

May 18, 2016

Wendy Tse
City of Ottawa
110 Laurier Street West
4th Floor Infrastructure Approvals Division
Ottawa, Ontario K1P 1J1

Attention:

Dear Ms. Tse:

**Reference: Kanata North CDP - EMP and MSS Final Drafts – Additional Comments
Response to Comments
Our File No. 112117**

This letter is provided in response to comments provided by the City on May 12, 2016, based on final drafts of the Kanata North CDP EMP and MSS reports.

Responses to comments are provided in red.

1. Pond 1:

- a) The proposed grades at the perimeter of the pond are up to 5m higher than the grade identified in the SWM Block (e.g., 86.48m vs. 81.50m); subject to confirmation of the proposed grades, please note the City will not accept retaining walls within the pond block (or ROW);
 - The proposed grades shown on the conceptual design for Pond 1 have been revised to eliminate the retaining wall. The revised pond grading is shown on the updated Figure 9.1, which will be included with the Final EMP.
- b) Given the comparatively steep road grade, please demonstrate how major system flows will be fully captured by SWM Pond 1 and not continue on to March Road;
 - The major system flow route has been updated to reflect the revised grading in the vicinity of Pond 1, and shown on the updated Figure 9.1. The majority of runoff from the upstream area would be directed into Pond 1 at a low point on Street C adjacent to the pond. Downstream of this low point, a small amount of overland flow from Street C will be directed onto March Road and into Pond 1, as indicated on the updated figure.
- c) Maintenance access is required around the entire SWM pond – not just on lands abutting the Shirley's Brook tributary;
 - The City of Ottawa Stormwater Management Facility Design Guidelines & Standards document states that service roads must provide access to sediment forebays, and inlet & outlet structures. The location of service roads has been revised, as shown on Figure 9.1. The proposed access roads will provide access to both sides of the pond forebay, the sediment management area, and the inlet and outlet structures.

- d) Additional detail is required to demonstrate construction of SWM Pond 1 will not impact existing development at 1053 March Road.

- Additional detail has been provided on Figure 9.1 to demonstrate no impact to the existing development at 1053 March Road.

2. Pond 2:

- a) The SWM Block must be expanded to include the land required for the major and minor system outlets/maintenance access to the pond; provide conceptual details/grading for major and minor system inlets/outlets to pond to confirm required block requirements.

- The overland flow route to Pond 2 will follow the proposed pathway/ access road adjacent to Tributary 3, as shown on revised Figure 9.2. The 6.0m wide pathway block will provide the required capacity to convey the overland flows from Street A to Pond 2 – supporting calculations will be provided in the MSS.

- b) Per the Preliminary Grading Plan, please demonstrate how major system flows are to be conveyed to Pond 2 through the Residential Multi-unit and the Mixed use blocks and identify any land requirements for this purpose.

- Major system flows from upstream areas will not be conveyed through the Residential Multi-unit and Mixed Use blocks. Any overland flow from these blocks will be directed to Pond 2, but major overland flows from the surrounding areas will be confined to the right-of-ways and/or the defined overland flow routes shown on the Preliminary Grading Plan.

3. Pond 2A:

- a) Given the comparatively steep road grade, please demonstrate how major system flows will be fully captured and not continue on to March Road;

- The proposed road grades shown on the grading plans provided as a part of the MSS have not been designed taking Pond 2A into consideration as Pond 2A is only intended as an alternative pond location within the Southwest Quadrant of the site.

Notwithstanding the above, the grading design for Street A could easily be adjusted to provide a low point and route major system flows into Pond 2A.

- b) The direction of major system flow at March Road and the Collector Road illustrated on Figure 9.3 is inconsistent with Plan and Profile drawing PP3. Please clarify and/or revise as required.

- As stated above, the proposed road grades have not been developed with Pond 2A in mind as it is intended as an alternative pond location. If Pond 2A is selected as the final location for the SWM facility, the proposed road grading will be adjusted as required.
- While not consistent with the Plan and Profile Drawing, Figure 9.3 has been revised to reflect the anticipated major drainage flow routes associated with this alternative.

4. **All Ponds:** As requested in comments provided in September 2015, please provide X-sections that indicate side slopes and show adjacent constraints where appropriate (property/ROW limits, setback limits, edge of woods, etc.).

- Pond cross-sections will be provided in the Final EMP. The conceptual pond designs for all ponds have been updated with additional grading details as requested.

Based on the response to the City's questions presented above, we are confident we have demonstrated the feasibility of the proposed stormwater system.

Yours truly,



Michael Petepiece, P.Eng.
Project Manager

cc.

Ted Cooper, P. Eng. Project Manager
Darlene Conway, P. Eng. Senior Project Manager
Joe Zagorski, P. Eng.
Michel Kearney, P. Eng.
Chris Rogers, P. Eng.
Tim Newton, P. Eng.
Amy MacPherson

Appendix C

Woodlot Evaluations



Muncaster
Environmental
Planning Inc.

May 7, 2015

Mr. Greg Winters
Project Manager - Planner
NOVATECH
Suite 200, 240 Michael Cowpland Drive
Kanata, Ontario
K2M 1P6

Dear Greg:

**RE: Kanata North Urban Expansion Area
Southwest Wooded Area, 1015 March Road
Environmental Impact Statement**

I have completed an Environmental Impact Statement (EIS) for a wooded area in the southwest corner of the Kanata North urban expansion area. City staff provided comments with respect to the status of this area in a memo dated June 27th, 2014. During a meeting with senior city staff on January 5th, 2015 it was recommended that the impact of development in a portion of the southwest wooded area on the balance of the wooded area outside of the urban expansion area be investigated.

For the purposes of this report March Road is considered in a north-south orientation.

Site Context

This 1.2 hectare wooded area is at the west end of the rectangular land holding identified as 1015 March Road and is currently composed of mixed and cedar forests. The tree cover in the southwest wooded area is relatively young. 1976 aerial photography indicates no contiguous tree cover with only scattered trees on or adjacent to the current southwest wooded area. This is collaborated by the Shirley's Brook and Watt's Creek Subwatershed Study (Dillon, 1999) which did not identify a wooded area in this portion of the Kanata North urban expansion area. The closest wooded area was designated Woodlot S12 by Dillon (1999), with the northeast edge of Woodlot S12 approximately 160 metres southwest of the southwest corner of the urban expansion area (Figure 1). Woodlot S12 was rated tenth of twenty-six natural features in the Shirley's Brook Subwatershed and was not identified for 'protection from development' by Dillon (1999).

The southwest wooded area is identified as a candidate component of the City's Natural Heritage System as shown on the Schedule L3 Overlay of the Official Plan.

The site is designated *Urban Expansion Area* on Schedule B of the City of Ottawa Official Plan, with adjacent lands in the rural area designated *General Rural* on Schedule A. The site and adjacent lands are zoned Rural (RU), with the rural residential development to the south along Marchbrook Crescent zoned Rural Residential (RR3). No environmental constraints are identified for the general area on Schedule K of the Official Plan. The North Branch of Shirley's Brook is immediately to the south of portions of the south periphery of the urban expansion area. No tributaries to the North Branch in the vicinity of the southwest wooded area are identified on existing mapping or were observed during the field surveys.

The closest provincially significant wetland, an east portion of the South March Highlands Wetland Complex, is approximately 950 metres southwest of the wooded area, west of Second Line Road. The South March Highlands are also a provincially significant life science Area of Natural and Scientific Interest and are the closest Natural Area, as identified in the Natural Environment System Strategy (Brunton, 1997).

Methodology

As the southwest wooded area is identified as a candidate component of the City's Natural Heritage System, an EIS is required to determine if development within the wooded area would have a negative impact on the natural features and functions of the general landscape, including Woodlot S12 to the west and southwest. This Environmental Impact Statement was prepared in accordance with Section 4.7.8 of the City of Ottawa Official Plan (City of Ottawa, 2010), following the standards of the Natural Heritage Reference Manual (OMNR, 2010) and the City of Ottawa's EIS Guidelines found at <http://ottawa.ca/en/development-application-review-process-0/environmental-impact-statement-guidelines>. The EIS includes the components of an Environmental Impact Statement as identified in Section 4.7.8.11 a) through i) of the City of Ottawa Official Plan (City of Ottawa, 2010). The field survey and this report were completed by Bernie Muncaster, who has a Master's of Science in Biology and over twenty-six years of experience in completing natural environment assessments.

The EIS will provide the methodology to mitigate as required negative impacts on significant features and functions. Potential Species at Risk in the general area were identified from Ministry of Natural Resources databases, the Ontario Breeding Bird Atlas and Species at Risk reported for the overall City of Ottawa.

The natural environment features of the southwest wooded area and adjacent lands were reviewed on December 4th, 2012, June 21st, 2013 and August 6th, 2014. Weather conditions for the June 21st survey, which began at 08:10, included sunny skies, calm winds and an air temperature of 22° C.

Existing Conditions

Terrestrial Habitat

The southwest wooded area is approximately 1.2 hectares, with a maximum width of less than 100 metres. Rock is common near the surface in many areas. The southwest wooded area is composed of two forest communities. A mixed forest in the east portion of the southwest wooded area includes white pines up to 36cm diameter at breast height (dbh) (Photo 1), with smaller green ash, white elm, white ash and white cedar also present. Hawthorn, prickly ash, tartarian honeysuckle and common buckthorn are in the understory, along with regenerating ash stems. The ground flora is reflected of disturbed conditions including common dandelion, Pennsylvania sedge, common strawberry, blue grass, white avens, tall buttercup, heal-all, tufted vetch, heart-leaved aster, bladder campion, common burdock, thicket creeper and wild grape.

To the west of the mixed forest is a small area of dense white cedar coniferous forest (Photo 2) with white pine well represented. The largest cedars are up to 34cm dbh (Photo 3). Smaller green ash, white birch and white elm up to 18cm are also in the coniferous forest. The understory includes regenerating ash stems along with hawthorn, prickly gooseberry, prickly ash and common juniper shrubs. Thicket creeper, wild grape, yellow violet and Canada goldenrod are representative of the ground flora, which appears limited due to the shading (Photo 3).

Wildlife observations in and adjacent to the southwest wooded area included black-capped chickadee, American crow, turkey vulture, Canada goose, blue jay, mourning dove, European starling, American robin, great-crested flycatcher, common yellowthroat, yellow warbler, song sparrow, grey catbird, Baltimore oriole, American goldfinch, red squirrel, woodchuck and white-tailed deer and raccoon tracks. No stick nests were observed on or adjacent to the southwest wooded area.

The southwest wooded area does not provide interior habitat as the maximum forest width is less than 100 metres.



Photo 1 - White pines in the mixed forest in the east portion of the southwest wooded area



Photo 2 - Dense white cedar in small area of coniferous forest in the west portion of the southwest wooded area



Photo 3 – Larger white cedar in the coniferous forest in the west portion of the southwest wooded area. Note lack of ground flora on August 6th, 2014

Aquatic Habitat

The North Branch of Shirley's Brook is just south of portions of the south edge of the urban expansion area (Figure 1). The North Branch flows to the east, and downstream of the site towards March Road meanders within a modest valley with defined top-of-slopes. Adjacent to the southwest wooded area the North Branch lacks an associated valley feature. Exposed rock is the dominant substrate and some canopy cover is provided by white cedar, white elm and white ash, except where the corridor is part of manicured residential yards. In-stream cover over the exposed rock was limited to scattered cobble and boulder (Photo 4). A weir and ponds are in the North Branch corridor further downstream of the southwest wooded area (Photo 5). The channel upstream of the weir was often dry and appears to support flow only during the spring freshet (water was in the channel on May 6th, 2013) or after storm events.

Fish species caught in the North Branch and on-line ponds upstream of March Road during sampling completed in 2013 as part of the urban expansion area studies included central mudminnow, northern redbelly dace, finescale dace, blacknose dace, creek chub, white sucker, brook stickleback and pumpkinseed. Note that no fish were caught on May 6th, 2013 at the sampling station closest to the southwest wooded area upstream of the weir.

The North Branch was considered by Dillon (1999) to be 'Type 2' fish habitat, the middle of three fish habitat quality types used by Dillon (1999). This reach of the North Branch was considered a high priority for restoration and enhancement by Dillon (1999). A major

component of the recommendations was restriction of cattle access, which has occurred. Dillon (1999) also recommended removal of the weir and barriers to enhance fish movement and additional restoration using other natural channel design techniques. The North Branch upstream of March Road was considered by Aquafor Beech (2006) to support a moderately tolerant/tolerant warmwater fish community.



Photo 4 – North Branch of Shirley`s Brook immediately south of the urban expansion area was dry on August 6th, 2014 and showed no signs of recent water.



Photo 5 – Weir and dry channel along North Branch of Shirley's Brook downstream of the southwest wooded area. View looking downstream, southeast on August 20th, 2013

Species at Risk

The Ontario Ministry of the Natural Resources' Make a Map: Natural Heritage Areas website was reviewed (www.giscoeapp.lrc.gov.on.ca/web/MNR/NHLUPS/NaturalHeritage/Viewer/Viewer.html). This site allows for a search of Threatened and Endangered species covered by the 2008 *Endangered Species Act*, as well as other species of interest. A search was conducted on the 1 km squares including the southwest wooded area and adjacent lands (18VR22-53 and 63). One Species at Risk was identified for both 1 km squares, the threatened eastern whip-poor-will. In addition one provincially rare species, ram's-head lady's-slipper, was also noted for both squares. Other Species at Risk reported in the general area through MNRF correspondence include Blanding's turtle, least bittern, American ginseng, chimney swift, bobolink, eastern meadowlark, barn swallow and butternut.

The breeding birds listed in the Ontario Breeding Bird Atlas for the 10 km square 18VR22, which includes the southwest wooded area, identified eastern whip-poor-will, barn swallow, eastern meadowlark and bobolink as threatened Species at Risk, as well as golden-winged warbler, a species of special concern.

The potential Species at Risk reported for the City of Ottawa were also reviewed, with an emphasis on the endangered and threatened species historically reported in the overall City, including butternut, American ginseng, eastern prairie fringed-orchid, flooded jellyskin, wood turtle, spiny softshell, Blanding's turtle, musk turtle, bobolink, eastern meadowlark, barn

swallow, bank swallow, Henslow's sparrow, loggerhead shrike, eastern whip-poor-will, bald eagle, cerulean warbler, golden eagle, least bittern, little brown myotis, northern long-eared bat, olive hickorynut, eastern cougar, common gray fox, lake sturgeon and American eel. The habitat requirements of these species along with those listed as special concern were reviewed.

The ram's-head lady's-slipper orchid is found in mature coniferous forests or coniferous fens and swamps, habitat not on or adjacent to the study area. Larger areas of wetland habitat necessary to support least bittern are not present on the urban expansion lands. Golden-winged warbler breeds in scrubby habitats and is reported in the South March Highlands area to the west of the study area, as is American ginseng which requires rich, moist, undisturbed and relatively mature sugar maple-dominated deciduous woods in areas of circumneutral soil such as over limestone or marble bedrock. Targeted surveys for eastern whip-poor-will following MNRF protocol were completed in May and June, 2014 for the Kanata North urban expansion area, including the southwest wooded area. No eastern whip-poor-will were heard at any of the sampling stations. The density of the understory in the southwest wooded area appears to be too great to be used by eastern whip-poor-will. The other potential species of special interest are discussed below.

Five Species at Risk were observed in the field surveys completed for the overall Kanata North urban expansion area, but no observations were in proximity to the southwest wooded area. Dozens of butternuts were observed east of March Road, with the majority noted at 936 March Road. No butternuts were observed west of March Road. Bobolink, eastern meadowlark (not in the breeding season) and barn swallow were observed in the overall Kanata North urban expansion area but not in proximity to the southwest wooded area. Bobolink and eastern meadowlark are grassland birds that nest in larger hayfields and other meadows with taller grass and minimal woody vegetation. This habitat is not present on or adjacent to the southwest wooded area.

Barn swallows use structures with open rafters such as barns, larger agricultural sheds and bridges for nesting. No suitable structures are in proximity to the southwest wooded area.

Potential chimney utilization by chimney swifts is possible in some of the farmhouses. However no suitable structures or chimneys are in proximity to the southwest wooded area.

Sightings of Blanding's turtle, a threatened Species at Risk in Ontario, have been recorded within two kilometres of the study area in Shirley's Bay and South March Highlands and a single Blanding's turtle was observed twice in May, 2014 in a tributary of Shirley's Brook west of March Road and approximately 400 meters northeast of the southwest wooded area. Following the general habitat description for the Blanding's turtle developed by the Ministry of Natural Resources and Forestry all suitable wetlands and watercourses within two kilometres from an occurrence are considered Category 2 habitat (OMNR, 2013). A buffer of 30 metres around the suitable wetlands/waterbodies is also included in the delineation of Category 2 lands. The North Branch of Shirley's Brook is considered suitable habitat and in discussions with MNRF the corridor along the North Branch has been identified as Category 2 habitat. Category 3 lands are between 30 and 250 metres around suitable Category 2 wetlands and waterbodies. The primary purpose with respect to Blanding's turtle habitat of the Category 3 lands is to provide

movement corridors between wetlands, a function which is essential for carrying out life processes associated with the Category 1 and 2 habitats (OMNR, 2013).

A Species of Concern, snapping turtle, was observed in the larger on-line pond along the North Branch of Shirley's Brook downstream of the southwest wooded area. This turtle occurs in almost any freshwater habitat, though it is most often found in slow-moving water with a soft mud or sand bottom and abundant vegetation.

Linkages and Significant Wildlife Habitat

The potential linkage function in the general area between Shirley's Bay and the Ottawa River to the east and South March Highlands to the west, including the Kanata North Urban Expansion Area, is limited by extensive agricultural lands, DND activities, the north-south March Road, Second Line Road and March Valley Road and rural residential developments. Aquafor Beech (2006) concluded that it is apparent that the scattered woodlots between Second Line Road and March Valley Road have deteriorated in terms of the quality and diversity of the woodland habitat they previously provided. Aquafor Beech (2006) identified three potential linkage locations; one along the North Branch, one along the North Tributary and one along Constance Creek to the north of the urban expansion area. Potential linkages along the North Branch of Shirley's Brook are limited by crossings of March Road, Second Line Road and March Valley Road, extensive agricultural lands and rural residential developments.

Flora, fauna or ecological conditions identified in the background review or field surveys that would trigger a Significant Wildlife Habitat designation are limited to the Blanding's turtle habitat described above. No other specific features such as amphibian breeding areas or winter feeding and roost areas for raptors were observed during the field surveys in and adjacent to the southwest wooded area.

Significant Woodlands

The forests within the southwest wooded area are less than 50 years old and do not support forest interior habitat. However the woodlot does extend in a continuous, although tenuous manner, to the west and southwest. The connectivity of the woodland is impacted by the rural residences along Marchbrook Circle and sporadic tree regeneration and removal on former agricultural lands. As a watercourse is present and the contiguous forest to the west and southwest of the southwest wooded area does have small areas of forest that are greater than 100 metres from a forest edge, the entire contiguous forest would be considered a significant woodland if mature stands of trees are present to the southwest of the site. Permission to access this area was not obtained. With forests present in the core Woodlot S12 area on older aerial photography (1976) the entire forest has the potential to be considered a Significant Woodland.

Despite the possibility that the overall wooded area could be considered a Significant Woodlot, removal of a portion of the southwest wooded area for urban residential development is not anticipated to have a significant impact on the forests to the west and southwest. Any features and functions for which the overall forest may be considered a significant woodland will not be

impacted. If the contiguous forest is a significant woodland, it will continue to function as a significant woodland even with removal of a portion of the southwest wooded area.

Urban Natural Area Evaluation

The southwest wooded area within the urban expansion area was evaluated using the criteria of the Urban Natural Areas Environmental Evaluation Study (Muncaster and Brunton, 2005). The wooded areas in the urban expansion area rated '3' (out of '5') for the connectivity, regeneration and ecological integrity criteria; '2' for the natural communities and wildlife habitat criteria and '1' for the size and shape, habitat maturity, representative flora and fauna and significant flora and fauna criteria. The average rating of the nine evaluation criteria is 1.89, which would indicate that the portion of the woodland in the urban expansion area would be considered to have a low overall significance. Privately owned urban natural areas scoring low overall are not considered by the City as a priority for acquisition or retention.

Impact Analysis and Recommendations

Potentially significant woodlands, the intermittent fish habitat of the North Branch of Shirley's Brook, and the Category 2 Blanding's turtle habitat along the Shirley's Brook corridor are the potential natural heritage features, as identified in the Provincial Policy Statement and OMNR (2010), on and adjacent to the southwest wooded area.

The southwest wooded area is too young to be considered significant and does not support interior habitat. This area and lands to the west and south were not forested in 1976. However the southwest wooded area is now contiguous with a larger area that was forested in 1976 further to the west and southwest. This 'core' wooded area was identified as Woodlot S12 by Dillon (1999). The connection between the southwest wooded area and Woodlot S12 is tenuous due to several breaks in the forest canopy, including the residences along Marchbrook Circle. However fingers of the wooded area appear to remain connected, with breaks of tree cover less than 20 metres in width.

The ecological features and functions of the southwest wooded area are considered minimal due to:

- the small size;
- location along the east edge of the contiguous tree cover, with adjacent disturbed habitat to the north, east and south, including the rural residential development to the south;
- a lack of mature trees;
- no interior forest habitat;
- many open areas of reduced tree cover; and,
- disturbed ground flora.

Portions of the southwest wooded area will be retained along the north part of the North Branch corridor to protect the intermittent fish habitat and the Category 2 Blanding's turtle habitat. At this time it is anticipated that a twenty-six metre width of the wooded area will be retained along the south boundary of the urban expansion area, to the north of the normal high water mark of the

North Branch. This is greater than the fifteen metre setback from the top of slope recommended in the Kanata North Environmental Management Plan for the North Branch downstream of March Road (CH2M Hill, 2001).

Given the distance of 160 metres to the closest portion of the core Woodlot S12 from the west edge of the southwest wooded area and several breaks in the forest canopy in the intervening lands, in combination with the minimal features of the southwest wooded area described above it is concluded that removal of a portion of the southwest wooded area will not impact the ability of the overall contiguous forest to function as a significant woodland.

The following general mitigation measures are recommended for development in and adjacent to the southwest wooded area. These recommendations will be modified and enhanced at the time of processing a plan of subdivision for the subject lands:

1. The extent of woody vegetation (tree and shrub) removal is to be minimized as much as possible. Where possible in conjunction with the development design and associated urban servicing constraints individual white pine and other trees should be retained;
2. Sturdy protective fencing, at least 1.3 metres in height, is to be placed along the north edge of the trees retained as part of the North Branch corridor and around other trees to be retained and protected;
3. No stockpiling or heavy machinery traffic should occur in the work area within five meters of the fencing to protect the critical root zone of the adjacent woody vegetation to be retained;
4. Woody vegetation removal is to occur before April 15th or after August 15th for the protection of breeding birds, unless a survey conducted within five days of the vegetation removal identifies no breeding activity;
5. The extent of exposed soils is to be kept to a minimum at all times. Re-vegetation of exposed, non-developed areas is to be achieved as soon as possible;
6. Lighting associated with the residences is to be directed away from the wooded areas to the west and minimized as much as possible;
7. Municipal by-laws and provincial regulations for noise will be followed;
8. Utilities will be located as required in the vicinity of the site prior to construction;
9. Waste will be managed in accordance with provincial regulations; and,
10. The contractor will have a spill kit on-hand at all times in case of spills or other accidents.

Conclusion

The southwest wooded area is approximately 1.2 hectares and is less than 100 metres in width. The wooded area is too young to be considered significant and does not support interior habitat. This area and lands to the west and south were not forested in 1976. The ecological features and functions of the southwest wooded area are considered minimal due to the small size, location along the east edge of the contiguous tree cover, with adjacent disturbed habitat to the north, east and south, a lack of mature trees, no interior forest habitat, many open areas of reduced tree cover and disturbed ground flora.

Approximately 37 percent (0.45 hectares) of the southwest wooded area will be retained along the north part of the North Branch corridor to protect the intermittent fish habitat and the Category 2 Blanding's turtle habitat.

Given the distance of 160 metres to the closest portion of the core Woodlot S12 from the west edge of the southwest wooded area and several breaks in the forest canopy in the intervening lands, in combination with the minimal features of the southwest wooded area described above it is concluded that removal of a portion of the southwest wooded area will not impact the ability of the overall contiguous forest to function as a significant woodland.

References

Aquafor Beech Limited. 2006. Greater Shirley's Brook Constance Creek Environmental Management Study. Unpublished report not approved by the City of Ottawa. October 2006. 48 pp. & append

Brunton, D. F. 1997. Summary: Natural Area Reports for Natural Areas West of the Rideau River (500 Series). Prepared for the Regional Municipality of Ottawa-Carleton, Planning and Development Approvals Department. Report #28-08d. 164 pp.

CH2M Hill. 2001. Kanata North Environmental/Stormwater Management Plan. Final Report. February, 2001. 71 pp. & append

City of Ottawa. 2010. City of Ottawa Official Plan. As adopted by City Council, May, 2003. Publication: 1-28. 227 pp & Sched.

Dillon Consulting Ltd. 1999. Shirley's Brook and Watt's Creek Subwatershed Study. June 1999.

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Ontario Ministry of Natural Resources. 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Second Edition. March 2010. 233 pp.

Ontario Ministry of Natural Resources. 2013. General Habitat Description for the Blanding's Turtle (*Emydoidea blandingii*). 7 pp.

Reliance Clause

This report has been prepared for Novatech Engineering Consultants Ltd., on behalf of the Kanata North Landowner's Group and in support of the Kanata North Community Design Plan. It is hereby acknowledged that Metcalfe Realty Company Limited, J. G. Rivard Limited and 8409706 Canada Inc. (Valecraft Homes), 3223701 Canada Inc. and 7089121 Canada Inc. (Junic/Multivesco) can rely upon and utilize this report for the purpose of obtaining approval of the community design plan and for their own use to seek development approval.

It is further acknowledged that future confirmed participating landowners within the Kanata North Landowner's Group can rely upon and utilize this report for the purpose of obtaining approval of the community design plan and for their own use to seek development approval.

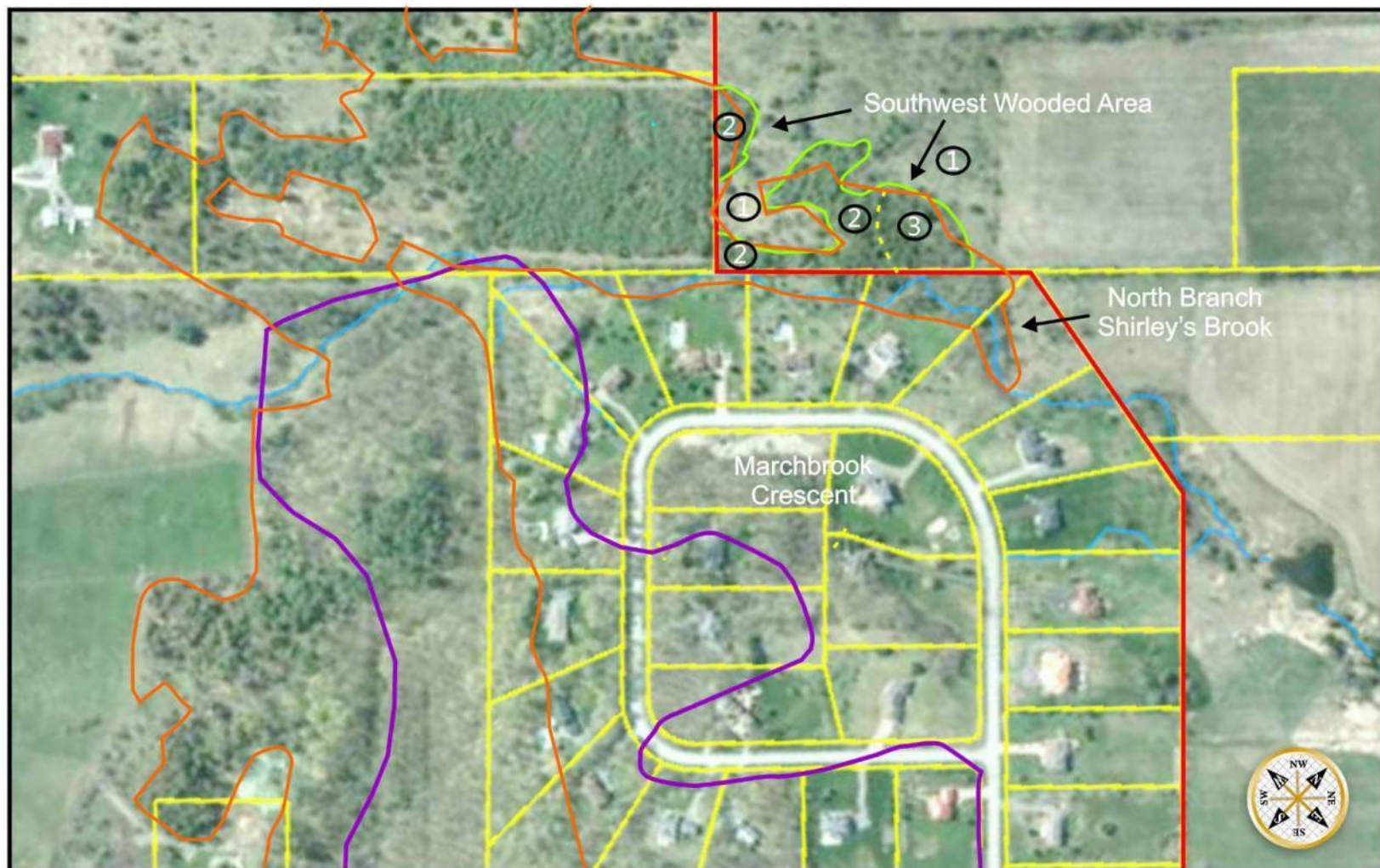
Please call if you have any questions on this EIS.

Yours Sincerely,
MUNCASTER ENVIRONMENTAL PLANNING INC.



Bernie Muncaster, M.Sc.
Principal

gwS12eis



Legend

- Urban Expansion Area
- Woodlot S12 (Dillon, 1999)
- Natural Heritage System (City of Ottawa)

Vegetation Communities

- ① Cultural thicket
- ② Dry-fresh white cedar coniferous forest
- ③ Dry-fresh white pine mixed forest

Figure 1

FILE: 12-25

March 16, 2015

Prepared for:

NOVATECH

Prepared by:



Muncaster
Environmental
Planning Inc.

SOUTHWEST WOODED AREA

Kanata North Urban Expansion Area



Muncaster
Environmental
Planning Inc.

November 26, 2014

Mr. Murray Chown
Senior Planner
Novatech Engineering Consultants Ltd.
Suite 200, 240 Michael Cowpland Drive
Kanata, Ontario
K2M 1P6

Dear Murray:

**RE: Kanata North Urban Expansion Area, Woodlot S20
Significant Woodland Assessment Using OMNR Criteria
Response to TAC Questions on November 20th**

During the November 20th Technical Advisory Committee meeting City of Ottawa staff made additional requests for more information concerning the significant woodland assessment of Woodlot S20 and our letter report *Kanata North Urban Expansion Area, Woodlot S20, Significant Woodland Assessment Using OMNR Criteria, Additional Assessments and Response to City Analysis* dated November 10th, 2014.

Woodlot S20 is in the Kanata North Urban Expansion Area of the City of Ottawa, east of March Road and west of a north-south railway line. The south portion of Woodlot S20 is on 936 March Road, with the north portion on 1020 March Road.

Survey of Older Trees

The table in Appendix A lists the older trees in Woodlot S20 with UTM, species and size. A column has been added to the right side of the table to provide the basal area for each tree. The updated table is provided at the end of this letter. Summary statistics are now provided at the end of the table to calculate Woodlot S20's basal area of trees greater than 40 cm diameter at breast height (dbh) and the density of trees at least 50cm dbh in size. Although these data were not provided in this detail in the November 10th report, the data were used in the analysis. The conclusion of the November 10th report have not changed, Woodlot S20 does not meet the larger tree size structure criterion for significant woodlands as identified in the fourth standard for uncommon characteristics. Woodlot S20 does not satisfy any of the uncommon characteristics identified in Criterion 3 of Table 7-2 of the Natural Heritage Reference Manual.

Fish Sampling and Assessment of Agricultural Channel

The following concerns were raised by City staff with respect to the location and extent of fish sampling. City staff were in the field on June 19th, 2014 and the fish sampling was completed on June 23rd. Our responses follow the concerns.

1. Figure 2 in the November 10th report showed the portion of Tributary 1 in the vicinity of Station 2 along the border between the east edge of Woodlot S20 and the agricultural field, while City staff recall the channel in the woods.

Response – The location of Tributary 1 in the vicinity of Station 2 as shown on Figure 2 in the November 20th report was incorrect. As shown in Photos 3 and 4 from Appendix B, Fish Habitat Analysis, and reproduced below, Tributary 1 in the vicinity of Station 2 was within the wooded area. A revised Figure 2 is provided on the next page. A review of the GPS marks confirmed Station 2 was within a forest representing part of Woodlot S20.



Photo 3 from Nov. 10 report: Station 2 looking upstream from downstream June 23, 2014

Revised Figure 2 - Location of Fish Habitat Assessment Stations, with Field Conditions on June 23rd

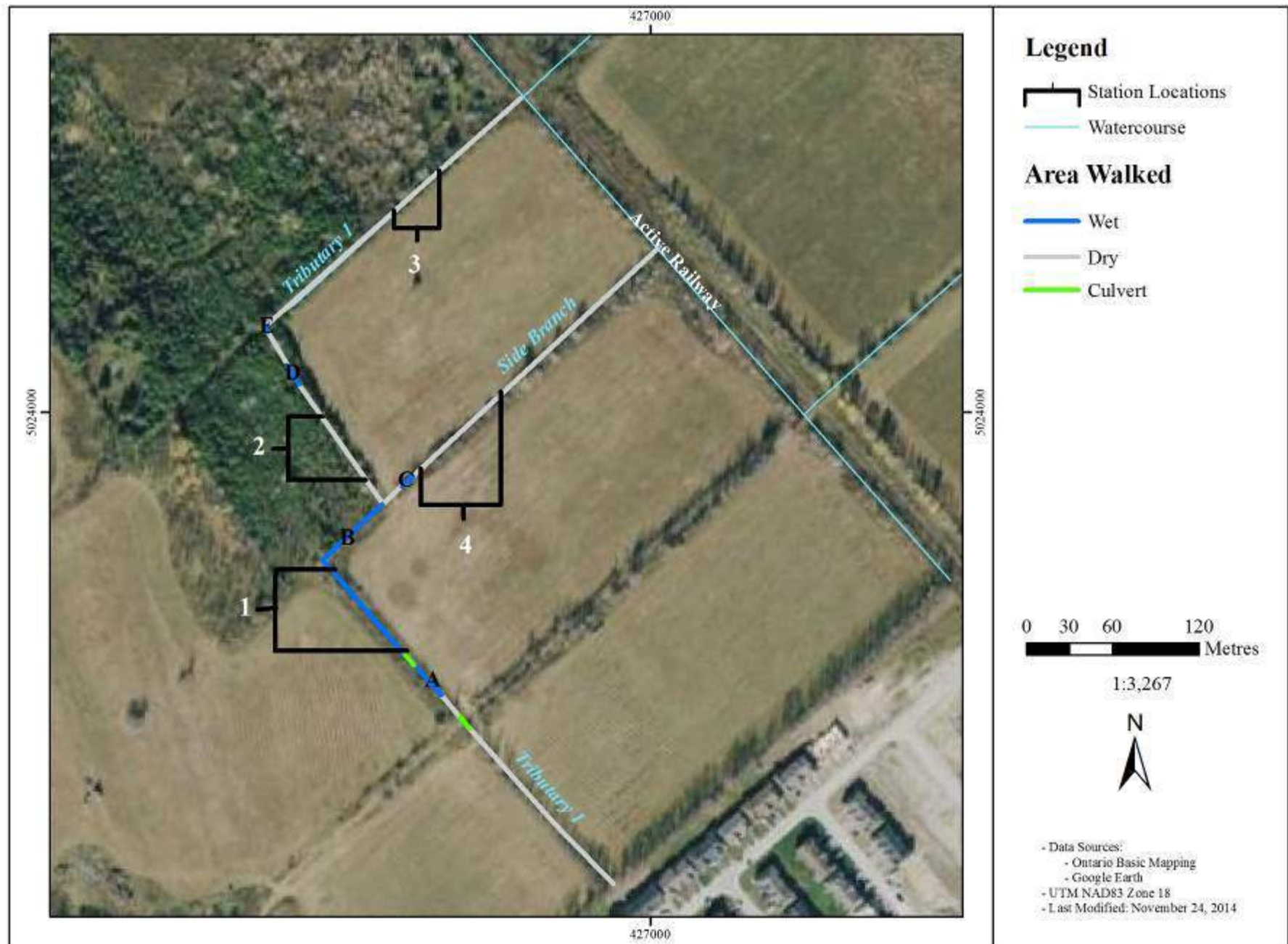




Photo 4 from Nov. 10 report: Station 2 looking downstream from upstream June 23, 2014

2. City staff believe they saw more water in the channels on June 19th compared to what was reported from the June 23rd sampling.

Response – The photos provided in Appendix B of the November 10th report, including the photos reproduced above, show long sections of dry channel on June 23rd. The wetted and dry areas of the channel on June 23rd are shown on the revised Figure 2 on page 3. Note that for most locations a ‘wet’ area represented 2cm or less of water. Where water depth permitted, fish sampling was completed outside of the habitat assessment stations.

Note that 13.8 mm of rainfall occurred on June 17th at Ottawa Airport, with another 1.4 mm on June 18th and an additional 9.8 mm between June 13th and 16th. No rainfall was recorded at Ottawa Airport between the City staff field review on June 19th and the fish sampling on June 23rd.

The revised Figure 2 on page 3 has five areas where a marginal amount of water was present. All of these areas contained too little water for fish sampling.

Location A on Figure 2

The estimated wetted width and depth at this location, upstream of a culvert, was 0.3 m and 2 cm, respectively.



Photo 1 Location A: Looking upstream from the culvert (June 23, 2014)

Location B on Figure 2

This location is downstream of Station 1 and the water was tapering off at this location. The estimated wetted width and depth at this location was 0.2 m and 1 cm, respectively.



