

DOWNSTREAM ANALYSIS REPORT

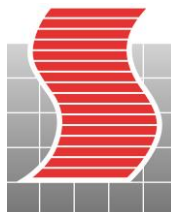
MOUNT HOPE WEST
RESIDENTIAL SUBDIVISION
UNITED HOLDINGS INC.

TOWN OF CALEDON

Project: 2024-5476

February 2026

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- Appendix B: Catchment Discretization by Model Scenario
- Appendix C: Hydrology Model Parameter Calculations
- Appendix D: VO Model Schematics

1.0 INTRODUCTION

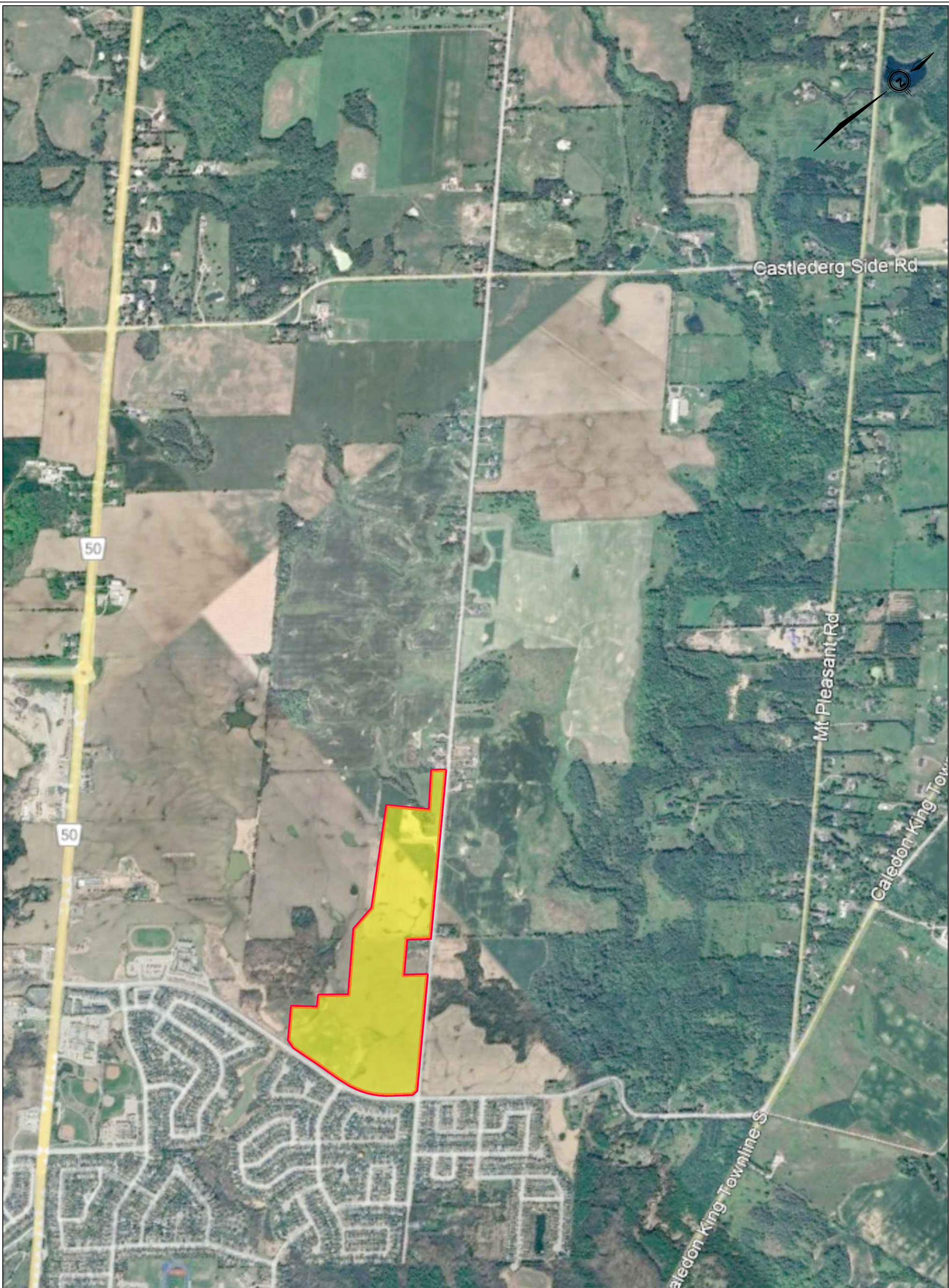
Schaeffers Consulting Engineers (SCE) is retained by United Holdings Inc. to perform the downstream assessment for a proposed residential subdivision. The objective of this report is to document the downstream analysis methodology and conclusions for the approximately 32 ha property referred to as “Mount Hope West” (“the Subject Site”), located west of Mount Hope Road, North of Columbia Way as a northerly extension of the existing Bolton community. The property is legally defined as Albion Lot 12 Concession 7, Town of Caledon, Regional Municipality of Peel. **Figure 1.1** shows the Project Site’s location.

The assessment will determine the hydrological impacts of the proposed project located within the Toronto and Region Conservation Authority (TRCA’s) jurisdiction. The assessment serves to inform the proposed storm water management (SWM) concept of the Subject Site.

1.1 Reference Reports and Studies

The following studies were utilized in the preparation of this report.

- “Humber River Hydrology Update Final Report”, Civica, June 2015
- “Functional Servicing Report, Mount Hope West”, SCE, 2025
- “Technical Guide - River and Stream Systems: Flooding Hazard Limit”, Ontario Ministry of Natural Resources (MNRF), 2002
- “Technical Guide - River and Stream Systems: Erosion Hazard Limit”, Ontario Ministry of Natural Resources (MNRF), 2002
- “Fluvial Geomorphic Assessment of a Humber River Tributary”, GEI Consultants Ltd, 2023.
- “Floodplain Delineation and Chanel Realignment Report”, SCE, 2025, DRAFT
- “Functional Servicing and Stormwater Management Report for Bolton North Hill Group”, by Crozier, February 2025



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LEGEND


 SUBJECT AREA

FIGURE 1.1
 LOCATION PLAN

2.0 PROJECT SETTING

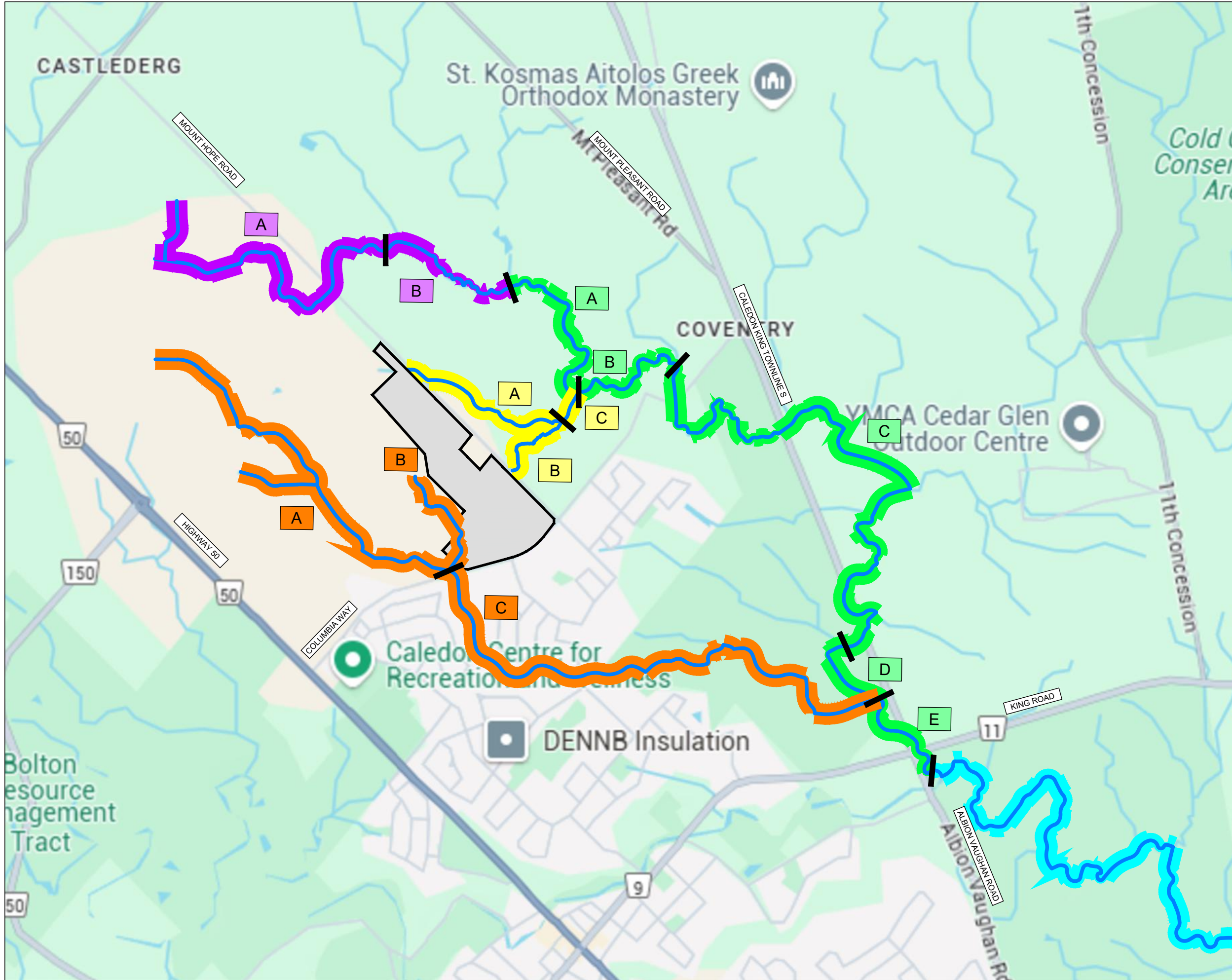
The following sections defines the study area, available topographic information used for the study, existing site conditions, and proposed site conditions.

