <2% |
| Downstream FVA: | Yes (Downtown Brampton) |
| # of Structures within FVA: | 110 Commercial; 13 Miscellaneous/Institutional; 68 Residential |
| Flood Frequency for FVA: | > 50 Year |
| Redside Dace Habitat: | No |
| Land Classification Characterization: | |
| Area of FSA Within Subwatershed: | 2027 ha |
| FSA As Proportion of Subwatershed: | 20.3 % |
| Assumed Imperviousness of FSA: | 51% |
| Receiving Systems: | Mixed (Confined and Unconfined Watercourses, HDFs) |
| Area of Preliminary SABE Concept Within Subwatershed: | 731 ha Community<br>146 ha Employment |
| Preliminary SABE Concept As Proportion of Subwatershed: | 8.8 % |
| Assumed Imperviousness of Preliminary SABE Concept: | 70% Community<br>90% Employment |
| Receiving Systems: | Mixed (Confined and Unconfined Watercourses, HDFs) |
| Area of SABE Testing Area Within Subwatershed: | 72 ha Community<br>136 ha Employment |
| SABE Testing Area As Proportion of Subwatershed: | 2.1 % |
| Assumed Imperviousness of SABE Testing Area: | 70% Community<br>90% Employment |
| Receiving Systems: | Mixed (Confined and Unconfined Watercourses, HDFs) |
| Range of Stormwater Management Sizing and Design Criteria | |
| Extended Detention Storage/Erosion Control: | 325 $m^3$/imp. ha |
| 100 Year Flood Control: | 400 $m^3$/imp. ha – 1250 $m^3$/imp. ha |
| Regional Storm Control: | 0 $m^3$/imp. ha – 1200 $m^3$/imp. ha |
| Water Budget: | 1 mm/imp. ha – 6 mm/imp. ha |
| Water Quality Criteria: | Enhanced Standard of Treatment<br>Thermal Mitigation |

| **Subwatershed: Fletcher's Creek Subwatershed** | | |
|---|---|---|
| Subwatershed Characterization: | | |
| Total Subwatershed Drainage Area: | 4169 ha | |
| Predominant Soil Group: | Clay Loam | |
| Predominant Grades: | <2% | |
| Downstream FVA: | No | |
| Redside Dace Habitat: | Yes | |
| Land Classification Characterization: | | |
| Area of FSA Within Subwatershed: | 186 ha | |
| FSA As Proportion of Subwatershed: | 4.5 % | |
| Assumed Imperviousness of FSA: | 51% | |
| Receiving Systems: | Mixed (Unconfined Watercourses, HDFs) | |
| Area of Preliminary SABE Concept Within Subwatershed: | | 126 ha Community<br>1 ha Employment |
| Preliminary SABE Concept As Proportion of Subwatershed: | | 3.1 % |
| Assumed Imperviousness of Preliminary SABE Concept: | | 70% Community<br>90% Employment |
| Receiving Systems: | | Mixed (Unconfined Watercourses, HDFs) |
| Range of Stormwater Management Sizing and Design Criteria | | |
| Extended Detention Storage/Erosion Control: | 250 $m^3$/imp. ha | |
| 100 Year Flood Control: | 600 $m^3$/imp. ha - 1250 $m^3$/imp. ha | |
| Regional Storm Control: | 0 $m^3$/imp. ha - 1225 $m^3$/imp. ha | |
| Water Budget: | 1 mm/imp. ha – 6 mm/imp. ha | |
| Water Quality Criteria: | Enhanced Standard of Treatment<br>Discharge temperatures below 24°C<br>Dissolved oxygen concentrations of at least 7 mg/L | |
| TSS levels less than 25 mg/L above background conditions | | |

| **Subwatershed: Huttonville Creek Subwatershed** | | |
|---|---|---|
| Subwatershed Characterization: | | |
| Total Subwatershed Drainage Area: | 1510 ha | |
| Predominant Soil Group: | Clay Loam | |
| Predominant Grades: | <2% | |
| Downstream FVA: | No | |
| Redside Dace Habitat: | Yes | |
| Land Classification Characterization: | | |
| Area of FSA Within Subwatershed: | 43 ha | |
| FSA As Proportion of Subwatershed: | 2.8 % | |
| Assumed Imperviousness of FSA: | 51% | |
| Receiving Systems: | HDFs | |
| Area of Preliminary SABE Concept Within Subwatershed: | | 2 ha Community<br>36 ha Employment |
| Preliminary SABE Concept As Proportion of Subwatershed: | | 2.5 % |
| Assumed Imperviousness of Preliminary SABE Concept: | | 70% Community<br>90% Employment |
| Receiving Systems: | | Mixed (Unconfined Watercourses, HDFs) |
| Range of Stormwater Management Sizing and Design Criteria | | |
| Extended Detention Storage/Erosion Control: | 200 $m^3$/imp. ha - 325 $m^3$/imp. ha | |
| 100 Year Flood Control: | 550 $m^3$/imp. ha - 1150 $m^3$/imp. ha | |
| Regional Storm Control: | 975 $m^3$/imp. ha - 1200 $m^3$/imp. ha | |
| Water Budget: | 1 mm/imp. ha – 6 mm/imp. ha | |
| Water Quality Criteria: | Enhanced Standard of Treatment<br>Discharge temperatures below 24°C | |
| Dissolved oxygen concentrations of at least 7 mg/L<br>TSS levels less than 25 mg/L above background conditions | | |