Photo 2 Location B: Looking upstream from the downstream end of the wetted area
(June 23, 2014)

Location C on Figure 2

The estimated wetted width and depth at this location was 0.4 m and 1 cm, respectively.



Photo 3 Location C: Looking downstream from the upstream end of the wetted area
(June 23, 2014)

Location D on Figure 2

The estimated wetted width and depth at this location was 0.3 m and 1 cm, respectively.



Photo 4 Location D: Looking downstream from the upstream end of the wetted area
(June 23, 2014)

Location E on Figure 2

The estimated wetted width and depth at this location was 0.4 m and 4 cm, respectively.



Photo 5 Location E: Looking downstream from the upstream end of the wetted area
(June 23, 2014)

3. Cyprinids were observed by City staff on June 19th but not reported in the catch from June 23rd.

Response – the culvert location is shown on the revised Figure 2, with Station 1 beginning immediately downstream of the culvert. The sampling for Station 1 included the portion of the channel immediately downstream of the culvert. Perhaps some of the fish observed on June 19th relocated from the drying channel or were susceptible to predation. Where water depth did not permit use of the electrofisher, the channel was sampled using dip nets, however many of the areas shown as wetted on the revised Figure 2 contained a couple of cm or less of water and could not be sampled with a dip net. The area upstream of the culvert did not contain enough water to be sampled on June 23rd (Photo 1, Location A on Figure 2).

4. A potential channel enters from the north within Woodlot S20 where Tributary 1 does a 90 degree turn to the east between Stations 2 and 3.

Response – There is no reference to this channel in the field notes completed by the two field biologists. No defined connection has been noted by the biologists during the fish habitat and other surveys including turtles, ELC and breeding birds. Wet areas have been observed in the areas to the north but no defined connection to Tributary 1.

Our conclusion remains that the limited fish habitat observed in the agricultural channel of Tributary 1 is not supported or influenced by the adjacent Woodlot S20.

Ecological Land Classification Methodology Applied to Woodlot S20 and Adjacent Communities

City staff requested that for each vegetation community the average number of trees with a dbh of 10cm and over per hectare and 40cm dbh and over per hectare be added to Table 1, *Summary of Tree Composition and Soil Data by Vegetation Community* in addition to the 25cm dbh threshold provided. This additional information is provided in the revised Table 1 on page 9.

In addition the basal area per hectare for trees 40cm dbh and larger is now provided for each community based on three plots. Note that for the three plots the average basal area per hectare for the small (0.61 hectares) community 9 in the northwest corner of Woodlot S20 was 9.33, exceeding the MNRF guideline of 8 m² per hectare for basal area. However as this community represents only 7.5 percent of Woodlot S20, it does not changed the overall significant woodland assessment of Woodlot S20, but does define a portion of the woodlot supporting a higher percentage of larger trees.

A correction is that the average basal area (BA) of the three plots per community presented in Table 1 is m² per hectare rather than the whole community.

Revised Table 1 – Summary of Tree Composition and Soil Data by Vegetation Community

Com. ID	Com. Size (ha)	PRISM					Average # of Trees with a DBH of 10cm and over per 1 ha	Average # of Trees with a DBH of 25cm and over per 1 ha	Average # of Trees with a DBH of 40cm and over per 1 ha	Effective Texture	Moisture Regime
		Species	Percent Species Comp.	Community Description	Average BA (m2/ha)	Average BA (m2/ha) of trees with a DBH of 40cm and over					
1	0.64	- grey birch - trembling aspen - tamarack	- 69% - 23% - 8%	grey birch 69%, and trembling aspen 23%	8.67	0.66	53.3	6.6	6.6	- very fine Sand - very fine Sandy Loam - very fine Loamy Sand	- Fresh - Moist
2	1.41	- trembling aspen - white pine - ash species - white cedar - American elm	- 75.0% - 8.3% - 8.3% - 4.2% - 4.2%	trembling aspen 75%	16.00	2.00	126.7	80.0	20.0	- very fine Sand - very fine Loamy Sand	- Fresh - Moist
3	0.60	NO TREES	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	0.84	- white cedar - balsam poplar - trembling aspen - American elm	- 79.3% - 10.3% - 6.9% - 3.5%	white cedar 79.3%, and balsam poplar 10.3%	19.33	0.00	26.7	20.0	0.0	- very fine Loamy Sand - Silty Clay Loam	- Fresh - Moist
5	0.91	- white cedar - American elm - balsam poplar	- 95.0% - 3.3% - 1.7%	white cedar 95%	40.00	0.00	333.3	20.0	0.0	- very fine Sand	- Moist

Revised Table 1 – Summary of Tree Composition and Soil Data by Vegetation Community

Com. ID	Com. Size (ha)	PRISM					Average # of Trees with a DBH of 10cm and over per 1 ha	Average # of Trees with a DBH of 25cm and over per 1 ha	Average # of Trees with a DBH of 40cm and over per 1 ha	Effective Texture	Moisture Regime
		Species	Percent Species Comp.	Community Description	Average BA (m ² /ha)	Average BA (m ² /ha) of trees with a DBH of 40cm and over					
6	1.00	- white cedar - American elm - green ash	-94.3% - 4.3% - 1.4%	white cedar 94.3%	46.67	2.67	453.3	153.4	26.7	- very fine Sand - very fine Loamy Sand - very fine Silty Sand	- Moist
7	1.30	- American elm - trembling aspen	- 91.3% - 8.7%	American elm 91.3%	15.33	0.00	140.0	20.0	0.0	- very fine Silty Sand - very fine Sandy Clay - Silty Clay	- Moist
8	3.50	- white cedar	- 100%	white cedar 100%	54.67	6.00	546.7	300.0	60.0	- very fine Sand - very fine Sandy Clay Loam	- Fresh
9	0.61	- white cedar - American elm - ash species	- 89.7% - 5.1% - 5.1%	white cedar 89.7%	26.00	9.33	260.0	166.6	93.3	- very fine Loamy Sand - very fine Sandy Loam - Clay Loam	- Fresh
10	0.76	- ash species - balsam poplar	- 94.7% - 5.3%	ash species 94.7%	12.67	1.34	60.0	13.4	13.4	- very fine Loamy Sand - very fine Sandy Clay Loam - Silty Clay Loam - Silty Clay	- Moist
11	1.69	NO TREES	N/A	N/A	N/A	N/A	N/A	N/A	N/A	- very fine Sand - very fine Loamy Sand - very fine Sandy Clay Loam	- Fresh - Moist

Revised Table 1 – Summary of Tree Composition and Soil Data by Vegetation Community

Com. ID	Com. Size (ha)	PRISM					Average # of Trees with a DBH of 10cm and over per 1 ha	Average # of Trees with a DBH of 25cm and over per 1 ha	Average # of Trees with a DBH of 40cm and over per 1 ha	Effective Texture	Moisture Regime
		Species	Percent Species Comp.	Community Description	Average BA (m2/ha)	Average BA (m2/ha) of trees with a DBH of 40cm and over					
12	0.74	NO TREES	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Proximity to Other Woodlands or Habitats Criterion

For this criterion the Natural Heritage Reference Manual states:

Woodlands should be considered significant if: a portion of the woodland is located within a specified distance (e.g., 30 m) of a significant natural feature or fish habitat likely receiving ecological benefit from the woodland and the entire woodland meets the minimum area threshold (e.g., 0.5–20 ha, depending on circumstance)

The Kemptville District Office of the Ministry of Natural Resources and Forestry utilizes a table with the rationale of minimum area thresholds for the Natural Heritage Reference Manual criteria (see Appendix A of the attached report by Hatch Ltd). Woodlot S20 (8.1 hectares) does not meet the minimum area requirement of 20 hectares given the regional forest cover of 38.9 percent in the Shirley's Brook Subwatershed Study (Dillon, 1999). This forest cover standard is used by the City in their June 27th significant woodland analysis. Hypothetically considering that Woodlot S20 extended to the railway corridor, the minimum area threshold of 20 hectares would still not be met.

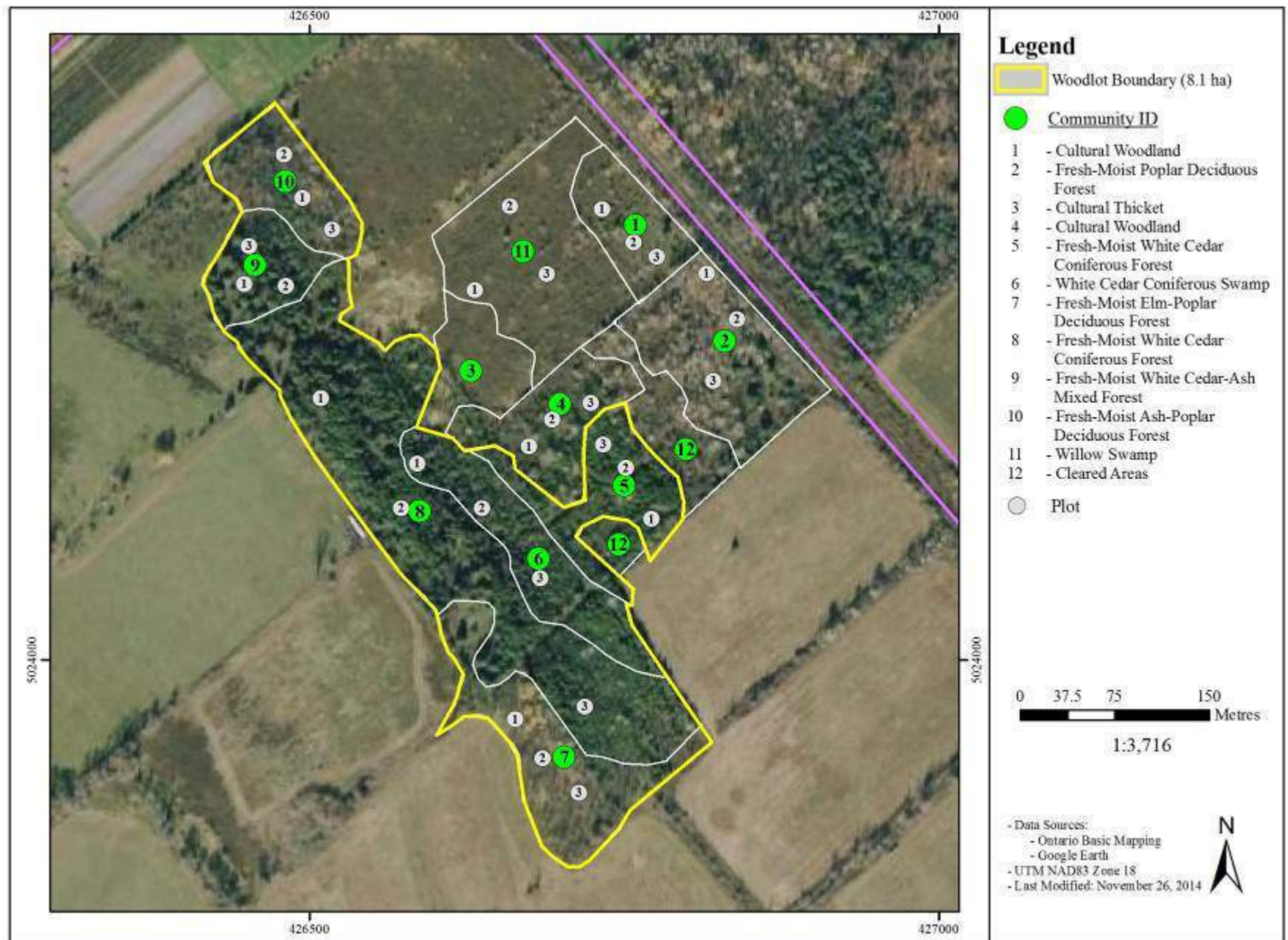
During the November 20th TAC meeting City staff suggested that if the forests to the east of the railway line, known as Woodlot S23, were significant then Woodlot S20, if it extends to the railway line, would be within 30 metres of a significant natural feature (the apparent significant woodland represented by Woodlot S23) as the break in the forest canopy at the railway line is 28 metres, less than the 30 metre threshold defined in the proximity criterion.

However in addition to not meeting the minimum area threshold, Woodlot S20 does not extend to the railway line. Following the direction in Appendix 8 of the City's EIS Guidelines only forest communities are included in the significant woodland assessment. Forest communities composing Woodlot S20 have been identified as Communities 5, 6, 7, 8, 9 and 10 on Figure 3. A 20 metre break in the forest canopy cover is the distance used in the Natural Heritage Reference Manual and Appendix 8 of the City's EIS guidelines to separate contiguous woodlands. The cultural woodland, vegetation community '4' on Figure 3 is not considered to be part of Woodlot S20 as it is not classified as a forest community. The cultural woodland, regardless of the removal of some woody vegetation in June, 2014 (Figure 3), provides a break of more than 40 metres between Woodlot S20 and the deciduous forest to the west of the railway line.

The data in Table 1 provide evidence that Community 4 is a cultural woodland. The average number of trees with a dbh of 10cm and over per hectare (26.7) is an order of magnitude less than the average number of trees with a dbh of 10cm and over per hectare for the adjacent cedar forest communities (333 for vegetation community 5 and 453 for vegetation community 6).

Woodlot S20 does not extend to the railway line and is not within 30 metres of a significant natural feature.

Figure 3 – Vegetation Communities and Plot Locations - Woodlot S20 and Adjacent Lands



Summary

Woodlot S20 is too small to be considered significant and it lacks interior habitat. No interior forest or area sensitive breeding birds were observed. The woodlot has been impacted by trails, logging, wind throw and non-native vegetation. There are no unique communities within the woodland and the woodland is not within 30 metres of a significant natural heritage feature. Woodlot S20 does not meet the minimum area to satisfy the size criteria for significance or the minimum area required for the proximity to other woodlands or other habitats sub-criterion in the ecological functions criteria.

The only Species at Risk observed was butternut, which is very common in the Kanata area and found in a variety of habitats. The trees and other features associated with Woodlot S20 do not impact the ability of an intermittent agricultural channel near the edge of Woodlot S20 to provide its limited features and functions.

The density of larger trees and basal area of trees at least 40cm dbh in Woodlot S20 is less than the required densities identified for significant woodlands in the uncommon characteristics criteria.

Our previous conclusion remains unchanged; Woodlot S20 is not a significant woodland.

References

Dillon Consulting Ltd. 1999. Shirley's Brook and Watt's Creek Subwatershed Study. June 1999.

Ontario Ministry of Natural Resources. 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Second Edition. March 2010. 233 pp.


Reliance Clause

This letter has been prepared for Novatech Engineering Consultants Ltd., on behalf of the Kanata North Landowner's Group and in support of the Kanata North Community Design Plan. It is hereby acknowledged that Metcalfe Realty Company Limited, J.G Rivard Limited and 8409706 Canada Inc. (Valecraft Homes), 3223701 Canada Inc. and 7089121 Canada Inc. (Junic/Multivesco) can rely upon and utilize this report for the purpose of obtaining approval of the community design plan and for their own use to seek development approval.

It is further acknowledged that future confirmed participating landowners within the Kanata North Landowner's Group can rely upon and utilize this report for the purpose of obtaining approval of the community design plan and for their own use to seek development approval.

Please call if you have any questions on this additional information concerning Woodlot S20.

Yours Sincerely,
MUNCASTER ENVIRONMENTAL PLANNING INC.

A handwritten signature in black ink, appearing to read "Bernie Muncaster".

Bernie Muncaster, M.Sc.
Principal

\\kanorthS20cityresponesenov26

APPENDIX A – LIST of LARGER TREES in WOODLOT S20
(UTM NAD83)

Tree #	Zone	Easting	Northing	Tree Species	DBH (cm)	Basal Area (m ²)
1	18 T	426450	5024209	White Cedar	67	0.3526
2	18 T	426478	5024190	Butternut	62	0.3019
3	18 T	426491	5024180	Butternut	69	0.3739
4	18 T	426554	5024092	Black Cherry	43	0.1452
5	18 T	426579	5024057	White Ash	68	0.3632
6	18 T	426590	5024045	White Cedar	48	0.1810
7	18 T	426596	5024039	White Cedar	40	0.1257
8	18 T	426626	5023957	Manitoba Maple	52	0.2124
9	18 T	426730	5023855	White Ash	58	0.2642
10	18 T	426738	5023868	White Ash	48	0.1810
11	18 T	426740	5023896	White Ash	42	0.1385
12	18 T	426723	5023899	White Ash	44	0.1520
13	18 T	426727	5023907	White Ash	43	0.1452
14	18 T	426705	5023933	Trembling Aspen	44	0.1520
15	18 T	426706	5023946	White Ash	41	0.1320
16	18 T	426740	5024041	Largetooth Aspen	58	0.2642
17	18 T	426678	5023987	Trembling Aspen	47	0.1735
18	18 T	426680	5023983	Trembling Aspen	44	0.1521
19	18 T	426682	5023971	Trembling Aspen	40	0.1257
20	18 T	426683	5023967	Trembling Aspen	47	0.1735
21	18 T	426661	5024061	Trembling Aspen	43	0.1452
22	18 T	426657	5024068	White Cedar	44	0.1521
23	18 T	426652	5024075	American Elm	41	0.1320
24	18 T	426643	5024077	White Cedar	46	0.1662
25	18 T	426643	5024075	White Cedar	42	0.1385
26	18 T	426642	5024076	White Cedar	42	0.1385
27	18 T	426632	5024073	White Cedar	71	0.3959
28	18 T	426626	5024064	Butternut	44	0.1520
29	18 T	426640	5024069	White Cedar	42	0.1385
30	18 T	426647	5024066	White Cedar	41	0.1320
31	18 T	426603	5024060	Butternut	42	0.1385
32	18 T	426607	5024056	White Cedar	48	0.1810
33	18 T	426603	5024051	White Cedar	42	0.1385
34	18 T	426601	5024047	White Cedar	40	0.1257
35	18 T	426602	5024039	White Cedar	51	0.2043
36	18 T	426615	5024055	White Cedar	58	0.2642
37	18 T	426619	5024060	White Cedar	44	0.1520
38	18 T	426622	5024055	White Cedar	54	0.2290
39	18 T	426620	5024057	White Cedar	65	0.3318
40	18 T	426639	5024061	White Cedar	68	0.3631

APPENDIX A – LIST of LARGER TREES in WOODLOT S20
(UTM NAD83)

Tree #	Zone	Easting	Northing	Tree Species	DBH (cm)	Basal Area (m ²)
41	18 T	426638	5024059	White Cedar	48	0.1810
42	18 T	426645	5024046	White Cedar	51	0.2043
43	18 T	426596	5024072	White Cedar	53	0.2206
44	18 T	426599	5024091	White Cedar	40	0.1257
45	18 T	426600	5024086	White Cedar	48	0.1810
46	18 T	426601	5024087	White Cedar	50	0.1964
47	18 T	426616	5024102	White Cedar	45	0.1590
48	18 T	426627	5024103	White Cedar	42	0.1385
49	18 T	426631	5024102	White Cedar	50	0.1964
50	18 T	426621	5024107	White Cedar	52	0.2124
51	18 T	426620	5024115	White Cedar	42	0.1385
52	18 T	426602	5024150	White Cedar	49	0.1886
53	18 T	426603	5024127	White Cedar	49	0.1886
54	18 T	426604	5024118	White Cedar	44	0.1520
55	18 T	426587	5024099	White Cedar	43	0.1452
56	18 T	426583	5024103	White Cedar	40	0.1257
57	18 T	426529	5024211	White Cedar	44	0.1520
58	18 T	426530	5024212	White Cedar	71	0.3959
59	18 T	426542	5024223	Red Maple	43	0.1452
60	18 T	426538	5024244	White Cedar	42	0.1385
61	18 T	426510	5024218	White Cedar	56	0.2463
62	18 T	426504	5024220	White Cedar	42	0.1385
63	18 T	426504	5024215	White Cedar	60	0.2827
64	18 T	426502	5024213	White Cedar	73	0.4185
65	18 T	426490	5024224	White Cedar	66	0.3421
66	18 T	426489	5024237	White Cedar	54	0.2290
67	18 T	426486	5024277	White Cedar	50	0.1964
68	18 T	426480	5024269	White Cedar	43	0.1452
69	18 T	426476	5024247	White Cedar	46	0.1662
70	18 T	426474	5024265	White Cedar	45	0.1590
71	18 T	426471	5024285	White Cedar	47	0.1735
72	18 T	426472	5024288	White Cedar	45	0.1590
73	18 T	426477	5024288	White Cedar	42	0.1385
74	18 T	426473	5024302	White Cedar	44	0.1520
75	18 T	426455	5024336	White Cedar	48	0.1810
76	18 T	426456	5024331	White Cedar	40	0.1257
77	18 T	426452	5024322	White Cedar	49	0.1886
78	18 T	426466	5024310	White Cedar	48	0.1810
79	18 T	426463	5024313	White Cedar	47	0.1735
80	18 T	426453	5024287	White Cedar	43	0.1452

APPENDIX A – LIST of LARGER TREES in WOODLOT S20
(UTM NAD83)

Tree #	Zone	Easting	Northing	Tree Species	DBH (cm)	Basal Area (m ²)
81	18 T	426450	5024308	White Cedar	53	0.2206
82	18 T	426457	5024407	Bur Oak	47	0.1735
83	18 T	426457	5024412	White Ash	41	0.1320
BASAL AREA OF TREES 40cm DBH AND GREATER SUM m²						15.9829
STAND SIZE ha						8.1
STAND BASAL AREA OF TREES 40cm DBH AND GREATER m²/ha						1.9732
NUMBER OF TREE 50CM AND OVER						26
NUMBER OF TREE 50CM AND OVER /ha						3.21



Muncaster
Environmental
Planning Inc.

July 2, 2015

Mr. Greg Winters
Project Manager - Planner
NOVATECH
Suite 200, 240 Michael Cowpland Drive
Kanata, Ontario
K2M 1P6

Dear Greg:

**RE: Stormwater Management Lands - Former Railway to March Valley Road
Kanata North Community Design Plan
Existing Natural Environment Conditions**

Introduction

A stormwater management facility to service portions of the Kanata North Community Design Plan (KNCDP) is proposed for the lands between the former rail line and March Valley Road. Figure 2 shows the three alternative facility locations under consideration. As shown on Figure 1 a detailed study area covers the footprint of the three possible locations for the facility and adjacent lands. This existing conditions report covers the forests in the vicinity as well.

For the purposes of this report March Valley Road and the former rail line are considered to be in a north-south direction. To assist in locating the features three forest locations (northeast, northwest and north-central) are referred to below and on Figure 1. It is noted that the forests are contiguous. An east-west property line between the holdings of Metcalfe Realty to the south and Valecraft Homes to the north is also shown on Figure 1 and referred to in the text as the 'property line'.

Methodology

The vegetation and other natural environment features of the study area were reviewed on June 5th, 2014 and May 14th, June 9th, June 10th and June 18th, 2015 (by Bernie Muncaster). Breeding bird surveys were completed between 06:30 and 10:00 on May 20th and June 4th, 2015 (by Andrew McKinley of McKinley Environmental Services). The weather during the breeding bird surveys was ideal for observations with sunny skies, a light breeze or calm winds and air temperatures between 7° C and 19° C.

Existing Conditions

Agricultural Channels

The west to east channel in the south west-east deciduous hedgerow showed no signs of flow or standing water with vegetation well established in the channel cross-section (Photo 2). The dry channel was observed on June 9th following a period of heavy rain. West of the former rail line any flow does not cross under the former rail line but does a ninety degree turn to the north to run parallel to and on the west side of the former rail line.

Near the north edge of the study area the channel along the north forest edge does not extend to March Valley Road. Standing water was observed in this channel on June 9th, but the water was not flowing, likely due to the apparent lack of an outlet.

The west to east channel in the central portion of the study area, along the south edge of the forest and to the east along the deciduous hedgerow was observed flowing on June 9th and June 18th, 2015. The wetted width on June 9th following a period of heavy rain was in the range of 75cm, with a water depth in the range of 5cm (Photo 1). The flow enters the roadside ditch on the west side of March Valley Road. A brook stickleback was observed in the roadside ditch on June 18th and raccoon tracks were noted in the central west to east channel.



Photo 1 – Flow in central west-east channel west of March Valley Road on June 18th, 2015



Photo 2 – No sign of flow conveyance in former channel along south west-east hedgerow in the south portion of the study area (June 9th, 2015)

Agricultural Fields

Agricultural fields planted in soybeans in 2015 and recent years are the dominant feature in the south portion of the study area (Photos 3 and 4). In addition to the planted crops, field mustard, field pennycress, brome grass, Philadelphia fleabane, common ragweed, common dandelion, common strawberry, wormseed mustard, tufted vetch, bladder campion and rough-fruited cinquefoil were also observed in the agricultural fields.

Wildlife observed in and adjacent to the fields included Canada goose, American robin, red-winged blackbird, common grackle, American crow, common yellowthroat, killdeer, tree swallow, barn swallow, blue jay, northern flicker, downy woodpecker, black-and-white warbler, house wren, savannah sparrow, song sparrow, European starling, ring-billed gull, American goldfinch, northern cardinal, grey catbird, red-bellied snake, wild turkey, white-tailed deer tracks and raccoon.



Photo 3 – Agricultural field planted in soybeans in south-central portion of the study area. View looking north to ‘North-central Forest’ from south end of field (June 18th, 2015)



Photo 4 – Agricultural field planted in soybeans along south edge of the study area. View looking west to deciduous hedgerow along former rail line (June 9th, 2015)

Cultural Meadow

A cultural meadow, vegetation community 2 on Figure 1, in the northeast portion of the study area is dominated by Canada goldenrod, with meadow grass, blue grass, wild parsnip, common burdock, Canada thistle, elecampane, wild carrot, tufted vetch, ox-eyed daisy and tall goldenrod also common ground flora (Photo 5). Regenerating ash stems are up to 8cm dbh, along with red raspberry shrubs.

Wildlife observed in and adjacent to the meadow habitat included Canada goose, European starling, American robin, song sparrow, field sparrow, American crow, common grackle, black-capped chickadee, wild turkey, ring-billed gull, eastern phoebe, common yellowthroat, chestnut-side warbler and yellow warbler.



Photo 5 – Cultural meadow in the northeast sector of the study area. View looking east to deciduous hedgerow along March Valley Road (June 10th, 2015)

Cultural Thicket

Red raspberry is dominant in the ticket habitats in the northeast sector of the study area. Bebb's willow, nannyberry, red-osier dogwood, grey dogwood, hawthorn, prickly ash and common buckthorn are also present along with regenerating ash, butternut and white elm stems up to 15cm diameter at breast height (dbh). Prickly ash is thick in portions of the thicket habitat between the northwest and northeast forests (Photos 6 and 7). Canada goldenrod is the dominant ground flora with tufted vetch, virgin's bower, orchard grass, reed canary grass, common milkweed, wild parsnip, white bedstraw, sensitive fern, Canada thistle, common dandelion,

common strawberry, Canada anemone and wild parsnip well represented. Small areas of cultural meadow are in the northwest portion of the thicket habitat between the northwest and northeast forests.

Yellow warbler, common yellowthroat, Wilson's warbler, magnolia warbler, black-billed cuckoo, alder flycatcher, American redstart, red-tailed hawk, gray catbird, American robin, eastern kingbird, red-winged blackbird, brown thrasher, song sparrow, savannah sparrow, chipping sparrow, blue jay, Baltimore oriole, American goldfinch, common gartersnake, grey squirrel and white-tailed deer beds were observed in the thicket habitats.



Photo 6 – Cultural thicket habitat in northeast sector of study area (June 10th, 2015)



Photo 7 – Cultural thicket habitat in north portion of the study area between the ‘Northeast Forest’ and ‘Northwest Forest’ (June 9th, 2015)

Deciduous Hedgerows

An intermittent west-east deciduous hedgerow (vegetation community 5 on Figure 1) is in the south portion of the study area. Four mature bur oaks are in the central-west portion of this intermittent hedgerow (Photo 8), along with smaller green ash and basswood up to 25cm dbh and dead elm. To the west of the bur oaks in the hedgerow is a mature (95cm dbh) white elm with good leaf-out (Photo 9). Another mature bur oak is to the west of the white elm. This coppice tree has individual stems up to 38cm dbh. Nannyberry, common buckthorn, red raspberry and hawthorn shrubs are thick among the hedgerow trees, along with regenerating bur oak stems. Wild grape and thicket creeper coverage was extensive on many of the hedgerow trees and shrubs. Reduced leaf-out was observed on many of the ash trees.

Another intermittent deciduous hedgerow is west of March Valley Road in the central-east portion of the study area. Green ash and white elm between 10 and 25cm dbh dominate this hedgerow, with Manitoba maple up to 35cm dbh. Wild grape coverage is extensive on some of the hedgerow trees.

The deciduous hedgerow along the west side of March Valley Road is dominated by green ash and white ash up to 44cm dbh, with a 20cm dbh bur oak, white elm up to 22cm dbh and smaller basswood (Photo 10). Nannyberry and glossy buckthorn shrubs are common among the hedgerow trees.

White ash, trembling aspen, green ash and white elm are the dominant tree species in another deciduous hedgerow along the east side of the former rail line, adjacent to the west edge of the south portion of the study area (Photo 11). The largest of the ash and poplar trees are in the 35cm dbh range but many of the ash had reduced leaf-out. Wild grape coverage was common on the lower branches of many of the hedgerow trees.



Photo 8 – Mature bur oak in the west part of the south west-east deciduous hedgerow in the south portion of the study area (June 9th, 2015)



Photo 9 – Mature white elm in the west part of the south west-east deciduous hedgerow in the south portion of the study area (June 9th, 2015)



Photo 10 – Deciduous hedgerow along the west side of March Valley Road south of the 'Property Line'. View looking south (June 10th, 2015)



Photo 11 – Deciduous hedgerow along the south side of the former rail line adjacent to the southwest portion of the study area. View looking northwest (June 18th, 2015)

Northeast Forest

Green ash is dominant in the northeast ash deciduous forest. Bur oak, white ash, white elm, soft maple (silver maple and Freeman maple), butternut, Manitoba maple and crack willow are well represented in areas of the northeast forest. Trembling aspen is common in the northwest portion, to the east of the adjacent thicket habitat. The largest aspens are in the range of 34cm dbh. Coniferous representation is generally limited to an area in the southwest corner of the northeast forest where white pines are up to 52cm dbh (Photo 14). A 23cm dbh white spruce was noted in the central portion of the northeast forest. Elsewhere in the northeast forest the largest trees are bur oaks up to 40cm dbh in the south portion (Photo 13) and crack willows and soft maples up to 48cm dbh and 38cm dbh, respectively along the west side of March Valley Road. The moisture regime appears wetter in this area along the west side of March Valley Road with sensitive fern the dominant ground flora in areas. The bur oak and maples appear to be in good condition, with reduced leaf-out on some of the ash. The canopy of the forest is generally more open in the northwest and south-central portions (Photo 15).

The understorey is very thick in most portions of the northeast forest with common and glossy buckthorn extensive in areas (Photo 12). Black current, hawthorn, gray dogwood, red raspberry, nannyberry and prickly ash are also present along with regenerating ash and Manitoba maple stems. Thicket creeper and wild grape are dominant in the ground flora in many areas. Other elements of the generally disturbed ground flora in the northeast forest include enchanter's nightshade, white avens, yellow avens, common burdock, Canada goldenrod, hog peanut,

common milkweed, wild parsnip, elecampane, yellow violet, Virginia waterleaf, narrow-leaved goldenrod, purple flowering raspberry, tall meadow rue, common strawberry, Canada anemone, sensitive fern, wild cucumber, poison ivy, tall buttercup, white bedstraw, red baneberry and Philadelphia fleabane.

The functions of the northeast forest are reduced due to the dominance of ash and poplar in many areas, disturbed and very thick understorey, ground flora dominated by non-native and/or invasive flora, the lack of forest interior potential in the forest width up to 150 metres, road noise and open canopy in many areas.

A smaller and younger area of ash forest (Photo 16) is just to the west of March Valley Road, south of the northeast forest and a meadow habitat. In addition to green ash up to 15cm dbh, apple and Manitoba maple are present. Regenerating ash stems are very common, along with common buckthorn, red raspberry and red-osier dogwood shrubs. The ground flora is reflective of the disturbed conditions and included wild grape, thicket creeper, common dandelion, Canada goldenrod, common burdock, blue violet and field horsetail.

Wildlife observed in the northwest deciduous forests included red-winged blackbird, black-capped chickadee, common yellowthroat, yellow warbler, yellow-rumped warbler, mourning dove, American woodcock, great-crested flycatcher, alder flycatcher, blue jay, Baltimore oriole, northern cardinal, northern flicker and American goldfinch. A rock pile is in the north-central portion of the northeast forest (427048/5024729).



*Photo 12 – Typical condition in the centre portion of the ‘Northeast Forest’
(June 9th, 2015)*



Photo 13 – Bur oaks up to 40cm dbh are in the south portion of the ‘Northeast Forest’ (June 9th, 2015)



Photo 14 – Mature white pine in the southwest portion of the ‘Northeast Forest’ (June 9th, 2015)



Photo 15 – Open canopy and thick shrub component in the north portion of the ‘Northeast Forest’ (June 9th, 2015)



Photo 16 – Young green ash in small ash deciduous forest west of March Valley Road, south of cultural meadow habitat (May 14th, 2015)

North-central Forest

As shown on Figure 1 the north-central forest is composed of a deciduous forest generally in the east portion and a mixed forest in the west.

Ash Deciduous Forest in the North-central Forest

Green ash is dominant in the deciduous forest component of the north-central forest. Red maple, Manitoba maple, sugar maple, trembling aspen, white cedar, white elm, bur oak, butternut, yellow birch, basswood, bitternut hickory and white pine are also present. Many large trees are in the central portion of the forest including white pine up to 90cm dbh, bur oak up to 100cm dbh (Photo 17), white ash and yellow birch up to 65cm dbh and red maple, sugar maple, white cedar, butternut and basswood in the 42cm – 55cm dbh range (Photo 18). Most of the trees appear to be in good condition, with the exception of poor leaf-out on many of the butternuts and ash and trunk decay on some of the larger ash.

Along the north edge of the deciduous forest, south of the cultural thicket to the north, a 100cm dbh white pine is approximately four metres south of the 'Property Line' which separates the forest and the thicket (Photo 20). White cedar between 34 and 43cm dbh and green ash, white ash and trembling aspen up to 35cm dbh are closer to the 'Property Line'. Butternut, many in poor condition, up to 50cm dbh are between 8 and 15 metres south of the 'Property Line'. The northeast tip of the deciduous forest, just south of the 'Property Line', is much scrubbier in nature than the core of the forest to the west, although a 54cm dbh bur oak is along the forest edge. The majority of trees in this area adjacent to the thicket habitat are smaller green ash and bur oak up to 20cm dbh, with much less representation up to 30cm dbh (Photo 19). Tartarian honeysuckle and glossy buckthorn are well established in this area. Further south the largest trees along the east forest edge are white pine and red maple up to 32cm and 25cm dbh, respectively. Deer stands were in the larger white pine and a bur oak (Photo 21).

Shrubs in the deciduous forest understorey include nannyberry, red raspberry, prickly ash, glossy buckthorn, common buckthorn, tartarian honeysuckle, prickly gooseberry and red elderberry. Sensitive fern and ostrich fern are dominant in portions of the ground flora. Canada goldenrod, white snakeroot, Philadelphia fleabane, wild ginger, white avens, Virginia waterleaf, yellow violet, thicket creeper, hog peanut, white trillium, enchanter's nightshade, jack-in-the pulpit, poison ivy, inland sedge, awl-fruited sedge, honewort, white avens, red baneberry and false nettle are representative of the other ground flora. Much of the ground flora is reflective of a wetter moisture regime and is generally much less disturbed once inside of the forest edges by about 30 metres.