2.1 Study Area


The Subject Site is located within the Main Humber subwatershed of the Humber River watershed. The topography reveals that the site drains mostly towards the east roadside ditches then through tributaries leading to Cold Creek West and ultimately to the Main Humber River. A portion of the existing lands drains southwest towards Columbia Way. There are no drainage features further upstream from the Subject Site as the area itself comprises of headwater lands for the tributaries draining into Cold Creek West. **Figure 2.1** illustrates the project location and the surrounding rivers and reaches of interest.

The current land use pattern within the Study Area and Subject Site is agricultural. There are existing private properties located toward the northeast of the Project Site. The northeast corner of the Project Site also contains an existing wetland feature. Greenbelt area is located past the west side of the Site. The proposed development covers approximately 32 ha. The draft plan of subdivision, prepared by SGL Planning and Design Inc. and dated May 16, 2025, is provided in **Appendix A** for reference.

A Study Area is established for the purpose of defining the extent of study for the downstream analysis. The Study Area extends from the Project Site until where the Humber River crosses Caledon King Townline South and King Street East. The downstream analysis evaluates potential impacts to the downstream reaches resulting from the proposed development and informs a SWM strategy to mitigate these impacts. **Figure 2.1** as well shows the extents of the Study Area as well as labelled reaches of the involved waterways. The Study Area covers approximately 750 ha of drainage area and over 10 km of river length. An existing flood vulnerable area (FVA) is located at the downstream end of Main Humber Tributary A.



LEGEND

-  SUBJECT SITE
-  REACH OF INTEREST
-  MAIN HUMBER TRIBUTARY A
-  COLD CREEK WEST
-  COLD CREEK WEST TRIBUTARY B
-  COLD CREEK WEST TRIBUTARY C
-  MAIN HUMBER RIVER
-  RIVER REACH ID

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FIGURE 2.1
STUDY EXTENTS & RIVER NAMES

2.2 Existing Conditions

The Subject Site directs flows to the east into Cold Creek West Tributary B, and south into Main Humber Tributary A. All tributaries eventually connect with Cold Creek West, and ultimately to the Main Humber River. The current land use pattern within the Study Area and Subject Site is agricultural. There are existing private properties located toward the northeast of the Project Site. The northeast corner of the Project Site also contains an existing wetland feature. Greenbelt area is located past the west side of the Site. The proposed development covers approximately 32 ha. An existing flood vulnerable area (FVA) is located at the downstream end of Main Humber Tributary A.

2.3 Post Development Conditions

Under post-development conditions, the Project Site will be developed in accordance with the draft plan of subdivision, prepared by SGL Planning and Design Inc. and dated May 16, 2025 (provided in **Appendix A**). The proposed land use will consist primarily of residential lands. There is also a proposed park block, located center-east section and a commercial block located in the south section of the development area.

The land will be re-graded to capture and convey surface runoff towards the proposed stormwater management ponds. Regrading the land will alter the existing drainage areas contributing to the tributaries exiting the site. A portion of surface flow will also be directed to existing wetlands. An existing culvert crossing is proposed to be upgraded to a pipe to allow passage of an existing stream crossing along Mt Hope Road. The existing culvert results in excess ponding along the roadside ditch.

The proposed SWM plan proposes two SWM ponds and uncontrolled drainage of the Northeast Site Plan. **Table 2-1** summarizes the SWM Plan as is defined by the *Functional Servicing and Stormwater Management Report* (Schaeffers 2025).

Table 2-1: SWM Strategy Summary of the Subject Site

SWM Strategy	Description	Quantity Control	Post Development Drainage Area (ha)	Runoff Coefficient
East SWM Pond	East Site drainage area	Regional Control	16.61	0.71
West SWM Pond	West Site drainage area	100-year Control	11.28	0.80
Uncontrolled	Northeast Site Plan	-	0.74	0.76

Quantity Controls for the site ponds were established in coordination with TRCA. Based on the consultation, larger development areas are subject to regional controls. Regional release rates are established for the East Pond due to the larger drainage area associated with the SWM pond. Regional release rates for the east pond were determined using the pre-development drainage area and maximum capacity of the existing culvert to which the pond shall discharge. Both ponds utilize the Humber River Sub-Basin 10 equations and their respective pre-development drainage areas to determine the remaining release rates. Note that the post development hydrological modelling presented within this analysis is for the uncontrolled condition.

2.4 BNHG Post Development Conditions

It is necessary to consider other future proposed developments that affect the Subject Site’s external catchment areas to appropriately determine the impacts for a complete downstream assessment. A nearby Landowner’s group, Bolton North Hill Landowner’s Group (BNHG) has a proposed draft plan of subdivision for their lands. The *Functional Servicing and Stormwater Management Report* prepared by Crozier (February 2025) identifies the proposed conditions of their lands.

Nearly 50 ha of land to be developed lies within the catchments of study for the Mount Hope West Project. As such, these lands have been included into this assessment. The proposed SWM strategy of the BNHG lands includes three SWM ponds. Two of these ponds are to be located to the west of the Subject Site and the third is to be located to the east of the Subject Site, across from Mount Hope Road. Presently, Regional controls are not proposed for the BNHG lands as documented by Crozier and summarized in **Table 2-2** (2025).

Table 2-2: SWM Strategy of the BNHG Lands

SWM Strategy	Description	Quantity Control	Post Development Drainage Area (ha)	Runoff Coefficient
SWM Pond 5	West of Subject Site	100-year Control	27.24	0.60
SWM Pond 8	West of Subject Site	100-year Control	17.48	0.61
SWM Pond 9	East of Subject Site	100-year Control	5.13	0.61

Note that the post development hydrological modelling presented within this analysis is for the uncontrolled condition.

3.0 METHODOLOGY

This section describes the methodology undertaken to execute the downstream analysis.

3.1 Hydrologic Modelling

The hydrologic assessment is performed by first acquiring existing TRCA VO hydrology models. The hydrology model is established in Visual OTTHYMO 6.2 (VO) software. For the hydrological assessment work, two models were acquired from the TRCA, prepared by Civica Infrastructure Inc., named as:

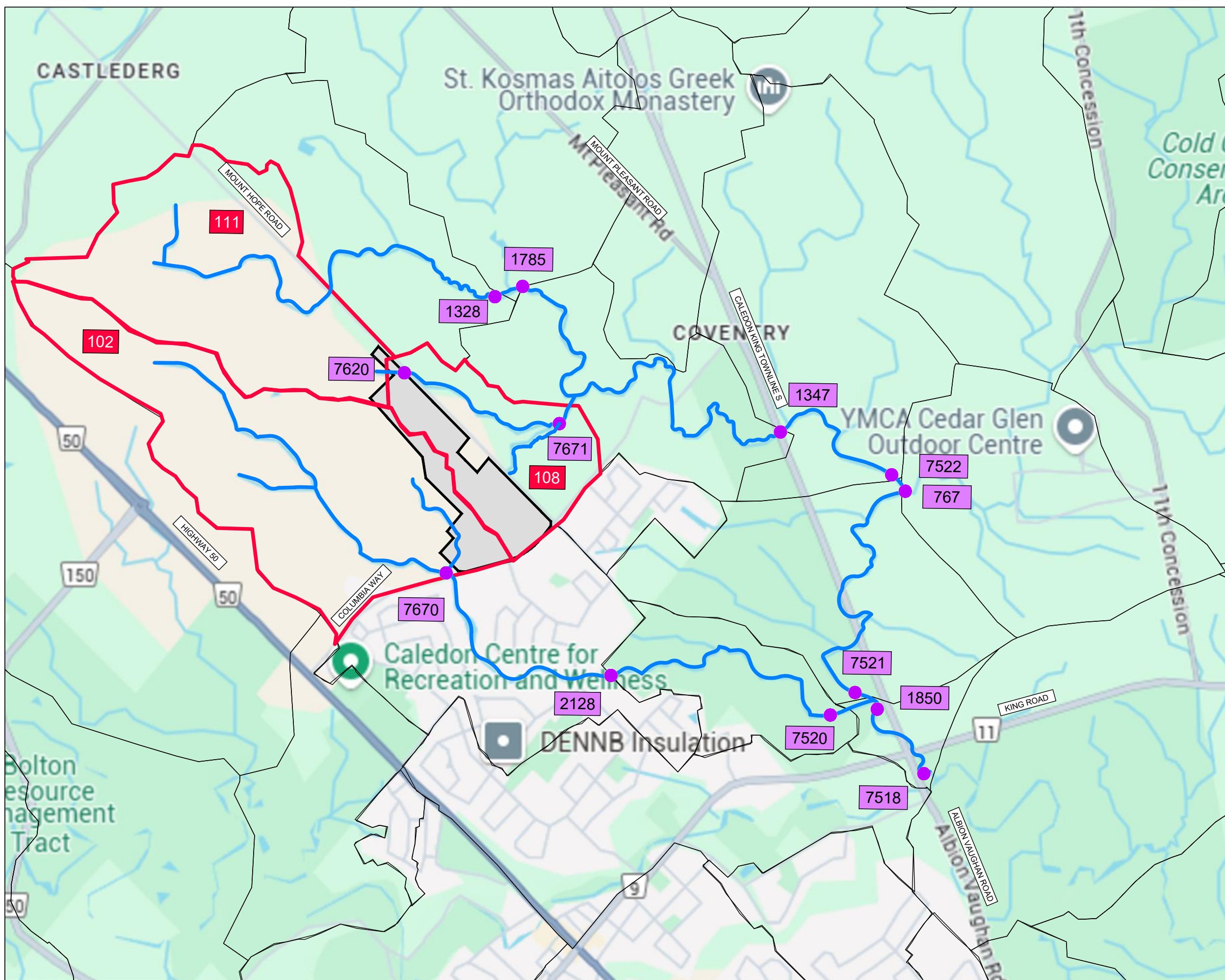
1. Humber – Large Storms – no ponds (2017) – this VO model is used as the basis for the regional storm assessment, using CNIII values. This model represents the future, uncontrolled conditions. Within this model, a scenario for the 350- and 500-year storms using CNII is available. This scenario has been used to model the 100-year storm scenarios as it represents future uncontrolled conditions.
2. Design Storm Scenarios (2015) – this VO model is used as the basis for assessments of storms of with 2- up to 100-year return periods. This model uses existing, controlled conditions.

At present, the TRCA is unable to provide a hydrology model for the future, uncontrolled conditions for the 100-year storm as this model is under development. Thus, the *Large Storms* model scenario for the 350– to 500-year storms has been used to model the 100-year storm. The scenario is established with future land use conditions and uncontrolled flows. This makes it appropriate for use to delineate the 100-year flood line.

The Subject Site is located within two existing catchments that serve as the headwaters of two tributaries, one drains to the east across Mount Hope Road, and one draining south across Columbia Way. **Figure 3.1** shows the extents of the downstream analysis including reach and tributary names.

The TRCA VO models have been updated to reflect pre-development and post development conditions considering the subject site. The resulting updated peak flows are then applied to the HEC-RAS model to complete the hydraulic assessment. **Figure 3.1** identifies key Nashyds and Addhyds from the VO model used throughout the assessment. **Appendix B** shows the catchment area discretization through each of the modelled scenarios. **Appendix D presents the VO model schematics for each scenario.**

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- LEGEND
- SUBJECT AREA
 - REACH OF INTEREST
 - TRCA VO MODEL CATHMENT NASHYD
 - TRCA VO MODEL CATHMENT NASHYD OF INTEREST
 - 111 TRCA VO MODEL CATHMENT NASHYD ID
 - ADDHYD NODE LOCATION
 - 789 ADDHYD NODE ID

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FIGURE 3.1
HYDROLOGICAL NODES

Four model scenarios established in VO are used to assess changes in peak flows from the proposed site as follows:

3.1.1 TRCA Model

The TRCA 's existing hydrology models are used as a starting point for this analysis. The TRCA Humber-Large Storms no ponds (future conditions, no ponds) model was used in modelling the Regional Storm. The TRCA Humber-Large Storms no ponds (future conditions, no ponds) 350– to 500-year model (CNII) was used for the 100-year floodplain assessment.

Three of the existing TRCA Nashyds are relevant to the Study Area and are updated in the later model scenarios as a result of the proposed Project Site footprint. **Table 3-1** describes the VO model elements of interest to the assessment.

Table 3-1: VO Model Element Description of Model Scenario 1 - TRCA Model

Element	Element Description	Changes Made
111	Nashyd representing a catchment area north of the site. This Nashyd contributes to Cold Creek West Tributary C.	None.
108	Nashyd representing the catchment area that contributes to two reaches feeding Cold Creek West Tributary B.	None.
102	Nashyd representing the catchment area that contributes to Main Humber Tributary A.	None.

3.1.2 SCE Modified Existing

SCE made updates to the existing TRCA Models to reflect existing site conditions. Existing drainage areas for the Nashyd encompassing the site area were corrected using available detailed site topography. Updating the baseline drainage areas would support more representative results of the Study Area peak flows. As well, identified subcatchments were discretized out from the existing TRCA Nashyds to establish the peak flows for reaches not previously modelled by the TRCA. This includes discretizing out the catchment for the channel realignment. **Table 3-2** describes the VO model elements of interest to the assessment.

Table 3-2: VO Model Element Description of Model Scenario 2 - SCE Modified Model

Element	Element Description	Changes Made Relative to Scenario 1
111	Nashyd representing a catchment area north of the site. This Nashyd contributes to Cold Creek West Tributary C.	Catchment area updated upon inspection of detailed topographic information.
7622	Representing the upstream catchment of Reach A for Cold Creek West Tributary B.	Nashyd discretized from the original TRCA Nashyd 108.
7687	Representing the middle portion of the catchment of Reach A for Cold Creek West Tributary B.	Nashyd discretized from the original TRCA Nashyd 108.
7685	Representing the downstream catchment of Reach A for Cold Creek West Tributary B.	Nashyd discretized from the original TRCA Nashyd 108.
7680	Representing the catchment contributing to Reach B of Cold Creek West Tributary B.	Nashyd discretized from the original TRCA Nashyd 108.
7683	Representing the catchment downstream area contributing to Reach C of Cold Creek West Tributary B.	Nashyd discretized from the original TRCA Nashyd 108.
102	Nashyd representing the catchment area that contributes to Reach A of Main Humber Tributary A.	Catchment area updated upon inspection of detailed topographic information and discretization. Net addition of land previously under Element 93.
7668	Representing the catchment contributing to Reach B of Main Humber Tributary A.	Nashyd discretized from the original TRCA Nashyd 102.

In order to maintain the calibration of the original TRCA model, time to peak (TP) values were maintained where reasonable. See **Appendix C** for detailed calculations of these site-specific parameters, as well as for a summary table of inputs for the 10- to 100-year storm model. The SCE Modified Model Scenario is used as the baseline for the downstream assessment.

3.1.3 SCE Post Development

This version introduces the site land use changes into the hydrology model by converting site areas into Standhyds. Site stormwater ponds are not included in this model, representing uncontrolled conditions for the purpose of floodplain delineation. **Table 3-3** describes the VO model elements of interest to the assessment.

Table 3-3: VO Model Element Description of Model Scenario 3 - SCE Proposed Model

Element	Element Description	Changes Made Relative to Scenario 2
111	Nashyd representing a catchment area north of the site. This Nashyd contributes to Cold Creek West Tributary C.	Consistent with Scenario 2.
7622	Representing the upstream catchment of Reach A for Cold Creek West Tributary B.	Updated catchment size due to site footprint.
7674	Representing the north portion of the Project Site that flows uncontrolled through Reach A of Cold Creek West Tributary B.	Established Standhyd (urbanized).
7687	Representing the middle portion of the catchment of Reach A for Cold Creek West Tributary B.	Updated catchment size due to site footprint.
7685	Representing the downstream catchment of Reach A for Cold Creek West Tributary B.	Updated catchment size due to site footprint.
7680	Representing the catchment contributing to Reach B of Cold Creek West Tributary B.	Updated catchment size due to site footprint.
7667	Representing the east portion of the Project Site that discharges to Reach B of Cold Creek West Tributary B.	Established Standhyd (urbanized).
7683	Representing the catchment downstream area contributing to Reach C of Cold Creek West Tributary B.	Consistent with Scenario 2.
102	Nashyd representing the catchment area that contributes to Reach A of Main Humber Tributary A.	Updated catchment size due to site footprint.
7668	Representing the catchment contributing to Reach B of Main Humber Tributary A.	Updated catchment size due to site footprint.
7669	Representing the west portion of the Project Site that discharges to Reach B of Main Humber Tributary A.	Established Standhyd (urbanized).

The relevant Nashyd and Standhyd parameters are updated using site topographic data and the resulting catchment delineation. See **Appendix C** for detailed calculations of these site-specific parameters, as well as for a summary table of inputs for the 2– to 100-year storm model.

Table 3-4 summarizes the VO parameters of the site affected Nashyds and Standhyds between each model scenario of the Regional Model.

Table 3-4: Regional Hydrological Model Parameters by VO Element

Model Scenario	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Model Parameter	CN			IA			TP			XIMP			TIMP		
111	95	95	95	10	10	10	1.26	1.26	1.26	NA	NA	NA	NA	NA	NA
108	94	-	-	10	-	-	0.89	-	-	NA	-	-	NA	-	-
7622	-	94	94	-	10	10	-	0.89	0.89	-	0	0	-	NA	NA
7674	-	-	93	-	-	1.5	-	-	-	-	-	0.68	-	-	0.72
7687	-	94	94	-	10	10	-	0.89	0.89	-	0	0	-	NA	NA
7685	-	94	94	-	10	10	-	0.89	0.89	-	0	0	-	NA	NA
7680	-	94	94	-	10	10	-	0.89	0.89	-	0	0	-	NA	NA
7667	-	-	95	-	-	1.5	-	-	-	-	-	0.62	-	-	0.72
7683	-	94	94	-	10	10	-	0.89	0.89	-	0	0	-	NA	NA
102	95	95	95	10	10	10	2.1	2.1	2.1	NA	0	0	NA	NA	NA
7668	-	95	95	-	10	10	-	0.83	0.83	-	0	0	-	NA	NA
7669	-	-	95	-	-	1.5	-	-	-	-	-	0.78	-	-	0.85

Notes:

Model Scenario 1 – TRCA
 Model Scenario 2 – SCE Modified
 Model Scenario 3 – SCE Post Dev (uncontrolled)
 “-” – VO element not present in Model Scenario
 “NA” – Model parameter not applicable to VO element

The flows resulting from the VO hydrologic model are used as inputs for the hydraulic model and generate the existing conditions and post developed conditions floodplain. Note that the post development hydrological modelling presented within this analysis is for the uncontrolled condition.

3.1.4 BNHG Post Development

This version includes the proposed land developments by BNHG in conjunction to the changes already identified in the SCE Post Dev scenario. Site stormwater ponds are not included in this model, representing uncontrolled conditions. **Table 3-5** describes the VO model elements of interest to the assessment.