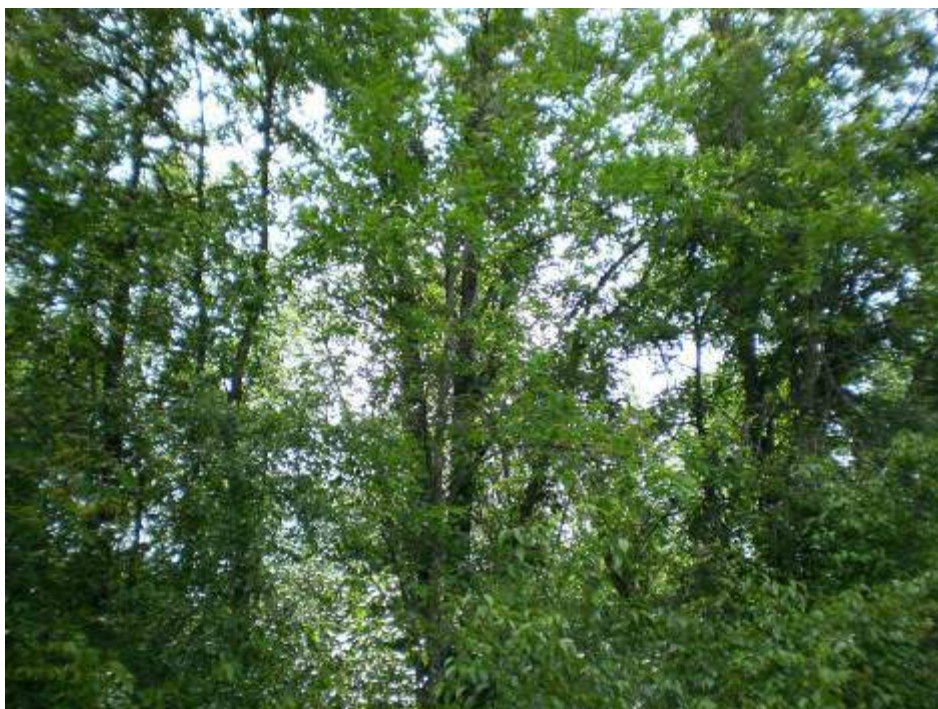
Wildlife observed in and adjacent to the fresh-moist ash forest included downy woodpecker, eastern wood pewee, common grackle, grey catbird, American robin, red-winged blackbird, common yellowthroat, veery, white-breasted nuthatch, pileated woodpecker, common gartersnake and red squirrel. Woodpecker cavities were noted in a few of the larger trees (Photo 22)



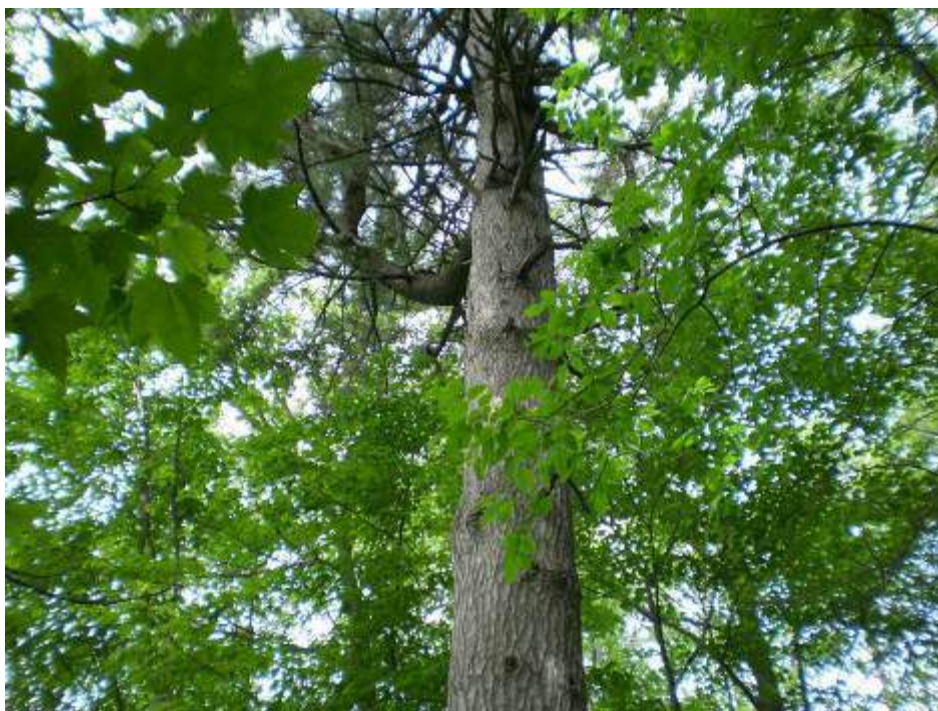
Photo 17 – Mature bur oak just east of the former rail line in the northwest corner of the 'North-central Forest' (June 18th, 2015)



Photo 18 – Mature yellow birch in the northeast portion of the 'North-central Forest' (June 10th, 2015)



*Photo 19 – Younger vegetation along the northeast edge of the of the ‘North-central Forest’
(June 10th, 2015)*



*Photo 20 – Mature white pine near north edge of the ‘North-central Forest’, south of the cultural
thicket to the north (June 10th, 2015)*



*Photo 21 – Deer stand in bur oak pine along east edge of the ‘North-central Forest’
(June 10th, 2015)*



*Photo 22 – Mature basswood with woodpecker cavities in the central-east portion of the
‘North-central Forest’ (June 10th, 2015)*

Mixed White Cedar – Hardwood Forest in the North-central Forest

This mixed forest in the west portion of the north-central forest is identified as vegetation community 8 on Figure 1. In addition to the dominant white cedar, white birch, sugar maple, white pine, red maple, bur oak, green ash, white ash, balsam poplar, white elm, butternut and basswood are well represented. Many white cedar, white pine and butternut trees are in the 40 – 60 cm dbh range.

Mature white pines and bur oak are along the south edge of the mixed forest east of the former rail line. Butternut, ash and trembling aspen up to 50cm dbh are also along the forest edge. Many of the ash and butternut are in poorer condition with decreased leaf-out and canker, respectively, although good leaf-out in 2015 was observed on some of the butternut. There is generally a five metre width of shrubs between the edge of trees and the cultivated field to the south.

The understorey is relatively open in many areas and includes nannyberry, tartarian honeysuckle, prickly ash, black current, apple, prickly gooseberry and red raspberry. Ostrich fern is dominant in areas of the ground flora. Elsewhere the ground flora is a combination of native and non-native and/or invasive species including lady fern, white snakeroot, red baneberry, white trillium, white baneberry, poison ivy, thicket creeper, yellow avens, scouring rush, brome grass, common strawberry, barren strawberry, yellow violet, wild cucumber, enchanter's nightshade, inland sedge, jack-in-the pulpit, tall meadow rue, stinging nettle and purple-flowering raspberry.

Wildlife observed in and adjacent to the mixed forest included blue jay, American robin, red-winged blackbird, downy woodpecker, northern cardinal, American crow, common yellowthroat, yellow warbler, great-crested flycatcher and red squirrel. Woodpecker holes were noted in a few of the larger cedars, along with a deer stand in one.

Northwest Forest

An ash-poplar deciduous forest is dominant in the northwest forest. This deciduous forest is generally younger than the contiguous ash-maple deciduous and mixed forests to the south. Trembling aspens and green ash are dominant, with a good representation of white ash, red maple, butternut, large-toothed aspen, white birch, grey birch and white elm. Bur oak and balsam poplar are also present. The largest trees are up to 40cm dbh, but most stems are smaller than 25cm dbh (Photo 23). Piles of firewood were noted in the east portion of this forest.

Prickly ash, tartarian honeysuckle, glossy buckthorn and blackberry are common in the understorey, which is dense in areas. Dominant areas of ostrich fern and sensitive fern indicate a wetter moisture regime. Other ground flora present in the northwest forest include white bedstraw, white snakeroot, wild grape, thicket creeper, Philadelphia fleabane, crested wood-fern, Canada goldenrod, white trillium, field horsetail and virgin's bower.

Wildlife observed in the northwest forest included eastern wood pewee, common yellowthroat, grey catbird, veery, white-breasted nuthatch, northern cardinal, black-and-white warbler, yellow warbler, ovenbird, hairy woodpecker, eastern phoebe and red squirrel.



Photo 23 – East portion of the ‘Northwest Forest’ (June 10th, 2015)

Species at Risk and other Species of Interest

Based on discussions with the Ministry of Natural Resources and Forestry, a review of existing databases and the work completed for the KNCDP, the potential threatened and endangered Species at Risk on and adjacent to the stormwater management facility study area include Blanding’s turtle, butternut, whip-poor-will, little brown myotis, northern long-eared bat, barn swallow, bobolink and eastern meadowlark. Potential species of special concern include milksnake, snapping turtle, golden-winged warbler, eastern wood pewee and wood thrush. Of these potential species, butternut and eastern wood pewee were observed on and adjacent to the study area.

Butternut is very common in the forests in the north portion of the study area and along the edges of the adjacent thicket habitat. Figure 1 shows the general area of butternut occurrences only in the vicinity of the alternative stormwater facilities and many of the ‘dots’ on Figure 1 represent more than one butternut. Dozens of other butternuts are present in the forests that are not in immediate proximity to one of the alternative stormwater management locations. The butternuts have a varied size range between 2 and 55cm dbh, with some butternuts appearing relatively healthy and others greatly impacted by the butternut canker. As part of the detailed design for the

stormwater management facility butternut health assessments will be completed for all butternuts within 25 metres of areas proposed to be disturbed. For the butternuts assessed as healthy ('retainable') a mitigation or compensation plan that provides an overall net benefit for the species must be developed in consultation with of the Ministry of Natural Resources and Forestry prior to their removal or operations within 25 metres that may harm the trees. In the absence of a compensation or mitigation plan, certain operations such as excavating that would remove or significantly compact the roots and soil, and cause direct harm to the tree are not permitted within the 25 metre radius protective buffer.

The agricultural fields in the south half of the study area are planted in soybeans and do not represent potential habitat for the grassland Species at Risk such as bobolink and eastern meadowlark. The meadow habitat in the east-central portion of the study area north of the cultivated fields is too small and contains too much woody vegetation to be utilized for nesting by the grassland Species at Risk. No bobolink or eastern meadowlark were observed during the 2015 breeding bird surveys or other field surveys.

Two barn swallows were observed foraging on insects over the central cultivated field on June 4th. During earlier surveys of the KNCDP potential nesting structures for barn swallows were observed west of March Road and in the northeast corner of the KNCDP. As there are no potential nesting structures within 200 metres of the current study area and the addition of stormwater management pond should add to the insect production of the area, it is anticipated that no further assessment of this threatened Species at Risk is required.

As part of the KNCDP studies a Blanding's turtle was observed twice along the North Tributary west of March Road, approximately 1.2 kilometres west of the current study area. However no turtles were observed within or adjacent to the current study area, including searches in the wooded areas. In addition the Ministry of Natural Resources and Forestry did not identify any Category 2 habitat (suitable wetlands or watercourses that extend up to two kilometres from an occurrence) in the study area. The Shirley's Brook corridor on the east side of March Valley Road is identified as Category 2 habitat. Category 3 lands for Blanding's turtle are between 30 and 250 metres around suitable Category 2 wetlands and waterbodies. The primary purpose with respect to Blanding's turtle habitat of the Category 3 lands is to provide movement corridors between wetlands, a function which is essential for carrying out life processes associated with the Category 1 and 2 habitats. Category 3 habitat extends onto the study area from the Category 2 habitat identified on the east side of March Valley Road.

No whip-poor-wills were heard during the three spring and early summer surveys conducted in 2014 for the KNCDP, including the current study area. The understories of the on-site forests are too dense with vegetation to support whip-poor-will use.

The northeast forest has a low potential for bat usage due to the generally scrubby nature with few larger trees. There are larger trees in the central and west portions of the north-central forest, however it is not anticipated that any of the stormwater management options would negatively impact any bat utilization of these trees.

Milksnake is relatively common in portions of eastern Ontario but is not often seen. It is found in open woodlands, clearings and around farmhouses where it hunts its major prey item, mice. No milksnake were seen during cover disturbance surveys completed as part of the breeding bird surveys on May 20th and June 4th, 2015 (two non-listed snake species, eastern garter and red-bellied, were observed). Another potential species of special concern, wood thrush, was not observed during the breeding bird surveys. Golden-winged warbler breeds in scrubby habitats and is known from the South March Highlands area to the west of the study area, but was not observed during the breeding bird and other field surveys. However a fourth potential species of special concern, eastern wood pewee was observed in the north-central and northwest forests (but not in the northeast forest).

During the KNCDP surveys, a species of special concern, snapping turtle, was observed in Pond 1 along the North Branch of Shirley's Brook, west of March Road and approximately 1.2 kilometres west of the current study area. This turtle occurs in almost any freshwater habitat, though it is most often found in slow-moving water with a soft mud or sand bottom and abundant vegetation. It is not anticipated that the one west-east channel with flowing water in the central portion of the study area contains suitable wetland riparian habitat for potential snapping turtle use and none were observed during the dedicated 2014 surveys or the other surveys in 2015.

In summary the only potential Species at Risk anticipated to be potentially impacted by one of the three stormwater management facility options is butternut. Eastern wood pewee, a species of special concern, is utilizing the north-central and northwest forests, which will not be impacted with appropriate mitigation measures as described below. Similarly any bat utilization in these forests is not anticipated to be impacted by the construction and operation of the stormwater management facility.

Recommendations

Three stormwater management facility alternatives, identified by NOVATECH as Options 2, 2a and 6, are proposed for consideration.

Option 2

This option is oriented perpendicular to the former rail line and March Valley Road and is entirely within the cultivated field in the central portion of the study area. There are no natural heritage concerns associated with the cultivated field, which was planted in soybeans in 2014 and 2015. However the south edge of the north-central forest to the north of the Option 2 footprint does support mature coniferous and deciduous trees in the mixed and deciduous forests. The largest of these trees are white pines and white ash in the range of 50 – 60cm dbh. A setback of six metres from these trees would be suitable to protect their critical root zones. Note that there is a band of approximately 5 metres of shrubs between these larger trees and the south edge of woody vegetation. An extra metre, for a total non-disturbance distance of seven metres from the trees, is recommended to provide two metres of protection for these shrubs.

Several butternuts are along the south edge of the North-central Forest. Although these

butternuts will not be removed, site disturbances may occur within 25 metres of the butternuts. If this option is selected the butternut health assessments will be completed at the time of detailed design and any healthy butternuts that may be harmed will be compensated for through an agreement with the Ministry of Natural Resources and Forestry.

To the north of this Option there is a west-east channel along the south edge of the north-central forest, with the shrubs along the south edge of the forest south of the channel. This channel currently appears to support forage fish habitat, however it is not anticipated to receive sufficient flow post-development to support fish habitat as the stormwater design for the KNCDP will direct surface water to the stormwater facility and associated outlet.

The west portion of the site disturbance for the Option 2 stormwater management facility should be four metres from the trees in the deciduous hedgerow along the east side of the former rail line corridor to protect the critical root zone of the hedgerow trees which are up to 35cm dbh.

A minor amount of deciduous tree removal would be required for the outlet of the Option 2 stormwater management facility in the deciduous hedgerow along the east side of March Valley Road. The hedgerow in this area is dominated by smaller green ash and white elm trees.

Option 2a

This option is parallel to the former rail line and includes the central and south cultivated fields and the intermittent west-east deciduous hedgerow between the two cultivated fields. As with the north cultivated field, the south cultivated field was planted in soybeans and contains no natural heritage concerns. Pond construction would require removal of the west portion of the intermittent deciduous hedgerow which includes four mature bur oaks and one mature white elm. All of these larger trees appear to be in good condition.

The west portion of the site disturbance for the Option 2a stormwater management facility should be four metres from the trees in the deciduous hedgerow along the east side of the former rail line corridor to protect the critical root zone of the hedgerow trees which are up to 35cm dbh.

To the north of this Option there is a west-east channel along the south edge of the north-central forest, with the shrubs along the south edge of the forest south of the channel. This channel currently appears to support forage fish habitat, however it is not anticipated to receive sufficient flow post-development to support fish habitat as the stormwater design for the KNCDP will direct surface water to the stormwater facility and associated outlet.

The outlet for the Option 2a stormwater management facility should be to the north of the west-east intermittent deciduous hedgerow to preserve these trees. The trees in the east portion of the intermittent deciduous hedgerow are not as large as those in the west portion. A no disturbance setback of four metres is recommended from the intermittent hedgerow. As with Option 2, a minor amount of deciduous tree removal would be required for the outlet of the Option 2a stormwater management facility in the deciduous hedgerow along the south side of March Valley Road.

With this option it is not anticipated that there would be any site disturbances within 25 metres of the butternuts along the south edge of the north-central forest or within 15 metres of the central west-east channel along the south portion of the north-central forest.

Option 6

This option includes open channels from the former rail line feeding forebays in the north thicket habitat and the southeast corner of the north-central forest. The forebays feed into an irregular shaped pond in the south and central portions of the northeast forest, the thicket and meadow habitats south of the northeast forest and between the northeast and northwest forest and the east portion of the north-central forest. This pond alternative would outlet to Shirley's Brook through an east section of the northeast forest.

Many butternuts will be removed or will be within 25 metres of the disturbances associated with this alternative. Butternut health assessments have not been completed but it is anticipated that approximately half to 60 percent of the butternuts would be assessed as healthy ('retainable'). An initial review suggests approximately 30 healthy butternuts would be subject to harm, with another approximately 30 healthy butternuts removed. It is anticipated that the vast majority of the healthy butternuts to be removed are less than 10cm dbh. Typically the butternuts that may be harmed are larger as they are found in the adjacent retained forests. If this stormwater alternative is selected butternut health assessments will be completed at the detailed design stage and any healthy butternuts that may be taken or harmed will be compensated for through an agreement with the Ministry of Natural Resources and Forestry.

New forest edges will be created in the east portion of the north-central forest and the south portion of the northeast forest. To reduce the potential for indirect impacts such as sunscald or wind throw, on the forest trees to be retained it is recommended that a band, 3 – 5 metres wide, be cleared a growing season before the balance of trees are removed to pre-stress the trees to be retained.

Much of the northeast forest to be removed with this option is scrubby, but larger bur oak and mature white pine would be removed in the northeast forest. It is anticipated that the majority of the soft maples along the east edge can be retained. Care is required with the position of the outlet to Shirley's Brook to retain as many of the soft maples as possible.

One of the most striking trees in the study area is a 100cm dbh white pine along the north edge of the north-central forest south of the property line and the thicket habitat. To protect this specimen tree a no-touch setback of 10 metres is recommended. This setback will extend between 4 and 5 metres into the thicket habitat. Along the west edge of this pond alternative a setback of three metres is recommended along the east edge of the northwest forest to the protect the smaller poplar and ash trees in this area.

If Option 6 is selected there is the opportunity to transplant regenerating native maple, bur oak and coniferous stems in good health and with an accessible root ball from the portions of the

northeast and east portion of the north-central forest to be disturbed. These native seedlings could be transplanted to lands adjacent to portions of the stormwater system that are currently lacking in woody vegetation such as along the inlet corridors from the west. This will provide a future seed source of native genetically-adapted trees of local origin;

The portion of the west-east channel extending east of the south edge of the north-central forest would be removed with Option 6. This channel currently appears to support forage fish habitat, however it is not anticipated to receive sufficient flow post-development to support fish habitat as the stormwater design for the KNCDP will direct surface water to the stormwater facility and associated outlet.

In addition to recommendations specific to each stormwater management pond option, the following general mitigation measures are recommended for environmental protection:

1. Woody vegetation removal is to occur before April 15th or after August 15th for the protection of breeding birds, unless a survey conducted within five days of the vegetation removal identifies no bird breeding activity. Note that during the leaf-out period identifying bird nests in the forest canopy can be difficult;
2. The following mitigation measures are recommended for the protection of retained trees:
 - All trees to be retained are to be protected with sturdy fencing installed before site alterations. The fencing is to be at least 1.2 metres in height. This tree protection fencing is to be installed along the critical root zone of the trees that form the new natural edge or the existing natural edge;
 - No grading or activities that may cause soil compaction such as heavy machinery traffic and stockpiling of material are permitted on the non-work side of the fencing. The existing grade is not to be raised or lowered within the fencing;
 - Signs, notices or posters are not to be attached to any tree;
 - No machinery maintenance or refuelling, storage of construction materials or stockpiling of earth is to occur within five metres of the critical root zone of the trees to be retained;
 - The root system, trunk or branches of the trees to be retained are to be protected and not damaged. If any roots of the trees to be retained are exposed during site alterations, the roots shall be immediately reburied with soil or covered with filter cloth, burlap or woodchips and kept moist until the roots can be buried permanently. A covering of plastic should be used to retain moisture during an extended period when watering may not be possible. Any roots that must be cut are to be cut cleanly to facilitate healing and as far from the tree as possible;
 - Exhaust fumes from all equipment during construction will not be directed towards the canopy of the potentially retained trees; and,
 - All of the supports and bracing for the protective fencing should be placed outside of the protected area and should be installed in such a way as to minimize root damage.

3. Proper sediment and erosion control is important for general environmental protection, including development of a sediment and erosion control plan, use of silt fencing around the perimeter of the work areas, mud mats at the construction accesses, and use of seepage barriers such as silt fencing, straw bale check dams and other sediment and erosion control measures in any temporary drainage ditches. It is important that the fencing and other measures are maintained throughout construction and removed when the site has been stabilized and re-vegetated. Sediment and erosion control measures must be monitored and properly implemented;
4. The extent of exposed soils is to be kept to a minimum at all times. Re-vegetation of exposed, non-developed areas is to be achieved as soon as possible;
5. Following installation of the silt fencing and prior to other site disturbances sweeps are to be completed of the work areas for turtles and snakes. Specimens are to be relocated to the core of the north-central forest or other appropriate areas in consultation with a qualified biologist;
6. Native tree and shrub species of local stock are strongly recommended for plantings on and adjacent to the stormwater management lands;
7. Municipal by-laws and provincial regulations for noise will be followed and utilities will be located as required in the vicinity of the site prior to construction. Waste will be managed in accordance with provincial regulations; and,
8. The contractor will have a spill kit on-hand at all times in case of spills or other accidents.

Conclusions

Each of the three stormwater management facility options will retain the core of the North-central forest. This forest is the most significant natural heritage feature in the vicinity of the study area due to many mature deciduous and coniferous trees of several species and much less disturbed understorey and ground flora.

Option 6 will result in the removal of a large portion of the northeast forest, although this forest is disturbed by the dominance of ash and poplar in many areas, disturbed and very thick understorey, ground flora dominated by non-native and/or invasive flora, the lack of forest interior potential in the forest width up to 150 metres, road noise, and an open canopy in many areas.

Option 2a would result in the removal of four mature bur oaks and a mature white elm in the west portion of an intermittent west-east hedgerow.

The only potential Species at Risk anticipated to be potentially impacted by one of the three stormwater management facility options is butternut. As part of the detailed design for the

stormwater management facility butternut health assessments will be completed for all butternuts within 25 metres of areas proposed to be disturbed.


Reliance Clause

This report has been prepared for Novatech Engineering Consultants Ltd., on behalf of the Kanata North Landowner's Group and in support of the Kanata North Community Design Plan. It is hereby acknowledged that Metcalfe Realty Company Limited, J. G. Rivard Limited and 8409706 Canada Inc. (Valecraft Homes), 3223701 Canada Inc. and 7089121 Canada Inc. (Junic/Multivesco) can rely upon and utilize this report for the purpose of obtaining approval of the community design plan and for their own use to seek development approval.

It is further acknowledged that future confirmed participating landowners within the Kanata North Landowner's Group can rely upon and utilize this report for the purpose of obtaining approval of the community design plan and for their own use to seek development approval.

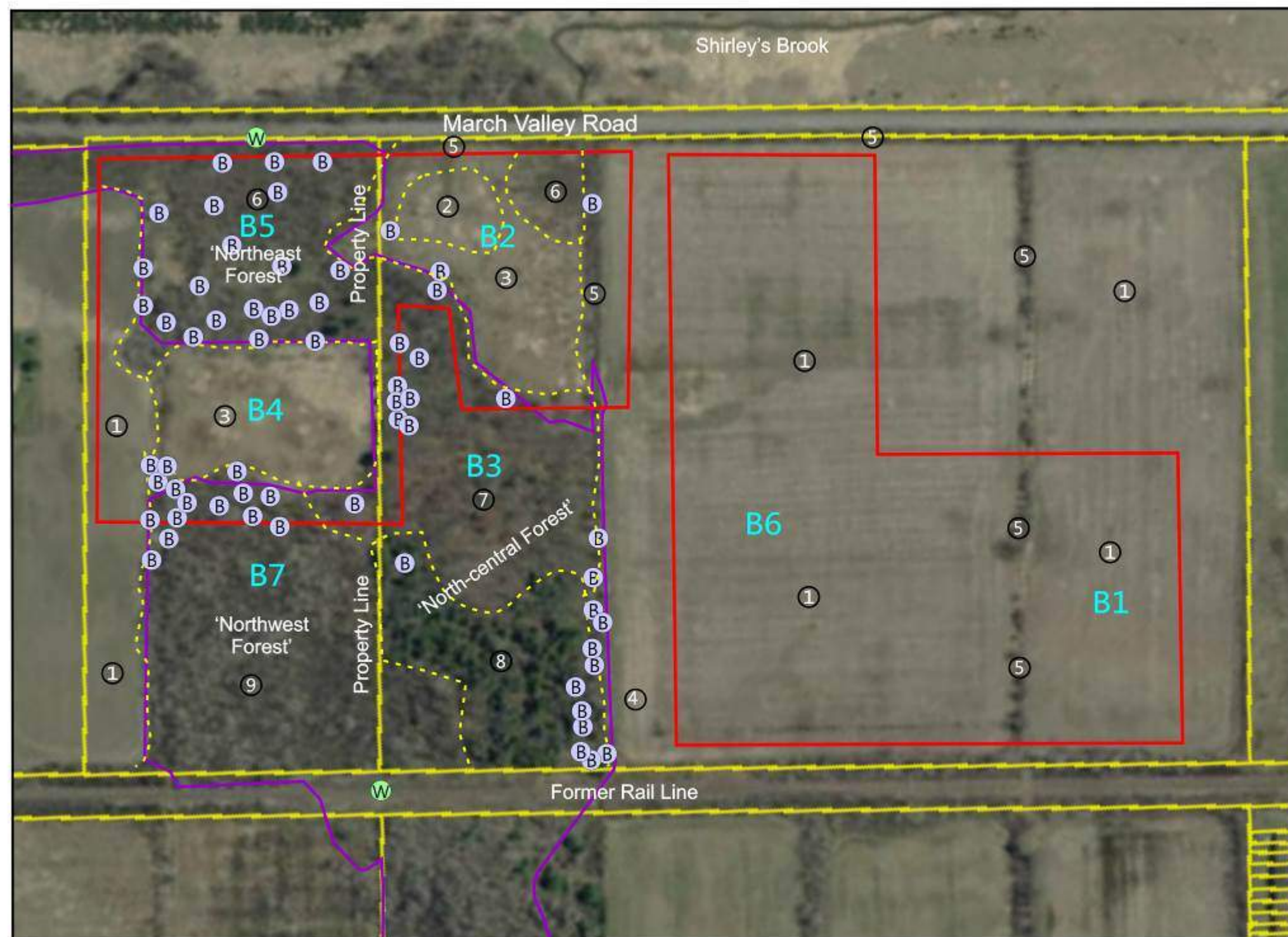
Please call if you have any questions on this Existing Conditions report.

Yours Sincerely,
MUNCASTER ENVIRONMENTAL PLANNING INC.



Bernie Muncaster, M.Sc.
Principal

swmlandsum



2014 air photo from City of Ottawa web site

Legend

- Detailed Study Area
- Vegetation Communities
- Candidate Natural Heritage System (OP Schedule L3)
- B2 Breeding Bird Point Counts
- W Whip-poor-will Survey Points
- B Areas of Butternuts (only shown in proximity to detailed study area)

Vegetation Communities

- 1 Cultivated field
- 2 Cultural meadow
- 3 Cultural thicket
- 4 Cultural woodland
- 5 Deciduous hedgerow
- 6 Ash deciduous forest
- 7 Ash-maple deciduous forest
- 8 White cedar-hardwood mixed forest
- 9 Ash-poplar deciduous forest



Approx. Scale 1:3,300 (on a 11 x 17 plot)



Prepared for: Novatech Engineering Consultants Ltd.

Prepared by:  Muncaster Environmental Planning Inc.

FILE: 12-25

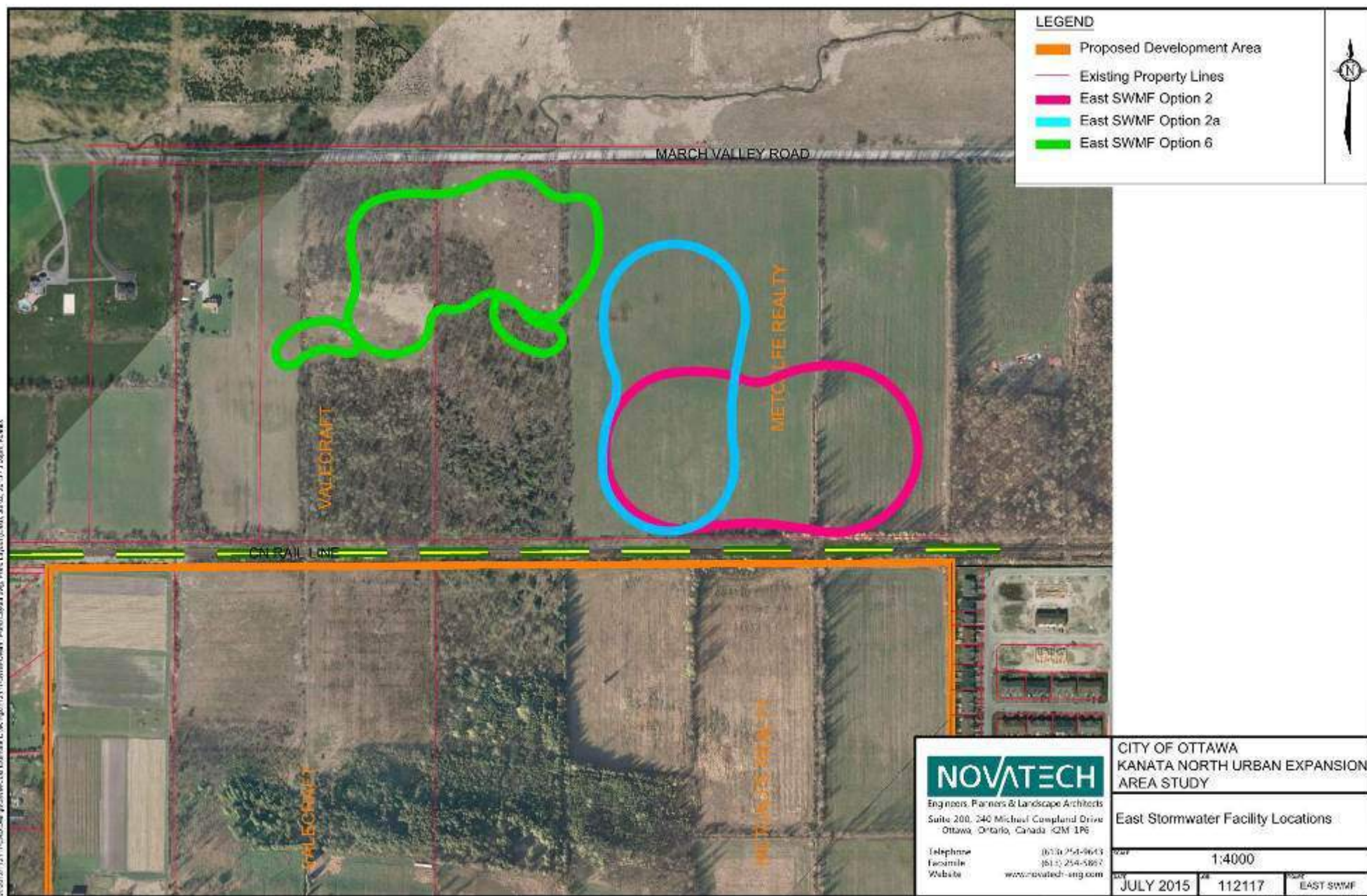
June 18, 2015

Figure 1

NATURAL HERITAGE FEATURES
POTENTIAL STORMWATER MANAGEMENT AREAS
EAST of the FORMER RAIL LINE

Kanata North Community Design Plan, City of Ottawa

FIGURE 2 – STORMWATER MANAGEMENT POND OPTIONS EAST of the RAIL LINE



Appendix D

Hydrologic Calculations & Modeling Files

Kanata North Community Design Plan
Pre-Development SWMHYMO Model Parameters



Time to Peak Calculations
(Bransby-Williams Method)

$T_c = 0.605 * (L / ((S^{0.2})(A^{0.1})))$

Drainage Area ID	Area (m2)	Area (ha)	Area (km2)	Length of Channel (m)	Length of Channel (km)	Slope of Channel (m/m)	Tc (hours)
201	1,151,423	115.14	1.151	749	0.75	0.020	3.42
202	2,636,363	263.64	2.636	1065	1.07	0.010	5.14
203	467,369	46.74	0.467	1025	1.03	0.010	2.52
204	293,893	29.39	0.294	552	0.55	0.010	1.42
205	108,387	10.84	0.108	322	0.32	0.020	0.80
301	864,268	86.43	0.864	1047	1.05	0.017	1.24
302	806,913	80.69	0.807	1470	1.47	0.015	1.80
303	651,627	65.16	0.652	971	0.97	0.010	1.31
304	187,795	18.78	0.188	580	0.58	0.010	1.04
305	26,094	2.61	0.026	100	0.10	0.010	0.22
401	167,797	16.78	0.168	941	0.94	0.012	1.66
402	108,910	10.89	0.109	450	0.45	0.010	0.85
403	33,135	3.31	0.033	150	0.15	0.027	0.26
501	626,486	62.65	0.626	450	0.45	0.023	0.60
502	518,434	51.84	0.518	458	0.46	0.010	0.75

SCS Curve Numbers (AMC II, HSG 'B/C')

Area ID	Land Use 1	Area	CN	IA (mm)	Land Use 2	Area	CN	IA (mm)	Land Use 3	Area	CN	IA (mm)	Weighted CN	Weighted IA (mm)
201	Woods (good)	65%	63	12.5	Woods (fair)	25%	67	10.0	Open Space (good)	10%	68	8.0	65	11.4
202	Woods (good)	20%	63	12.5	Estate Residential	35%	70	4.0	50% pasture & 50% Row Crops (good)	45%	73	8.5	70	7.7
203	Cultivated Row Crops (Straight/Contour) (good)	70%	80	7.0	Pasture (good)	20%	65	9.0	Open Space (good)	10%	68	9.0	76	7.6
204	Cultivated Row Crops (Straight/Contour) (good)	70%	80	7.0	Pasture (good)	20%	65	9.0	Open Space (good)	10%	68	9.0	76	7.6
205	Industrial Districts (School/ Church area)	50%	88	4.0	Open Space (good)	50%	68	8.0	-	-	-	-	78	6.0
301	Woods (good)	95%	63	12.5	Open Space (good)	5%	68	8.0	-	-	-	-	63	
302	Woods (good)	60%	63	12.5	Estate Residential	5%	70	4.0	Pasture (good)	35%	65	9.0	64	10.9
303	Woods (good)	37%	63	12.5	Estate Residential	25%	70	4.0	50% pasture & 50% Row Crops (good)	38%	73	8.5	69	8.9
304	Cultivated Row Crops (Straight/Contour) (good)	78%	80	7.0	Estate Residential	5%	70	4.0	Open Space (good)	17%	68	8.0	77	7.0
305	Estate/ Rural Residential	45%	70	4.0	Open Space (fair)	50%	74	6.5	Woods (fair)	5%	67	10.0	72	5.6
401	Woods (good)	22%	63	12.5	Estate Residential	50%	70	4.0	Open Space (good)	28%	68	8.0	68	7.0
402	Cultivated Row Crops (Straight/Contour) (good)	85%	80	7.0	Estate Residential	10%	70	4.0	Open Space (good)	5%	68	8.0	78	6.8
403	Estate/ Rural Residential	90%	70	4.0	Open Space (fair)	10%	74	6.5	-	-	-	-	70	4.3
501	Woods (good)	20%	63	12.5	Pasture (good)	20%	65	9.0	Cultivated Row Crops (Straight/Contour) (good)	60%	80	7.0	74	8.5
502	Woods (good)	30%	63	12.5	Pasture (good)	45%	65	9.0	Cultivated Row Crops (Straight/Contour) (good)	25%	80	7.0	68	9.6

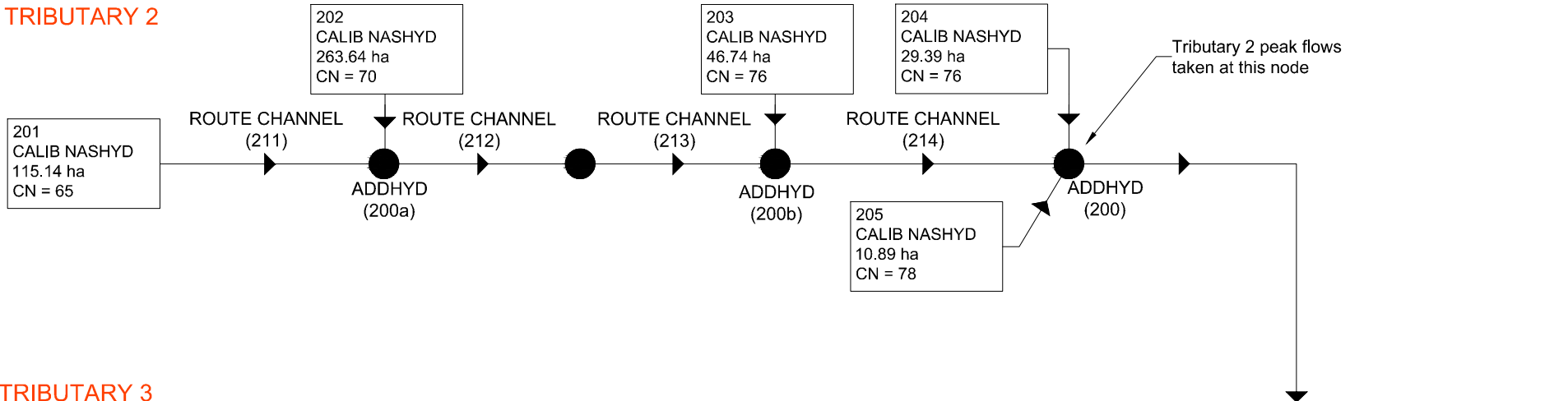
SCS Curve Numbers and Initial Abstraction Values

Landuse	Condition	CN (HSG 'B')	CN (HSG 'C')	AVG. CN (HSG 'B/C')	IA (mm)
Woods	Poor	66	77	72	7.0
	Fair	60	73	67	10.0
	Good	55	70	63	12.5
Estate Residential (2 acre avg. lot size)	12% Impervious	65	77	71	4.0
Open Space (lawns, parks, etc.)	Grass Cover < 50% (Poor)	79	86	83	5.0
	Grass Cover 50% to 75% (Fair)	69	79	74	6.5
	Grass Cover > 75% (Good)	61	74	68	8.0
Agriculture (pasture, grassland or range)	Poor	67	77	72	5.0
	Fair	69	79	74	7.0
	Good	58	72	65	9.0
Agriculture (Cultivated Row Crops - Straight)	Poor	81	88	85	5.0
	Good	78	85	82	7.0
Agriculture (Cultivated Row Crops - Contoured)	Poor	79	84	82	5.0
	Good	75	82	79	7.0
Agriculture (Cultivated Row Crops - Avg. Straight / Contoured)	Poor	80	86	83	5.0
	Good	77	84	80	7.0