Table 3-5: VO Model Element Description of Model Scenario 4 – BNHG Post Development

Element	Element Description	Changes Made Relative to Scenario 3
111	Nashyd representing a catchment area north of the site. This Nashyd contributes to Cold Creek West Tributary C.	Consistent with Scenario 3.
7622	Representing the upstream catchment of Reach A for Cold Creek West Tributary B.	Consistent with Scenario 3.
7674	Representing the north portion of the Project Site that flows uncontrolled through Reach A of Cold Creek West Tributary B.	Consistent with Scenario 3.
7687	Representing the middle portion of the catchment of Reach A for Cold Creek West Tributary B.	Consistent with Scenario 3.
7685	Representing the downstream catchment of Reach A for Cold Creek West Tributary B.	Consistent with Scenario 3.
7680	Representing the catchment contributing to Reach B of Cold Creek West Tributary B.	Updated catchment size due to BNHG site footprint.
7667	Representing the east portion of the Project Site that discharges to Reach B of Cold Creek West Tributary B.	Consistent with Scenario 3.
7683	Representing the catchment downstream area contributing to Reach C of Cold Creek West Tributary B.	Updated catchment size due to BNHG site footprint.
7209	Representing a BNHG developed area that discharges to Reach C of Cold Creek West Tributary B.	BNHG Established Standhyd (urbanized).
102	Nashyd representing the catchment area that contributes to Reach A of Main Humber Tributary A.	Updated catchment size due to BNHG site footprint.
7694	Nashyd representing the catchment area that contributes to Reach A of Main Humber Tributary A.	Discretized out from 102 due to BNHG site footprint.
7205	Representing a BNHG developed area that discharges to Reach A of Main Humber Tributary A.	BNHG Established Standhyd (urbanized).
7208	Representing a BNHG developed area that discharges to Reach A of Main Humber Tributary A.	BNHG Established Standhyd (urbanized).
7668	Representing the catchment contributing to Reach B of Main Humber Tributary A.	Consistent with Scenario 3.
7669	Representing the west portion of the Project Site that discharges to Reach B of Main Humber Tributary A.	Consistent with Scenario 3.

The relevant Nashyd and Standhyd parameters are updated using site topographic data and the resulting catchment delineation. The parameters established for the urbanized proposed site areas including CN, IA, TIMP, and XIMP are taken from the FSSR report BNHG prepared by Crozier (February 2025). The model parameters used are summarized in **Table 3-6**. Note that the post development hydrological modelling presented within this analysis is for the uncontrolled condition.

Table 3-6: Hydrological Model Parameters by VO Element of BNHG Lands

Model Parameter	CN	IA	XIMP	TIMP
7209	96	5	0.50	0.59
7208	82	5	0.50	0.59
7205	82	5	0.49	0.57

Note:
Parameters are taken from the BNHG *Functional Servicing and Stormwater Management Report* prepared by Crozier (February 2025). These parameters are applied for both the 100-year storm and Regional Storm.

4.0 RESULTS

4.1 Hydrologic Modelling Results

The hydrological VO model had been updated into three scenarios to compare the impacts of the site on the local hydrology. **Table 4-1** presents the updated drainage areas between each scenario.

Table 4-1: Catchment Areas by Model Scenario (ha)

Tributary	Node	Description	TRCA Model	SCE Modified Model	SCE Post Dev Model	BNHG Post Dev Model
Cold Creek West Tributary C	111	Original TRCA Nashyd	116.21	110.28	110.28	110.28
	108	Original TRCA Nashyd	57.05	0	0	0
Cold Creek West Tributary B	7667	To be developed; Reach B	0	0	17.88	17.88
	7674	To be developed; Reach A	0	0	0.74	0.74
	7622	Catchment to Reach A	0	8.79	7.12	7.12
	7687	Catchment to Reach A	0	18.09	11.46	11.46
	7685	Catchment to Reach A	0	7.40	6.55	6.55
	7680	Catchment to Reach B	0	24.30	12.56	8.74
	7683	Catchment to Reach C	0	5.87	5.87	4.56
	7209	BNHG to be developed; to Reach C	0	0	0	5.13
Main Humber Tributary A	102	Original TRCA Nashyd; Reach A	150.31	114.2	113.44	50.39
	7694	BNHG discretized catchment to Reach A	0	0	0	18.33
	7208	BNHG to be developed; Reach A	0	0	0	17.48
	7205	BNHG to be developed; Reach A	0	0	0	27.24
	7668	Realigned Channel; Reach B	0	39.53	31.08	31.08
	7669	To be developed; Reach C	0	0	11.47	11.47
Total Sum of Areas (ha)			323.57	328.45	328.45	328.45

Note:

An increase of 4.88 ha is noted between the TRCA model scenario and the SCE model scenarios. This is due to corrected catchment boundaries of the existing TRCA Nashyd catchments in VO. 4.88 ha were removed from the relevant adjacent catchment (Nashyd 93).

4.1.1 SCE Regional Results

Table 4-2 provides a summary of flows for the Regional Storm between the TRCA, SCE Modified Existing, and SCE Post Development scenarios.

Table 4-2: Regional Peak Flows by Model Scenario (m³/s)

Reach	Areal Reduction Factor	VO Element	Cross-Section	TRCA Model	SCE Existing	SCE Post Dev
Cold Creek West Tributary C						
A	100	111 ¹	2317.44	5.40	5.33	5.33
A	100	111	1324.43	9.01	8.55	8.55
A	100	1328 ¹	621.5	9.85	9.76	9.76
B	100	1328	779.11	15.99	15.50	15.50
Cold Creek West Tributary B						
A	100	7686	981.64	-	2.41	1.74
A	100	7684	607.56	-	3.08	2.33
B	100	7680/7682	1000	-	2.19	3.48
C	100	108/7671	185.93	5.13	5.79	5.88
Cold Creek West						
A	100	1785 ¹	1099.88	156.33	156.14	156.14
B	98.2	1347	4301.05	161.51	161.61	160.44
C	98.2	7522	3514.84	170.72	170.82	170.20
C	97.1	767	1098.91	282.60	282.72	281.64
D	97.1	7521	1502	287.13	287.01	286.52
Main Humber Tributary A						
A	100	102 ¹	4822.04	4.32	4.03	4.03
B	100	7668	946	-	3.67	2.89
A	100	102/7670	4121.04	8.91	10.10	10.22
A ²	100	2128 ¹	3191.63	16.15	16.99	17.62
A ²	100	2128 ¹	2802.56	19.44	20.45	21.21
A ²	100	2128	2093.17	22.47	23.87	24.91
A ²	100	7520	1801.09	24.72	26.09	26.91
Cold Creek West						
E	97.1	1850	1402	298.89	299.35	298.13
E	97.1	7518	724	299.43	299.39	298.01

Note:

¹ – indicates that the flow applied to the related HECRAS cross section is a prorated value from the VO element

² – due to later discretization under post-development scenarios, this reach is defined as reach C

“-” - indicates that a flow is not available as the associated VO element does not exist within the Model Scenario.

Table 4-3 provides a comparison of the flows to assess impacts of the post-development conditions from the site.

Table 4-3: Regional Peak Flow Comparison Between Model Scenarios

Reach	VO Element	Flow Difference (Model 2 - Model 1) (m ³ /s)	Percent Difference (Model 2 – Model 1 / Model 1)	Flow Difference (Model 3 - Model 2) (m ³ /s)	Percent Difference (Model 3 – Model 2 / Model 2)
Cold Creek West Tributary C					
A	111	-0.07	-1%	0.00	0%
A	111	-0.46	-5%	0.00	0%
A	1328	-0.09	-1%	0.00	0%
B	1328	-0.49	-3%	0.00	0%
Cold Creek West Tributary B					
A	108/7671	0.66	13%	0.08	1%
Cold Creek West					
A	1785 ¹	-0.19	0%	0.00	0%
B	1347	0.10	0%	-1.16	-1%
C	7522	0.10	0%	-0.61	0%
C	767	0.12	0%	-1.08	0%
D	7521	-0.12	0%	-0.49	0%
Main Humber Tributary A					
A	102 ¹	-0.29	-7%	-0.01	0%
A	102	1.19	13%	-0.04	-1%
A ²	2128 ¹	0.84	5%	0.63	4%
A ²	2128 ¹	1.01	5%	0.76	4%
A ²	2128	1.40	6%	1.04	4%
A ²	7520	1.37	6%	0.82	3%
Cold Creek West					
E	1850	0.47	0%	-1.22	0%
E	7518	-0.04	0%	-1.38	0%
Note: Model Scenario 1 – TRCA; Model Scenario 2 – SCE Modified; Model Scenario 3 – SCE Post Dev (uncontrolled) ¹ – indicates that the flow applied to the related HECRAS cross section is a prorated value from the VO element ² – due to later discretization under post-development scenarios, this reach is defined as reach C					

The peak flow comparison in **Table 4-3** between the TRCA Model and the SCE Modified Existing does show some variation in flow when comparing the ratios between model scenarios. The results between these two models spread from a range of -7% to 13%. These impacts to peak flows come at the result of adjusting catchment boundaries based on topographic information.

When comparing the results of the SCE Post Development uncontrolled scenario to the SCE Modified Existing scenario, variation in peak flows is nominal, with a spread of -1% and 4%. Changes in flow are mostly observed along Main Humber Tributary A. The downstream nodes along Reach E of Cold Creek West, are negligibly impacted by the SCE post-development condition, experiencing and a reduction in flow by 1 m³/s. Thus, the post dev condition overall has minimal impacts on the changes to peak flow within the system.

The East SWM pond facility has proposed regional controls based on consultation with the TRCA, with release rates established to meet the existing culvert capacity that will discharge SWM pond flows across Mount Hope Road. The increases in flow along Main Humber Tributary A are due to the contributing flows from the Subject Site. The West SWM pond, servicing towards Main Humber Tributary A, has not proposed regional controls. The West site drainage area is less than the area draining to the east. As well, Main Humber Tributary A is a confined channel with significant freeboard available under regional storm conditions. The impacts of the additional flow from the Subject Site minimally affect the surrounding areas. This is documented further in the *Floodplain Delineation and Channel Realignment Design Report* which (Schaeffers 2025).

4.1.2 100 Year Results

Table 4-4 provides a summary of flows for the 100 year 6-hour storm peak flows between the model scenarios.

Table 4-4: 100 Year 6-hour AES Storm Peak Flows by Model Scenario (m³/s)

Reach	VO Element	Cross-Section	TRCA Model	SCE Existing	SCE Post Dev
Cold Creek West Tributary C					
A	111 ¹	2317.44	1.99	1.97	1.97
A	111	1324.43	3.32	3.15	3.15
A	1328 ¹	621.5	3.43	3.40	3.40
B	1328	779.11	5.57	5.41	5.41
Cold Creek West Tributary B					
A	7686	981.64	-	0.97	0.69
A	7684	607.56	-	1.24	0.93
B	7680/7682	1000	-	0.88	3.42
C	108/7671	185.93	2.00	2.33	4.10
Cold Creek West					
A	1785 ¹	1099.88	30.45	30.34	30.34
B	1347	4301.05	31.99	32.06	31.65
C	7522	3514.84	34.45	34.52	34.17
C	767	1098.91	57.20	57.27	56.89
D	7521	1502	58.20	58.26	57.95
Main Humber Tributary A					
A	102 ¹	4822.04	1.35	1.26	1.26
B	7668	946	-	1.56	1.23
A	102/7670	4121.04	2.78	3.42	3.42
A ²	2128 ¹	3191.63	14.36	14.66	16.03
A ²	2128 ¹	2802.56	17.28	17.65	19.29
A ²	2128	2093.17	19.98	20.60	22.67
A ²	7520	1801.09	14.97	15.44	16.97
Cold Creek West					
E	1850	1402	61.69	61.80	61.36
E	7518	724	61.68	61.76	61.32
<p>Note:</p> <p>¹ – indicates that the flow applied to the related HECRAS cross section is a prorated value from the VO element</p> <p>² – due to later discretization under post-development scenarios, this reach is defined as reach C</p> <p>“-” - indicates that a flow is not available as the associated VO element does not exist within the Model Scenario.</p> <p>Note that the model flows provided are those resulting from the <i>Large Storms</i> VO Model as it represents future, uncontrolled conditions. The actual TRCA flows used within the HECRAS Model come from the <i>Design Storms Existing conditions, with ponds</i> model.</p>					

Table 4-5 provides a comparison of the flows to compare impacts of the modelling approach and post-development conditions to the site.

Table 4-5: 100 Year 6-hour AES Peak Flow Comparison Between Model Scenarios

Reach	VO Element	Flow Difference (Model 2 - Model 1) (m ³ /s)	Percent Difference (Model 2 – Model 1 / Model 1)	Flow Difference (Model 3 - Model 2) (m ³ /s)	Percent Difference (Model 3 – Model 2 / Model 2)
Cold Creek West Tributary C					
A	111	-0.02	-1%	0	0%
A	111	-0.17	-5%	0	0%
A	1328	-0.03	-1%	0	0%
B	1328	-0.16	-3%	0	0%
Cold Creek West Tributary B					
C	108/7671	0.33	17%	1.77	76%
Cold Creek West					
A	1785 ¹	-0.11	0%	0	0%
B	1347	0.07	0%	-0.41	-1%
C	7522	0.07	0%	-0.35	-1%
C	7522	0.07	0%	-0.38	-1%
C	767	0.06	0%	-0.31	-1%
D	7521	-0.11	0%	0	0%
Main Humber Tributary A					
A	102 ¹	-0.09	-7%	0	0%
A	102	0.64	23%	0	0%
A ²	2128 ¹	0.3	2%	1.37	9%
A ²	2128 ¹	0.37	2%	1.64	9%
A ²	2128	0.62	3%	2.07	10%
A ²	7520	0.47	3%	1.53	10%
Cold Creek West					
E	1850	0.11	0%	-0.44	-1%
E	7518	0.08	0%	-0.44	-1%
Note: Model Scenario 1 – TRCA; Model Scenario 2 – SCE Modified; Model Scenario 3 – SCE Post Dev (uncontrolled) ¹ – indicates that the flow applied to the related HECRAS cross section is a prorated value from the VO element ² – due to later discretization under post-development scenarios, this reach is defined as reach C					

The peak flow comparison in **Table 4-5** between the TRCA Model and the SCE Modified Existing does show some variation in flow when comparing the ratios between model scenarios. The results between these two models spread from a range of -7% and 23%. These impacts to peak flows come at the result of adjusting catchment boundaries based on topographic information.

When comparing the results of the SCE Post Dev scenario to the SCE Modified Existing scenario, variation

in peak flow captures the impacts of the urbanized land. Peak flow increases are seen directly downstream of developed areas, as expected. Along Main Humber Tributary A, peak flows increase by 10%. Along Cold Creek West Tributary B, peak flow increases by 76% along Reach C. As the flood hydrographs make their way through the system, the impacts of the development are dissipated at the downstream nodes. Peak flow impacts along Reach E of Cold Creek West are negligible, experiencing a reduction in flow by $0.4 \text{ m}^3/\text{s}$.

As identified in *Floodplain Delineation and Channel Realignment Design Report*, flow increases from the uncontrolled post development model along Cold Creek West Tributary B and Main Humber Tributary A can be accommodated within the channel valley (Schaeffers 2025). It should be noted that both SWM ponds in the post development condition will implement a 2- to 100-year flood control which would further reduce flow increases of the Subject Site development.

4.1.3 BNHG Scenario Results

The Post Dev Scenarios featuring the BNHG proposed developed land is summarized in this section. **Table 4-6** shows both the peak flows and peak flow comparison of the Regional Storm results between the SCE Modified Existing scenario (Model 2) and the BNHG Post Development scenario (Model 4).

Table 4-6: BNHG Scenario Regional Peak Flows and Comparison

Reach	Area Reduction Factor	VO Element	Cross-Section	SCE Mod Existing (m ³ /s)	BNHG Post Dev (m ³ /s)	Flow Difference (BNHG – SCE Mod) (m ³ /s)	Ratio of Flow Change (BNHG / SCE Mod) (-)
Cold Creek West Tributary C							
A	100	111 ¹	2317.44	5.33	5.33	0.00	0%
A	100	111	1324.43	8.55	8.55	0.00	0%
A	100	1328 ¹	621.5	9.76	9.76	0.00	0%
B	100	1328	779.11	15.50	15.50	0.00	0%
Cold Creek West Tributary B							
A	100	7686	981.64	5.79	6.12	0.33	6%
Cold Creek West							
A	100	17851	1099.88	156.14	156.14	0.00	0%
B	98.2	1347	4301.05	161.61	160.06	-1.55	0%
C	98.2	7522	3514.84	170.82	169.83	-0.99	0%
C	97.1	767	1098.91	282.72	281.36	-1.36	0%
D	97.1	7521	1502	287.01	286.26	-0.75	0%
Main Humber Tributary A							
A	100	1021	4822.04	4.03	4.51	0.48	12%
A	100	7670	4121.04	10.1	12.95	2.85	28%
A ²	100	2128 ¹	3191.63	16.99	20.72	3.73	22%
A ²	100	2128 ¹	2802.56	20.45	24.95	4.5	22%
A ²	100	2128	2093.17	23.87	29.32	5.45	23%
A ²	100	7520	1801.09	26.09	30.81	4.72	18%
Cold Creek West							
E	97.1	1850	1402	299.35	295.86	-3.49	-1%
E	97.1	7518	724	299.39	295.83	-3.56	-1%
Note: ¹ – indicates that the flow applied to the related HECRAS cross section is a prorated value from the VO element ² – due to later discretization under post-development scenarios, this reach is defined as reach C							

Comparing the results of the BNHG Post Dev scenario to the SCE Modified Existing scenario, variation in peak flow captures the impacts of the urbanized land. Peak flow increases are seen directly downstream of the developed areas, as expected. Along Main Humber Tributary A, peak flows increase by 28%. Along Cold Creek West Tributary B, peak flow increases by 6% along Reach C. As the flood hydrographs make their way through the system, the impacts from the urbanized land are dissipated. Peak flow impacts along Reach E of Cold Creek West are negligible, experiencing a reduction in flow by 3.6 m³/s relative to its initial 299.4 m³/s flow.

Further discussed in the *Floodplain Delineation and Channel Realignment Design Report*, the impacts to the floodplain from the increased flows are contained within valley corridors (Schaeffers 2025). Impacts to existing private properties are not observed, and thus regional controls are not determined as necessary. At the time of this assessment, it is noted that BNHG does not propose regional controls for the nearly 50 ha of development proposed. Requirements for regional controls are subject to the review of the TRCA. Based on Schaeffers coordination with the TRCA, larger development areas are subject to regional controls. Therefore, regional controls may be required for BNHG lands.

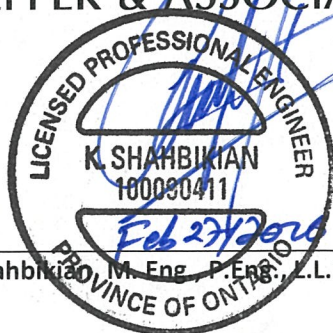
5.0 CONCLUSION

This Downstream Analysis Report has been prepared to demonstrate there is no significant impact to downstream reaches in terms of peak flow changes.

- Modifications were made to the TRCA *Humber – Large Storms – no ponds (2017)* VO Model to capture the proposed site impacts to drainage area and land use. The selected TRCA VO Model was used for the Regional and 100-year storms in order to model future uncontrolled conditions.
- A downstream peak flow comparison was performed between the SCE Modified Existing model and the SCE Post Dev model. The results confirm a lack of significant impact from the Mount Hope West site flows in the post development uncontrolled scenario.
- Based on the results of the assessment, established release rates are recommended for the Subject Site. Regional controls are deemed not required for the West SWM pond of the Subject Site. Regional controls are recommended for the East SWM pond based on flow increases and as recommended by the TRCA.
- A downstream peak flow comparison was performed between the SCE Modified Existing model and the BNHG Post Dev model. It was found that Main Humber Tributary A experiences significant flow increases. Flows are contained within the valley corridors of the Main Humber Tributary. Requirements for Regional controls are subject to the review of the TRCA for larger developments due to the significant flow increases experiences at the reaches south of Columbia Way.