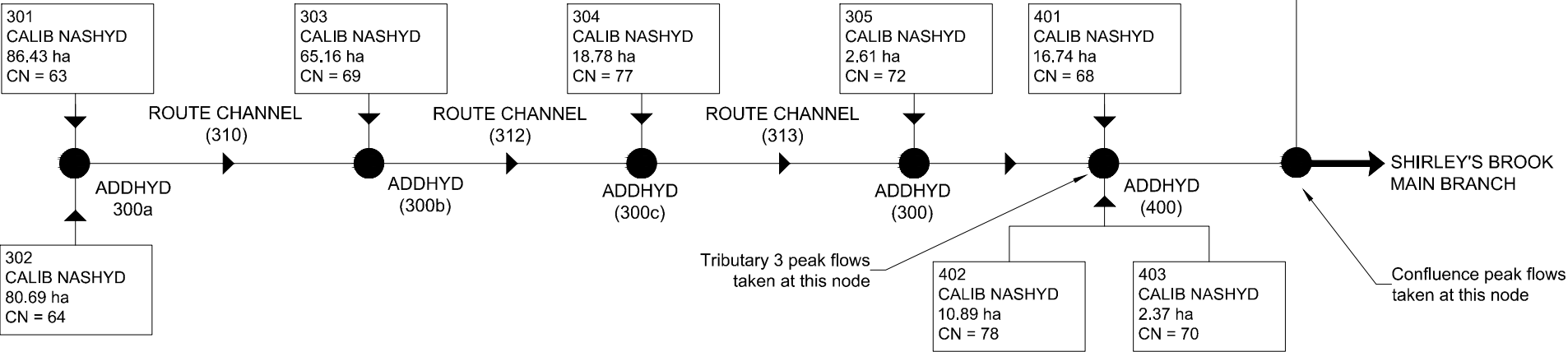
Initial Abstraction

Cover Type	IA (mm)	Min IA (mm)	Max IA (mm)
Open Water	0	0	0
Road (Asphalt/Concrete)	2.5	1.25	3.75
Gravel/Fill/Quarry	5	-	-
Estate Lot Residential	4	2.5	4
Open/Grass/Natural	8	5	12.5
Field/Crop (Cultivated)	8	5	12.5
Wood/Brush	10	5	15.2

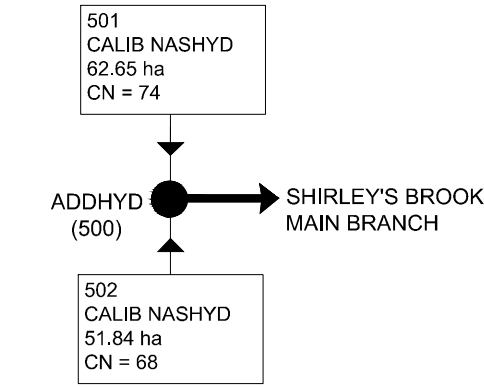
TRIBUTARY 2



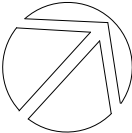
TRIBUTARY 3



EAST OF MARCH ROAD



KANATA NORTH
COMMUNITY DESIGN PLAN



DATE
MAY 2016
SCALE
NTS
JOB
112117

FIGURE NO. SWMHYMO-PRE
SWMHYMO PRE-DEVELOPMENT
SCHEMATIC

NOVATECH
Engineers, Planners & Landscape Architects

SWMHYMO INPUT FILE (Pre-Development, Event-based) – KN-PRE.dat

```

2      Metric units
*****
*# Project Name: [Kanata North]   Project Number: [112117]
*# Date       : 16-09-2015
*# Modeller   : [Kallie Auld]
*# Company    : NOVATECH ENGINEERING CONSULTANTS LTD
*# License #   : 5320763
*****
*This model has been developed to match the peak flows of the Shirley's Brook
*Subwatershed Study from the City of Ottawa.
*Time to peak values have been altered to mimic flows.
*Shirleys Brook - Pre-Development Model
*Model parameters based on original AECOM model
*Model parameters are provided in Volume 2, Appendix D of the KNCDP EMP
*****
START      TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[1]
           C25mm-4.stm

*#-----|-----|
READ STORM      STORM_FILENAME=["STORM.001"]
*#=====|=====|
*****PEAK FLOW FOR TRIBUTARY 2*****
*#-----|-----|
CALIB NASHYD    ID=[1], NHYD=["201"], DT=[5]min, AREA=[115.14](ha),
                DWF=[0](cms), CN/C=[65], IA=[11.4](mm),
                N=[1.1], TP=[3.42]hrs,
                END=-1

*#-----|-----|
ROUTE CHANNEL   IDout=[2], NHYD=["211"], IDin=[1],
                RDT=[5](min),
                CHLGTH=[557.6](m), CHSLOPE=[0.89](%),
                FPSLOPE=[0.89](%),
                SECNUM=[2096], NSEG=[3]
                ( SEGROUGH, SEGDIST (m))=[0.35,30.79 -0.040,51.78 0.35,96.66] NSEG times
                ( DISTANCE (m), ELEVATION (m))=[ 0 , 87.99 ]
                [ 11.43 , 86.90 ]
                [ 30.79 , 86.74 ]
                [ 34.09 , 86.37 ]
                [ 35.26 , 86.12 ]
                [ 39.56 , 86.12 ]
                [ 45.35 , 86.52 ]
                [ 51.78 , 86.75 ]
                [ 63.33 , 86.96 ]
                [ 65.76 , 86.99 ]
                [ 76.04 , 87.55 ]
                [ 96.66 , 87.99 ]

*#-----|-----|
CALIB NASHYD    ID=[3], NHYD=["202"], DT=[5]min, AREA=[263.64](ha),
                DWF=[0](cms), CN/C=[70], IA=[7.7](mm),
                N=[1.1], TP=[5.14]hrs,
                END=-1

*#-----|-----|
ADD HYD         IDsum=[1], NHYD=["200a"], IDs to add=[2,3]
*#-----|-----|
ROUTE CHANNEL   IDout=[2], NHYD=["212"], IDin=[1],
                RDT=[5](min),
                CHLGTH=[255.4](m), CHSLOPE=[0.88](%),
                FPSLOPE=[0.88](%),
                SECNUM=[1538], NSEG=[3]
                ( SEGROUGH, SEGDIST (m))=[0.35,17.84 -0.035,25.92 0.35,65.1] NSEG times
                ( DISTANCE (m), ELEVATION (m))=[ 0 , 82.05 ]
                [ 11.78 , 81.45 ]
                [ 15.00 , 81.32 ]
                [ 17.21 , 80.82 ]
                [ 17.84 , 80.58 ]
                [ 19.57 , 79.94 ]
                [ 20.79 , 80.14 ]
                [ 22.02 , 80.27 ]
                [ 25.92 , 80.55 ]
                [ 39.31 , 80.79 ]
                [ 43.55 , 80.84 ]
                [ 48.04 , 80.82 ]

```

```

                [ 50.86 , 80.85 ]
                [ 65.10 , 81.47 ]

*#-----|-----|
ROUTE CHANNEL   IDout=[1], NHYD=["213"], IDin=[2],
                RDT=[5](min),
                CHLGTH=[437.0](m), CHSLOPE=[0.5](%),
                FPSLOPE=[0.5](%),
                SECNUM=[1283], NSEG=[3]
                ( SEGROUGH, SEGDIST (m))=[0.35,36.15 -0.035,50.18 0.35,75.27] NSEG times
                ( DISTANCE (m), ELEVATION (m))=[ 0 , 78.59 ]
                [ 10.33 , 78.65 ]
                [ 29.43 , 78.60 ]
                [ 36.15 , 78.43 ]
                [ 37.26 , 78.27 ]
                [ 41.19 , 78.00 ]
                [ 45.62 , 78.00 ]
                [ 50.18 , 78.42 ]
                [ 51.67 , 78.43 ]
                [ 60.03 , 78.37 ]
                [ 60.89 , 78.34 ]
                [ 75.27 , 78.42 ]

*#-----|-----|
CALIB NASHYD    ID=[2], NHYD=["203"], DT=[5]min, AREA=[46.74](ha),
                DWF=[0](cms), CN/C=[76], IA=[7.6](mm),
                N=[1.1], TP=[2.52]hrs,
                END=-1

*#-----|-----|
ADD HYD         IDsum=[3], NHYD=["200b"], IDs to add=[1,2]
*#-----|-----|
ROUTE CHANNEL   IDout=[1], NHYD=["214"], IDin=[3],
                RDT=[5](min),
                CHLGTH=[542.6](m), CHSLOPE=[0.52](%),
                FPSLOPE=[0.52](%),
                SECNUM=[0808], NSEG=[3]
                ( SEGROUGH, SEGDIST (m))=[0.35,19.56 -0.035,32.26 0.35,49.77] NSEG times
                ( DISTANCE (m), ELEVATION (m))=[ 0 , 77.40 ]
                [ 9.26 , 77.00 ]
                [ 12.15 , 77.00 ]
                [ 13.67 , 76.75 ]
                [ 19.56 , 76.75 ]
                [ 22.86 , 76.51 ]
                [ 26.14 , 76.00 ]
                [ 29.07 , 76.00 ]
                [ 32.26 , 76.75 ]
                [ 33.60 , 76.98 ]
                [ 44.31 , 77.50 ]
                [ 49.77 , 77.74 ]

*#-----|-----|
CALIB NASHYD    ID=[2], NHYD=["204"], DT=[5]min, AREA=[29.39](ha),
                DWF=[0](cms), CN/C=[76], IA=[7.6](mm),
                N=[1.1], TP=[1.42]hrs,
                END=-1

*#-----|-----|
CALIB NASHYD    ID=[3], NHYD=["205"], DT=[5]min, AREA=[10.89](ha),
                DWF=[0](cms), CN/C=[78], IA=[6](mm),
                N=[3.0], TP=[0.80]hrs,
                END=-1

*#-----|-----|
ADD HYD         IDsum=[10], NHYD=["200"], IDs to add=[1,2,3]
*#-----|-----|
*PRINT HYD      ID=[10], # OF PCYCLES=[1]
*#-----|-----|
*****PEAK FLOW FOR TRIBUTARY 3*****
*#-----|-----|
CALIB NASHYD    ID=[1], NHYD=["301"], DT=[5]min, AREA=[86.43](ha),
                DWF=[0](cms), CN/C=[63], IA=[12.3](mm),
                N=[1.1], TP=[1.24]hrs,
                END=-1

*#-----|-----|
CALIB NASHYD    ID=[2], NHYD=["302"], DT=[5]min, AREA=[80.69](ha),

```

SWMHYMO INPUT FILE (Pre-Development, Event-based) – KN-PRE.dat

```

DWF=[0](cms), CN/C=[64], IA=[10.9](mm),
N=[1.1], TP=[1.80]hrs,
END=-1
*%-----
ADD HYD IDsum=[3], NHYD=["300a"], IDs to add=[1,2]
*%-----
ROUTE CHANNEL IDout=[1], NHYD=["310"], IDin=[3],
RDT=[5](min),
CHLGTH=[448.8](m), CHSLOPE=[1.62](%),
FPSLOPE=[1.62](%),
SECNUM=[4122], NSEG=[3]
( SEGROUGH, SEGDIST (m))=[0.35,36.85 -0.04,57.43 0.35,98.10] NSEG times
( DISTANCE (m), ELEVATION (m))=[ 0 , 85.97 ]
[ 29.14 , 86.03 ]
[ 35.73 , 85.88 ]
[ 36.85 , 85.69 ]
[ 39.63 , 85.47 ]
[ 43.19 , 85.31 ]
[ 47.24 , 84.78 ]
[ 50.54 , 84.78 ]
[ 54.28 , 84.94 ]
[ 57.43 , 85.70 ]
[ 65.07 , 85.80 ]
[ 67.25 , 85.80 ]
[ 70.81 , 85.80 ]
[ 98.10 , 86.10 ]
*%-----
CALIB NASHYD ID=[2], NHYD=["303"], DT=[5]min, AREA=[65.16](ha),
DWF=[0](cms), CN/C=[69], IA=[8.9](mm),
N=[1.1], TP=[1.31]hrs,
END=-1
*%-----
ADD HYD IDsum=[3], NHYD=["300b"], IDs to add=[1,2]
*%-----
ROUTE CHANNEL IDout=[1], NHYD=["312"], IDin=[3],
RDT=[5](min),
CHLGTH=[423.0](m), CHSLOPE=[1.17](%),
FPSLOPE=[1.17](%),
SECNUM=[3673], NSEG=[3]
( SEGROUGH, SEGDIST (m))=[0.35,43.21 -0.035,60.18 0.35,88.46] NSEG times
( DISTANCE (m), ELEVATION (m))=[ 0 , 81.92 ]
[ 24.54 , 81.13 ]
[ 30.36 , 81.05 ]
[ 43.21 , 80.25 ]
[ 50.74 , 79.70 ]
[ 56.30 , 79.70 ]
[ 60.18 , 80.25 ]
[ 73.61 , 80.39 ]
[ 88.46 , 80.79 ]
*%-----
CALIB NASHYD ID=[2], NHYD=["304"], DT=[5]min, AREA=[18.78](ha),
DWF=[0](cms), CN/C=[77], IA=[7.0](mm),
N=[1.1], TP=[1.04]hrs,
END=-1
*%-----
ADD HYD IDsum=[3], NHYD=["300c"], IDs to add=[1,2]
*%-----
ROUTE CHANNEL IDout=[1], NHYD=["313"], IDin=[3],
RDT=[5](min),
CHLGTH=[219.4](m), CHSLOPE=[1.28](%),
FPSLOPE=[1.28](%),
SECNUM=[3250], NSEG=[3]
( SEGROUGH, SEGDIST (m))=[0.35,20.91 -0.035,30.21 0.35,49.15] NSEG times
( DISTANCE (m), ELEVATION (m))=[ 0 , 77.74 ]
[ 9.02 , 77.11 ]
[ 20.91 , 76.04 ]
[ 24.36 , 75.70 ]
[ 24.7 , 75.59 ]
[ 26.13 , 75.58 ]
[ 26.44 , 75.76 ]
[ 30.21 , 76.02 ]

```

```

[ 34.47 , 76.58 ]
[ 35.79 , 76.66 ]
[ 40.79 , 76.69 ]
[ 45.14 , 76.99 ]
[ 46.86 , 77.73 ]
[ 49.15 , 78.01 ]
*%-----
CALIB NASHYD ID=[2], NHYD=["305"], DT=[5]min, AREA=[2.61](ha),
DWF=[0](cms), CN/C=[72], IA=[5.6](mm),
N=[1.1], TP=[0.22]hrs,
END=-1
*%-----
ADD HYD IDsum=[9], NHYD=["300"], IDs to add=[1,2]
*%-----
CALIB NASHYD ID=[1], NHYD=["401"], DT=[5]min, AREA=[16.78](ha),
DWF=[0](cms), CN/C=[68], IA=[7.0](mm),
N=[1.1], TP=[1.66]hrs,
END=-1
*%-----
CALIB NASHYD ID=[2], NHYD=["402"], DT=[5]min, AREA=[10.89](ha),
DWF=[0](cms), CN/C=[78], IA=[6.8](mm),
N=[1.1], TP=[0.85]hrs,
END=-1
*%-----
CALIB NASHYD ID=[3], NHYD=["403"], DT=[5]min, AREA=[2.37](ha),
DWF=[0](cms), CN/C=[70], IA=[4.3](mm),
N=[1.1], TP=[0.27]hrs,
END=-1
*%-----
ADD HYD IDsum=[8], NHYD=["400"], IDs to add=[1,2,3]
*%-----
*****TRIBUTARY 3 PEAK FLOWS*****
*****
ADD HYD IDsum=[1], NHYD=["TRIB3"], IDs to add=[8,9]
*%-----
*PRINT HYD ID=[1], # OF PCYCLES=[1]
*%-----
*****PEAK FLOW AT CONFLUENCE*****
*****
ADD HYD IDsum=[7], NHYD=["CONFL"], IDs to add=[10,1]
*%-----
*PRINT HYD ID=[7], # OF PCYCLES=[1]
*%-----
*****PEAK FLOW FROM EAST SIDE OF MARCH ROAD*****
*****
CALIB NASHYD ID=[1], NHYD=["501"], DT=[5]min, AREA=[62.65](ha),
DWF=[0](cms), CN/C=[74], IA=[8.5](mm),
N=[1.1], TP=[0.60]hrs,
END=-1
*%-----
CALIB NASHYD ID=[2], NHYD=["502"], DT=[5]min, AREA=[51.84](ha),
DWF=[0](cms), CN/C=[68], IA=[9.6](mm),
N=[1.1], TP=[0.75]hrs,
END=-1
*%-----
ADD HYD IDsum=[6], NHYD=["500"], IDs to add=[1,2]
*%-----
*PRINT HYD ID=[6], # OF PCYCLES=[1]
*%-----
*****TOTAL PEAK FLOW FOR KNUEA*****
*****
ADD HYD IDsum=[5], NHYD=["TOTAL"], IDs to add=[7,6]
*%-----
START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[2]
C2-4.stm
*%-----
START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[3]

```

SWMHYMO INPUT FILE (Pre-Development, Event-based) – KN-PRE.dat

```

C5-4.stm
*%-----|-----|
START      TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[4]
C100-4.stm
*%-----|-----|
START      TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[5]
S12-25mm.stm
*%-----|-----|
START      TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[6]
S2-12.stm
*%-----|-----|
START      TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[7]
S5-12.stm
*%-----|-----|
START      TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[8]
S100-12.stm
*%-----|-----|
START      TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[9]
S24-25mm.stm
*%-----|-----|
START      TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[10]
S2-24.stm
*%-----|-----|
START      TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[11]
S5-24.stm
*%-----|-----|
START      TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[12]
S100-24.stm
*%-----|-----|
FINISH

```


Page 1 of 16

SWMHYMO OUTPUT FILE (Pre-Development, Event-based) – KN-PRE.sum

```

[TP= 1.24:DT= 5.00]
001:0016-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:302      80.69      .012 No_date      4:25      1.27      .051
[CN= 64.0: N= 1.10]
[TP= 1.80:DT= 5.00]
001:0017-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           01:301      86.43      .015 No_date      4:05      1.00      n/a
+ 02:302      80.69      .012 No_date      4:25      1.27      n/a
[DT= 5.00] SUM= 03:300a      167.12      .027 No_date      4:15      1.13      n/a
001:0018-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300a      167.12      .027 No_date      4:15      1.13      n/a
[RD= 5.00] out<- 01:310      167.12      .026 No_date      4:45      1.13      n/a
[L/S/n= 449./1.620/.040]
[Vmax= .430:Dmax= .015]
001:0019-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:303      65.16      .021 No_date      4:05      1.99      .080
[CN= 69.0: N= 1.10]
[TP= 1.31:DT= 5.00]
001:0020-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           01:310      167.12      .026 No_date      4:45      1.13      n/a
+ 02:303      65.16      .021 No_date      4:05      1.99      n/a
[DT= 5.00] SUM= 03:300b      232.28      .047 No_date      4:35      1.37      n/a
001:0021-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300b      232.28      .047 No_date      4:35      1.37      n/a
[RD= 5.00] out<- 01:312      232.28      .047 No_date      5:00      1.37      n/a
[L/S/n= 423./1.170/.035]
[Vmax= .421:Dmax= .018]
001:0022-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:304      18.78      .013 No_date      4:00      3.45      .138
[CN= 77.0: N= 1.10]
[TP= 1.04:DT= 5.00]
001:0023-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           01:312      232.28      .047 No_date      5:00      1.37      n/a
+ 02:304      18.78      .013 No_date      4:00      3.45      n/a
[DT= 5.00] SUM= 03:300c      251.06      .059 No_date      4:50      1.52      n/a
001:0024-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300c      251.06      .059 No_date      4:50      1.52      n/a
[RD= 5.00] out<- 01:313      251.06      .059 No_date      4:55      1.52      n/a
[L/S/n= 219./1.280/.035]
[Vmax= .645:Dmax= .057]
001:0025-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:305      2.61      .005 No_date      2:45      3.18      .127
[CN= 72.0: N= 1.10]
[TP= .22:DT= 5.00]
001:0026-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           01:313      251.06      .059 No_date      4:55      1.52      n/a
+ 02:305      2.61      .005 No_date      2:45      3.18      n/a
[DT= 5.00] SUM= 09:300      253.67      .063 No_date      4:40      1.54      n/a
001:0027-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      01:401      16.78      .005 No_date      4:15      2.35      .094
[CN= 68.0: N= 1.10]
[TP= 1.66:DT= 5.00]
001:0028-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:402      10.89      .010 No_date      4:00      3.69      .147
[CN= 78.0: N= 1.10]
[TP= .85:DT= 5.00]
001:0029-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      03:403      2.37      .004 No_date      2:50      3.31      .132
[CN= 70.0: N= 1.10]
[TP= .27:DT= 5.00]
001:0030-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           01:401      16.78      .005 No_date      4:15      2.35      n/a
+ 02:402      10.89      .010 No_date      4:00      3.69      n/a
+ 03:403      2.37      .004 No_date      2:50      3.31      n/a
[DT= 5.00] SUM= 08:400      30.04      .019 No_date      4:00      2.91      n/a
001:0031-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           08:400      30.04      .019 No_date      4:00      2.91      n/a
+ 09:300      253.67      .063 No_date      4:40      1.54      n/a
[DT= 5.00] SUM= 01:TRIB3      283.71      .080 No_date      4:30      1.69      n/a
001:0032-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           10:200      465.80      .082 No_date      3:05      2.25      n/a

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+ 01:TRIB3      283.71      .080 No_date      4:30      1.69      n/a
[DT= 5.00] SUM= 07:CONFL      749.51      .155 No_date      4:05      2.03      n/a
001:0033-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      01:501      62.65      .051 No_date      4:00      2.57      .103
[CN= 74.0: N= 1.10]
[TP= .60:DT= 5.00]
001:0034-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:502      51.84      .024 No_date      4:00      1.76      .070
[CN= 68.0: N= 1.10]
[TP= .075:DT= 5.00]
001:0035-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           01:501      62.65      .051 No_date      4:00      2.57      n/a
+ 02:502      51.84      .024 No_date      4:00      1.76      n/a
[DT= 5.00] SUM= 06:500      114.49      .076 No_date      4:00      2.20      n/a
001:0036-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           07:CONFL      749.51      .155 No_date      4:05      2.03      n/a
+ 06:500      114.49      .076 No_date      4:00      2.20      n/a
[DT= 5.00] SUM= 05:TOTAL      864.00      .231 No_date      4:00      2.06      n/a
** END OF RUN : 1

*****
RUN:COMMAND#
002:0001-----
START
[TZERO = .00 hrs on 0]
[METOUT= 2 (1=imperial, 2=metric output)]
[NSTORM= 1 ]
[NRUN = 2 ]
#*****
# Project Name: [Kanata North] Project Number: [112117]
# Date : 16-09-2015
# Modeller : [Kallie Auld]
# Company : NOVATECH ENGINEERING CONSULTANTS LTD
# License # : 5320763
#*****
#*****
002:0002-----
READ STORM
Filename = STORM.001
Comment =
[SDT=10.00:SDUR= 4.00:PTOT= 33.89]
002:0003-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      01:201      115.14      .023 No_date      5:45      3.18      .094
[CN= 65.0: N= 1.10]
[TP= 3.42:DT= 5.00]
002:0004-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:201      115.14      .023 No_date      5:45      3.18      n/a
[RD= 5.00] out<- 02:211      115.14      .023 No_date      6:10      3.18      n/a
[L/S/n= 558./ .890/.040]
[Vmax= .423:Dmax= .011]
002:0005-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      03:202      263.64      .058 No_date      7:15      5.08      .150
[CN= 70.0: N= 1.10]
[TP= 5.14:DT= 5.00]
002:0006-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           02:211      115.14      .023 No_date      6:10      3.18      n/a
+ 03:202      263.64      .058 No_date      7:15      5.08      n/a
[DT= 5.00] SUM= 01:200a      378.78      .081 No_date      6:50      4.50      n/a
002:0007-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:200a      378.78      .081 No_date      6:50      4.50      n/a
[RD= 5.00] out<- 02:212      378.78      .081 No_date      6:55      4.50      n/a
[L/S/n= 255./ .880/.035]
[Vmax= .513:Dmax= .180]
002:0008-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:212      378.78      .081 No_date      6:55      4.50      n/a
[RD= 5.00] out<- 01:213      378.78      .081 No_date      7:15      4.50      n/a

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SWMHYMO OUTPUT FILE (Pre-Development, Event-based) – KN-PRE.sum

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[L/S/n= 437./ .500/.035]
{Vmax= .259:Dmax= .056}
002:0009-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:203 46.74 .026 No_date 4:50 6.49 .192
[CN= 76.0: N= 1.10]
[TP= 2.52:DT= 5.00]
002:0010-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:213 378.78 .081 No_date 7:15 4.50 n/a
+ 02:203 46.74 .026 No_date 4:50 6.49 n/a
[DT= 5.00] SUM= 03:200b 425.52 .107 No_date 6:05 4.72 n/a
002:0011-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:200b 425.52 .107 No_date 6:05 4.72 n/a
[RD= 5.00] out<- 01:214 425.52 .107 No_date 6:55 4.72 n/a
[L/S/n= 543./ .520/.035]
{Vmax= .344:Dmax= .082}
002:0012-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:204 29.39 .028 No_date 4:05 6.49 .192
[CN= 76.0: N= 1.10]
[TP= 1.42:DT= 5.00]
002:0013-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:205 10.89 .107 No_date 2:30 7.82 .231
[CN= 78.0: N= 3.00]
[TP= .80:DT= 5.00]
002:0014-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:214 425.52 .107 No_date 6:55 4.72 n/a
+ 02:204 29.39 .028 No_date 4:05 6.49 n/a
+ 03:205 10.89 .107 No_date 2:30 7.82 n/a
[DT= 5.00] SUM= 10:200 465.80 .167 No_date 3:00 4.90 n/a
002:0015-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:301 86.43 .040 No_date 4:05 2.73 .081
[CN= 63.0: N= 1.10]
[TP= 1.24:DT= 5.00]
002:0016-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:302 80.69 .030 No_date 4:20 3.19 .094
[CN= 64.0: N= 1.10]
[TP= 1.80:DT= 5.00]
002:0017-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:301 86.43 .040 No_date 4:05 2.73 n/a
+ 02:302 80.69 .030 No_date 4:20 3.19 n/a
[DT= 5.00] SUM= 03:300a 167.12 .070 No_date 4:05 2.95 n/a
002:0018-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300a 167.12 .070 No_date 4:05 2.95 n/a
[RD= 5.00] out<- 01:310 167.12 .069 No_date 4:40 2.95 n/a
[L/S/n= 449./ .1.620/.040]
{Vmax= .430:Dmax= .038}
002:0019-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:303 65.16 .047 No_date 4:00 4.49 .132
[CN= 69.0: N= 1.10]
[TP= 1.31:DT= 5.00]
002:0020-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:310 167.12 .069 No_date 4:40 2.95 n/a
+ 02:303 65.16 .047 No_date 4:00 4.49 n/a
[DT= 5.00] SUM= 03:300b 232.28 .116 No_date 4:30 3.38 n/a
002:0021-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300b 232.28 .116 No_date 4:30 3.38 n/a
[RD= 5.00] out<- 01:312 232.28 .115 No_date 4:55 3.38 n/a
[L/S/n= 423./ .1.170/.035]
{Vmax= .421:Dmax= .045}
002:0022-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:304 18.78 .026 No_date 4:00 7.04 .208
[CN= 77.0: N= 1.10]
[TP= 1.04:DT= 5.00]
002:0023-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:312 232.28 .115 No_date 4:55 3.38 n/a
+ 02:304 18.78 .026 No_date 4:00 7.04 n/a
[DT= 5.00] SUM= 03:300c 251.06 .140 No_date 4:45 3.66 n/a
002:0024-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300c 251.06 .140 No_date 4:45 3.66 n/a
[RD= 5.00] out<- 01:313 251.06 .140 No_date 4:50 3.66 n/a
[L/S/n= 219./ .1.280/.035]
{Vmax= .658:Dmax= .121}

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002:0025-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:305 2.61 .011 No_date 2:35 6.30 .186
[CN= 72.0: N= 1.10]
[TP= .22:DT= 5.00]
002:0026-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:313 251.06 .140 No_date 4:50 3.66 n/a
+ 02:305 2.61 .011 No_date 2:35 6.30 n/a
[DT= 5.00] SUM= 09:300 253.67 .147 No_date 4:40 3.68 n/a
002:0027-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:401 16.78 .011 No_date 4:10 4.94 .146
[CN= 68.0: N= 1.10]
[TP= 1.66:DT= 5.00]
002:0028-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:402 10.89 .019 No_date 4:00 7.44 .219
[CN= 78.0: N= 1.10]
[TP= .85:DT= 5.00]
002:0029-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:403 2.37 .008 No_date 2:50 6.33 .187
[CN= 70.0: N= 1.10]
[TP= .27:DT= 5.00]
002:0030-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:401 16.78 .011 No_date 4:10 4.94 n/a
+ 02:402 10.89 .019 No_date 4:00 7.44 n/a
+ 03:403 2.37 .008 No_date 2:50 6.33 n/a
[DT= 5.00] SUM= 08:400 30.04 .037 No_date 4:00 5.95 n/a
002:0031-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 08:400 30.04 .037 No_date 4:00 5.95 n/a
+ 09:300 253.67 .147 No_date 4:40 3.68 n/a
[DT= 5.00] SUM= 01:TRIB3 283.71 .182 No_date 4:30 3.92 n/a
002:0032-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 10:200 465.80 .167 No_date 3:00 4.90 n/a
+ 01:TRIB3 283.71 .182 No_date 4:30 3.92 n/a
[DT= 5.00] SUM= 07:CONFL 749.51 .343 No_date 4:10 4.53 n/a
002:0033-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:501 62.65 .111 No_date 4:00 5.63 .166
[CN= 74.0: N= 1.10]
[TP= .60:DT= 5.00]
002:0034-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:502 51.84 .056 No_date 4:00 4.10 .121
[CN= 68.0: N= 1.10]
[TP= .75:DT= 5.00]
002:0035-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:501 62.65 .111 No_date 4:00 5.63 n/a
+ 02:502 51.84 .056 No_date 4:00 4.10 n/a
[DT= 5.00] SUM= 06:500 114.49 .167 No_date 4:00 4.94 n/a
002:0036-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 07:CONFL 749.51 .343 No_date 4:10 4.53 n/a
+ 06:500 114.49 .167 No_date 4:00 4.94 n/a
[DT= 5.00] SUM= 05:TOTAL 864.00 .508 No_date 4:00 4.59 n/a
** END OF RUN : 2

```

RUN:COMMAND#

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003:0001-----
START
[ TZERO = .00 hrs on 0 ]
[ METOUT= 2 (1=imperial, 2=metric output) ]
[ NSTORM= 1 ]
[ NRUN = 3 ]

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# Project Name: [Kanata North] Project Number: [112117]
# Date : 16-09-2015
# Modeller : [Kallie Auld]
# Company : NOVATECH ENGINEERING CONSULTANTS LTD
# License # : 5320763

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SWMHYMO OUTPUT FILE (Pre-Development, Event-based) – KN-PRE.sum

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*****
003:0002-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  READ STORM
  Filename = STORM.001
  Comment =
  [SDT=10.00:SDUR= 4.00:PTOT= 45.18]
003:0003-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  CALIB NASHYD 01:201 115.14 .049 No_date 5:45 6.69 .148
  [CN= 65.0: N= 1.10]
  [Tp= 3.42:DT= 5.00]
003:0004-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  ROUTE CHANNEL -> 01:201 115.14 .049 No_date 5:45 6.69 n/a
  [RDT= 5.00] out<- 02:211 115.14 .049 No_date 6:10 6.69 n/a
  [L/S/n= 558./ .890/.040]
  {Vmax= .423:Dmax= .023}
003:0005-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  CALIB NASHYD 03:202 263.64 .110 No_date 7:20 9.60 .212
  [CN= 70.0: N= 1.10]
  [Tp= 5.14:DT= 5.00]
003:0006-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  ADD HYD 02:211 115.14 .049 No_date 6:10 6.69 n/a
  + 03:202 263.64 .110 No_date 7:20 9.60 n/a
  [DT= 5.00] SUM= 01:200a 378.78 .159 No_date 6:50 8.71 n/a
003:0007-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  ROUTE CHANNEL -> 01:200a 378.78 .159 No_date 6:50 8.71 n/a
  [RDT= 5.00] out<- 02:212 378.78 .159 No_date 6:55 8.71 n/a
  [L/S/n= 255./ .880/.035]
  {Vmax= .614:Dmax= .237}
003:0008-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  ROUTE CHANNEL -> 02:212 378.78 .159 No_date 6:55 8.71 n/a
  [RDT= 5.00] out<- 01:213 378.78 .159 No_date 7:05 8.71 n/a
  [L/S/n= 437./ .500/.035]
  {Vmax= .334:Dmax= .083}
003:0009-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  CALIB NASHYD 02:203 46.74 .048 No_date 4:50 11.99 .265
  [CN= 76.0: N= 1.10]
  [Tp= 2.52:DT= 5.00]
003:0010-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  ADD HYD 01:213 378.78 .159 No_date 7:05 8.71 n/a
  + 02:203 46.74 .048 No_date 4:50 11.99 n/a
  [DT= 5.00] SUM= 03:200b 425.52 .206 No_date 6:30 9.07 n/a
003:0011-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  ROUTE CHANNEL -> 03:200b 425.52 .206 No_date 6:30 9.07 n/a
  [RDT= 5.00] out<- 01:214 425.52 .206 No_date 6:40 9.07 n/a
  [L/S/n= 543./ .520/.035]
  {Vmax= .436:Dmax= .122}
003:0012-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  CALIB NASHYD 02:204 29.39 .052 No_date 4:00 11.99 .265
  [CN= 76.0: N= 1.10]
  [Tp= 1.42:DT= 5.00]
003:0013-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  CALIB NASHYD 03:205 10.89 .201 No_date 2:35 13.85 .307
  [CN= 78.0: N= 3.00]
  [Tp= .80:DT= 5.00]
003:0014-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  ADD HYD 01:214 425.52 .206 No_date 6:40 9.07 n/a
  + 02:204 29.39 .052 No_date 4:00 11.99 n/a
  + 03:205 10.89 .201 No_date 2:35 13.85 n/a
  [DT= 5.00] SUM= 10:200 465.80 .338 No_date 3:15 9.37 n/a
003:0015-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  CALIB NASHYD 01:301 86.43 .086 No_date 4:00 5.94 .131
  [CN= 63.0: N= 1.10]
  [Tp= 1.24:DT= 5.00]
003:0016-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  CALIB NASHYD 02:302 80.69 .063 No_date 4:20 6.63 .147
  [CN= 64.0: N= 1.10]
  [Tp= 1.80:DT= 5.00]
003:0017-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  ADD HYD 01:301 86.43 .086 No_date 4:00 5.94 n/a
  + 02:302 80.69 .063 No_date 4:20 6.63 n/a
  [DT= 5.00] SUM= 03:300a 167.12 .150 No_date 4:05 6.27 n/a

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003:0018-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  ROUTE CHANNEL -> 03:300a 167.12 .150 No_date 4:05 6.27 n/a
  [RDT= 5.00] out<- 01:310 167.12 .149 No_date 4:35 6.27 n/a
  [L/S/n= 449./1.620/.040]
  {Vmax= .449:Dmax= .069}
003:0019-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  CALIB NASHYD 02:303 65.16 .091 No_date 4:00 8.75 .194
  [CN= 69.0: N= 1.10]
  [Tp= 1.31:DT= 5.00]
003:0020-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  ADD HYD 01:310 167.12 .149 No_date 4:35 6.27 n/a
  + 02:303 65.16 .091 No_date 4:00 8.75 n/a
  [DT= 5.00] SUM= 03:300b 232.28 .239 No_date 4:25 6.97 n/a
003:0021-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  ROUTE CHANNEL -> 03:300b 232.28 .239 No_date 4:25 6.97 n/a
  [RDT= 5.00] out<- 01:312 232.28 .238 No_date 4:40 6.97 n/a
  [L/S/n= 423./1.170/.035]
  {Vmax= .468:Dmax= .071}
003:0022-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  CALIB NASHYD 02:304 18.78 .047 No_date 4:00 12.78 .283
  [CN= 77.0: N= 1.10]
  [Tp= 1.04:DT= 5.00]
003:0023-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  ADD HYD 01:312 232.28 .238 No_date 4:40 6.97 n/a
  + 02:304 18.78 .047 No_date 4:00 12.78 n/a
  [DT= 5.00] SUM= 03:300c 251.06 .285 No_date 4:35 7.40 n/a
003:0024-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  ROUTE CHANNEL -> 03:300c 251.06 .285 No_date 4:35 7.40 n/a
  [RDT= 5.00] out<- 01:313 251.06 .285 No_date 4:40 7.40 n/a
  [L/S/n= 219./1.280/.035]
  {Vmax= .741:Dmax= .183}
003:0025-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  CALIB NASHYD 02:305 2.61 .020 No_date 2:35 11.32 .251
  [CN= 72.0: N= 1.10]
  [Tp= .22:DT= 5.00]
003:0026-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  ADD HYD 01:313 251.06 .285 No_date 4:40 7.40 n/a
  + 02:305 2.61 .020 No_date 2:35 11.32 n/a
  [DT= 5.00] SUM= 09:300 253.67 .298 No_date 4:35 7.44 n/a
003:0027-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  CALIB NASHYD 01:401 16.78 .020 No_date 4:10 9.24 .205
  [CN= 68.0: N= 1.10]
  [Tp= 1.66:DT= 5.00]
003:0028-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  CALIB NASHYD 02:402 10.89 .034 No_date 4:00 13.39 .296
  [CN= 78.0: N= 1.10]
  [Tp= .85:DT= 5.00]
003:0029-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  CALIB NASHYD 03:403 2.37 .015 No_date 2:45 11.16 .247
  [CN= 70.0: N= 1.10]
  [Tp= .27:DT= 5.00]
003:0030-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  ADD HYD 01:401 16.78 .020 No_date 4:10 9.24 n/a
  + 02:402 10.89 .034 No_date 4:00 13.39 n/a
  + 03:403 2.37 .015 No_date 2:45 11.16 n/a
  [DT= 5.00] SUM= 08:400 30.04 .068 No_date 4:00 10.90 n/a
003:0031-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  ADD HYD 08:400 30.04 .068 No_date 4:00 10.90 n/a
  + 09:300 253.67 .298 No_date 4:35 7.44 n/a
  [DT= 5.00] SUM= 01:TRIB3 283.71 .363 No_date 4:20 7.81 n/a
003:0032-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  ADD HYD 10:200 465.80 .338 No_date 3:15 9.37 n/a
  + 01:TRIB3 283.71 .363 No_date 4:20 7.81 n/a
  [DT= 5.00] SUM= 07:CONFL 749.51 .683 No_date 4:00 8.78 n/a
003:0033-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  CALIB NASHYD 01:501 62.65 .211 No_date 4:00 10.68 .236
  [CN= 74.0: N= 1.10]
  [Tp= .60:DT= 5.00]
003:0034-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
  CALIB NASHYD 02:502 51.84 .112 No_date 4:00 8.16 .181
  [CN= 68.0: N= 1.10]

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SWMHYMO OUTPUT FILE (Pre-Development, Event-based) – KN-PRE.sum

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[DT= .75:DT= 5.00]
003:0035-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:501          62.65          .211 No_date 4:00 10.68 n/a
+ 02:502          51.84          .112 No_date 4:00 8.16 n/a
[DT= 5.00] SUM= 06:500          114.49          .323 No_date 4:00 9.54 n/a
003:0036-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          07:CONFL          749.51          .683 No_date 4:00 8.78 n/a
+ 06:500          114.49          .323 No_date 4:00 9.54 n/a
[DT= 5.00] SUM= 05:TOTAL          864.00          1.006 No_date 4:00 8.88 n/a
** END OF RUN : 3

```

RUN:COMMAND#

```

004:0001-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
START
[TZERO = .00 hrs on 0]
[METOUT= 2 (1=imperial, 2=metric output)]
[NSTORM= 1]
[NRUN = 4]

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# Project Name: [Kanata North] Project Number: [112117]
# Date : 16-09-2015
# Modeller : [Kallie Auld]
# Company : NOVATECH ENGINEERING CONSULTANTS LTD
# License # : 5320763

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004:0002-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
READ STORM
Filename = STORM.001
Comment =
[SDT=10.00:SDUR= 4.00:PTOT= 76.02]
004:0003-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:201          115.14          .152 No_date 5:35 20.74 .273
[CN= 65.0: N= 1.10]
[TP= 3.42:DT= 5.00]
004:0004-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:201          115.14          .152 No_date 5:35 20.74 n/a
[RD= 5.00] out<- 02:211          115.14          .152 No_date 6:05 20.74 n/a
[L/S/n= 558./ .890/.040]
[Vmax= .423:Dmax= .070]
004:0005-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:202          263.64          .301 No_date 7:15 26.35 .347
[CN= 70.0: N= 1.10]
[TP= 5.14:DT= 5.00]
004:0006-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          02:211          115.14          .152 No_date 6:05 20.74 n/a
+ 03:202          263.64          .301 No_date 7:15 26.35 n/a
[DT= 5.00] SUM= 01:200a          378.78          .453 No_date 6:40 24.64 n/a
004:0007-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:200a          378.78          .453 No_date 6:40 24.64 n/a
[RD= 5.00] out<- 02:212          378.78          .453 No_date 6:45 24.64 n/a
[L/S/n= 255./ .880/.035]
[Vmax= .762:Dmax= .349]
004:0008-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:212          378.78          .453 No_date 7:00 24.64 n/a
[RD= 5.00] out<- 01:213          378.78          .453 No_date 7:00 24.64 n/a
[L/S/n= 437./ .500/.035]
[Vmax= .474:Dmax= .149]
004:0009-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:203          46.74          .126 No_date 4:45 31.50 .414
[CN= 76.0: N= 1.10]
[TP= 2.52:DT= 5.00]
004:0010-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:213          378.78          .453 No_date 7:00 24.64 n/a
+ 02:203          46.74          .126 No_date 4:45 31.50 n/a

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[DT= 5.00] SUM= 03:200b          425.52          .577 No_date 6:10 25.39 n/a
004:0011-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:200b          425.52          .577 No_date 6:10 25.39 n/a
[RD= 5.00] out<- 01:214          425.52          .577 No_date 6:30 25.39 n/a
[L/S/n= 543./ .520/.035]
[Vmax= .627:Dmax= .220]
004:0012-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:204          29.39          .137 No_date 4:00 31.50 .414
[CN= 76.0: N= 1.10]
[TP= 1.42:DT= 5.00]
004:0013-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:205          10.89          .521 No_date 2:35 34.61 .455
[CN= 78.0: N= 3.00]
[TP= .80:DT= 5.00]
004:0014-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:214          425.52          .577 No_date 6:30 25.39 n/a
+ 02:204          29.39          .137 No_date 4:00 31.50 n/a
+ 03:205          10.89          .521 No_date 2:35 34.61 n/a
[DT= 5.00] SUM= 10:200          465.80          .977 No_date 3:00 26.00 n/a
004:0015-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:301          86.43          .277 No_date 4:00 19.07 .251
[CN= 63.0: N= 1.10]
[TP= 1.24:DT= 5.00]
004:0016-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:302          80.69          .194 No_date 4:15 20.39 .268
[CN= 64.0: N= 1.10]
[TP= 1.80:DT= 5.00]
004:0017-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:301          86.43          .277 No_date 4:00 19.07 n/a
+ 02:302          80.69          .194 No_date 4:15 20.39 n/a
[DT= 5.00] SUM= 03:300a          167.12          .472 No_date 4:00 19.71 n/a
004:0018-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300a          167.12          .472 No_date 4:00 19.71 n/a
[RD= 5.00] out<- 01:310          167.12          .470 No_date 4:20 19.71 n/a
[L/S/n= 449./ .1620/.040]
[Vmax= .655:Dmax= .130]
004:0019-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:303          65.16          .259 No_date 4:00 24.86 .327
[CN= 69.0: N= 1.10]
[TP= 1.31:DT= 5.00]
004:0020-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:310          167.12          .470 No_date 4:20 19.71 n/a
+ 02:303          65.16          .259 No_date 4:00 24.86 n/a
[DT= 5.00] SUM= 03:300b          232.28          .728 No_date 4:15 21.15 n/a
004:0021-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300b          232.28          .728 No_date 4:15 21.15 n/a
[RD= 5.00] out<- 01:312          232.28          .727 No_date 4:25 21.15 n/a
[L/S/n= 423./ .170/.035]
[Vmax= .715:Dmax= .138]
004:0022-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:304          18.78          .122 No_date 4:00 32.88 .433
[CN= 77.0: N= 1.10]
[TP= 1.04:DT= 5.00]
004:0023-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:312          232.28          .727 No_date 4:25 21.15 n/a
+ 02:304          18.78          .122 No_date 4:00 32.88 n/a
[DT= 5.00] SUM= 03:300c          251.06          .847 No_date 4:20 22.03 n/a
004:0024-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300c          251.06          .847 No_date 4:20 22.03 n/a
[RD= 5.00] out<- 01:313          251.06          .846 No_date 4:25 22.03 n/a
[L/S/n= 219./ .1280/.035]
[Vmax= .911:Dmax= .309]
004:0025-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:305          2.61          .053 No_date 2:30 29.31 .386
[CN= 72.0: N= 1.10]
[TP= .22:DT= 5.00]
004:0026-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:313          251.06          .846 No_date 4:25 22.03 n/a
+ 02:305          2.61          .053 No_date 2:30 29.31 n/a
[DT= 5.00] SUM= 09:300          253.67          .883 No_date 4:15 22.11 n/a
004:0027-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-

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SWMHYMO OUTPUT FILE (Pre-Development, Event-based) – KN-PRE.sum

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CALIB NASHYD      01:401      16.78      .054 No_date      4:05      25.27 .332
[CN= 68.0: N= 1.10]
[TP= 1.66:DT= 5.00]
004:0028-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:402      10.89      .087 No_date      4:00      34.02 .447
[CN= 78.0: N= 1.10]
[TP= .85:DT= 5.00]
004:0029-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      03:403      2.37      .040 No_date      2:40      28.49 .375
[CN= 70.0: N= 1.10]
[TP= .27:DT= 5.00]
004:0030-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD
      01:401      16.78      .054 No_date      4:05      25.27 n/a
      + 02:402      10.89      .087 No_date      4:00      34.02 n/a
      + 03:403      2.37      .040 No_date      2:40      28.49 n/a
[DT= 5.00] SUM= 08:400      30.04      .175 No_date      4:00      28.69 n/a
004:0031-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD
      08:400      30.04      .175 No_date      4:00      28.69 n/a
      + 09:300      253.67      .883 No_date      4:15      22.11 n/a
[DT= 5.00] SUM= 01:TRIB3      283.71      1.055 No_date      4:10      22.80 n/a
004:0032-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD
      10:200      465.80      .977 No_date      3:00      26.00 n/a
      + 01:TRIB3      283.71      1.055 No_date      4:10      22.80 n/a
[DT= 5.00] SUM= 07:CONFL      749.51      1.943 No_date      3:25      24.79 n/a
004:0033-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      01:501      62.65      .570 No_date      3:50      29.08 .383
[CN= 74.0: N= 1.10]
[TP= .60:DT= 5.00]
004:0034-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:502      51.84      .322 No_date      4:00      23.73 .312
[CN= 68.0: N= 1.10]
[TP= .75:DT= 5.00]
004:0035-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD
      01:501      62.65      .570 No_date      3:50      29.08 n/a
      + 02:502      51.84      .322 No_date      4:00      23.73 n/a
[DT= 5.00] SUM= 06:500      114.49      .892 No_date      4:00      26.66 n/a
004:0036-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD
      07:CONFL      749.51      1.943 No_date      3:25      24.79 n/a
      + 06:500      114.49      .892 No_date      4:00      26.66 n/a
[DT= 5.00] SUM= 05:TOTAL      864.00      2.826 No_date      3:35      25.03 n/a
** END OF RUN : 4

```

RUN:COMMAND#

```

005:0001-----
START
[TZERO = .00 hrs on 0]
[METOUT= 2 (1=imperial, 2=metric output)]
[NSTORM= 1]
[NRUN = 5]
*****
# Project Name: [Kanata North] Project Number: [112117]
# Date : 16-09-2015
# Modeller : [Kallie Auld]
# Company : NOVATECH ENGINEERING CONSULTANTS LTD
# License # : 5320763
*****
005:0002-----
READ STORM
Filename = STORM.001
Comment =
[SDT=30.00:SDUR= 12.00:PTOT= 25.00]
005:0003-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      01:201      115.14      .009 No_date      12:25      1.23 .049
[CN= 65.0: N= 1.10]

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[TP= 3.42:DT= 5.00]
005:0004-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:201      115.14      .009 No_date      12:25      1.23 n/a
[RD= 5.00] out<- 02:211      115.14      .009 No_date      13:05      1.23 n/a
[L/S/n= 558./ .890/.040]
[Vmax= .423:Dmax= .004]
005:0005-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      03:202      263.64      .027 No_date      13:20      2.37 .095
[CN= 70.0: N= 1.10]
[TP= 5.14:DT= 5.00]
005:0006-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD
      02:211      115.14      .009 No_date      13:05      1.23 n/a
      + 03:202      263.64      .027 No_date      13:20      2.37 n/a
[DT= 5.00] SUM= 01:200a      378.78      .036 No_date      13:10      2.03 n/a
005:0007-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:200a      378.78      .036 No_date      13:10      2.03 n/a
[RD= 5.00] out<- 02:212      378.78      .036 No_date      13:00      2.03 n/a
[L/S/n= 255./ .880/.035]
[Vmax= .400:Dmax= .129]
005:0008-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:212      378.78      .036 No_date      13:00      2.03 n/a
[RD= 5.00] out<- 01:213      378.78      .036 No_date      14:10      2.03 n/a
[L/S/n= 437./ .500/.035]
[Vmax= .199:Dmax= .035]
005:0009-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:203      46.74      .012 No_date      12:00      3.10 .124
[CN= 76.0: N= 1.10]
[TP= 2.52:DT= 5.00]
005:0010-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD
      01:213      378.78      .036 No_date      14:10      2.03 n/a
      + 02:203      46.74      .012 No_date      12:00      3.10 n/a
[DT= 5.00] SUM= 03:200b      425.52      .047 No_date      13:30      2.14 n/a
005:0011-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:200b      425.52      .047 No_date      13:30      2.14 n/a
[RD= 5.00] out<- 01:214      425.52      .047 No_date      14:10      2.14 n/a
[L/S/n= 543./ .520/.035]
[Vmax= .320:Dmax= .045]
005:0012-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:204      29.39      .012 No_date      12:00      3.10 .124
[CN= 76.0: N= 1.10]
[TP= 1.42:DT= 5.00]
005:0013-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      03:205      10.89      .041 No_date      6:55      3.98 .159
[CN= 78.0: N= 3.00]
[TP= .80:DT= 5.00]
005:0014-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD
      01:214      425.52      .047 No_date      14:10      2.14 n/a
      + 02:204      29.39      .012 No_date      12:00      3.10 n/a
      + 03:205      10.89      .041 No_date      6:55      3.98 n/a
[DT= 5.00] SUM= 10:200      465.80      .063 No_date      12:10      2.25 n/a
005:0015-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      01:301      86.43      .013 No_date      12:00      1.00 .040
[CN= 63.0: N= 1.10]
[TP= 1.24:DT= 5.00]
005:0016-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:302      80.69      .011 No_date      12:00      1.27 .051
[CN= 64.0: N= 1.10]
[TP= 1.80:DT= 5.00]
005:0017-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD
      01:301      86.43      .013 No_date      12:00      1.00 n/a
      + 02:302      80.69      .011 No_date      12:00      1.27 n/a
[DT= 5.00] SUM= 03:300a      167.12      .024 No_date      12:00      1.13 n/a
005:0018-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300a      167.12      .024 No_date      12:00      1.13 n/a
[RD= 5.00] out<- 01:310      167.12      .024 No_date      12:15      1.13 n/a
[L/S/n= 449./ .1620/.040]
[Vmax= .430:Dmax= .013]
005:0019-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:303      65.16      .018 No_date      12:00      1.99 .080
[CN= 69.0: N= 1.10]
[TP= 1.31:DT= 5.00]

```

SWMHYMO OUTPUT FILE (Pre-Development, Event-based) – KN-PRE.sum

```

005:0020-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:310      167.12      .024 No_date 12:15      1.13  n/a
                + 02:303      65.16      .018 No_date 12:00      1.99  n/a
[DT= 5.00] SUM= 03:300b      232.28      .043 No_date 12:05      1.37  n/a
005:0021-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300b      232.28      .043 No_date 12:05      1.37  n/a
[RD= 5.00] out<- 01:312      232.28      .042 No_date 12:20      1.37  n/a
[L/S/n= 423./1.170/.035]
[Vmax= .421:Dmax= .017]
005:0022-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:304      18.78      .011 No_date 11:00      3.45  .138
[CN= 77.0: N= 1.10]
[TP= 1.04:DT= 5.00]
005:0023-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:312      232.28      .042 No_date 12:20      1.37  n/a
                + 02:304      18.78      .011 No_date 11:00      3.45  n/a
[DT= 5.00] SUM= 03:300c      251.06      .053 No_date 12:10      1.52  n/a
005:0024-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300c      251.06      .053 No_date 12:10      1.52  n/a
[RD= 5.00] out<- 01:313      251.06      .053 No_date 12:15      1.52  n/a
[L/S/n= 219./1.280/.035]
[Vmax= .645:Dmax= .051]
005:0025-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:305      2.61      .004 No_date 7:00      3.18  .127
[CN= 72.0: N= 1.10]
[TP= .22:DT= 5.00]
005:0026-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:313      251.06      .053 No_date 12:15      1.52  n/a
                + 02:305      2.61      .004 No_date 7:00      3.18  n/a
[DT= 5.00] SUM= 09:300      253.67      .055 No_date 12:10      1.54  n/a
005:0027-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     01:401      16.78      .005 No_date 12:00      2.36  .094
[CN= 68.0: N= 1.10]
[TP= 1.66:DT= 5.00]
005:0028-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:402      10.89      .008 No_date 10:30      3.69  .147
[CN= 78.0: N= 1.10]
[TP= .85:DT= 5.00]
005:0029-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     03:403      2.37      .003 No_date 7:00      3.31  .132
[CN= 70.0: N= 1.10]
[TP= .27:DT= 5.00]
005:0030-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:401      16.78      .005 No_date 12:00      2.36  n/a
                + 02:402      10.89      .008 No_date 10:30      3.69  n/a
                + 03:403      2.37      .003 No_date 7:00      3.31  n/a
[DT= 5.00] SUM= 08:400      30.04      .014 No_date 9:30      2.91  n/a
005:0031-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          08:400      30.04      .014 No_date 9:30      2.91  n/a
                + 09:300      253.67      .055 No_date 12:10      1.54  n/a
[DT= 5.00] SUM= 01:TRIB3      283.71      .069 No_date 12:00      1.69  n/a
005:0032-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          10:200      465.80      .063 No_date 12:10      2.25  n/a
                + 01:TRIB3      283.71      .069 No_date 12:00      1.69  n/a
[DT= 5.00] SUM= 07:CONFL      749.51      .132 No_date 12:05      2.03  n/a
005:0033-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     01:501      62.65      .039 No_date 9:30      2.57  .103
[CN= 74.0: N= 1.10]
[TP= .60:DT= 5.00]
005:0034-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:502      51.84      .019 No_date 10:40      1.76  .070
[CN= 68.0: N= 1.10]
[TP= .75:DT= 5.00]
005:0035-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:501      62.65      .039 No_date 9:30      2.57  n/a
                + 02:502      51.84      .019 No_date 10:40      1.76  n/a
[DT= 5.00] SUM= 06:500      114.49      .058 No_date 10:30      2.20  n/a
005:0036-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          07:CONFL      749.51      .132 No_date 12:05      2.03  n/a
                + 06:500      114.49      .058 No_date 10:30      2.20  n/a
[DT= 5.00] SUM= 05:TOTAL      864.00      .187 No_date 12:00      2.06  n/a

```

** END OF RUN : 5

RUN:COMMAND#

```

006:0001-----
START
[TZERO = .00 hrs on 0]
[METOUT= 2 (1=imperial, 2=metric output)]
[NSTORM= 1 ]
[NRUN = 6 ]
#*****
# Project Name: [Kanata North] Project Number: [112117]
# Date : 16-09-2015
# Modeller : [Kallie Auld]
# Company : NOVATECH ENGINEERING CONSULTANTS LTD
# License # : 5320763
#*****
006:0002-----
READ STORM
Filename = STORM.001
Comment =
[SDT=30.00:SDUR= 12.00:PTOT= 42.34]
006:0003-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     01:201      115.14      .041 No_date 12:10      5.71  .135
[CN= 65.0: N= 1.10]
[TP= 3.42:DT= 5.00]
006:0004-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:201      115.14      .041 No_date 12:10      5.71  n/a
[RD= 5.00] out<- 02:211      115.14      .041 No_date 12:50      5.71  n/a
[L/S/n= 558./ .890/.040]
[Vmax= .423:Dmax= .019]
006:0005-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     03:202      263.64      .095 No_date 13:05      8.36  .197
[CN= 70.0: N= 1.10]
[TP= 5.14:DT= 5.00]
006:0006-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          02:211      115.14      .041 No_date 12:50      5.71  n/a
                + 03:202      263.64      .095 No_date 13:05      8.36  n/a
[DT= 5.00] SUM= 01:200a      378.78      .136 No_date 12:55      7.55  n/a
006:0007-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:200a      378.78      .136 No_date 12:55      7.55  n/a
[RD= 5.00] out<- 02:212      378.78      .136 No_date 13:00      7.55  n/a
[L/S/n= 255./ .880/.035]
[Vmax= .597:Dmax= .226]
006:0008-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:212      378.78      .136 No_date 13:00      7.55  n/a
[RD= 5.00] out<- 01:213      378.78      .136 No_date 13:25      7.55  n/a
[L/S/n= 437./ .500/.035]
[Vmax= .318:Dmax= .076]
006:0009-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:203      46.74      .040 No_date 12:00      10.50  .248
[CN= 76.0: N= 1.10]
[TP= 2.52:DT= 5.00]
006:0010-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:213      378.78      .136 No_date 13:25      7.55  n/a
                + 02:203      46.74      .040 No_date 12:00      10.50  n/a
[DT= 5.00] SUM= 03:200b      425.52      .176 No_date 12:50      7.88  n/a
006:0011-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:200b      425.52      .176 No_date 12:50      7.88  n/a
[RD= 5.00] out<- 01:214      425.52      .176 No_date 13:10      7.88  n/a
[L/S/n= 543./ .520/.035]
[Vmax= .404:Dmax= .110]
006:0012-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:204      29.39      .041 No_date 12:00      10.50  .248
[CN= 76.0: N= 1.10]

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SWMHYMO OUTPUT FILE (Pre-Development, Event-based) – KN-PRE.sum

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[TP= 1.42:DT= 5.00]
006:0013-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:205      10.89      .135 No_date      6:50      12.23      .289
[CN= 78.0: N= 3.00]
[TP= .80:DT= 5.00]
006:0014-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           01:214      425.52      .176 No_date      13:10      7.88      n/a
+ 02:204          29.39      .041 No_date      12:00      10.50      n/a
+ 03:205          10.89      .135 No_date      6:50      12.23      n/a
[DT= 5.00] SUM= 10:200      465.80      .229 No_date      12:05      8.14      n/a
006:0015-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      01:301      86.43      .064 No_date      12:00      5.03      .119
[CN= 63.0: N= 1.10]
[TP= 1.24:DT= 5.00]
006:0016-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:302      80.69      .050 No_date      12:00      5.67      .134
[CN= 64.0: N= 1.10]
[TP= 1.80:DT= 5.00]
006:0017-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           01:301      86.43      .064 No_date      12:00      5.03      n/a
+ 02:302          80.69      .050 No_date      12:00      5.67      n/a
[DT= 5.00] SUM= 03:300a      167.12      .114 No_date      12:00      5.34      n/a
006:0018-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL    -> 03:300a      167.12      .114 No_date      12:00      5.34      n/a
[RD= 5.00] out<- 01:310      167.12      .114 No_date      12:05      5.34      n/a
[L/S/n= 449./1.620/.040]
[Vmax= .431:Dmax= .061]
006:0019-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:303      65.16      .069 No_date      12:00      7.58      .179
[CN= 69.0: N= 1.10]
[TP= 1.31:DT= 5.00]
006:0020-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           01:310      167.12      .114 No_date      12:05      5.34      n/a
+ 02:303          65.16      .069 No_date      12:00      7.58      n/a
[DT= 5.00] SUM= 03:300b      232.28      .183 No_date      12:00      5.97      n/a
006:0021-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL    -> 03:300b      232.28      .183 No_date      12:00      5.97      n/a
[RD= 5.00] out<- 01:312      232.28      .183 No_date      12:10      5.97      n/a
[L/S/n= 423./1.170/.035]
[Vmax= .440:Dmax= .062]
006:0022-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:304      18.78      .035 No_date      10:30      11.23      .265
[CN= 77.0: N= 1.10]
[TP= 1.04:DT= 5.00]
006:0023-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           01:312      232.28      .183 No_date      12:10      5.97      n/a
+ 02:304          18.78      .035 No_date      10:30      11.23      n/a
[DT= 5.00] SUM= 03:300c      251.06      .217 No_date      12:00      6.36      n/a
006:0024-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL    -> 03:300c      251.06      .217 No_date      12:00      6.36      n/a
[RD= 5.00] out<- 01:313      251.06      .217 No_date      12:05      6.36      n/a
[L/S/n= 219./1.280/.035]
[Vmax= .700:Dmax= .154]
006:0025-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:305      2.61      .013 No_date      6:45      9.96      .235
[CN= 72.0: N= 1.10]
[TP= .22:DT= 5.00]
006:0026-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           01:313      251.06      .217 No_date      12:05      6.36      n/a
+ 02:305          2.61      .013 No_date      6:45      9.96      n/a
[DT= 5.00] SUM= 09:300      253.67      .222 No_date      12:00      6.40      n/a
006:0027-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      01:401      16.78      .016 No_date      12:00      8.06      .190
[CN= 68.0: N= 1.10]
[TP= 1.66:DT= 5.00]
006:0028-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:402      10.89      .025 No_date      9:25      11.78      .278
[CN= 78.0: N= 1.10]
[TP= .85:DT= 5.00]
006:0029-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      03:403      2.37      .011 No_date      7:00      9.85      .233

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[CN= 70.0: N= 1.10]
[TP= .27:DT= 5.00]
006:0030-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           01:401      16.78      .016 No_date      12:00      8.06      n/a
+ 02:402          10.89      .025 No_date      9:25      11.78      n/a
+ 03:403          2.37      .011 No_date      7:00      9.85      n/a
[DT= 5.00] SUM= 08:400      30.04      .048 No_date      9:00      9.55      n/a
006:0031-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           08:400      30.04      .048 No_date      9:00      9.55      n/a
+ 09:300          253.67      .222 No_date      12:00      6.40      n/a
[DT= 5.00] SUM= 01:TRIB3      283.71      .267 No_date      11:35      6.73      n/a
006:0032-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           10:200      465.80      .229 No_date      12:05      8.14      n/a
+ 01:TRIB3          283.71      .267 No_date      11:35      6.73      n/a
[DT= 5.00] SUM= 07:CONFL      749.51      .495 No_date      12:00      7.61      n/a
006:0033-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      01:501      62.65      .144 No_date      9:00      9.30      .220
[CN= 74.0: N= 1.10]
[TP= .60:DT= 5.00]
006:0034-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:502      51.84      .076 No_date      9:30      7.04      .166
[CN= 68.0: N= 1.10]
[TP= .75:DT= 5.00]
006:0035-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           01:501      62.65      .144 No_date      9:00      9.30      n/a
+ 02:502          51.84      .076 No_date      9:30      7.04      n/a
[DT= 5.00] SUM= 06:500      114.49      .220 No_date      9:00      8.28      n/a
006:0036-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           07:CONFL      749.51      .495 No_date      12:00      7.61      n/a
+ 06:500          114.49      .220 No_date      9:00      8.28      n/a
[DT= 5.00] SUM= 05:TOTAL      864.00      .699 No_date      11:00      7.70      n/a
** END OF RUN : 6

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```

RUN:COMMAND#
007:0001-----
START
[ZERO = .00 hrs on 0]
[METOUT= 2 (1=imperial, 2=metric output)]
[NSTORM= 1 ]
[NRUN = 7 ]
*****
# Project Name: [Kanata North] Project Number: [112117]
# Date : 16-09-2015
# Modeller : [Kallie Auld]
# Company : NOVATECH ENGINEERING CONSULTANTS LTD
# License # : 5320763
*****
007:0002-----
READ STORM
Filename = STORM.001
Comment =
[SDT=30.00:SDUR= 12.00:PTOT= 56.18]
007:0003-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      01:201      115.14      .080 No_date      12:05      11.05      .197
[CN= 65.0: N= 1.10]
[TP= 3.42:DT= 5.00]
007:0004-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL    -> 01:201      115.14      .080 No_date      12:05      11.05      n/a
[RD= 5.00] out<- 02:211      115.14      .080 No_date      12:45      11.05      n/a
[L/S/n= 558./ .890/.040]
[Vmax= .423:Dmax= .037]
007:0005-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      03:202      263.64      .170 No_date      13:00      14.94      .266
[CN= 70.0: N= 1.10]

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SWMHYMO OUTPUT FILE (Pre-Development, Event-based) – KN-PRE.sum

```

[TP= 5.14:DT= 5.00]
007:0006-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          02:211          115.14          .080 No_date 12:45 11.05 n/a
+ 03:202          263.64          .170 No_date 13:00 14.94 n/a
[DT= 5.00] SUM= 01:200a          378.78          .249 No_date 12:50 13.75 n/a
007:0007-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:200a          378.78          .249 No_date 12:50 13.75 n/a
[RD= 5.00] out<- 02:212          378.78          .249 No_date 12:55 13.75 n/a
[L/S/n= 255./ .880/.035]
{Vmax= .672:Dmax= .279}
007:0008-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:212          378.78          .249 No_date 12:55 13.75 n/a
[RD= 5.00] out<- 01:213          378.78          .249 No_date 13:20 13.75 n/a
[L/S/n= 437./ .500/.035]
{Vmax= .392:Dmax= .107}
007:0009-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:203          46.74          .071 No_date 12:00 18.32 .326
[CN= 76.0: N= 1.10]
[TP= 2.52:DT= 5.00]
007:0010-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:213          378.78          .249 No_date 13:20 13.75 n/a
+ 02:203          46.74          .071 No_date 12:00 18.32 n/a
[DT= 5.00] SUM= 03:200b          425.52          .319 No_date 12:50 14.26 n/a
007:0011-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:200b          425.52          .319 No_date 12:50 14.26 n/a
[RD= 5.00] out<- 01:214          425.52          .319 No_date 13:05 14.26 n/a
[L/S/n= 543./ .520/.035]
{Vmax= .514:Dmax= .157}
007:0012-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:204          29.39          .071 No_date 11:15 18.32 .326
[CN= 76.0: N= 1.10]
[TP= 1.42:DT= 5.00]
007:0013-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     03:205          10.89          .235 No_date 6:50 20.67 .368
[CN= 78.0: N= 3.00]
[TP= .80:DT= 5.00]
007:0014-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:214          425.52          .319 No_date 13:05 14.26 n/a
+ 02:204          29.39          .071 No_date 11:15 18.32 n/a
+ 03:205          10.89          .235 No_date 6:50 20.67 n/a
[DT= 5.00] SUM= 10:200          465.80          .417 No_date 7:20 14.66 n/a
007:0015-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     01:301          86.43          .126 No_date 11:50 9.97 .178
[CN= 63.0: N= 1.10]
[TP= 1.24:DT= 5.00]
007:0016-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:302          80.69          .096 No_date 12:00 10.90 .194
[CN= 64.0: N= 1.10]
[TP= 1.80:DT= 5.00]
007:0017-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:301          86.43          .126 No_date 11:50 9.97 n/a
+ 02:302          80.69          .096 No_date 12:00 10.90 n/a
[DT= 5.00] SUM= 03:300a          167.12          .222 No_date 12:00 10.42 n/a
007:0018-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300a          167.12          .222 No_date 12:00 10.42 n/a
[RD= 5.00] out<- 01:310          167.12          .222 No_date 12:00 10.42 n/a
[L/S/n= 449./ .620/.040]
{Vmax= .491:Dmax= .084}
007:0019-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:303          65.16          .126 No_date 11:05 13.85 .247
[CN= 69.0: N= 1.10]
[TP= 1.31:DT= 5.00]
007:0020-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:310          167.12          .222 No_date 12:00 10.42 n/a
+ 02:303          65.16          .126 No_date 11:05 13.85 n/a
[DT= 5.00] SUM= 03:300b          232.28          .348 No_date 12:00 11.38 n/a
007:0021-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300b          232.28          .348 No_date 12:00 11.38 n/a
[RD= 5.00] out<- 01:312          232.28          .348 No_date 12:00 11.38 n/a
[L/S/n= 423./ .170/.035]
{Vmax= .535:Dmax= .089}

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007:0022-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:304          18.78          .060 No_date 10:30 19.34 .344
[CN= 77.0: N= 1.10]
[TP= 1.04:DT= 5.00]
007:0023-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:312          232.28          .348 No_date 12:00 11.38 n/a
+ 02:304          18.78          .060 No_date 10:30 19.34 n/a
[DT= 5.00] SUM= 03:300c          251.06          .406 No_date 12:00 11.98 n/a
007:0024-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300c          251.06          .406 No_date 12:00 11.98 n/a
[RD= 5.00] out<- 01:313          251.06          .406 No_date 12:00 11.98 n/a
[L/S/n= 219./ .1280/.035]
{Vmax= .809:Dmax= .227}
007:0025-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:305          2.61          .024 No_date 6:35 17.13 .305
[CN= 72.0: N= 1.10]
[TP= .22:DT= 5.00]
007:0026-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:313          251.06          .406 No_date 12:00 11.98 n/a
+ 02:305          2.61          .024 No_date 6:35 17.13 n/a
[DT= 5.00] SUM= 09:300          253.67          .416 No_date 11:15 12.03 n/a
007:0027-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     01:401          16.78          .028 No_date 12:00 14.34 .255
[CN= 68.0: N= 1.10]
[TP= 1.66:DT= 5.00]
007:0028-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:402          10.89          .043 No_date 9:00 20.15 .359
[CN= 78.0: N= 1.10]
[TP= .85:DT= 5.00]
007:0029-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     03:403          2.37          .018 No_date 7:00 16.74 .298
[CN= 70.0: N= 1.10]
[TP= .27:DT= 5.00]
007:0030-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:401          16.78          .028 No_date 12:00 14.34 n/a
+ 02:402          10.89          .043 No_date 9:00 20.15 n/a
+ 03:403          2.37          .018 No_date 7:00 16.74 n/a
[DT= 5.00] SUM= 08:400          30.04          .083 No_date 9:00 16.63 n/a
007:0031-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          08:400          30.04          .083 No_date 9:00 16.63 n/a
+ 09:300          253.67          .416 No_date 11:15 12.03 n/a
[DT= 5.00] SUM= 01:TRIB3          283.71          .494 No_date 11:10 12.52 n/a
007:0032-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          10:200          465.80          .417 No_date 7:20 14.66 n/a
+ 01:TRIB3          283.71          .494 No_date 11:10 12.52 n/a
[DT= 5.00] SUM= 07:CONFL          749.51          .900 No_date 12:00 13.85 n/a
007:0033-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     01:501          62.65          .259 No_date 9:00 16.60 .296
[CN= 74.0: N= 1.10]
[TP= .60:DT= 5.00]
007:0034-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:502          51.84          .143 No_date 9:00 13.06 .233
[CN= 68.0: N= 1.10]
[TP= .75:DT= 5.00]
007:0035-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:501          62.65          .259 No_date 9:00 16.60 n/a
+ 02:502          51.84          .143 No_date 9:00 13.06 n/a
[DT= 5.00] SUM= 06:500          114.49          .402 No_date 9:00 15.00 n/a
007:0036-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          07:CONFL          749.51          .900 No_date 12:00 13.85 n/a
+ 06:500          114.49          .402 No_date 9:00 15.00 n/a
[DT= 5.00] SUM= 05:TOTAL          864.00          1.272 No_date 10:40 14.00 n/a
** END OF RUN : 7

```

RUN: COMMAND#

SWMHYMO OUTPUT FILE (Pre-Development, Event-based) – KN-PRE.sum

```

008:0001-----
START
[TZERO = .00 hrs on 0]
[METOUT= 2 (1=imperial, 2=metric output)]
[NSTORM= 1]
[NRUN = 8]
*****
# Project Name: [Kanata North] Project Number: [112117]
# Date : 16-09-2015
# Modeller : [Kallie Auld]
# Company : NOVATECH ENGINEERING CONSULTANTS LTD
# License # : 5320763
*****
008:0002-----
READ STORM
Filename = STORM.001
Comment =
[SDT=10.00:SDUR= 12.00:PTOT= 93.91]
008:0003-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:201 115.14 .224 No_date 12:00 31.04 .331
[CN= 65.0: N= 1.10]
[TP= 3.42:DT= 5.00]
008:0004-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:201 115.14 .224 No_date 12:00 31.04 n/a
[RD= 5.00] out<- 02:211 115.14 .224 No_date 12:35 31.04 n/a
[L/S/n= 558./ .890/.040]
[Vmax= .432:Dmax= .094]
008:0005-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:202 263.64 .433 No_date 12:50 38.10 .406
[CN= 70.0: N= 1.10]
[TP= 5.14:DT= 5.00]
008:0006-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 02:211 115.14 .224 No_date 12:35 31.04 n/a
+ 03:202 263.64 .433 No_date 12:50 38.10 n/a
[DT= 5.00] SUM= 01:200a 378.78 .656 No_date 12:40 35.95 n/a
008:0007-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:200a 378.78 .656 No_date 12:40 35.95 n/a
[RD= 5.00] out<- 02:212 378.78 .656 No_date 12:45 35.95 n/a
[L/S/n= 255./ .880/.035]
[Vmax= .821:Dmax= .400]
008:0008-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:212 378.78 .656 No_date 12:45 35.95 n/a
[RD= 5.00] out<- 01:213 378.78 .656 No_date 13:00 35.95 n/a
[L/S/n= 437./ .500/.035]
[Vmax= .530:Dmax= .182]
008:0009-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:203 46.74 .172 No_date 12:00 44.73 .476
[CN= 76.0: N= 1.10]
[TP= 2.52:DT= 5.00]
008:0010-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:213 378.78 .656 No_date 13:00 35.95 n/a
+ 02:203 46.74 .172 No_date 12:00 44.73 n/a
[DT= 5.00] SUM= 03:200b 425.52 .826 No_date 12:40 36.92 n/a
008:0011-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:200b 425.52 .826 No_date 12:40 36.92 n/a
[RD= 5.00] out<- 01:214 425.52 .825 No_date 12:50 36.92 n/a
[L/S/n= 543./ .520/.035]
[Vmax= .703:Dmax= .268]
008:0012-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:204 29.39 .172 No_date 10:40 44.73 .476
[CN= 76.0: N= 1.10]
[TP= 1.42:DT= 5.00]
008:0013-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:205 10.89 .567 No_date 6:45 48.43 .516
[CN= 78.0: N= 3.00]
[TP= .80:DT= 5.00]
008:0014-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:214 425.52 .825 No_date 12:50 36.92 n/a
+ 02:204 29.39 .172 No_date 10:40 44.73 n/a
+ 03:205 10.89 .567 No_date 6:45 48.43 n/a

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[DT= 5.00] SUM= 10:200 465.80 1.129 No_date 7:10 37.68 n/a
008:0015-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:301 86.43 .363 No_date 10:40 28.86 .307
[CN= 63.0: N= 1.10]
[TP= 1.24:DT= 5.00]
008:0016-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:302 80.69 .268 No_date 12:00 30.50 .325
[CN= 64.0: N= 1.10]
[TP= 1.80:DT= 5.00]
008:0017-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:301 86.43 .363 No_date 10:40 28.86 n/a
+ 02:302 80.69 .268 No_date 12:00 30.50 n/a
[DT= 5.00] SUM= 03:300a 167.12 .629 No_date 11:20 29.65 n/a
008:0018-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300a 167.12 .629 No_date 11:20 29.65 n/a
[RD= 5.00] out<- 01:310 167.12 .629 No_date 11:30 29.65 n/a
[L/S/n= 449./ 1.620/.040]
[Vmax= .705:Dmax= .149]
008:0019-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:303 65.16 .330 No_date 10:35 36.29 .386
[CN= 69.0: N= 1.10]
[TP= 1.31:DT= 5.00]
008:0020-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:310 167.12 .629 No_date 11:30 29.65 n/a
+ 02:303 65.16 .330 No_date 10:35 36.29 n/a
[DT= 5.00] SUM= 03:300b 232.28 .958 No_date 11:05 31.51 n/a
008:0021-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300b 232.28 .958 No_date 11:05 31.51 n/a
[RD= 5.00] out<- 01:312 232.28 .958 No_date 11:15 31.51 n/a
[L/S/n= 423./ 1.170/.035]
[Vmax= .802:Dmax= .164]
008:0022-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:304 18.78 .146 No_date 9:20 46.40 .494
[CN= 77.0: N= 1.10]
[TP= 1.04:DT= 5.00]
008:0023-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:312 232.28 .958 No_date 11:15 31.51 n/a
+ 02:304 18.78 .146 No_date 9:20 46.40 n/a
[DT= 5.00] SUM= 03:300c 251.06 1.101 No_date 10:45 32.63 n/a
008:0024-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300c 251.06 1.101 No_date 10:45 32.63 n/a
[RD= 5.00] out<- 01:313 251.06 1.101 No_date 10:50 32.63 n/a
[L/S/n= 219./ 1.280/.035]
[Vmax= .961:Dmax= .344]
008:0025-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:305 2.61 .060 No_date 6:30 41.68 .444
[CN= 72.0: N= 1.10]
[TP= .22:DT= 5.00]
008:0026-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:313 251.06 1.101 No_date 10:50 32.63 n/a
+ 02:305 2.61 .060 No_date 6:30 41.68 n/a
[DT= 5.00] SUM= 09:300 253.67 1.126 No_date 10:50 32.72 n/a
008:0027-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:401 16.78 .071 No_date 12:00 36.59 .390
[CN= 68.0: N= 1.10]
[TP= 1.66:DT= 5.00]
008:0028-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:402 10.89 .102 No_date 9:00 47.79 .509
[CN= 78.0: N= 1.10]
[TP= .85:DT= 5.00]
008:0029-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:403 2.37 .045 No_date 6:45 40.46 .431
[CN= 70.0: N= 1.10]
[TP= .27:DT= 5.00]
008:0030-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:401 16.78 .071 No_date 12:00 36.59 n/a
+ 02:402 10.89 .102 No_date 9:00 47.79 n/a
+ 03:403 2.37 .045 No_date 6:45 40.46 n/a
[DT= 5.00] SUM= 08:400 30.04 .204 No_date 9:00 40.95 n/a
008:0031-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 08:400 30.04 .204 No_date 9:00 40.95 n/a

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SWMHYMO OUTPUT FILE (Pre-Development, Event-based) – KN-PRE.sum

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+ 09:300      253.67  1.126 No_date  10:50  32.72  n/a
[DT= 5.00] SUM= 01:TRIB3      283.71  1.319 No_date  10:45  33.59  n/a
008:0032-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      10:200      465.80  1.129 No_date  7:10  37.68  n/a
+ 01:TRIB3      283.71  1.319 No_date  10:45  33.59  n/a
[DT= 5.00] SUM= 07:CONFL      749.51  2.345 No_date  11:10  36.13  n/a
008:0033-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:501      62.65  .665 No_date  8:00  41.76  .445
[CN= 74.0: N= 1.10]
[TP= .60:DT= 5.00]
008:0034-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:502      51.84  .387 No_date  9:00  34.87  .371
[CN= 68.0: N= 1.10]
[TP= .75:DT= 5.00]
008:0035-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:501      62.65  .665 No_date  8:00  41.76  n/a
+ 02:502      51.84  .387 No_date  9:00  34.87  n/a
[DT= 5.00] SUM= 06:500      114.49  1.045 No_date  8:20  38.64  n/a
008:0036-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      07:CONFL      749.51  2.345 No_date  11:10  36.13  n/a
+ 06:500      114.49  1.045 No_date  8:20  38.64  n/a
[DT= 5.00] SUM= 05:TOTAL      864.00  3.343 No_date  9:15  36.46  n/a
** END OF RUN : 8