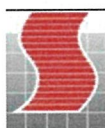
We trust that you will find this material satisfactory, and we are looking forward to receiving your comments soon. Should you have any questions or comments, please do not hesitate to contact us.

SCHAEFFER & ASSOCIATES LTD.



Koryun Shahbikian, M. Eng., P. Eng., L.L.M.,
Partner

Sukhpreet Saini, B. A. Sc., E.I.T.
Water Resources Analyst



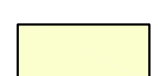

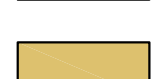
Appendix A

Draft Plan of Subdivision

DEVELOPMENT CONCEPT

UNITED HOLDINGS INC.

LEGEND

-  DRAFT PLAN BOUNDARY
-  9.8m SINGLE DETACHED
-  13.7m SEMI-DETACHED
-  6.1m STREET TOWNHOUSE
-  OTHER RESIDENTIAL
-  COMMERCIAL
-  PARK
-  STORM WATER MANAGEMENT
-  NATURAL HERITAGE SYSTEM
-  ROAD BUFFER
-  OPEN SPACE
-  SERVICING BLOCK
-  FUTURE DEVELOPMENT


UNIT STATISTICS

TYPE	LOTS/BLOCKS	UNITS
9.8m SINGLE DETACHED	100	100
13.7m SEMI-DETACHED	165	330
6.1m STR. TOWNHOUSE	29	171
OTHER RESIDENTIAL	TBD	TBD
TOTAL (NOT INCLUDING TBD OF 'OTHER RESID.')	294	601

NOTE:

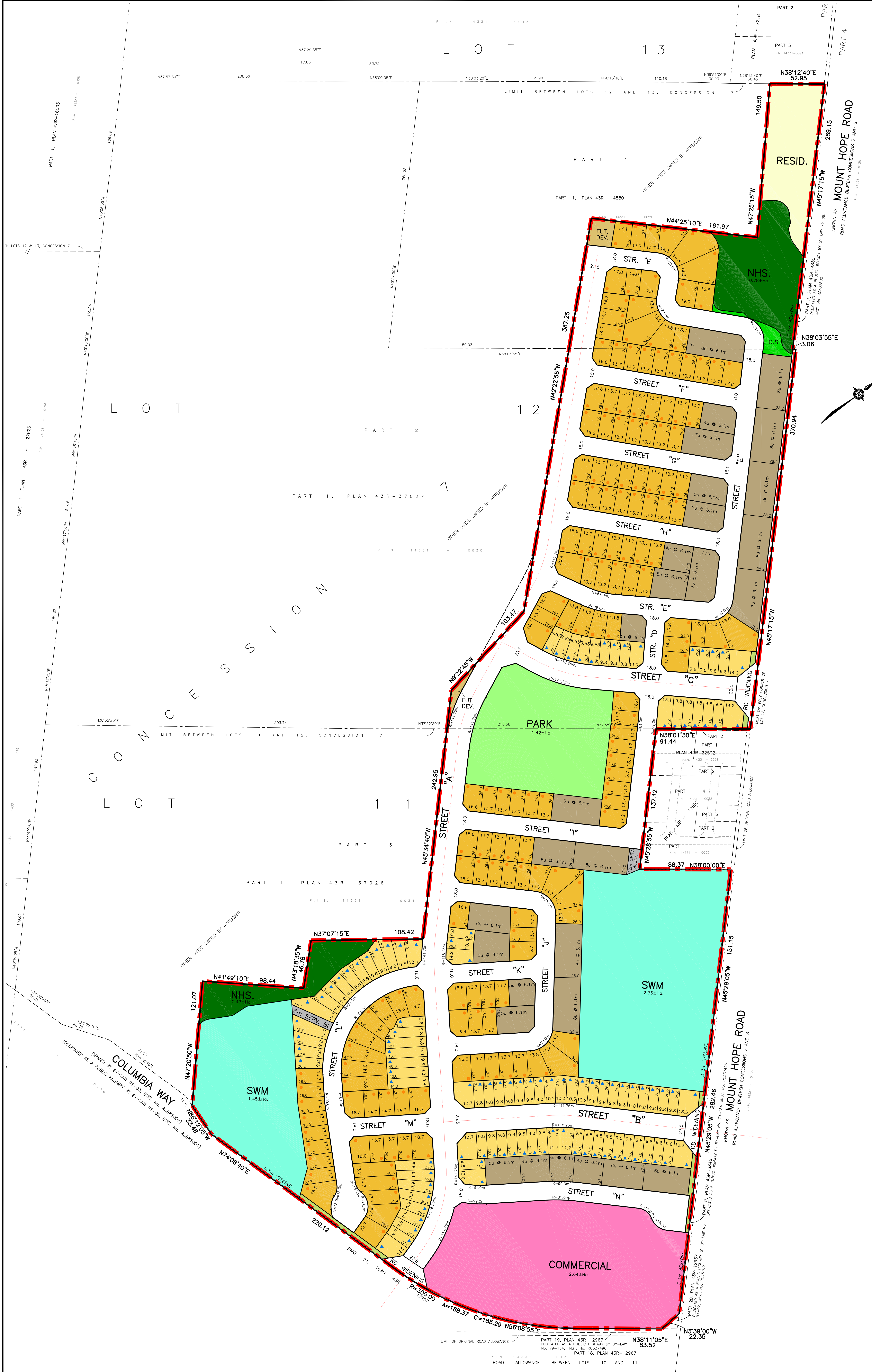
THIS DRAWING IS CONCEPTUAL AND PROVIDED FOR DISCUSSION PURPOSES ONLY.

BOUNDARY INFORMATION, ROAD ALIGNMENT, AND AREA/UNIT COUNT CALCULATIONS ARE SUBJECT TO CHANGE AND NEED TO BE VERIFIED.



PROJECT No. P-3638
 SCALE 1:1500
 JANUARY 14, 2026
 3638DES17

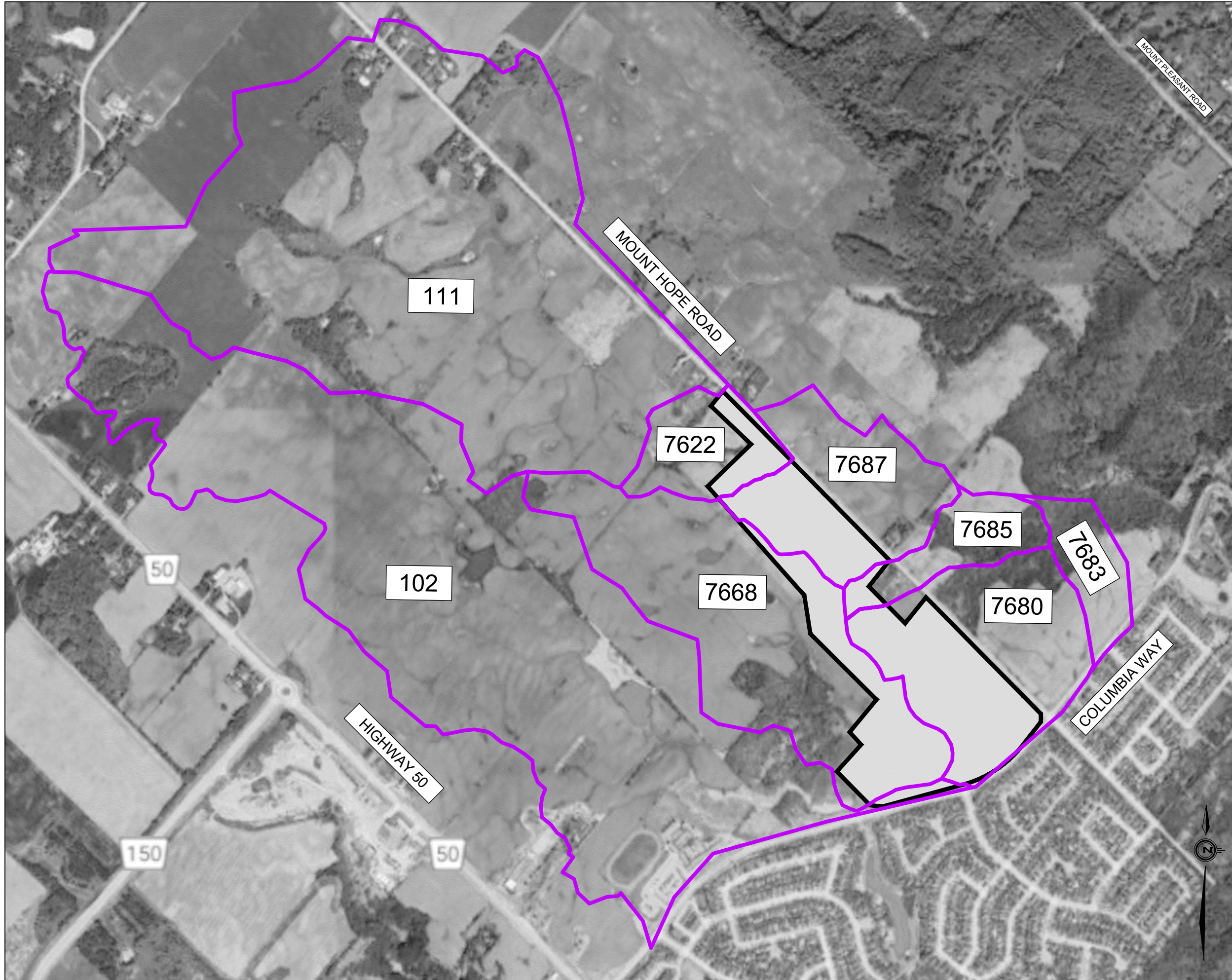
64 JARDIN DRIVE - UNIT 1B,
 CONCORD ONT. L4K 3P3
 TEL: (905)668-4055