```

RUN:COMMAND#

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009:0001-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
START
[TZERO = .00 hrs on 0]
[METOUT= 2 (1=imperial, 2=metric output)]
[NSTORM= 1 ]
[NRUN = 9 ]
*****
# Project Name: [Kanata North] Project Number: [112117]
# Date : 16-09-2015
# Modeller : [Kallie Auld]
# Company : NOVATECH ENGINEERING CONSULTANTS LTD
# License # : 5320763
*****
009:0002-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
READ STORM
Filename = STORM.001
Comment =
[SDT=60.00:SDUR= 24.00:PTOT= 25.05]
009:0003-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:201      115.14  .008 No_date  24:00  1.24  .049
[CN= 65.0: N= 1.10]
[TP= 3.42:DT= 5.00]
009:0004-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:201      115.14  .008 No_date  24:00  1.24  n/a
[RD= 5.00] out<- 02:211      115.14  .008 No_date  24:25  1.24  n/a
[L/S/n= 558./ .890/.040]
[Vmax= .423:Dmax= .004]
009:0005-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:202      263.64  .026 No_date  24:00  2.39  .095
[CN= 70.0: N= 1.10]
[TP= 5.14:DT= 5.00]
009:0006-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      02:211      115.14  .008 No_date  24:25  1.24  n/a
+ 03:202      263.64  .026 No_date  24:00  2.39  n/a
[DT= 5.00] SUM= 01:200a      378.78  .035 No_date  24:15  2.04  n/a
009:0007-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:200a      378.78  .035 No_date  24:15  2.04  n/a
[RD= 5.00] out<- 02:212      378.78  .035 No_date  24:25  2.04  n/a
[L/S/n= 255./ .880/.035]

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{Vmax= .395:Dmax= .127}
009:0008-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:212      378.78  .035 No_date  24:25  2.04  n/a
[RD= 5.00] out<- 01:213      378.78  .035 No_date  25:05  2.04  n/a
[L/S/n= 437./ .500/.035]
[Vmax= .198:Dmax= .034]
009:0009-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:203      46.74  .011 No_date  24:00  3.12  .124
[CN= 76.0: N= 1.10]
[TP= 2.52:DT= 5.00]
009:0010-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:213      378.78  .035 No_date  25:05  2.04  n/a
+ 02:203      46.74  .011 No_date  24:00  3.12  n/a
[DT= 5.00] SUM= 03:200b      425.52  .045 No_date  24:35  2.16  n/a
009:0011-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:200b      425.52  .045 No_date  24:35  2.16  n/a
[RD= 5.00] out<- 01:214      425.52  .045 No_date  25:10  2.16  n/a
[L/S/n= 543./ .520/.035]
[Vmax= .320:Dmax= .043]
009:0012-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:204      29.39  .010 No_date  21:00  3.12  .124
[CN= 76.0: N= 1.10]
[TP= 1.42:DT= 5.00]
009:0013-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:205      10.89  .031 No_date  12:45  4.00  .160
[CN= 78.0: N= 3.00]
[TP= .80:DT= 5.00]
009:0014-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:214      425.52  .045 No_date  25:10  2.16  n/a
+ 02:204      29.39  .010 No_date  21:00  3.12  n/a
+ 03:205      10.89  .031 No_date  12:45  4.00  n/a
[DT= 5.00] SUM= 10:200      465.80  .057 No_date  24:05  2.26  n/a
009:0015-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:301      86.43  .010 No_date  22:00  1.00  .040
[CN= 63.0: N= 1.10]
[TP= 1.24:DT= 5.00]
009:0016-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:302      80.69  .010 No_date  24:00  1.28  .051
[CN= 64.0: N= 1.10]
[TP= 1.80:DT= 5.00]
009:0017-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:301      86.43  .010 No_date  22:00  1.00  n/a
+ 02:302      80.69  .010 No_date  24:00  1.28  n/a
[DT= 5.00] SUM= 03:300a      167.12  .020 No_date  22:50  1.13  n/a
009:0018-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300a      167.12  .020 No_date  22:50  1.13  n/a
[RD= 5.00] out<- 01:310      167.12  .020 No_date  23:15  1.13  n/a
[L/S/n= 449./ .1620/.040]
[Vmax= .430:Dmax= .011]
009:0019-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:303      65.16  .015 No_date  21:00  2.00  .080
[CN= 69.0: N= 1.10]
[TP= 1.31:DT= 5.00]
009:0020-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:310      167.12  .020 No_date  23:15  1.13  n/a
+ 02:303      65.16  .015 No_date  21:00  2.00  n/a
[DT= 5.00] SUM= 03:300b      232.28  .035 No_date  22:00  1.38  n/a
009:0021-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300b      232.28  .035 No_date  22:00  1.38  n/a
[RD= 5.00] out<- 01:312      232.28  .035 No_date  22:10  1.38  n/a
[L/S/n= 423./ .1170/.035]
[Vmax= .421:Dmax= .014]
009:0022-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:304      18.78  .009 No_date  18:00  3.47  .138
[CN= 77.0: N= 1.10]
[TP= 1.04:DT= 5.00]
009:0023-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:312      232.28  .035 No_date  22:10  1.38  n/a
+ 02:304      18.78  .009 No_date  18:00  3.47  n/a
[DT= 5.00] SUM= 03:300c      251.06  .043 No_date  21:40  1.53  n/a
009:0024-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-

```

SWMHYMO OUTPUT FILE (Pre-Development, Event-based) – KN-PRE.sum

```

ROUTE CHANNEL -> 03:300c      251.06      .043 No_date  21:40  1.53  n/a
[RD= 5.00] out<- 01:313      251.06      .043 No_date  21:45  1.53  n/a
[L/S/n= 219./1.280/.035]
[Vmax= .645:Dmax= .042]
009:0025-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:305      2.61      .003 No_date  13:00  3.20  .128
[CN= 72.0: N= 1.10]
[TP= .22:DT= 5.00]
009:0026-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:313      251.06      .043 No_date  21:45  1.53  n/a
+ 02:305          2.61      .003 No_date  13:00  3.20  n/a
[DT= 5.00] SUM= 09:300      253.67      .044 No_date  21:35  1.55  n/a
009:0027-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      01:401      16.78      .004 No_date  21:00  2.37  .095
[CN= 68.0: N= 1.10]
[TP= 1.66:DT= 5.00]
009:0028-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:402      10.89      .006 No_date  16:15  3.70  .148
[CN= 78.0: N= 1.10]
[TP= .85:DT= 5.00]
009:0029-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      03:403      2.37      .003 No_date  13:00  3.32  .133
[CN= 70.0: N= 1.10]
[TP= .27:DT= 5.00]
009:0030-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:401      16.78      .004 No_date  21:00  2.37  n/a
+ 02:402          10.89      .006 No_date  16:15  3.70  n/a
+ 03:403          2.37      .003 No_date  13:00  3.32  n/a
[DT= 5.00] SUM= 08:400      30.04      .012 No_date  16:00  2.93  n/a
009:0031-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          08:400      30.04      .012 No_date  16:00  2.93  n/a
+ 09:300          253.67      .044 No_date  21:35  1.55  n/a
[DT= 5.00] SUM= 01:TRIB3      283.71      .054 No_date  19:00  1.70  n/a
009:0032-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          10:200      465.80      .057 No_date  24:05  2.26  n/a
+ 01:TRIB3          283.71      .054 No_date  19:00  1.70  n/a
[DT= 5.00] SUM= 07:CONFL      749.51      .110 No_date  21:55  2.05  n/a
009:0033-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      01:501      62.65      .030 No_date  16:00  2.59  .103
[CN= 74.0: N= 1.10]
[TP= .60:DT= 5.00]
009:0034-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:502      51.84      .015 No_date  18:00  1.77  .071
[CN= 68.0: N= 1.10]
[TP= .75:DT= 5.00]
009:0035-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:501      62.65      .030 No_date  16:00  2.59  n/a
+ 02:502          51.84      .015 No_date  18:00  1.77  n/a
[DT= 5.00] SUM= 06:500      114.49      .045 No_date  16:00  2.22  n/a
009:0036-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          07:CONFL      749.51      .110 No_date  21:55  2.05  n/a
+ 06:500          114.49      .045 No_date  16:00  2.22  n/a
[DT= 5.00] SUM= 05:TOTAL      864.00      .149 No_date  18:30  2.07  n/a
** END OF RUN : 9

```

RUN:COMMAND#

```

010:0001-----
START
[TZERO = .00 hrs on 0]
[METOUT= 2 (1=imperial, 2=metric output)]
[NSTORM= 1]
[NRUN = 10]

```

```

# Project Name: [Kanata North] Project Number: [112117]
# Date : 16-09-2015

```

```

# Modeller : [Kallie Auld]
# Company : NOVATECH ENGINEERING CONSULTANTS LTD
# License # : 5320763
#*****
010:0002-----
READ STORM
Filename = STORM.001
Comment =
[SDT=60.00:SDUR= 24.00:PTOT= 48.02]
010:0003-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      01:201      115.14      .052 No_date  24:00  7.73  .161
[CN= 65.0: N= 1.10]
[TP= 3.42:DT= 5.00]
010:0004-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:201      115.14      .052 No_date  24:00  7.73  n/a
[RD= 5.00] out<- 02:211      115.14      .052 No_date  24:15  7.73  n/a
[L/S/n= 558./ .890/.040]
[Vmax= .423:Dmax= .024]
010:0005-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      03:202      263.64      .120 No_date  24:00  10.90  .227
[CN= 70.0: N= 1.10]
[TP= 5.14:DT= 5.00]
010:0006-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          02:211      115.14      .052 No_date  24:15  7.73  n/a
+ 03:202          263.64      .120 No_date  24:00  10.90  n/a
[DT= 5.00] SUM= 01:200a      378.78      .172 No_date  24:05  9.94  n/a
010:0007-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:200a      378.78      .172 No_date  24:05  9.94  n/a
[RD= 5.00] out<- 02:212      378.78      .172 No_date  24:10  9.94  n/a
[L/S/n= 255./ .880/.035]
[Vmax= .622:Dmax= .244]
010:0008-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:212      378.78      .172 No_date  24:10  9.94  n/a
[RD= 5.00] out<- 01:213      378.78      .172 No_date  24:25  9.94  n/a
[L/S/n= 437./ .500/.035]
[Vmax= .345:Dmax= .087]
010:0009-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:203      46.74      .046 No_date  22:00  13.54  .282
[CN= 76.0: N= 1.10]
[TP= 2.52:DT= 5.00]
010:0010-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:213      378.78      .172 No_date  24:25  9.94  n/a
+ 02:203          46.74      .046 No_date  22:00  13.54  n/a
[DT= 5.00] SUM= 03:200b      425.52      .217 No_date  24:05  10.33  n/a
010:0011-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:200b      425.52      .217 No_date  24:05  10.33  n/a
[RD= 5.00] out<- 01:214      425.52      .218 No_date  24:10  10.33  n/a
[L/S/n= 543./ .520/.035]
[Vmax= .451:Dmax= .127]
010:0012-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:204      29.39      .044 No_date  18:00  13.54  .282
[CN= 76.0: N= 1.10]
[TP= 1.42:DT= 5.00]
010:0013-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      03:205      10.89      .134 No_date  12:35  15.53  .324
[CN= 78.0: N= 3.00]
[TP= .80:DT= 5.00]
010:0014-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:214      425.52      .218 No_date  24:10  10.33  n/a
+ 02:204          29.39      .044 No_date  18:00  13.54  n/a
+ 03:205          10.89      .134 No_date  12:35  15.53  n/a
[DT= 5.00] SUM= 10:200      465.80      .266 No_date  24:05  10.66  n/a
010:0015-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      01:301      86.43      .072 No_date  18:00  6.90  .144
[CN= 63.0: N= 1.10]
[TP= 1.24:DT= 5.00]
010:0016-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:302      80.69      .058 No_date  21:00  7.66  .159
[CN= 64.0: N= 1.10]
[TP= 1.80:DT= 5.00]

```


SWMHYMO OUTPUT FILE (Pre-Development, Event-based) – KN-PRE.sum

```

010:0017-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:301      86.43      .072 No_date  18:00    6.90  n/a
                + 02:302      80.69      .058 No_date  21:00    7.66  n/a
[DT= 5.00] SUM= 03:300a      167.12      .128 No_date  19:00    7.27  n/a
010:0018-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300a      167.12      .128 No_date  19:00    7.27  n/a
[RD= 5.00] out<- 01:310      167.12      .128 No_date  19:05    7.27  n/a
[L/S/n= 449./1.620/.040]
[Vmax= .438:Dmax= .064]
010:0019-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:303      65.16      .076 No_date  18:00    9.99 .208
[CN= 69.0: N= 1.10]
[TP= 1.31:DT= 5.00]
010:0020-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:310      167.12      .128 No_date  19:05    7.27  n/a
                + 02:303      65.16      .076 No_date  18:00    9.99  n/a
[DT= 5.00] SUM= 03:300b      232.28      .204 No_date  18:30    8.03  n/a
010:0021-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300b      232.28      .204 No_date  18:30    8.03  n/a
[RD= 5.00] out<- 01:312      232.28      .204 No_date  18:50    8.03  n/a
[L/S/n= 423./1.170/.035]
[Vmax= .450:Dmax= .065]
010:0022-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:304      18.78      .038 No_date  16:00   14.40 .300
[CN= 77.0: N= 1.10]
[TP= 1.04:DT= 5.00]
010:0023-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:312      232.28      .204 No_date  18:50    8.03  n/a
                + 02:304      18.78      .038 No_date  16:00   14.40  n/a
[DT= 5.00] SUM= 03:300c      251.06      .241 No_date  18:30    8.50  n/a
010:0024-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300c      251.06      .241 No_date  18:30    8.50  n/a
[RD= 5.00] out<- 01:313      251.06      .240 No_date  18:35    8.50  n/a
[L/S/n= 219./1.280/.035]
[Vmax= .714:Dmax= .164]
010:0025-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:305      2.61      .014 No_date  13:00   12.74 .265
[CN= 72.0: N= 1.10]
[TP= .22:DT= 5.00]
010:0026-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:313      251.06      .240 No_date  18:35    8.50  n/a
                + 02:305      2.61      .014 No_date  13:00   12.74  n/a
[DT= 5.00] SUM= 09:300      253.67      .245 No_date  18:30    8.55  n/a
010:0027-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     01:401      16.78      .017 No_date  18:50   10.48 .218
[CN= 68.0: N= 1.10]
[TP= 1.66:DT= 5.00]
010:0028-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:402      10.89      .026 No_date  15:10   15.05 .314
[CN= 78.0: N= 1.10]
[TP= .85:DT= 5.00]
010:0029-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     03:403      2.37      .011 No_date  13:00   12.53 .261
[CN= 70.0: N= 1.10]
[TP= .27:DT= 5.00]
010:0030-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:401      16.78      .017 No_date  18:50   10.48  n/a
                + 02:402      10.89      .026 No_date  15:10   15.05  n/a
                + 03:403      2.37      .011 No_date  13:00   12.53  n/a
[DT= 5.00] SUM= 08:400      30.04      .051 No_date  14:15   12.30  n/a
010:0031-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          08:400      30.04      .051 No_date  14:15   12.30  n/a
                + 09:300      253.67      .245 No_date  18:30    8.55  n/a
[DT= 5.00] SUM= 01:TRIB3      283.71      .293 No_date  18:05    8.95  n/a
010:0032-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          10:200      465.80      .266 No_date  24:05   10.66  n/a
                + 01:TRIB3      283.71      .293 No_date  18:05    8.95  n/a
[DT= 5.00] SUM= 07:CONFL      749.51      .549 No_date  18:35   10.01  n/a
010:0033-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     01:501      62.65      .156 No_date  14:00   12.13 .253
[CN= 74.0: N= 1.10]

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[TP= .60:DT= 5.00]
010:0034-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:502      51.84      .083 No_date  15:20    9.35 .195
[CN= 68.0: N= 1.10]
[TP= .75:DT= 5.00]
010:0035-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:501      62.65      .156 No_date  14:00   12.13  n/a
                + 02:502      51.84      .083 No_date  15:20    9.35  n/a
[DT= 5.00] SUM= 06:500      114.49      .237 No_date  14:25   10.87  n/a
010:0036-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          07:CONFL      749.51      .549 No_date  18:35   10.01  n/a
                + 06:500      114.49      .237 No_date  14:25   10.87  n/a
[DT= 5.00] SUM= 05:TOTAL      864.00      .762 No_date  18:00   10.12  n/a
** END OF RUN : 10

```

```

RUN:COMMAND#
011:0001-----
START
[TZERO = .00 hrs on 0]
[METOUT= 2 (1=imperial, 2=metric output)]
[NSTORM= 1 ]
[NRUN = 11 ]
*****
# Project Name: [Kanata North] Project Number: [112117]
# Date : 16-09-2015
# Modeller : [Kallie Auld]
# Company : NOVATECH ENGINEERING CONSULTANTS LTD
# License # : 5320763
*****
011:0002-----
READ STORM
Filename = STORM.001
Comment =
[SDT=60.00:SDUR= 24.00:PTOT= 61.92]
011:0003-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     01:201      115.14      .091 No_date  24:00   13.63 .220
[CN= 65.0: N= 1.10]
[TP= 3.42:DT= 5.00]
011:0004-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:201      115.14      .091 No_date  24:00   13.63  n/a
[RD= 5.00] out<- 02:211      115.14      .091 No_date  24:10   13.63  n/a
[L/S/n= 558./ .890/.040]
[Vmax= .423:Dmax= .042]
011:0005-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     03:202      263.64      .198 No_date  24:00   18.03 .291
[CN= 70.0: N= 1.10]
[TP= 5.14:DT= 5.00]
011:0006-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          02:211      115.14      .091 No_date  24:10   13.63  n/a
                + 03:202      263.64      .198 No_date  24:00   18.03  n/a
[DT= 5.00] SUM= 01:200a      378.78      .289 No_date  24:00   16.69  n/a
011:0007-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:200a      378.78      .289 No_date  24:00   16.69  n/a
[RD= 5.00] out<- 02:212      378.78      .289 No_date  24:10   16.69  n/a
[L/S/n= 255./ .880/.035]
[Vmax= .701:Dmax= .298]
011:0008-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:212      378.78      .289 No_date  24:10   16.69  n/a
[RD= 5.00] out<- 01:213      378.78      .289 No_date  24:25   16.69  n/a
[L/S/n= 437./ .500/.035]
[Vmax= .411:Dmax= .116]
011:0009-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:203      46.74      .075 No_date  21:15   21.93 .354
[CN= 76.0: N= 1.10]

```

SWMHYMO OUTPUT FILE (Pre-Development, Event-based) – KN-PRE.sum

```
[Tp= 2.52:DT= 5.00]
011:0010-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:213          378.78          .289 No_date  24:25  16.69  n/a
                + 02:203          46.74          .075 No_date  21:15  21.93  n/a
[DT= 5.00] SUM= 03:200b          425.52          .363 No_date  24:10  17.27  n/a
011:0011-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL   -> 03:200b          425.52          .363 No_date  24:10  17.27  n/a
[RD= 5.00] out<- 01:214          425.52          .363 No_date  24:20  17.27  n/a
[L/S/n= 543./ .520/.035]
{Vmax= .534:Dmax= .169}
011:0012-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:204          29.39          .072 No_date  18:00  21.93 .354
[CN= 76.0: N= 1.10]
[Tp= 1.42:DT= 5.00]
011:0013-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     03:205          10.89          .216 No_date  12:35  24.51 .396
[CN= 78.0: N= 3.00]
[Tp= .80:DT= 5.00]
011:0014-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:214          425.52          .363 No_date  24:20  17.27  n/a
                + 02:204          29.39          .072 No_date  18:00  21.93  n/a
                + 03:205          10.89          .216 No_date  12:35  24.51  n/a
[DT= 5.00] SUM= 10:200          465.80          .441 No_date  21:30  17.73  n/a
011:0015-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     01:301          86.43          .130 No_date  18:00  12.39 .200
[CN= 63.0: N= 1.10]
[Tp= 1.24:DT= 5.00]
011:0016-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:302          80.69          .101 No_date  21:00  13.42 .217
[CN= 64.0: N= 1.10]
[Tp= 1.80:DT= 5.00]
011:0017-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:301          86.43          .130 No_date  18:00  12.39  n/a
                + 02:302          80.69          .101 No_date  21:00  13.42  n/a
[DT= 5.00] SUM= 03:300a          167.12          .230 No_date  18:05  12.89  n/a
011:0018-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL   -> 03:300a          167.12          .230 No_date  18:05  12.89  n/a
[RD= 5.00] out<- 01:310          167.12          .230 No_date  18:30  12.89  n/a
[L/S/n= 449./1.620/.040]
{Vmax= .496:Dmax= .086}
011:0019-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:303          65.16          .129 No_date  18:00  16.82 .272
[CN= 69.0: N= 1.10]
[Tp= 1.31:DT= 5.00]
011:0020-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:310          167.12          .230 No_date  18:30  12.89  n/a
                + 02:303          65.16          .129 No_date  18:00  16.82  n/a
[DT= 5.00] SUM= 03:300b          232.28          .358 No_date  18:10  13.99  n/a
011:0021-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL   -> 03:300b          232.28          .358 No_date  18:10  13.99  n/a
[RD= 5.00] out<- 01:312          232.28          .358 No_date  18:25  13.99  n/a
[L/S/n= 423./1.170/.035]
{Vmax= .543:Dmax= .091}
011:0022-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:304          18.78          .061 No_date  16:00  23.06 .372
[CN= 77.0: N= 1.10]
[Tp= 1.04:DT= 5.00]
011:0023-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:312          232.28          .358 No_date  18:25  13.99  n/a
                + 02:304          18.78          .061 No_date  16:00  23.06  n/a
[DT= 5.00] SUM= 03:300c          251.06          .418 No_date  18:10  14.67  n/a
011:0024-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL   -> 03:300c          251.06          .418 No_date  18:10  14.67  n/a
[RD= 5.00] out<- 01:313          251.06          .418 No_date  18:15  14.67  n/a
[L/S/n= 219./1.280/.035]
{Vmax= .811:Dmax= .229}
011:0025-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:305          2.61          .023 No_date  13:00  20.45 .330
[CN= 72.0: N= 1.10]
[Tp= .22:DT= 5.00]
011:0026-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
```

```
ADD HYD          01:313          251.06          .418 No_date  18:15  14.67  n/a
                + 02:305          2.61          .023 No_date  13:00  20.45  n/a
[DT= 5.00] SUM= 09:300          253.67          .426 No_date  18:10  14.73  n/a
011:0027-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     01:401          16.78          .029 No_date  18:15  17.29 .279
[CN= 68.0: N= 1.10]
[Tp= 1.66:DT= 5.00]
011:0028-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:402          10.89          .043 No_date  15:00  23.97 .387
[CN= 78.0: N= 1.10]
[Tp= .85:DT= 5.00]
011:0029-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     03:403          2.37          .018 No_date  13:00  19.94 .322
[CN= 70.0: N= 1.10]
[Tp= .70:DT= 5.00]
011:0030-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:401          16.78          .029 No_date  18:15  17.29  n/a
                + 02:402          10.89          .043 No_date  15:00  23.97  n/a
                + 03:403          2.37          .018 No_date  13:00  19.94  n/a
[DT= 5.00] SUM= 08:400          30.04          .084 No_date  14:00  19.92  n/a
011:0031-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          08:400          30.04          .084 No_date  14:00  19.92  n/a
                + 09:300          253.67          .426 No_date  18:10  14.73  n/a
[DT= 5.00] SUM= 01:TRIB3          283.71          .503 No_date  18:00  15.28  n/a
011:0032-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          10:200          465.80          .441 No_date  21:30  17.73  n/a
                + 01:TRIB3          283.71          .503 No_date  18:00  15.28  n/a
[DT= 5.00] SUM= 07:CONFL          749.51          .929 No_date  18:20  16.80  n/a
011:0033-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     01:501          62.65          .264 No_date  14:00  20.00 .323
[CN= 74.0: N= 1.10]
[Tp= .60:DT= 5.00]
011:0034-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:502          51.84          .144 No_date  15:00  15.93 .257
[CN= 68.0: N= 1.10]
[Tp= .75:DT= 5.00]
011:0035-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:501          62.65          .264 No_date  14:00  20.00  n/a
                + 02:502          51.84          .144 No_date  15:00  15.93  n/a
[DT= 5.00] SUM= 06:500          114.49          .407 No_date  14:05  18.16  n/a
011:0036-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          07:CONFL          749.51          .929 No_date  18:20  16.80  n/a
                + 06:500          114.49          .407 No_date  14:05  18.16  n/a
[DT= 5.00] SUM= 05:TOTAL          864.00          1.289 No_date  16:15  16.98  n/a
** END OF RUN : 11
```

RUN:COMMAND#

```
012:0001-----
START
[TZERO = .00 hrs on 0]
[METOUT= 2 (1=imperial, 2=metric output)]
[NSTORM= 1]
[NRUN = 12]
# *****
# Project Name: [Kanata North] Project Number: [112117]
# Date : 16-09-2015
# Modeller : [Kallie Auld]
# Company : NOVATECH ENGINEERING CONSULTANTS LTD
# License # : 5320763
# *****
012:0002-----
READ STORM
Filename = STORM.001
Comment =
```

SWMHYMO OUTPUT FILE (Pre-Development, Event-based) – KN-PRE.sum

```
[SDT=60.00:SDUR= 24.00:PTOT= 105.74]
012:0003-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:201 115.14 .257 No_date 24:00 38.51 .364
[CN= 65.0: N= 1.10]
[TP= 3.42:DT= 5.00]
012:0004-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:201 115.14 .257 No_date 24:00 38.51 n/a
[RD= 5.00] out<- 02:211 115.14 .257 No_date 24:05 38.51 n/a
[L/S/n= 558./ .890/.040]
{Vmax= .442:Dmax= .101}
012:0005-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:202 263.64 .510 No_date 24:00 46.46 .439
[CN= 70.0: N= 1.10]
[TP= 5.14:DT= 5.00]
012:0006-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 02:211 115.14 .257 No_date 24:05 38.51 n/a
+ 03:202 263.64 .510 No_date 24:00 46.46 n/a
[DT= 5.00] SUM= 01:200a 378.78 .766 No_date 24:00 44.04 n/a
012:0007-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:200a 378.78 .766 No_date 24:00 44.04 n/a
[RD= 5.00] out<- 02:212 378.78 .766 No_date 24:05 44.04 n/a
[L/S/n= 255./ .880/.035]
{Vmax= .846:Dmax= .421}
012:0008-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:212 378.78 .766 No_date 24:05 44.04 n/a
[RD= 5.00] out<- 01:213 378.78 .766 No_date 24:10 44.04 n/a
[L/S/n= 437./ .500/.035]
{Vmax= .557:Dmax= .198}
012:0009-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:203 46.74 .184 No_date 21:00 54.00 .511
[CN= 76.0: N= 1.10]
[TP= 2.52:DT= 5.00]
012:0010-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:213 378.78 .766 No_date 24:10 44.04 n/a
+ 02:203 46.74 .184 No_date 21:00 54.00 n/a
[DT= 5.00] SUM= 03:200b 425.52 .946 No_date 24:10 45.14 n/a
012:0011-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:200b 425.52 .946 No_date 24:10 45.14 n/a
[RD= 5.00] out<- 01:214 425.52 .946 No_date 24:10 45.14 n/a
[L/S/n= 543./ .520/.035]
{Vmax= .729:Dmax= .287}
012:0012-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:204 29.39 .180 No_date 17:50 54.00 .511
[CN= 76.0: N= 1.10]
[TP= 1.42:DT= 5.00]
012:0013-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:205 10.89 .532 No_date 12:30 58.05 .549
[CN= 78.0: N= 3.00]
[TP= .80:DT= 5.00]
012:0014-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:214 425.52 .946 No_date 24:10 45.14 n/a
+ 02:204 29.39 .180 No_date 17:50 54.00 n/a
+ 03:205 10.89 .532 No_date 12:30 58.05 n/a
[DT= 5.00] SUM= 10:200 465.80 1.144 No_date 13:05 46.00 n/a
012:0015-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:301 86.43 .383 No_date 18:00 35.99 .340
[CN= 63.0: N= 1.10]
[TP= 1.24:DT= 5.00]
012:0016-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:302 80.69 .287 No_date 18:25 37.84 .358
[CN= 64.0: N= 1.10]
[TP= 1.80:DT= 5.00]
012:0017-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:301 86.43 .383 No_date 18:00 35.99 n/a
+ 02:302 80.69 .287 No_date 18:25 37.84 n/a
[DT= 5.00] SUM= 03:300a 167.12 .670 No_date 18:00 36.88 n/a
012:0018-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300a 167.12 .670 No_date 18:00 36.88 n/a
[RD= 5.00] out<- 01:310 167.12 .669 No_date 18:05 36.88 n/a
[L/S/n= 449./1.620/.040]
{Vmax= .720:Dmax= .154}
```

```
012:0019-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:303 65.16 .345 No_date 17:40 44.45 .420
[CN= 69.0: N= 1.10]
[TP= 1.31:DT= 5.00]
012:0020-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:310 167.12 .669 No_date 18:05 36.88 n/a
+ 02:303 65.16 .345 No_date 17:40 44.45 n/a
[DT= 5.00] SUM= 03:300b 232.28 1.014 No_date 18:00 39.01 n/a
012:0021-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300b 232.28 1.014 No_date 18:00 39.01 n/a
[RD= 5.00] out<- 01:312 232.28 1.014 No_date 18:05 39.01 n/a
[L/S/n= 423./1.170/.035]
{Vmax= .815:Dmax= .169}
012:0022-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:304 18.78 .151 No_date 15:15 55.84 .528
[CN= 77.0: N= 1.10]
[TP= 1.04:DT= 5.00]
012:0023-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:312 232.28 1.014 No_date 18:05 39.01 n/a
+ 02:304 18.78 .151 No_date 15:15 55.84 n/a
[DT= 5.00] SUM= 03:300c 251.06 1.159 No_date 18:00 40.26 n/a
012:0024-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300c 251.06 1.159 No_date 18:00 40.26 n/a
[RD= 5.00] out<- 01:313 251.06 1.159 No_date 18:00 40.26 n/a
[L/S/n= 219./1.280/.035]
{Vmax= .969:Dmax= .350}
012:0025-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:305 2.61 .059 No_date 13:00 50.41 .477
[CN= 72.0: N= 1.10]
[TP= .22:DT= 5.00]
012:0026-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:313 251.06 1.159 No_date 18:00 40.26 n/a
+ 02:305 2.61 .059 No_date 13:00 50.41 n/a
[DT= 5.00] SUM= 09:300 253.67 1.180 No_date 16:30 40.37 n/a
012:0027-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:401 16.78 .075 No_date 18:00 44.67 .422
[CN= 68.0: N= 1.10]
[TP= 1.66:DT= 5.00]
012:0028-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:402 10.89 .106 No_date 14:20 57.39 .543
[CN= 78.0: N= 1.10]
[TP= .85:DT= 5.00]
012:0029-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:403 2.37 .046 No_date 13:00 48.93 .463
[CN= 70.0: N= 1.10]
[TP= .27:DT= 5.00]
012:0030-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:401 16.78 .075 No_date 18:00 44.67 n/a
+ 02:402 10.89 .106 No_date 14:20 57.39 n/a
+ 03:403 2.37 .046 No_date 13:00 48.93 n/a
[DT= 5.00] SUM= 08:400 30.04 .214 No_date 14:00 49.61 n/a
012:0031-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 08:400 30.04 .214 No_date 14:00 49.61 n/a
+ 09:300 253.67 1.180 No_date 16:30 40.37 n/a
[DT= 5.00] SUM= 01:TRIB3 283.71 1.382 No_date 16:20 41.35 n/a
012:0032-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 10:200 465.80 1.144 No_date 13:05 46.00 n/a
+ 01:TRIB3 283.71 1.382 No_date 16:20 41.35 n/a
[DT= 5.00] SUM= 07:CONFL 749.51 2.481 No_date 18:15 44.24 n/a
012:0033-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:501 62.65 .698 No_date 14:00 50.70 .480
[CN= 74.0: N= 1.10]
[TP= .60:DT= 5.00]
012:0034-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:502 51.84 .404 No_date 14:10 42.86 .405
[CN= 68.0: N= 1.10]
[TP= .75:DT= 5.00]
012:0035-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:501 62.65 .698 No_date 14:00 50.70 n/a
+ 02:502 51.84 .404 No_date 14:10 42.86 n/a
[DT= 5.00] SUM= 06:500 114.49 1.102 No_date 14:00 47.15 n/a
```

SWMHYMO OUTPUT FILE (Pre-Development, Event-based) – KN-PRE.sum