Appendix B



Catchment Discretization by Model Scenario

PHI Gotfried
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RESIDENTIAL SUBDIVISION
UNITED HOLDINGS INC.
C/O SOLMAR DEVELOPMENT CORP.
TOWN OF CALEDON

LEGEND

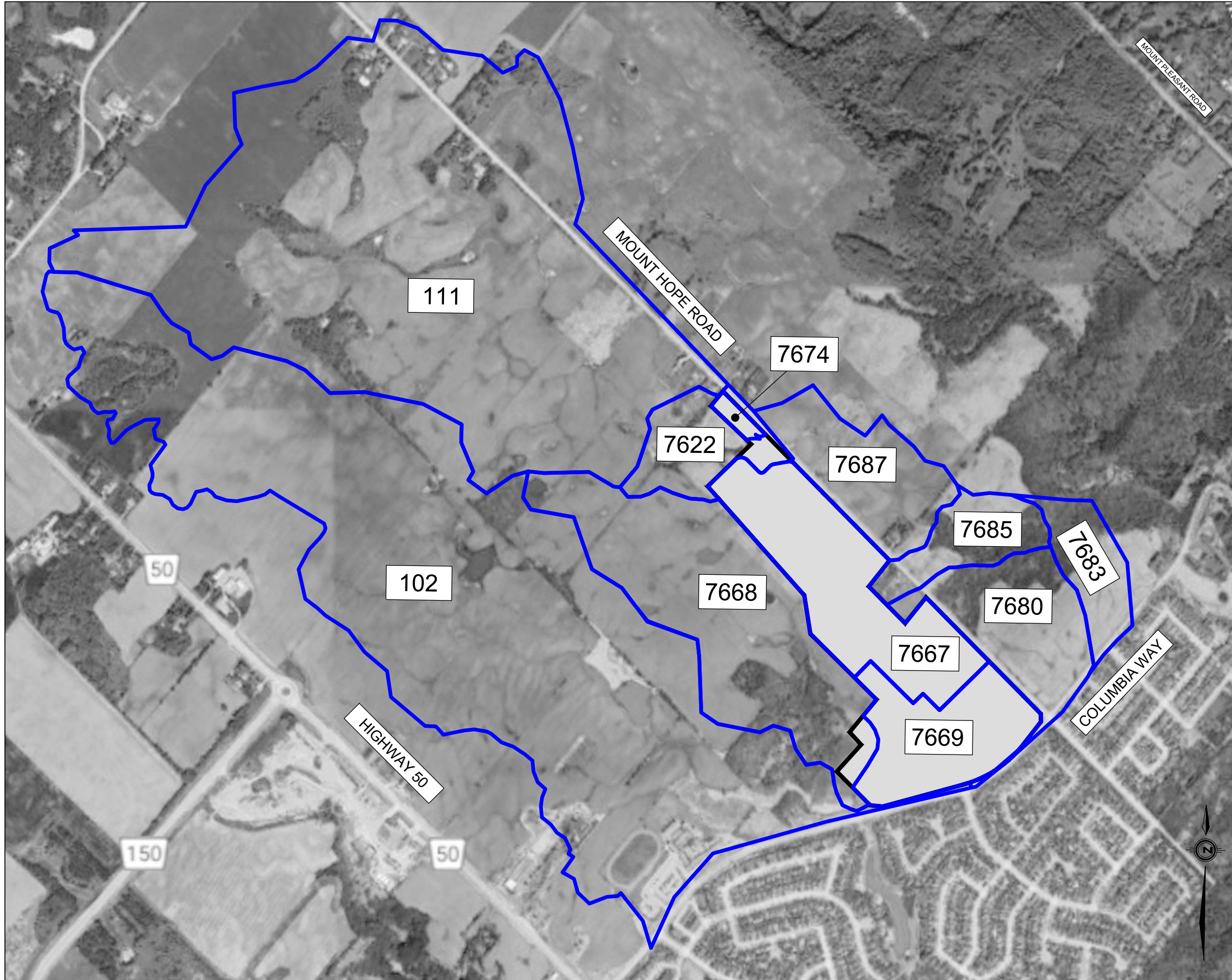
-  SUBJECT SITE
-  EXISTING DRAINAGE AREAS



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FIGURE C.1
EXISTING DRAINAGE AREAS

PHI Gottfried
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RESIDENTIAL SUBDIVISION
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-  SUBJECT SITE
-  POST DRAINAGE AREAS




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FIGURE C.2
POST DEVELOPMENT DRAINAGE AREAS

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LEGEND

 SUBJECT SITE

 POST DRAINAGE AREAS




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FIGURE C.3
BOLTON NORTH HILL AND SCHAEFFERS
POST DEVELOPMENT DRAINAGE AREAS

Appendix C

Hydrology Model Parameter Calculations





**Mount Hope West
Time to Peak Calculation**

Catchment	Area	Watershed Slope, S_w	Watershed Slope, channel, $S_{w,1}$	Overland Flow Length, L	Overland Flow Length, L1	Velocity (Figure 1, VO Reference Guide)	Velocity (Figure 2, VO Reference Guide)	Runoff Coefficient, C	Time of Concentration (Upland)	Time to Peak (Upland)	Time to Peak, $t_p = 0.33t_c$ (Upland)
	(ha)	(%)	(%)	(m)	(m)	(m/s)	(m/s)	-	minutes	minutes	(hrs)
Channel Realignment	39.53	0.2	0.8	1112.3	218.1	0.1	0.4	0.3	151.7	50.1	0.83

1. The Soil Group was based on the MTO Design Chart 1.08.
2. Watershed slope was calculated using the Equivalent Slope Method (Ministry of Transportation).

References:

1. Northcott, Kate and Switzer, Glenn. December 13, 2013. Stormwater Technical Guide. Nottawasaga Valley Conservation Authority (NVCA). 8195 8th Line, Utopia, ON. L0M1TO.
2. Hoffman, D.W., Wicklund R.E., and Richards, N.R. 1962. Soil Survey of Simcoe County Ontario. Report No.29 of the Ontario Soil Survey. Research Branch, Canada Department of Agriculture and the Ontario Agricultural College. Guelph, Ontario.
3. Civica Infrastructure Inc. March 2017. Visual OTTHYMO Reference Manual Version 5.0. Civica Municipal Water Resources.
4. Urban Hydrology for Small Watersheds. June 1986. Technical Release (TR)-55. Second Edition. Natural Resources Conservation Service. Conservation Engineering Division. United States Department of Agriculture.
5. Ministry of Transportation Guidelines.

Table D.1: Summary of Nashyd Inputs - Regional Storm Scenarios

Scenario	NHYD	DT [min]	AREA [ha]	DWF [m ³ /s]	CN	IA [mm]	N	TP [hr]	STORM INDEX	RAIN [mm/hr]
TRCA	111	5	116.21	0	95	10	1.75	1.26	1	0
TRCA	108	5	57.05	0	94	10	1.75	0.89	1	0
TRCA	102	5	150.31	0	95	10	1.75	2.1	1	0
SCE Mod	102	5	114.2	0	95	10	1.75	2.1	1	0
SCE Mod	111	5	110.28	0	95	10	1.75	1.26	1	0
SCE Mod	7622	5	8.79	0	94	10	1.75	0.89	1	0
SCE Mod	7668	5	39.53	0	95	10	1.75	0.83	1	0
SCE Mod	7680	5	24.3	0	94	10	1.75	0.89	1	0
SCE Mod	7683	5	5.87	0	94	10	1.75	0.89	1	0
SCE Mod	7685	5	7.4	0	94	10	1.75	0.89	1	0
SCE Mod	7687	5	18.09	0	94	10	1.75	0.89	1	0
SCE PD	7687	5	11.46	0	94	10	1.75	0.89	1	0
SCE PD	7685	5	6.55	0	94	10	1.75	0.89	1	0
SCE PD	7683	5	5.87	0	94	10	1.75	0.89	1	0
SCE PD	7680	5	12.56	0	94	10	1.75	0.89	1	0
SCE PD	7622	5	7.12	0	94	10	1.75	0.89	1	0
SCE PD	7668	5	31.08	0	95	10	1.75	0.83	1	0
SCE PD	102	5	113.44	0	95	10	1.75	2.1	1	0
SCE PD	111	5	110.28	0	95	10	1.75	1.26	1	0
BNHG PD	7694	5	18.33	0	95	10	1.75	2.1	1	0
BNHG PD	7687	5	11.46	0	94	10	1.75	0.89	1	0
BNHG PD	7685	5	6.55	0	94	10	1.75	0.89	1	0
BNHG PD	7683	5	4.56	0	94	10	1.75	0.89	1	0
BNHG PD	7680	5	8.74	0	94	10	1.75	0.89	1	0
BNHG PD	7622	5	7.12	0	94	10	1.75	0.89	1	0