```

012:0036-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
  ADD HYD          07:CONFL      749.51    2.481 No_date   18:15   44.24   n/a
    + 06:500        114.49    1.102 No_date   14:00   47.15   n/a
  [DT= 5.00] SUM=  05:TOTAL      864.00    3.507 No_date   14:00   44.62   n/a
012:0002-----
  FINISH
-----
*****
  WARNINGS / ERRORS / NOTES
-----
  Simulation ended on 2016-05-20    at 09:51:13
=====

```


Kanata North Community Design Plan
Post-Development SWMHYMO Model Parameters



Post-Development Parameters (STANDHYDs)

Drainage Area ID	Area (m2)	Area (ha)	Slope (%)	Runoff Coefficient	TIMP (%)	XIMP (%)
203a	273,150	27.32	2.3%	0.64	63%	50%
203b	207,574	20.76	2.3%	0.62	60%	48%
203c	49,457	4.95	2.3%	0.70	71%	57%
203d	12,565	1.26	2.3%	0.69	70%	56%
304a	96,118	9.61	1.6%	0.60	57%	46%
402a	56,768	5.68	2.1%	0.71	73%	58%
402b	60,670	6.07	2.1%	0.71	73%	58%
402c	11,860	1.19	2.1%	0.68	69%	55%
SWMF1	26,780	2.68	0.0%	0.76	80%	64%
SWMF2	18,531	1.85	0.0%	0.76	80%	64%
MR1	33,246	3.32	1.0%	0.90	100%	80%
MR2	30,444	3.04	1.0%	0.90	100%	80%
501a	93,236	9.32	2.3%	0.85	93%	74%
501b	384,172	38.42	2.3%	0.67	67%	54%
501c	391,019	39.10	2.3%	0.65	64%	51%
SWMF3	119,834	11.98	0.0%	0.76	80%	64%

*XIMP = 0.8 x TIMP

(Bransby-Williams Method)

Drainage Area ID	Area (m2)	Area (ha)	Area (km2)	Length of Channel (m)	Length of Channel (km)	Slope of Channel (m/m)	Tc (hours)
211	18,704	1.870	0.019	457	0.46	0.005	1.17
212	9,459	0.946	0.009	230	0.23	0.010	0.56
213	14,348	1.435	0.014	320	0.32	0.017	0.67
214	16,854	1.685	0.017	400	0.40	0.014	0.85
215	11,851	1.185	0.012	260	0.26	0.005	0.69
216	11,773	1.177	0.012	260	0.26	0.008	0.65
311	11,499	1.150	0.011	260	0.26	0.024	0.52
312	13,045	1.304	0.013	275	0.28	0.010	0.64
313	7,162	0.716	0.007	160	0.16	0.021	0.34
314	9,385	0.938	0.009	200	0.20	0.013	0.46
401	167,797	16.780	0.168	941	0.94	0.012	1.66
403a	26,583	2.66	0.027	150	0.15	0.027	0.27

Post-Development Parameters (NASHHYDs)

Area ID	Land Use 1	Area	CN	IA (mm)	Land Use 2	Area	CN	IA (mm)	Land Use 3	Area	CN	IA (mm)	Weighted CN	Weighted IA (mm)
211	Cultivated Row Crops (Straight/Contour) (good)	70%	80	7.0	Pasture (good)	25%	65	9.0	Open Space (good)	5%	68	8.0	76	7.6
212	Pasture (good)	75%	65	9.0	Open Space (good)	25%	68	8.0	-	-	-	-	66	8.8
213	Woods (good)	10%	63	12.5	Pasture (good)	50%	65	9.0	Open Space (good)	40%	68	8.0	66	9.0
214	Woods (good)	30%	63	12.5	Cultivated Row Crops (Straight/Contour) (good)	45%	80	7.0	Open Space (good)	25%	68	8.0	72	8.9
215	Woods (good)	60%	63	12.5	Cultivated Row Crops (Straight/Contour) (good)	10%	80	7.0	Open Space (good)	30%	68	8.0	66	10.6
216	Woods (good)	80%	63	12.5	Cultivated Row Crops (Straight/Contour) (good)	5%	80	7.0	Open Space (good)	15%	68	8.0	65	11.6
311	Woods (good)	15%	63	12.5	Pasture (good)	65%	65	9.0	Open Space (good)	20%	68	8.0	65	9.3
312	Woods (good)	5%	63	12.5	Cultivated Row Crops (Straight/Contour) (good)	70%	80	7.0	Open Space (good)	25%	68	8.0	76	7.5
313	Woods (good)	5%	63	12.5	Open Space (good)	95%	68	8.0	-	-	-	-	68	8.2
314	Woods (good)	5%	63	12.5	Open Space (good)	95%	68	8.0	-	-	-	-	68	8.2
401	Woods (good)	22%	63	12.5	Estate Residential	50%	70	4.0	Open Space (good)	28%	68	8.0	68	7.0
403a	Estate/ Rural Residential	90%	70	4.0	Open Space (fair)	10%	74	6.5	-	-	-	-	70	4.3

SCS Curve Numbers and Initial Abstraction Values

Landuse	Condition	CN (HSG 'B')	CN (HSG 'C')	AVG. CN (HSG 'B/C')	IA (mm)
Woods	Poor	66	77	67	7.0
	Fair	60	73	63	10.0
	Good	55	70	71	12.5
Estate Residential (2 acre avg. lot size)	12% Impervious	65	77	83	4.0
Open Space (lawns, parks, etc.)	Grass Cover < 50% (Poor)	79	86	74	5.0
	Grass Cover 50% to 75% (Fair)	69	79	68	6.5
	Grass Cover > 75% (Good)	61	74	72	8.0
Agriculture (pasture, grassland or range)	Poor	67	77	74	5.0
	Fair	69	79	65	7.0
	Good	58	72	85	9.0
Agriculture (Cultivated Row Crops - Straight)	Poor	81	88	82	5.0
	Good	78	85	82	7.0
Agriculture (Cultivated Row Crops - Contoured)	Poor	79	84	79	5.0
	Good	75	82	83	7.0
Agriculture (Cultivated Row Crops - Avg. Straight / Contoured)	Poor	80	86	80	5.0
	Good	77	84	#DIV/0!	7.0

Initial Abstraction

Cover Type	IA (mm)	Min IA (mm)	Max IA (mm)
Open Water	0	0	0
Road (Asphalt/Concrete)	2.5	1.25	3.75
Gravel/Fill/Quarry	5	-	-
Estate Lot Residential	4	2.5	4
Open/Grass/Natural	8	5	12.5
Field/Crop (Cultivated)	8	5	12.5
Wood/Brush	10	5	15.2

Runoff Coefficients

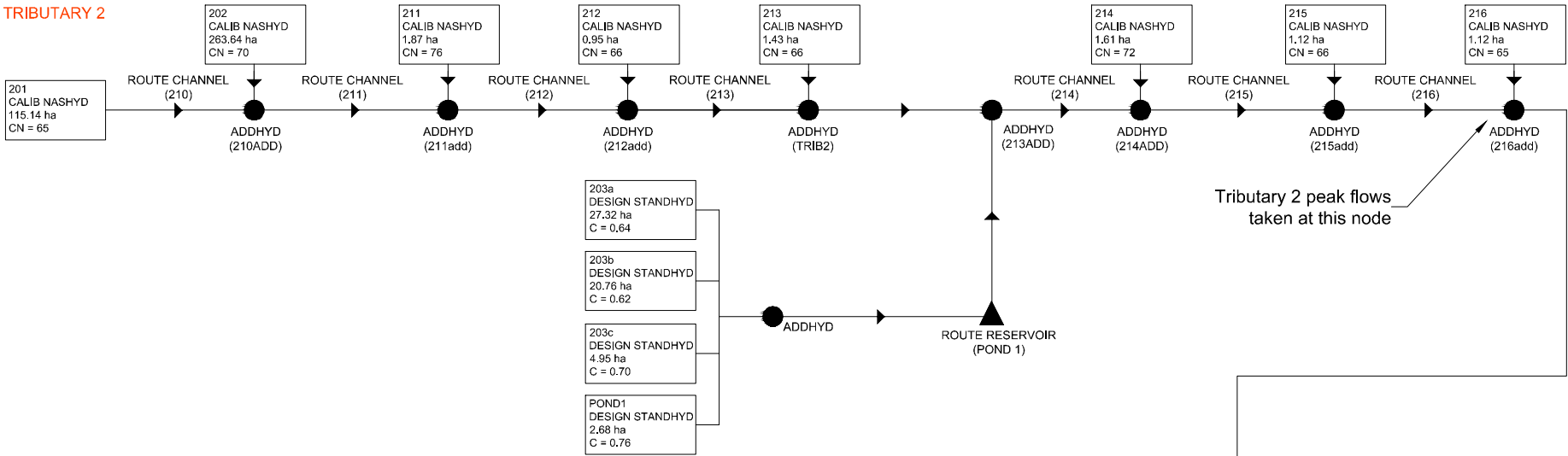
Land Use	Runoff Coeff.
Street-Oriented Residential	0.65
Multi-Unit Residential	0.70
School/ Church	0.65
Parks	0.40
Open Space	0.20
Mixed Use/ Commercial	0.85
Park and Ride	0.85
Arterial Roads/ Transitway	0.70
SWM Pond	0.76

Drainage Area	Receiving Pond	Land Use & Areas									Total Area (ha)	Weighted Runoff Coefficient	TIMP ¹	XIMP ²
		Low-density	Medium-density	School/ Church	Parks	Open Space	Commercial	Park & Ride / Fire	ROW	SWM POND				
203a	Pond 1	12.47	2.70	5.10		2.40	0.35	3.30	1.00		27.32	0.64	63%	51%
203b	Pond 1	18.56			2.20						20.76	0.62	61%	48%
203c	Pond 1		1.20	2.94			0.20		0.61		4.95	0.68	68%	54%
203d	Pond 3			1.06					0.20		1.26	0.66	65%	52%
304a	Pond 2		3.10		4.50		0.67		1.34		9.61	0.57	53%	42%
401	Pond 2	RURAL SUBDIVISION									16.78	CN = 68	-	-
402a	Pond 2	2.65	2.10						0.93		5.68	0.68	68%	54%
402b	On-site		3.33	2.00					0.74		6.07	0.68	69%	55%
402c	On-site	1.06							0.13		1.19	0.66	65%	52%
403a	-	RURAL AREA									2.66	CN = 70	-	-
SWMF1	N/A									2.68	2.68	0.76	80%	64%
SWMF2	N/A									1.85	1.85	0.76	80%	64%
MR1	Pond 3								3.32		3.32	0.70	71%	57%
MR2	Pond 3								3.04		3.04	0.70	71%	57%
501a	Pond 3						8.80		0.52		9.32	0.84	92%	73%
502	Pond 3	26.78	1.80	2.80	1.70		2.96		2.38		38.42	0.66	66%	53%
503	Pond 3	30.65	2.66	2.30	2.10				1.39		39.10	0.64	63%	50%
SWMF3	N/A									11.98	11.98	0.76	80%	64%

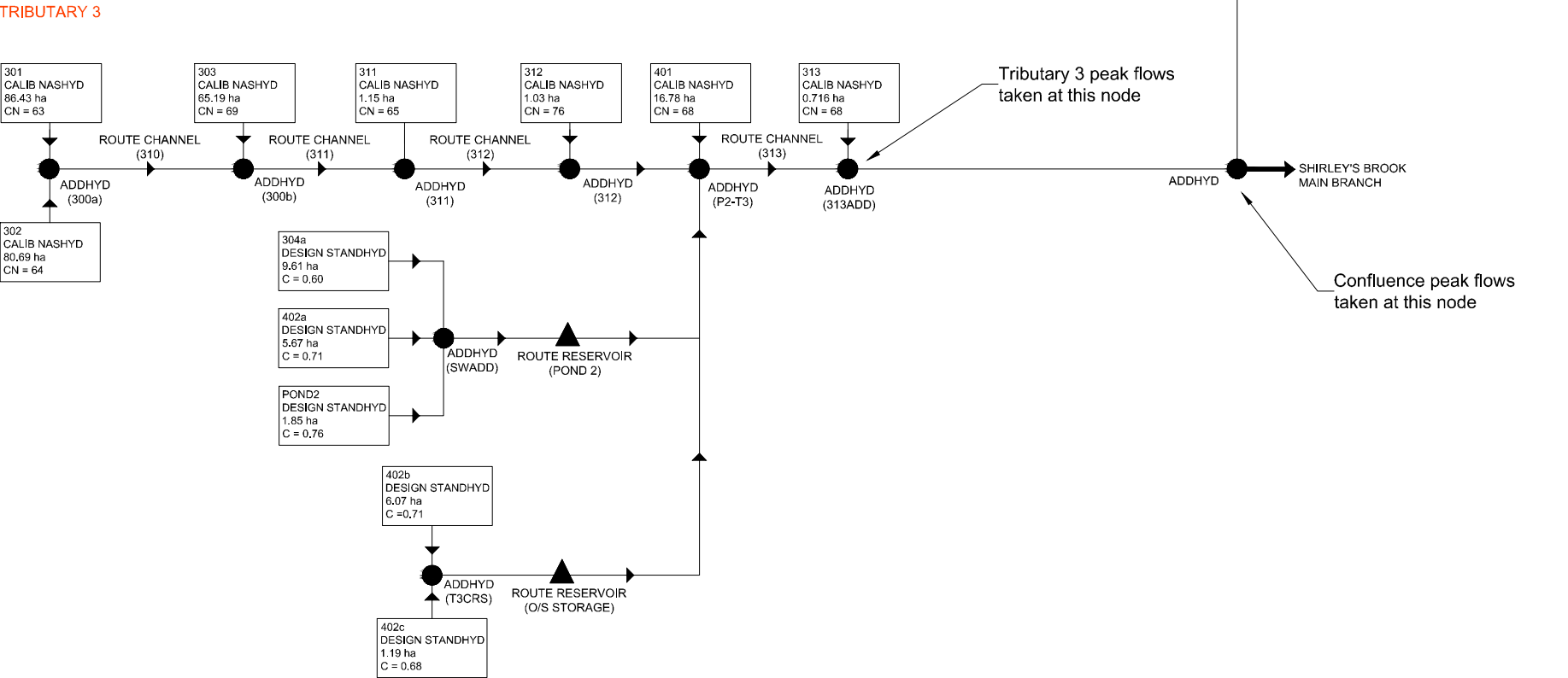
¹ TIMP = [(C-0.2)/0.7]

² XIMP = 0.8*TIMP

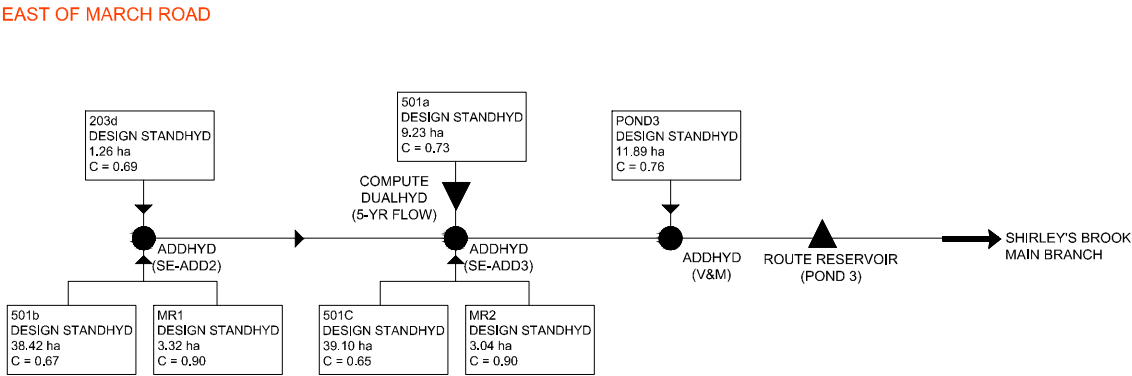
TRIBUTARY 2



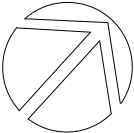
TRIBUTARY 3



EAST OF MARCH ROAD



KANATA NORTH
COMMUNITY DESIGN PLAN



DATE
MAY 2016

SCALE
NTS

JOB
112117

FIGURE NO. SWMHYMO-POST
SWMHYMO
POST-DEVELOPMENT
SCHEMATIC



Engineers, Planners & Landscape Architects

SWMHYMO INPUT FILE (Post-Development, Event-based) – KNPOST.dat

```

2      Metric units
*******
** Project Name: [Kanata North]      Project Number: [112117]
** Date       : 03-30-2016
** Modeller   : [Kallie Auld]
** Company    : NOVATECH ENGINEERING CONSULTANTS LTD
** License #  : 5320763
*******
*Shirleys Brook - Post-Development Model
*Model parameters based on original AECOM model
*See "20150911 - Shirley's Brook Modeling Parameters.xls"
*******
START      TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[1]
           C25mm-4.stm

*%-----|-----|
READ STORM  STORM_FILENAME=["STORM.001"]
*%-----|-----|
DEFAULT VALUES  ICASedef=[1], read and print values
                 DEFVAL_FILENAME=["OTTAWA.DEF"]
*%-----|-----|
*****
***** FLOW TO TRIBUTARY 2 *****
*****
**FLOW FROM UPSTREAM AREA/ THROUGH TRIBUTARY 2 UP TO MARCH ROAD**
*%-----|-----|
CALIB NASHYD  ID=[1], NHYD=["201"], DT=[5]min, AREA=[115.14](ha),
               DWF=[0](cms), CN/C=[65], IA=[11.4](mm),
               N=[1.1], TP=[3.42]hrs,
               END=-1
*%-----|-----|
ROUTE CHANNEL IDout=[2], NHYD=["210"], IDin=[1],
               RDT=[5](min),
               CHLGTH=[557.6](m), CHSLOPE=[0.89](%),
               FPSLOPE=[0.89](%),
               SECNUM=[2096], NSEG=[3]
               ( SEGROUGH, SEGDIST (m))=[0.35,30.79 -0.040,51.78 0.35,96.66] NSEG times
               ( DISTANCE (m), ELEVATION (m))=[ 0.00 , 87.99 ]
               [ 11.43 , 86.90 ]
               [ 30.79 , 86.74 ]
               [ 34.09 , 86.37 ]
               [ 35.26 , 86.12 ]
               [ 39.56 , 86.12 ]
               [ 45.35 , 86.52 ]
               [ 51.78 , 86.75 ]
               [ 63.33 , 86.96 ]
               [ 65.76 , 86.99 ]
               [ 76.04 , 87.55 ]
               [ 96.66 , 87.99 ]
*%-----|-----|
CALIB NASHYD  ID=[1], NHYD=["202"], DT=[5]min, AREA=[263.64](ha),
               DWF=[0](cms), CN/C=[70], IA=[7.7](mm),
               N=[1.1], TP=[5.14]hrs,
               END=-1
*%-----|-----|
ADD HYD      IDsum=[3], NHYD=["210add"], IDs to add=[1,2]
*%-----|-----|
ROUTE CHANNEL IDout=[1], NHYD=["211"], IDin=[3],
               RDT=[5](min),
               CHLGTH=[450](m), CHSLOPE=[1.0](%),
               FPSLOPE=[1.0](%),
               SECNUM=[1], NSEG=[3]
               ( SEGROUGH, SEGDIST (m))=[0.35,17.5 -0.1,22.5 0.35,40] NSEG times
               ( DISTANCE (m), ELEVATION (m))=[ 0.0 , 3.0 ]
               [ 17.0 , 1.0 ]
               [ 17.5 , 0.0 ]
               [ 22.5 , 0.0 ]
               [ 23.0 , 1.0 ]
               [ 40.0 , 3.0 ]
*%-----|-----|
CALIB NASHYD  ID=[2], NHYD=["211"], DT=[5]min, AREA=[1.87](ha),
               DWF=[0](cms), CN/C=[76], IA=[7.6](mm),

```

```

N=[1.1], TP=[1.17]hrs,
END=-1
*%-----|-----|
ADD HYD      IDsum=[3], NHYD=["211add"], IDs to add=[1,2]
*%-----|-----|
ROUTE CHANNEL IDout=[1], NHYD=["212"], IDin=[3],
               RDT=[5](min),
               CHLGTH=[230](m), CHSLOPE=[1.0](%),
               FPSLOPE=[1.0](%),
               SECNUM=[1], NSEG=[3]
               ( SEGROUGH, SEGDIST (m))=[0.35,17.5 -0.1,22.5 0.35,40] NSEG times
               ( DISTANCE (m), ELEVATION (m))=[ 0.0 , 3.0 ]
               [ 17.0 , 1.0 ]
               [ 17.5 , 0.0 ]
               [ 22.5 , 0.0 ]
               [ 23.0 , 1.0 ]
               [ 40.0 , 3.0 ]
*%-----|-----|
CALIB NASHYD  ID=[2], NHYD=["212"], DT=[5]min, AREA=[0.95](ha),
               DWF=[0](cms), CN/C=[66], IA=[8.8](mm),
               N=[1.1], TP=[0.56]hrs,
               END=-1
*%-----|-----|
ADD HYD      IDsum=[3], NHYD=["212add"], IDs to add=[1,2]
*%-----|-----|
ROUTE CHANNEL IDout=[1], NHYD=["213"], IDin=[3],
               RDT=[5](min),
               CHLGTH=[330](m), CHSLOPE=[1.0](%),
               FPSLOPE=[1.0](%),
               SECNUM=[1], NSEG=[3]
               ( SEGROUGH, SEGDIST (m))=[0.35,17.5 -0.1,22.5 0.35,40] NSEG times
               ( DISTANCE (m), ELEVATION (m))=[ 0.0 , 3.0 ]
               [ 17.0 , 1.0 ]
               [ 17.5 , 0.0 ]
               [ 22.5 , 0.0 ]
               [ 23.0 , 1.0 ]
               [ 40.0 , 3.0 ]
*%-----|-----|
CALIB NASHYD  ID=[2], NHYD=["213"], DT=[5]min, AREA=[1.43](ha),
               DWF=[0](cms), CN/C=[66], IA=[9.0](mm),
               N=[1.1], TP=[0.67]hrs,
               END=-1
*%-----|-----|
*****Flow from upstream area in Trib 2 up to March Road*****
*****
ADD HYD      IDsum=[9], NHYD=["TRIB2"], IDs to add=[1,2]
*%-----|-----|
***** FLOW FROM DEVELOPMENT AREA TO POND 1 *****
*****
*%-----|-----|
DESIGN STANDHYD ID=[1], NHYD=["203a"], DT=[5]min, AREA=[27.32](ha),
                 XIMP=[0.50], TIMP=[0.63], DWF=[0](cms), LOSS=[1],
                 SLOPE=[2.3](%), END=-1
*%-----|-----|
DESIGN STANDHYD ID=[2], NHYD=["203b"], DT=[5]min, AREA=[20.76](ha),
                 XIMP=[0.48], TIMP=[0.60], DWF=[0](cms), LOSS=[1],
                 SLOPE=[2.3](%), END=-1
*%-----|-----|
DESIGN STANDHYD ID=[3], NHYD=["203c"], DT=[5]min, AREA=[4.95](ha),
                 XIMP=[0.57], TIMP=[0.71], DWF=[0](cms), LOSS=[1],
                 SLOPE=[2.3](%), END=-1
*%-----|-----|
DESIGN STANDHYD ID=[4], NHYD=["POND1"], DT=[5]min, AREA=[2.68](ha),
                 XIMP=[0.64], TIMP=[0.80], DWF=[0](cms), LOSS=[1],
                 SLOPE=[0.1](%), END=-1
*%-----|-----|
**Flow to cross under Tributary 2
ADD HYD      IDsum=[5], NHYD=["T2CRS"], IDs to add=[2,3]
*%-----|-----|

```


SWMHYMO INPUT FILE (Post-Development, Event-based) – KNPOST.dat

```

*Total flow to Pond 1
ADD HYD IDsum=[6], NHYD=["P1FLOW"], IDs to add=[1,4,5]
*%-----|-----|
*****
***POND 1 SIZING***
*****
ROUTE RESERVOIR IDout=[1], NHYD=["POND1"], IDin=[6],
RDT=[5](min),
TABLE of ( OUTFLOW-STORAGE ) values
(cms) - (ha-m)
[ 0.000 , 0.000 ]
[ 0.036 , 0.728 ]
[ 0.089 , 1.182 ]
[ 0.177 , 1.678 ]
[ 0.346 , 3.115 ]
[ -1 , -1 ] (max twenty pts)
IDovf=[2], NHYDovf=["P1-OVF"]
*****
*%-----|-----|
*****
**TOTAL FLOW IN TRIB 2 AT MARCH ROAD**
*****
ADD HYD IDsum=[2], NHYD=["213ADD"], IDs to add=[1,9]
*%-----|-----|
ROUTE CHANNEL IDout=[1], NHYD=["214"], IDin=[2],
RDT=[5](min),
CHLGTH=[390](m), CHSLOPE=[1.7](%),
FPSLOPE=[1.7](%),
N=[1.1], TP=[0.17]hrs,
END=-1
SECNUM=[5],
( SEGROUGH, SEGDIST (m))=[0.35,17.5 -0.1,22.5 0.35,40] NSEG times
( DISTANCE (m), ELEVATION (m))=[ 0.0 , 3.0 ]
[ 17.0 , 1.0 ]
[ 17.5 , 0.0 ]
[ 22.5 , 0.0 ]
[ 23.0 , 1.0 ]
[ 40.0 , 3.0 ]
*%-----|-----|
CALIB NASHYD ID=[3], NHYD=["214"], DT=[5]min, AREA=[1.61](ha),
DWF=[0](cms), CN/C=[72], IA=[8.9](mm),
N=[1.1], TP=[0.17]hrs,
END=-1
*%-----|-----|
ADD HYD IDsum=[2], NHYD=["214ADD"], IDs to add=[1,3]
*%-----|-----|
ROUTE CHANNEL IDout=[1], NHYD=["215"], IDin=[2],
RDT=[5](min),
CHLGTH=[260](m), CHSLOPE=[1.4](%),
FPSLOPE=[1.4](%),
N=[1.1], TP=[0.17]hrs,
END=-1
SECNUM=[6],
( SEGROUGH, SEGDIST (m))=[0.35,17.5 -0.1,22.5 0.35,40] NSEG times
( DISTANCE (m), ELEVATION (m))=[ 0.0 , 3.0 ]
[ 17.0 , 1.0 ]
[ 17.5 , 0.0 ]
[ 22.5 , 0.0 ]
[ 23.0 , 1.0 ]
[ 40.0 , 3.0 ]
*%-----|-----|
CALIB NASHYD ID=[2], NHYD=["TRB215"], DT=[5]min, AREA=[1.12](ha),
DWF=[0](cms), CN/C=[66], IA=[10.6](mm),
N=[1.1], TP=[0.17]hrs,
END=-1
*%-----|-----|
ADD HYD IDsum=[3], NHYD=["215ADD"], IDs to add=[1,2]
*%-----|-----|
ROUTE CHANNEL IDout=[1], NHYD=["216"], IDin=[3],
RDT=[5](min),
CHLGTH=[250](m), CHSLOPE=[0.5](%),
FPSLOPE=[0.5](%),
N=[1.1], TP=[0.17]hrs,
END=-1
SECNUM=[7],
( SEGROUGH, SEGDIST (m))=[0.35,17.5 -0.1,22.5 0.35,40] NSEG times
( DISTANCE (m), ELEVATION (m))=[ 0.0 , 3.0 ]

```

```

[ 17.0 , 1.0 ]
[ 17.5 , 0.0 ]
[ 22.5 , 0.0 ]
[ 23.0 , 1.0 ]
[ 40.0 , 3.0 ]
*%-----|-----|
CALIB NASHYD ID=[2], NHYD=["TRB216"], DT=[5]min, AREA=[1.12](ha),
DWF=[0](cms), CN/C=[65], IA=[11.6](mm),
N=[1.1], TP=[0.17]hrs,
END=-1
*%-----|-----|
*****
**FLOW IN TRIB 2 UPSTREAM OF CONFLUENCE**
*****
ADD HYD IDsum=[10], NHYD=["T2-US"], IDs to add=[1,2]
*%-----|-----|
*PRINT HYD ID=[10], # OF PCYCLES=[3]
*%-----|-----|
*
*
*****
*****PEAK FLOW TO TRIBUTARY 3*****
*****
**FLOW FROM UPSTREAM AREA/ THROUGH TRIBUTARY 3 UP TO MARCH ROAD**
*%-----|-----|
CALIB NASHYD ID=[1], NHYD=["301"], DT=[5]min, AREA=[86.43](ha),
DWF=[0](cms), CN/C=[63], IA=[12.3](mm),
N=[1.1], TP=[1.24]hrs,
END=-1
*%-----|-----|
CALIB NASHYD ID=[2], NHYD=["302"], DT=[5]min, AREA=[80.69](ha),
DWF=[0](cms), CN/C=[64], IA=[10.9](mm),
N=[1.1], TP=[1.80]hrs,
END=-1
*%-----|-----|
ADD HYD IDsum=[3], NHYD=["300a"], IDs to add=[1,2]
*%-----|-----|
ROUTE CHANNEL IDout=[1], NHYD=["310"], IDin=[3],
RDT=[5](min),
CHLGTH=[448.8](m), CHSLOPE=[1.62](%),
FPSLOPE=[1.62](%),
N=[1.1], TP=[0.17]hrs,
END=-1
SECNUM=[4122],
( SEGROUGH, SEGDIST (m))=[0.35,36.85 -0.04,57.43 0.35,98.10] NSEG times
( DISTANCE (m), ELEVATION (m))=[ 0 , 85.97 ]
[ 29.14 , 86.03 ]
[ 35.73 , 85.88 ]
[ 36.85 , 85.69 ]
[ 39.63 , 85.47 ]
[ 43.19 , 85.31 ]
[ 47.24 , 84.78 ]
[ 50.54 , 84.78 ]
[ 54.28 , 84.94 ]
[ 57.43 , 85.70 ]
[ 65.07 , 85.80 ]
[ 67.25 , 85.80 ]
[ 70.81 , 85.80 ]
[ 98.10 , 86.10 ]
*%-----|-----|
CALIB NASHYD ID=[2], NHYD=["303"], DT=[5]min, AREA=[65.19](ha),
DWF=[0](cms), CN/C=[69], IA=[8.9](mm),
N=[1.1], TP=[1.31]hrs,
END=-1
*%-----|-----|
ADD HYD IDsum=[3], NHYD=["300b"], IDs to add=[1,2]
*%-----|-----|
ROUTE CHANNEL IDout=[1], NHYD=["311"], IDin=[3],
RDT=[5](min),
CHLGTH=[270](m), CHSLOPE=[1.17](%),
FPSLOPE=[1.17](%),
N=[1.1], TP=[0.17]hrs,
END=-1
SECNUM=[3673],
( SEGROUGH, SEGDIST (m))=[0.35,17.5 -0.1,22.5 0.35,40] NSEG times
( DISTANCE (m), ELEVATION (m))=[ 0.0 , 3.0 ]

```

SWMHYMO INPUT FILE (Post-Development, Event-based) – KNPOST.dat

```

( SEGROUGH, SEGDIST (m))=[0.35,17.5 -0.1,22.5 0.35,40] NSEG times
( DISTANCE (m), ELEVATION (m))=[ 0.0 , 3.0 ]
[ 17.0 , 1.0 ]
[ 17.5 , 0.0 ]
[ 22.5 , 0.0 ]
[ 23.0 , 1.0 ]
[ 40.0 , 3.0 ]
**-----|-----|
CALIB NASHYD ID=[2], NHYD=["TRB311"], DT=[5]min, AREA=[1.15](ha),
DWF=[0](cms), CN/C=[65], IA=[9.3](mm),
N=[1.1], TP=[0.52]hrs,
END=-1
**-----|-----|
ADD HYD IDsum=[3], NHYD=["311ADD"], IDs to add=[1,2]
**-----|-----|
ROUTE CHANNEL IDout=[1], NHYD=["312"], IDin=[3],
RDT=[5](min),
CHLGTH=[270](m), CHSLOPE=[1.17](%),
FPSLOPE=[1.17](%),
SECNUM=[3673], NSEG=[3]
( SEGROUGH, SEGDIST (m))=[0.35,17.5 -0.1,22.5 0.35,40] NSEG times
( DISTANCE (m), ELEVATION (m))=[ 0.0 , 3.0 ]
[ 17.0 , 1.0 ]
[ 17.5 , 0.0 ]
[ 22.5 , 0.0 ]
[ 23.0 , 1.0 ]
[ 40.0 , 3.0 ]
**-----|-----|
CALIB NASHYD ID=[2], NHYD=["TRB312"], DT=[5]min, AREA=[1.304](ha),
DWF=[0](cms), CN/C=[76], IA=[7.5](mm),
N=[1.1], TP=[0.64]hrs,
END=-1
**-----|-----|
ADD HYD IDsum=[9], NHYD=["312ADD"], IDs to add=[1,2]
**-----|-----|
*****
**FLOW FROM DEVELOPMENT AREA TO POND 2**
*****
**-----|-----|
DESIGN STANDHYD ID=[1], NHYD=["304a"], DT=[5]min, AREA=[9.61](ha),
XIMP=[0.46], TIMP=[0.57], DWF=[0](cms), LOSS=[1],
SLOPE=[1.6](%), END=-1
**-----|-----|
DESIGN STANDHYD ID=[2], NHYD=["402a"], DT=[5]min, AREA=[5.67](ha),
XIMP=[0.58], TIMP=[0.73], DWF=[0](cms), LOSS=[1],
SLOPE=[2.1](%), END=-1
**-----|-----|
DESIGN STANDHYD ID=[3], NHYD=["POND2"], DT=[5]min, AREA=[1.85](ha),
XIMP=[0.64], TIMP=[0.80], DWF=[0](cms), LOSS=[1],
SLOPE=[0.1](%), END=-1
**-----|-----|
*****
*****FLOW TO POND 2*****
*****
**-----|-----|
ADD HYD IDsum=[4], NHYD=["P2FLOW"], IDs to add=[1,2,3]
**-----|-----|
*****
***SIZING FOR POND 2***
*****
ROUTE RESERVOIR IDout=[1], NHYD=["POND2"], IDin=[4],
RDT=[5](min),
TABLE of ( OUTFLOW-STORAGE ) values
(cms) - (ha-m)
[ 0.000 , 0.000 ]
[ 0.003 , 0.240 ]
[ 0.016 , 0.398 ]
[ 0.031 , 0.560 ]
[ 0.084 , 1.003 ]
[ -1 , -1 ] (max twenty pts)
IDovf=[2], NHYDovf=["P2OVF"]
**-----|-----|
*****

```

```

**FLOW FROM DEVELOPMENT AREA TO ON SITE STORAGE**
*****
**-----|-----|
DESIGN STANDHYD ID=[2], NHYD=["402b"], DT=[5]min, AREA=[6.07](ha),
XIMP=[0.58], TIMP=[0.73], DWF=[0](cms), LOSS=[1],
SLOPE=[2.1](%), END=-1
**-----|-----|
DESIGN STANDHYD ID=[3], NHYD=["402c"], DT=[5]min, AREA=[1.19](ha),
XIMP=[0.55], TIMP=[0.68], DWF=[0](cms), LOSS=[1],
SLOPE=[2.1](%), END=-1
**-----|-----|
**On-site storage for SouthWest area**
ADD HYD IDsum=[4], NHYD=["400-OS"], IDs to add=[2,3]
**-----|-----|
*****
**On-Site Storage Required**
*****
ROUTE RESERVOIR IDout=[2], NHYD=["OSSTOR"], IDin=[4],
RDT=[5](min),
TABLE of ( OUTFLOW-STORAGE ) values
(cms) - (ha-m)
[ 0.000 , 0.000 ]
[ 0.800 , 0.005 ]
[ 0.816 , 0.200 ]
[ -1 , -1 ] (max twenty pts)
IDovf=[3], NHYDovf=["OSOVF"]
**-----|-----|
*****
**FLOW FROM UPSTREAM AREA - MB CIRCLE**
*****
**-----|-----|
CALIB NASHYD ID=[3], NHYD=["401"], DT=[5]min, AREA=[16.78](ha),
DWF=[0](cms), CN/C=[68], IA=[7.0](mm),
N=[3.0], TP=[1.66]hrs,
END=-1
**-----|-----|
*****
**TOTAL FLOW IN TRIB 3 AT MARCH ROAD**
*****
ADD HYD IDsum=[4], NHYD=["P2-T3"], IDs to add=[1,2,3,9]
**-----|-----|
ROUTE CHANNEL IDout=[1], NHYD=["313"], IDin=[4],
RDT=[5](min),
CHLGTH=[423.0](m), CHSLOPE=[1.17](%),
FPSLOPE=[1.17](%),
SECNUM=[3673], NSEG=[3]
( SEGROUGH, SEGDIST (m))=[0.35,17.5 -0.1,22.5 0.35,40] NSEG times
( DISTANCE (m), ELEVATION (m))=[ 0.0 , 3.0 ]
[ 17.0 , 1.0 ]
[ 17.5 , 0.0 ]
[ 22.5 , 0.0 ]
[ 23.0 , 1.0 ]
[ 40.0 , 3.0 ]
**-----|-----|
CALIB NASHYD ID=[2], NHYD=["TRB313"], DT=[5]min, AREA=[0.716](ha),
DWF=[0](cms), CN/C=[68], IA=[8.2](mm),
N=[1.1], TP=[0.34]hrs,
END=-1
**-----|-----|
*****
**FLOW IN TRIBUTARY 3 UPSTREAM OF CONFLUENCE**
*****
**-----|-----|
ADD HYD IDsum=[3], NHYD=["313ADD"], IDs to add=[1,2,]
**-----|-----|
*PRINT HYD ID=[3], # OF PCYCLES=[3]
**-----|-----|
CALIB NASHYD ID=[4], NHYD=["TRB314"], DT=[5]min, AREA=[0.938](ha),
DWF=[0](cms), CN/C=[68], IA=[8.2](mm),
N=[1.1], TP=[0.46]hrs,
END=-1

```

SWMHYMO INPUT FILE (Post-Development, Event-based) – KNPOST.dat

```

*%-----|-----
ADD HYD      IDsum=[3], NHYD=["313ADD"], IDs to add=[1,2]
*%-----|-----
*****TOTAL FLOW AT CONFLUENCE*****
*****TOTAL FLOW AT CONFLUENCE*****
*%-----|-----
CALIB NASHYD ID=[4], NHYD=["403a"], DT=[5]min, AREA=[2.66](ha),
              DWF=[0](cms), CN/C=[70], IA=[4.3](mm),
              N=[1.1], TP=[0.27]hrs,
              END=-1
*%-----|-----
ADD HYD      IDsum=[1], NHYD=["CONFLU"], IDs to add=[10,3,4]
*%-----|-----
*PRINT HYD   ID=[1], # OF PCYCLES=[3]
*%-----|-----
*
*
*
*****PEAK FLOW FROM EAST SIDE OF MARCH ROAD*****
*****PEAK FLOW FROM EAST SIDE OF MARCH ROAD*****
*%-----|-----
DESIGN STANDHYD ID=[1], NHYD=["203d"], DT=[5]min, AREA=[1.26](ha),
                 XIMP=[0.56], TIMP=[0.70], DWF=[0](cms), LOSS=[1],
                 SLOPE=[2.3](%), END=-1
*%-----|-----
DESIGN STANDHYD ID=[2], NHYD=["501a"], DT=[5]min, AREA=[9.32](ha),
                 XIMP=[0.74], TIMP=[0.93], DWF=[0](cms), LOSS=[1],
                 SLOPE=[0.80](%), END=-1
*%-----|-----
*****5-year peak flow to pond***
*****5-year peak flow to pond***
COMPUTE DUALHYD IDin=[2], CINLET=[2.06](cms), NINLET=[1],
                 MAJID=[3], MajNHYD=["OSSTOR"],
                 MINID=[4], MinNHYD=["TOPOND"],
                 TMJSTO=[890](cu-m)
*%-----|-----
DESIGN STANDHYD ID=[5], NHYD=["501b"], DT=[5]min, AREA=[38.42](ha),
                 XIMP=[0.54], TIMP=[0.67], DWF=[0](cms), LOSS=[1],
                 SLOPE=[2.3](%), END=-1
*%-----|-----
DESIGN STANDHYD ID=[6], NHYD=["501c"], DT=[5]min, AREA=[39.10](ha),
                 XIMP=[0.51], TIMP=[0.64], DWF=[0](cms), LOSS=[1],
                 SLOPE=[2.3](%), END=-1
*%-----|-----
DESIGN STANDHYD ID=[7], NHYD=["MR1"], DT=[5]min, AREA=[3.32](ha),
                 XIMP=[0.80], TIMP=[0.99], DWF=[0](cms), LOSS=[1],
                 SLOPE=[1.0](%), END=-1
*%-----|-----
DESIGN STANDHYD ID=[8], NHYD=["MR2"], DT=[5]min, AREA=[3.04](ha),
                 XIMP=[0.80], TIMP=[0.99], DWF=[0](cms), LOSS=[1],
                 SLOPE=[1.0](%), END=-1
*%-----|-----
ADD HYD      IDsum=[10], NHYD=["VALE"], IDs to add=[1,5,7]
*%-----|-----
ADD HYD      IDsum=[9], NHYD=["MET"], IDs to add=[4,6,8]
*%-----|-----
DESIGN STANDHYD ID=[1], NHYD=["POND3"], DT=[5]min, AREA=[11.89](ha),
                 XIMP=[0.64], TIMP=[0.80], DWF=[0](cms), LOSS=[1],
                 SLOPE=[0.1](%), END=-1
*%-----|-----
ADD HYD      IDsum=[8], NHYD=["P3ADD"], IDs to add=[10,9,1]
*%-----|-----
*****SIZING FOR POND 3***
*****SIZING FOR POND 3***
ROUTE RESERVOIR IDout=[1], NHYD=["POND3"], IDin=[8],
                 RDT=[5](min),

```