Table D.2: Summary of Nashyd Inputs 2 - 100 Year Storm Scenarios

Scenario	NHYD	DT [min]	AREA [ha]	DWF [m ³ /s]	CN	IA [mm]	N	TP [hr]	STORM INDEX	RAIN [mm/hr]
TRCA	102	5	150.31	0	89	10	1.75	2.1	1	0
TRCA	108	5	57.05	0	88	10	1.75	0.89	1	0
TRCA	111	5	116.21	0	89	10	1.75	1.26	1	0
SCE Mod	7685	5	7.4	0	88	10	1.75	0.89	1	0
SCE Mod	111	5	110.28	0	89	10	1.75	1.26	1	0
SCE Mod	102	5	114.2	0	89	10	1.75	2.1	1	0
SCE Mod	7668	5	39.53	0	89	10	1.75	0.83	1	0
SCE Mod	7687	5	18.09	0	88	10	1.75	0.89	1	0
SCE Mod	7680	5	24.3	0	88	10	1.75	0.89	1	0
SCE Mod	7683	5	5.87	0	88	10	1.75	0.89	1	0
SCE Mod	7622	5	8.79	0	88	10	1.75	0.89	1	0
SCE PD	7687	5	11.46	0	88	10	1.75	0.89	1	0
SCE PD	111	5	110.28	0	89	10	1.75	1.26	1	0
SCE PD	102	5	113.44	0	89	10	1.75	2.1	1	0
SCE PD	7668	5	31.08	0	89	10	1.75	0.83	1	0
SCE PD	7683	5	5.87	0	88	10	1.75	0.89	1	0
SCE PD	7680	5	12.56	0	88	10	1.75	0.89	1	0
SCE PD	7622	5	7.12	0	88	10	1.75	0.89	1	0
SCE PD	7685	5	6.55	0	88	10	1.75	0.89	1	0
BNHG PD	7694	5	18.33	0	89	10	1.75	2.1	1	0
BNHG PD	111	5	110.28	0	89	10	1.75	1.26	1	0
BNHG PD	7687	5	11.46	0	88	10	1.75	0.89	1	0
BNHG PD	7668	5	31.08	0	89	10	1.75	0.83	1	0
BNHG PD	102	5	50.39	0	89	10	1.75	2.1	1	0
BNHG PD	7685	5	6.55	0	88	10	1.75	0.89	1	0
BNHG PD	7622	5	7.12	0	88	10	1.75	0.89	1	0
BNHG PD	7683	5	4.56	0	88	10	1.75	0.89	1	0
BNHG PD	7680	5	8.74	0	88	10	1.75	0.89	1	0

Table D.3: Summary of Standhyd Inputs - Regional Storm Scenarios

Scenario	NHYD	DT [min]	AREA [ha]	TIMP	XIMP	DWF [m³/s]	LOSS	SLPP [%]	LGP [m]	MNP	SCP [hr]	DPSI [mm]	SLPI [%]	LGI Type	LGI [m]	MNI	SCI [hr]	STORM INDEX	RAIN [mm/hr]	CN	IA
SCE PD	7667	5	17.88	0.72	0.62	0	Modified SCS Curve Method	2	40	0.25	0	1	1	Auto	345.25	0.013	0	1	0	95	1.5
SCE PD	7669	5	11.47	0.85	0.78	0	Modified SCS Curve Method	2	40	0.25	0	1	1	Auto	276.53	0.013	0	1	0	95	1.5
SCE PD	7674	5	0.74	0.72	0.68	0	Modified SCS Curve Method	2	40	0.25	0	1	1	Auto	70.24	0.013	0	1	0	93	1.5
BNHG PD	7209	5	5.13	0.59	0.5	0	Modified SCS Curve Method	2	40	0.25	0	1	1	Auto	184.93	0.013	0	1	0	96	5
BNHG PD	7667	5	17.88	0.72	0.62	0	Modified SCS Curve Method	2	40	0.25	0	1	1	Auto	345.25	0.013	0	1	0	95	1.5
BNHG PD	7669	5	11.47	0.85	0.78	0	Modified SCS Curve Method	2	40	0.25	0	1	1	Auto	276.53	0.013	0	1	0	95	1.5
BNHG PD	7205	5	27.24	0.57	0.49	0	Modified SCS Curve Method	2	40	0.25	0	1	1	Auto	426.15	0.013	0	1	0	82	5
BNHG PD	7208	5	17.48	0.59	0.5	0	Modified SCS Curve Method	2	40	0.25	0	1	1	Auto	341.37	0.013	0	1	0	82	5
BNHG PD	7674	5	0.74	0.72	0.68	0	Modified SCS Curve Method	2	40	0.25	0	1	1	Auto	70.24	0.013	0	1	0	93	1.5

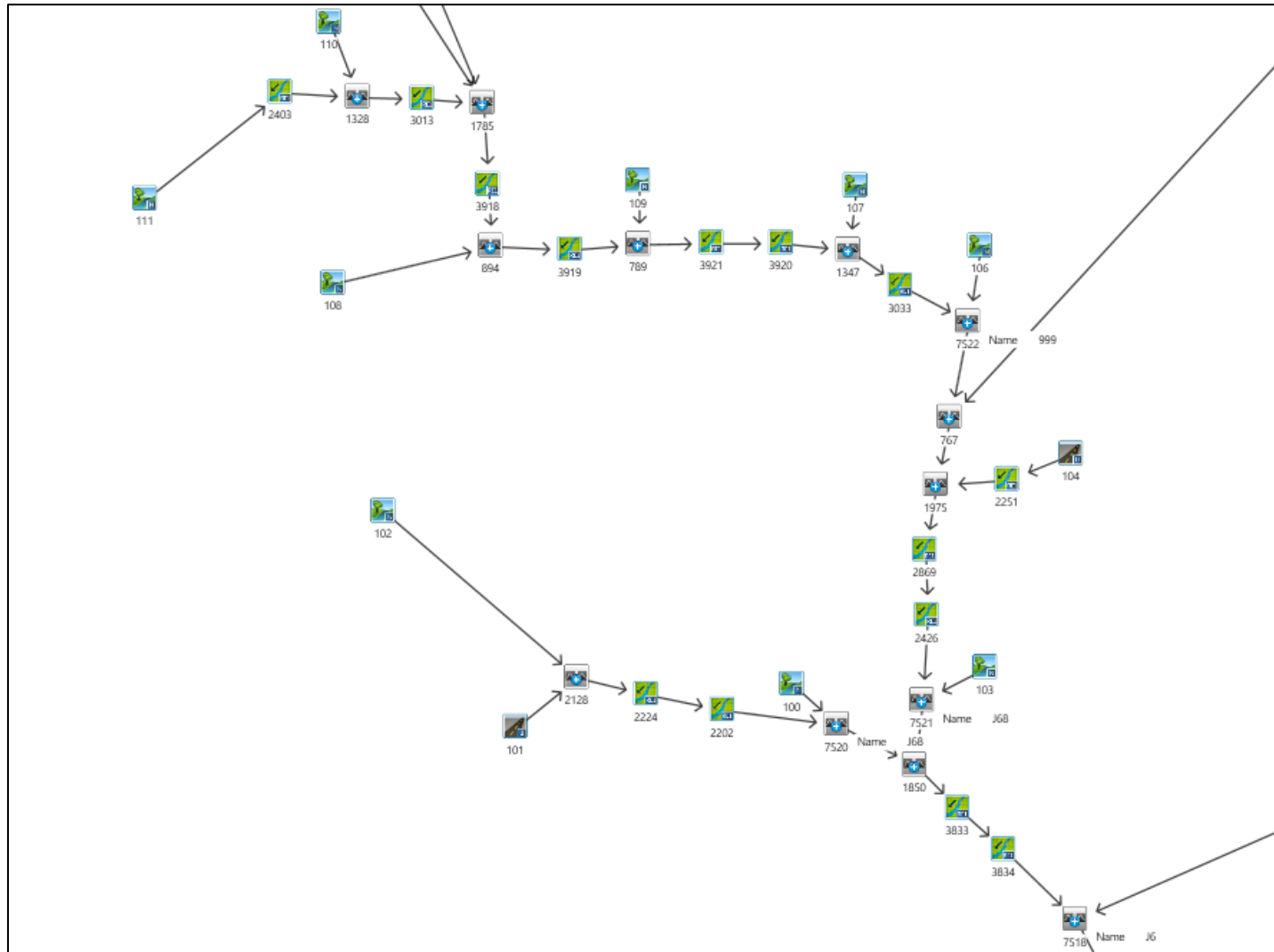
Table D.4: Summary of Standhyd Inputs 2 - 100 Year Storm Scenarios

Scenario	NHYD	DT [min]	AREA [ha]	TIMP	XIMP	DWF [m³/s]	LOSS	SLPP [%]	LGP [m]	MNP	SCP [hr]	DPSI [mm]	SLPI [%]	LGI Type	LGI [m]	MNI	SCI [hr]	STORM INDEX	RAIN [mm/hr]	CN	IA
SCE PD	7667	5	17.88	0.72	0.62	0	Modified SCS Curve Method	2	40	0.25	0	1	1	Auto	345.25	0.013	0	1	0	85	1.5
SCE PD	7669	5	11.47	0.85	0.78	0	Modified SCS Curve Method	2	40	0.25	0	1	1	Auto	276.53	0.013	0	1	0	85	1.5
SCE PD	7674	5	0.74	0.72	0.68	0	Modified SCS Curve Method	2	40	0.25	0	1	1	Auto	70.24	0.013	0	1	0	85	1.5
BNHG PD	7209	5	5.13	0.59	0.5	0	Modified SCS Curve Method	2	40	0.25	0	1	1	Auto	184.93	0.013	0	1	0	96	5
BNHG PD	7669	5	11.47	0.85	0.78	0	Modified SCS Curve Method	2	40	0.25	0	1	1	Auto	276.53	0.013	0	1	0	85	1.5
BNHG PD	7674	5	0.74	0.72	0.68	0	Modified SCS Curve Method	2	40	0.25	0	1	1	Auto	70.24	0.013	0	1	0	85	1.5
BNHG PD	7208	5	17.48	0.59	0.5	0	Modified SCS Curve Method	2	40	0.25	0	1	1	Auto	341.37	0.013	0	1	0	82	5
BNHG PD	7205	5	27.24	0.57	0.49	0	Modified SCS Curve Method	2	40	0.25	0	1	1	Auto	426.15	0.013	0	1	0	82	5
BNHG PD	7667	5	17.88	0.72	0.62	0	Modified SCS Curve Method	2	40	0.25	0	1	1	Auto	345.25	0.013	0	1	0	85	1.5

Appendix D

VO Model Schematics

TRCA Model – Model Scenario 1



SCE Post Development Model – Model Scenario 3