```

TABLE of ( OUTFLOW-STORAGE ) values
              (cms) - (ha-m)
              [ 0.000 , 0.000 ]
              [ 0.058 , 1.610 ]
              [ 0.220 , 2.515 ]
              [ 0.402 , 3.488 ]
              [ 1.045 , 6.115 ]
              [ -1 , -1 ] (max twenty pts)
              IDovf=[2], NHYDovf=["E-OVF"]
*%-----|-----
*****TOTAL FLOW TO SHIRLEY'S BROOK**
*****TOTAL FLOW TO SHIRLEY'S BROOK**
*%-----|-----
*PRINT HYD   ID=[1], # OF PCYCLES=[3]
*%-----|-----
*****
*****
*****
*%-----|-----
START        TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[2]
              C2-4.stm
*%-----|-----
START        TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[3]
              C5-4.stm
*%-----|-----
*START       TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[4]
*              C10-4.stm
*%-----|-----
START        TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[5]
              C100-4.stm
*%-----|-----
START        TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[6]
              S12-25mm.stm
*%-----|-----
START        TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[7]
              S2-12.stm
*%-----|-----
START        TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[8]
              S5-12.stm
*%-----|-----
*START       TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[9]
*              S10-12.stm
*%-----|-----
*START       TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[10]
*              S25-12.stm
*%-----|-----
*START       TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[11]
*              S50-12.stm
*%-----|-----
START        TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[12]
              S100-12.stm
*%-----|-----
START        TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[13]
              S24-25mm.stm
*%-----|-----
START        TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[14]
              S2-24.stm
*%-----|-----
START        TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[15]
              S5-24.stm
*%-----|-----
START        TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[16]
              S100-24.stm
*%-----|-----
FINISH

```

NOVATECH
Engineers, Planners & Landscape Architects

```
#####
# Project Name: [Kanata North]      Project Number: [112117]
# Date         : 03-30-2016
# Modeller     : [Kallie Auld]
# Company      : NOVATECH ENGINEERING CONSULTANTS LTD
#####
```

```
#*****      : 5320763
#*****
RUN:COMMAND#
001:0001-----
START
[TZERO = .00 hrs on 0]
[METOUT= 2 (1=imperial, 2=metric output)]
[NSTORM= 1 ]
[NRUN = 1 ]
001:0002-----
READ STORM
Filename = STORM.001
Comment =
[SdT=10.00:SDUR= 4.00:PTOT= 25.00]
001:0003-----
DEFAULT VALUES
Filename = M:\2012\112117\data\CALCUL-1\swmhymo\POSTDE-1\OTTAWA.DEF
ICASEdv = 1 (read and print data)
FileTitle= ----- ENTER YOUR COMMENTS ON THIS LINE AND THE NEXT ONE ---
----- PARAMETER VALUES MUST BE ENTERED AFTER COLUMN 60 -----
Horton's infiltration equation parameters:
[Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F= .00 mm]
Parameters for PERVIOUS surfaces in STANDHYD:
[IAPER= 4.67 mm] [LGP=40.00 m] [MNP=.250]
Parameters for IMPERVIOUS surfaces in STANDHYD:
[IAimp= 1.57 mm] [CLI= 1.50] [MNI=.013]
Parameters used in NASHYD:
[La= 4.67 mm] [N= 3.00]
001:0004-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
CALIB NASHYD 01:201 115.14 .009 No_date 5:55 1.23 .049
[CN= 65.0: N= 1.10]
[Tp= 3.42:DT= 5.00]
001:0005-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
ROUTE CHANNEL -> 01:201 115.14 .009 No_date 5:55 1.23 n/a
[RDT= 5.00] out<- 02:210 115.14 .009 No_date 6:20 1.23 n/a
[L/S/n= 558./ <.890/.040]
{Vmax=.423:Dmax=.004}
001:0006-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
CALIB NASHYD 01:202 263.64 .027 No_date 7:25 2.37 .095
[CN= 70.0: N= 1.10]
[Tp= 5.14:DT= 5.00]
001:0007-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
ADD HYD 01:202 263.64 .027 No_date 7:25 2.37 n/a
+ 02:210 115.14 .009 No_date 6:20 1.23 n/a
[DT= 5.00] SUM= 03:210add 378.78 .036 No_date 7:00 2.02 n/a
001:0008-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
ROUTE CHANNEL -> 03:210add 378.78 .036 No_date 7:00 2.02 n/a
[RDT= 5.00] out<- 01:211 378.78 .036 No_date 7:30 2.02 n/a
[L/S/n= 450./1.000/.100]
{Vmax=.288:Dmax=.025}
001:0009-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
CALIB NASHYD 02:211 1.87 .001 No_date 4:00 3.10 .124
[CN= 76.0: N= 1.10]
[Tp= 1.17:DT= 5.00]
001:0010-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
ADD HYD 01:211 378.78 .036 No_date 7:30 2.02 n/a
+ 02:211 1.87 .001 No_date 4:00 3.10 n/a
[DT= 5.00] SUM= 03:211add 380.65 .037 No_date 7:15 2.03 n/a
001:0011-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
ROUTE CHANNEL -> 03:211add 380.65 .037 No_date 7:15 2.03 n/a
[RDT= 5.00] out<- 01:212 380.65 .037 No_date 7:30 2.03 n/a
[L/S/n= 230./1.000/.100]
{Vmax=.288:Dmax=.025}
001:0012-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
CALIB NASHYD 02:212 .95 .001 No_date 4:00 1.77 .071
[CN= 66.0: N= 1.10]
[Tp= .56:DT= 5.00]
001:0013-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
ADD HYD 01:212 380.65 .037 No_date 7:30 2.03 n/a
+ 02:212 .95 .001 No_date 4:00 1.77 n/a
```


SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

```
[DT= 5.00] SUM= 03:212add 381.60 .037 No_date 7:15 2.03 n/a
001:0014-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:212add 381.60 .037 No_date 7:15 2.03 n/a
[RD= 5.00] out<- 01:213 381.60 .037 No_date 7:40 2.03 n/a
[L/S/n= 330./1.000/.100]
[Vmax= .288:Dmax= .026]
001:0015-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:213 1.43 .001 No_date 4:00 1.74 .070
[CN= 66.0: N= 1.10]
[TP= .67:DT= 5.00]
001:0016-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:213 381.60 .037 No_date 7:40 2.03 n/a
+ 02:213 1.43 .001 No_date 4:00 1.74 n/a
[DT= 5.00] SUM= 09:TRIB2 383.03 .038 No_date 7:25 2.03 n/a
001:0017-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 01:203a 27.32 2.004 No_date 1:40 13.51 .540
[XIMP=.50:TIMP=.63]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
001:0018-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 02:203b 20.76 1.491 No_date 1:40 12.93 .517
[XIMP=.48:TIMP=.60]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
001:0019-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 03:203c 4.95 .472 No_date 1:40 15.23 .609
[XIMP=.57:TIMP=.71]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
001:0020-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 04:POND1 2.68 .198 No_date 1:45 17.13 .685
[XIMP=.64:TIMP=.80]
[SLP= .10:DT= 5.00]
[LOSS= 1 : HORTONS]
001:0021-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 02:203b 20.76 1.491 No_date 1:40 12.93 n/a
+ 03:203c 4.95 .472 No_date 1:40 15.23 n/a
[DT= 5.00] SUM= 05:T2CRS 25.71 1.963 No_date 1:40 13.37 n/a
001:0022-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:203a 27.32 2.004 No_date 1:40 13.51 n/a
+ 04:POND1 2.68 .198 No_date 1:45 17.13 n/a
+ 05:T2CRS 25.71 1.963 No_date 1:40 13.37 n/a
[DT= 5.00] SUM= 06:P1FLOW 55.71 4.157 No_date 1:40 13.62 n/a
001:0023-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 06:P1FLOW 55.71 4.157 No_date 1:40 13.62 n/a
[RD= 5.00] out<- 01:POND1 55.71 .036 No_date 4:05 13.62 n/a
overflow <= 02:P1-OVF .00 .000 No_date 0:00 .00 n/a
{MxStoUsed=.7285E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
001:0024-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:POND1 55.71 .036 No_date 4:05 13.62 n/a
+ 09:TRIB2 383.03 .038 No_date 7:25 2.03 n/a
[DT= 5.00] SUM= 02:213ADD 438.74 .072 No_date 6:20 3.50 n/a
001:0025-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:213ADD 438.74 .072 No_date 6:20 3.50 n/a
[RD= 5.00] out<- 01:214 438.74 .072 No_date 6:40 3.50 n/a
[L/S/n= 390./1.700/.100]
[Vmax= .376:Dmax= .038]
001:0026-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:214 1.61 .003 No_date 2:40 2.25 .090
[CN= 72.0: N= 1.10]
[TP= .17:DT= 5.00]
001:0027-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:214 438.74 .072 No_date 6:40 3.50 n/a
+ 03:214 1.61 .003 No_date 2:40 2.25 n/a
[DT= 5.00] SUM= 02:214ADD 440.35 .073 No_date 6:25 3.50 n/a
001:0028-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:214ADD 440.35 .073 No_date 6:25 3.50 n/a
[RD= 5.00] out<- 01:215 440.35 .073 No_date 6:40 3.50 n/a
[L/S/n= 260./1.400/.100]
[Vmax= .341:Dmax= .042]
001:0029-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
```

```
CALIB NASHYD 02:TRB215 1.12 .001 No_date 2:55 1.42 .057
[CN= 66.0: N= 1.10]
[TP= .17:DT= 5.00]
001:0030-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:215 440.35 .073 No_date 6:40 3.50 n/a
+ 02:TRB215 1.12 .001 No_date 2:55 1.42 n/a
[DT= 5.00] SUM= 03:215ADD 441.47 .073 No_date 6:30 3.49 n/a
001:0031-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:215ADD 441.47 .073 No_date 6:30 3.49 n/a
[RD= 5.00] out<- 01:216 441.47 .073 No_date 7:00 3.49 n/a
[L/S/n= 250./1.500/.100]
[Vmax= .204:Dmax= .071]
001:0032-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB216 1.12 .001 No_date 3:00 1.19 .048
[CN= 65.0: N= 1.10]
[TP= .17:DT= 5.00]
001:0033-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:216 441.47 .073 No_date 7:00 3.49 n/a
+ 02:TRB216 1.12 .001 No_date 3:00 1.19 n/a
[DT= 5.00] SUM= 10:T2-US 442.59 .073 No_date 6:55 3.48 n/a
001:0034-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:301 86.43 .015 No_date 4:05 1.00 .040
[CN= 63.0: N= 1.10]
[TP= 1.24:DT= 5.00]
001:0035-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:302 80.69 .012 No_date 4:25 1.27 .051
[CN= 64.0: N= 1.10]
[TP= 1.80:DT= 5.00]
001:0036-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:301 86.43 .015 No_date 4:05 1.00 n/a
+ 02:302 80.69 .012 No_date 4:25 1.27 n/a
[DT= 5.00] SUM= 03:300a 167.12 .027 No_date 4:15 1.13 n/a
001:0037-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300a 167.12 .027 No_date 4:15 1.13 n/a
[RD= 5.00] out<- 01:310 167.12 .026 No_date 4:45 1.13 n/a
[L/S/n= 449./1.620/.040]
[Vmax= .430:Dmax= .015]
001:0038-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:303 65.19 .021 No_date 4:05 1.99 .080
[CN= 69.0: N= 1.10]
[TP= 1.31:DT= 5.00]
001:0039-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:310 167.12 .026 No_date 4:45 1.13 n/a
+ 02:303 65.19 .021 No_date 4:05 1.99 n/a
[DT= 5.00] SUM= 03:300b 232.31 .047 No_date 4:35 1.37 n/a
001:0040-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300b 232.31 .047 No_date 4:35 1.37 n/a
[RD= 5.00] out<- 01:311 232.31 .047 No_date 4:55 1.37 n/a
[L/S/n= 270./1.170/.100]
[Vmax= .312:Dmax= .030]
001:0041-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB311 1.15 .001 No_date 4:00 1.61 .064
[CN= 65.0: N= 1.10]
[TP= .52:DT= 5.00]
001:0042-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:311 232.31 .047 No_date 4:55 1.37 n/a
+ 02:TRB311 1.15 .001 No_date 4:00 1.61 n/a
[DT= 5.00] SUM= 03:311ADD 233.46 .047 No_date 4:55 1.37 n/a
001:0043-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:311ADD 233.46 .047 No_date 4:55 1.37 n/a
[RD= 5.00] out<- 01:312 233.46 .047 No_date 5:10 1.37 n/a
[L/S/n= 270./1.170/.100]
[Vmax= .312:Dmax= .030]
001:0044-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB312 1.30 .001 No_date 4:00 3.13 .125
[CN= 76.0: N= 1.10]
[TP= .64:DT= 5.00]
001:0045-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:312 233.46 .047 No_date 5:10 1.37 n/a
+ 02:TRB312 1.30 .001 No_date 4:00 3.13 n/a
[DT= 5.00] SUM= 09:312ADD 234.76 .048 No_date 5:10 1.38 n/a
```

SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

```

001:0046-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 01:304a          9.61      .670 No_date  1:40  12.36 .495
  [XIMP=.46:TIMP=.57]
  [SLP=1.60:DT= 5.00]
  [LOSS= 1 : HORTONS]
001:0047-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 02:402a          5.67      .547 No_date  1:40  15.57 .623
  [XIMP=.58:TIMP=.73]
  [SLP=2.10:DT= 5.00]
  [LOSS= 1 : HORTONS]
001:0048-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 03:POND2          1.85      .160 No_date  1:40  17.13 .685
  [XIMP=.64:TIMP=.80]
  [SLP= .10:DT= 5.00]
  [LOSS= 1 : HORTONS]
001:0049-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD
  01:304a          9.61      .670 No_date  1:40  12.36 n/a
  + 02:402a          5.67      .547 No_date  1:40  15.57 n/a
  + 03:POND2          1.85      .160 No_date  1:40  17.13 n/a
  [DT= 5.00] SUM= 04:P2FLOW          17.13  1.378 No_date  1:40  13.94 n/a
001:0050-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 04:P2FLOW          17.13  1.378 No_date  1:40  13.94 n/a
  [RDT= 5.00] out<- 01:POND2          17.13  .003 No_date  4:15  13.94 n/a
  overflow <= 02:P2OVF          .00      .000 No_date  0:00  .00 n/a
  {MxStoUsed=.2360E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
001:0051-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 02:402b          6.07      .584 No_date  1:40  15.57 .623
  [XIMP=.58:TIMP=.73]
  [SLP=2.10:DT= 5.00]
  [LOSS= 1 : HORTONS]
001:0052-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 03:402c          1.19      .113 No_date  1:40  14.65 .586
  [XIMP=.55:TIMP=.68]
  [SLP=2.10:DT= 5.00]
  [LOSS= 1 : HORTONS]
001:0053-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD
  02:402b          6.07      .584 No_date  1:40  15.57 n/a
  + 03:402c          1.19      .113 No_date  1:40  14.65 n/a
  [DT= 5.00] SUM= 04:400-OS          7.26      .696 No_date  1:40  15.42 n/a
001:0054-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 04:400-OS          7.26      .696 No_date  1:40  15.42 n/a
* [RDT= 5.00] out<- 02:OSSSTOR          7.26      .708 No_date  1:40  15.42 n/a
  overflow <= 03:OSSOVF          .00      .000 No_date  0:00  .00 n/a
  {MxStoUsed=.4596E-02, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
001:0055-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:401          16.78      .030 No_date  3:55  2.36 .094
  [CN= 68.0: N= 3.00]
  [Tp= 1.66:DT= 5.00]
001:0056-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD
  01:POND2          17.13      .003 No_date  4:15  13.94 n/a
  + 02:OSSSTOR          7.26      .708 No_date  1:40  15.42 n/a
  + 03:401          16.78      .030 No_date  3:55  2.36 n/a
  + 09:312ADD          234.76      .048 No_date  5:10  1.38 n/a
  [DT= 5.00] SUM= 05:710 No_date  1:40  2.59 n/a
001:0057-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 04:P2-T3          275.93      .710 No_date  1:40  2.59 n/a
  [RDT= 5.00] out<- 01:313          275.93      .315 No_date  1:45  2.59 n/a
  [L/S/n= 423./1.170/.100]
  {Vmax= .448:Dmax= .291}
001:0058-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB313          .72      .001 No_date  3:40  2.06 .082
  [CN= 68.0: N= 1.10]
  [Tp= .34:DT= 5.00]
001:0059-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD
  01:313          275.93      .315 No_date  1:45  2.59 n/a
  + 02:TRB313          .72      .001 No_date  3:40  2.06 n/a
  [DT= 5.00] SUM= 03:313ADD          276.65      .315 No_date  1:45  2.59 n/a
001:0060-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 04:TRB314          .94      .001 No_date  4:00  2.06 .083
  [CN= 68.0: N= 1.10]
  [Tp= .46:DT= 5.00]

```

```

001:0061-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD
  01:313          275.93      .315 No_date  1:45  2.59 n/a
  + 02:TRB313          .72      .001 No_date  3:40  2.06 n/a
  [DT= 5.00] SUM= 03:313ADD          276.65      .315 No_date  1:45  2.59 n/a
001:0062-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 04:403a          2.66      .005 No_date  2:50  3.31 .132
  [CN= 70.0: N= 1.10]
  [Tp= .27:DT= 5.00]
001:0063-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD
  10:T2-US          442.59      .073 No_date  6:55  3.48 n/a
  + 03:313ADD          276.65      .315 No_date  1:45  2.59 n/a
  + 04:403a          2.66      .005 No_date  2:50  3.31 n/a
  [DT= 5.00] SUM= 01:CONFLU          721.90      .320 No_date  1:50  3.14 n/a
001:0064-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 01:203d          1.26      .122 No_date  1:40  15.00 .600
  [XIMP=.56:TIMP=.70]
  [SLP=2.30:DT= 5.00]
  [LOSS= 1 : HORTONS]
001:0065-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 02:501a          9.32      1.059 No_date  1:40  20.53 .821
  [XIMP=.74:TIMP=.93]
  [SLP= .80:DT= 5.00]
  [LOSS= 1 : HORTONS]
001:0066-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
COMPUTE DUALHYD 02:501a          9.32      1.059 No_date  1:40  20.53 n/a
  Major System / 03:OSSSTOR          .00      .000 No_date  0:00  .00 n/a
  Minor System \ 04:TOPOND          9.32      1.059 No_date  1:40  20.53 n/a
  {MjSysSto=.0000E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
001:0067-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 05:501b          38.42      2.941 No_date  1:40  14.42 .577
  [XIMP=.54:TIMP=.67]
  [SLP=2.30:DT= 5.00]
  [LOSS= 1 : HORTONS]
001:0068-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 06:501c          39.10      2.828 No_date  1:40  13.74 .549
  [XIMP=.51:TIMP=.64]
  [SLP=2.30:DT= 5.00]
  [LOSS= 1 : HORTONS]
001:0069-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 07:MR1          3.32      .491 No_date  1:40  23.05 .922
  [XIMP=.80:TIMP=.99]
  [SLP=1.00:DT= 5.00]
  [LOSS= 1 : HORTONS]
001:0070-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 08:MR2          3.04      .452 No_date  1:40  23.05 .922
  [XIMP=.80:TIMP=.99]
  [SLP=1.00:DT= 5.00]
  [LOSS= 1 : HORTONS]
001:0071-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD
  01:203d          1.26      .122 No_date  1:40  15.00 n/a
  + 05:501b          38.42      2.941 No_date  1:40  14.42 n/a
  + 07:MR1          3.32      .491 No_date  1:40  23.05 n/a
  [DT= 5.00] SUM= 10:VALE          43.00      3.555 No_date  1:40  15.11 n/a
001:0072-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD
  04:TOPOND          9.32      1.059 No_date  1:40  20.53 n/a
  + 06:501c          39.10      2.828 No_date  1:40  13.74 n/a
  + 08:MR2          3.04      .452 No_date  1:40  23.05 n/a
  [DT= 5.00] SUM= 09:MET          51.46      4.339 No_date  1:40  15.52 n/a
001:0073-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 01:POND3          11.89      .753 No_date  1:45  17.13 .685
  [XIMP=.64:TIMP=.80]
  [SLP= .10:DT= 5.00]
  [LOSS= 1 : HORTONS]
001:0074-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD
  10:VALE          43.00      3.555 No_date  1:40  15.11 n/a
  + 09:MET          51.46      4.339 No_date  1:40  15.52 n/a
  + 01:POND3          11.89      .753 No_date  1:45  17.13 n/a
  [DT= 5.00] SUM= 08:P3ADD          106.35      8.573 No_date  1:40  15.53 n/a
001:0075-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 08:P3ADD          106.35      8.573 No_date  1:40  15.53 n/a
  [RDT= 5.00] out<- 01:POND3          106.35      .058 No_date  4:10  15.53 n/a

```

SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

```
overflow <= 02:E-OVF .00 .000 No_date 0:00 .00 n/a
{MxStoUsed=.1600E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
** END OF RUN : 1
```

RUN:COMMAND#

```
002:0001-----
START
[TZERO = .00 hrs on 0]
[METOUT= 2 (1=imperial, 2=metric output)]
[NSTORM= 1 ]
[NRUN = 2 ]
```

```
# Project Name: [Kanata North] Project Number: [112117]
# Date : 03-30-2016
# Modeller : [Kallie Auld]
# Company : NOVATECH ENGINEERING CONSULTANTS LTD
# License # : 5320763
```

```
002:0002-----
READ STORM
Filename = STORM.001
Comment =
[SDT=10.00:SDUR= 4.00:PTOT= 33.89]
```

002:0003-----

```
DEFAULT VALUES
Filename = M:\2012\112117\data\CALCUL-1\swmhyo\POSTDE-1\OTTAWA.DEF
ICASEdv = 1 (read and print data)
FileTitle= ----- ENTER YOUR COMMENTS ON THIS LINE AND THE NEXT ONE ---
----- PARAMETER VALUES MUST BE ENTERED AFTER COLUMN 60 -----
```

```
Horton's infiltration equation parameters:
[Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F= .00 mm]
Parameters for PERVIOUS surfaces in STANDHYD:
[IAper= 4.67 mm] [LGP=40.00 m] [MNP= .250]
Parameters for IMPERVIOUS surfaces in STANDHYD:
[IAimp= 1.57 mm] [CLI= 1.50] [MNI= .013]
Parameters used in NASHYD:
[Ia= 4.67 mm] [N= 3.00]
```

```
002:0004-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:201 115.14 .023 No_date 5:45 3.18 .094
[CN= 65.0: N= 1.10]
[TP= 3.42:DT= 5.00]
```

```
002:0005-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:201 115.14 .023 No_date 5:45 3.18 n/a
[RD= 5.00] out<- 02:210 115.14 .023 No_date 6:10 3.18 n/a
[L/S/n= 558./1.000/.040]
[Vmax= .423:Dmax= .011]
```

```
002:0006-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:202 263.64 .058 No_date 7:15 5.08 .150
[CN= 70.0: N= 1.10]
[TP= 5.14:DT= 5.00]
```

```
002:0007-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:202 263.64 .058 No_date 7:15 5.08 n/a
+ 02:210 115.14 .023 No_date 6:10 3.18 n/a
[DT= 5.00] SUM= 03:210add 378.78 .081 No_date 6:50 4.50 n/a
```

```
002:0008-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:210add 378.78 .081 No_date 6:50 4.50 n/a
[RD= 5.00] out<- 01:211 378.78 .081 No_date 7:20 4.50 n/a
[L/S/n= 450./1.000/.100]
[Vmax= .288:Dmax= .056]
```

```
002:0009-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:211 1.87 .002 No_date 4:00 6.49 .191
[CN= 76.0: N= 1.10]
[TP= 1.17:DT= 5.00]
```

```
002:0010-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
```

```
ADD HYD 01:211 378.78 .081 No_date 7:20 4.50 n/a
+ 02:211 1.87 .002 No_date 4:00 6.49 n/a
```

```
[DT= 5.00] SUM= 03:211add 380.65 .083 No_date 7:05 4.51 n/a
```

```
002:0011-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:211add 380.65 .083 No_date 7:05 4.51 n/a
```

```
[RD= 5.00] out<- 01:212 380.65 .083 No_date 7:20 4.51 n/a
[L/S/n= 230./1.000/.100]
[Vmax= .288:Dmax= .057]
```

```
002:0012-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:212 .95 .001 No_date 4:00 4.04 .119
[CN= 66.0: N= 1.10]
[TP= .56:DT= 5.00]
```

```
002:0013-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:212 380.65 .083 No_date 7:20 4.51 n/a
+ 02:212 .95 .001 No_date 4:00 4.04 n/a
```

```
[DT= 5.00] SUM= 03:212add 381.60 .084 No_date 7:05 4.51 n/a
```

```
002:0014-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:212add 381.60 .084 No_date 7:05 4.51 n/a
```

```
[RD= 5.00] out<- 01:213 381.60 .084 No_date 7:30 4.51 n/a
[L/S/n= 330./1.000/.100]
[Vmax= .288:Dmax= .057]
```

```
002:0015-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:213 1.43 .002 No_date 4:00 3.98 .117
[CN= 66.0: N= 1.10]
[TP= .67:DT= 5.00]
```

```
002:0016-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:213 381.60 .084 No_date 7:30 4.51 n/a
+ 02:213 1.43 .002 No_date 4:00 3.98 n/a
```

```
[DT= 5.00] SUM= 09:TRIB2 383.03 .085 No_date 7:15 4.51 n/a
```

```
002:0017-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 01:203a 27.32 2.924 No_date 1:30 19.94 .588
[XIMP=.50:TIMP=.63]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
```

```
002:0018-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 02:203b 20.76 2.179 No_date 1:30 19.21 .567
[XIMP=.48:TIMP=.60]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
```

```
002:0019-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 03:203c 4.95 .711 No_date 1:30 22.20 .655
[XIMP=.57:TIMP=.71]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
```

```
002:0020-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 04:POND1 2.68 .307 No_date 1:30 24.68 .728
[XIMP=.64:TIMP=.80]
[SLP=.10:DT= 5.00]
[LOSS= 1 : HORTONS]
```

```
002:0021-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 02:203b 20.76 2.179 No_date 1:30 19.21 n/a
+ 03:203c 4.95 .711 No_date 1:30 22.20 n/a
```

```
[DT= 5.00] SUM= 05:T2CRS 25.71 2.890 No_date 1:30 19.78 n/a
```

```
002:0022-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:203a 27.32 2.924 No_date 1:30 19.94 n/a
+ 04:POND1 2.68 .307 No_date 1:30 24.68 n/a
```

```
+ 05:T2CRS 25.71 2.890 No_date 1:30 19.78 n/a
[DT= 5.00] SUM= 06:P1FLOW 55.71 6.121 No_date 1:30 20.10 n/a
```

```
002:0023-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 06:P1FLOW 55.71 6.121 No_date 1:30 20.10 n/a
```

```
[RD= 5.00] out<- 01:POND1 55.71 .075 No_date 4:05 20.10 n/a
overflow <= 02:P1-OVF .00 .000 No_date 0:00 .00 n/a
{MxStoUsed=.1059E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
```

```
002:0024-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:POND1 55.71 .075 No_date 4:05 20.10 n/a
+ 09:TRIB2 383.03 .085 No_date 7:15 4.51 n/a
```

```
[DT= 5.00] SUM= 02:213ADD 438.74 .153 No_date 5:45 6.49 n/a
```

```
002:0025-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:213ADD 438.74 .153 No_date 5:45 6.49 n/a
```

```
[RD= 5.00] out<- 01:214 438.74 .153 No_date 6:05 6.49 n/a
```

SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

```

[L/S/n= 390./1.700/.100]
{Vmax= .376:Dmax= .080}
002:0026-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:214 1.61 .006 No_date 2:30 5.05 .149
[CN= 72.0: N= 1.10]
[TP= .17:DT= 5.00]
002:0027-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:214 438.74 .153 No_date 6:05 6.49 n/a
+ 03:214 1.61 .006 No_date 2:30 5.05 n/a
[DT= 5.00] SUM= 02:214ADD 440.35 .155 No_date 5:55 6.48 n/a
002:0028-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:214ADD 440.35 .155 No_date 5:55 6.48 n/a
[RD= 5.00] out<- 01:215 440.35 .154 No_date 6:10 6.48 n/a
[L/S/n= 260./1.400/.100]
{Vmax= .341:Dmax= .089}
002:0029-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB215 1.12 .003 No_date 2:40 3.52 .104
[CN= 66.0: N= 1.10]
[TP= .17:DT= 5.00]
002:0030-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:215 440.35 .154 No_date 6:10 6.48 n/a
+ 02:TRB215 1.12 .003 No_date 2:40 3.52 n/a
[DT= 5.00] SUM= 03:215ADD 441.47 .155 No_date 6:05 6.48 n/a
002:0031-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:215ADD 441.47 .155 No_date 6:05 6.48 n/a
[RD= 5.00] out<- 01:216 441.47 .155 No_date 6:30 6.48 n/a
[L/S/n= 250./ .500/.100]
{Vmax= .204:Dmax= .150}
002:0032-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB216 1.12 .003 No_date 2:40 3.12 .092
[CN= 65.0: N= 1.10]
[TP= .17:DT= 5.00]
002:0033-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:216 441.47 .155 No_date 6:30 6.48 n/a
+ 02:TRB216 1.12 .003 No_date 2:40 3.12 n/a
[DT= 5.00] SUM= 10:T2-US 442.59 .155 No_date 6:25 6.47 n/a
002:0034-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:301 86.43 .040 No_date 4:05 2.73 .081
[CN= 63.0: N= 1.10]
[TP= 1.24:DT= 5.00]
002:0035-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:302 80.69 .030 No_date 4:20 3.19 .094
[CN= 64.0: N= 1.10]
[TP= 1.80:DT= 5.00]
002:0036-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:301 86.43 .040 No_date 4:05 2.73 n/a
+ 02:302 80.69 .030 No_date 4:20 3.19 n/a
[DT= 5.00] SUM= 03:300a 167.12 .070 No_date 4:05 2.95 n/a
002:0037-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300a 167.12 .070 No_date 4:05 2.95 n/a
[RD= 5.00] out<- 01:310 167.12 .069 No_date 4:40 2.95 n/a
[L/S/n= 449./1.620/.040]
{Vmax= .430:Dmax= .038}
002:0038-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:303 65.19 .047 No_date 4:00 4.49 .132
[CN= 69.0: N= 1.10]
[TP= 1.31:DT= 5.00]
002:0039-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:310 167.12 .069 No_date 4:40 2.95 n/a
+ 02:303 65.19 .047 No_date 4:00 4.49 n/a
[DT= 5.00] SUM= 03:300b 232.31 .116 No_date 4:30 3.38 n/a
002:0040-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300b 232.31 .116 No_date 4:30 3.38 n/a
[RD= 5.00] out<- 01:311 232.31 .115 No_date 4:50 3.38 n/a
[L/S/n= 270./1.170/.100]
{Vmax= .312:Dmax= .073}
002:0041-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB311 1.15 .002 No_date 4:00 3.75 .111
[CN= 65.0: N= 1.10]
[TP= .52:DT= 5.00]
002:0042-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-

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ADD HYD 01:311 232.31 .115 No_date 4:50 3.38 n/a
+ 02:TRB311 1.15 .002 No_date 4:00 3.75 n/a
[DT= 5.00] SUM= 03:311ADD 233.46 .117 No_date 4:50 3.39 n/a
002:0043-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:311ADD 233.46 .117 No_date 4:50 3.39 n/a
[RD= 5.00] out<- 01:312 233.46 .116 No_date 5:05 3.39 n/a
[L/S/n= 270./1.170/.100]
{Vmax= .312:Dmax= .074}
002:0044-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB312 1.30 .003 No_date 4:00 6.53 .193
[CN= 76.0: N= 1.10]
[TP= .64:DT= 5.00]
002:0045-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:312 233.46 .116 No_date 5:05 3.39 n/a
+ 02:TRB312 1.30 .003 No_date 4:00 6.53 n/a
[DT= 5.00] SUM= 09:312ADD 234.76 .118 No_date 5:05 3.40 n/a
002:0046-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 01:304a 9.61 .988 No_date 1:30 18.49 .545
[XIMP=.46:TIMP=.57]
[SLP=1.60:DT= 5.00]
[LOSS= 1 : HORTONS]
002:0047-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 02:402a 5.67 .823 No_date 1:30 22.67 .669
[XIMP=.58:TIMP=.73]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
002:0048-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 03:POND2 1.85 .221 No_date 1:30 24.68 .728
[XIMP=.64:TIMP=.80]
[SLP= .10:DT= 5.00]
[LOSS= 1 : HORTONS]
002:0049-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:304a 9.61 .988 No_date 1:30 18.49 n/a
+ 02:402a 5.67 .823 No_date 1:30 22.67 n/a
+ 03:POND2 1.85 .221 No_date 1:30 24.68 n/a
[DT= 5.00] SUM= 04:P2FLOW 17.13 2.031 No_date 1:30 20.54 n/a
002:0050-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 04:P2FLOW 17.13 2.031 No_date 1:30 20.54 n/a
[RD= 5.00] out<- 01:POND2 17.13 .011 No_date 4:05 20.54 n/a
overflow <= 02:P2OVF .00 .000 No_date 0:00 .00 n/a
{MxStoUsed=.3433E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0 hrs}
002:0051-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 02:402b 6.07 .879 No_date 1:30 22.67 .669
[XIMP=.58:TIMP=.73]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
002:0052-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 03:402c 1.19 .170 No_date 1:30 21.42 .632
[XIMP=.55:TIMP=.68]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
002:0053-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 02:402b 6.07 .879 No_date 1:30 22.67 n/a
+ 03:402c 1.19 .170 No_date 1:30 21.42 n/a
[DT= 5.00] SUM= 04:400-OS 7.26 1.049 No_date 1:30 22.46 n/a
002:0054-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 04:400-OS 7.26 1.049 No_date 1:30 22.46 n/a
[RD= 5.00] out<- 02:OSSTOR 7.26 .801 No_date 1:35 22.46 n/a
overflow <= 03:OSOVF .00 .000 No_date 0:00 .00 n/a
{MxStoUsed=.1404E-01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0 hrs}
002:0055-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:401 16.78 .062 No_date 3:45 4.94 .146
[CN= 68.0: N= 3.00]
[TP= 1.66:DT= 5.00]
002:0056-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:POND2 17.13 .011 No_date 4:05 20.54 n/a
+ 02:OSSTOR 7.26 .801 No_date 1:35 22.46 n/a
+ 03:401 16.78 .062 No_date 3:45 4.94 n/a
+ 09:312ADD 234.76 .118 No_date 5:05 3.40 n/a
[DT= 5.00] SUM= 04:P2-T3 275.93 .807 No_date 1:35 5.06 n/a
002:0057-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-

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SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

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ROUTE CHANNEL -> 04:P2-T3      275.93      .807 No_date      1:35      5.06 n/a
[RD= 5.00] out<- 01:313      275.93      .556 No_date      1:40      5.06 n/a
[L/S/n= 423./1.170/.100]
[Vmax= .490:Dmax= .318]
002:0058-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:TRB313      .72      .002 No_date      3:20      4.54 .134
[CN= 68.0: N= 1.10]
[TP= .34:DT= 5.00]
002:0059-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:313      275.93      .556 No_date      1:40      5.06 n/a
+ 02:TRB313      .72      .002 No_date      3:20      4.54 n/a
[DT= 5.00] SUM= 03:313ADD      276.65      .557 No_date      1:40      5.06 n/a
002:0060-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      04:TRB314      .94      .002 No_date      4:00      4.54 .134
[CN= 68.0: N= 1.10]
[TP= .46:DT= 5.00]
002:0061-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:313      275.93      .556 No_date      1:40      5.06 n/a
+ 02:TRB313      .72      .002 No_date      3:20      4.54 n/a
[DT= 5.00] SUM= 03:313ADD      276.65      .557 No_date      1:40      5.06 n/a
002:0062-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      04:403a      2.66      .009 No_date      2:50      6.33 .187
[CN= 70.0: N= 1.10]
[TP= .27:DT= 5.00]
002:0063-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      10:T2-US      442.59      .155 No_date      6:25      6.47 n/a
+ 03:313ADD      276.65      .557 No_date      1:40      5.06 n/a
+ 04:403a      2.66      .009 No_date      2:50      6.33 n/a
[DT= 5.00] SUM= 01:CONFLU      721.90      .569 No_date      1:40      5.93 n/a
002:0064-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD      01:203d      1.26      .185 No_date      1:30      21.90 .646
[XIMP=.56:TIMP=.70]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
002:0065-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD      02:501a      9.32      1.537 No_date      1:30      28.94 .854
[XIMP=.74:TIMP=.93]
[SLP=.80:DT= 5.00]
[LOSS= 1 : HORTONS]
002:0066-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
COMPUTE DUALHYD      02:501a      9.32      1.537 No_date      1:30      28.94 n/a
Major System / 03:OSSOR      .00      .000 No_date      0:00      .00 n/a
Minor System \ 04:TOPOND      9.32      1.537 No_date      1:30      28.94 n/a
{MjSysSto=.0000E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
002:0067-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD      05:501b      38.42      4.266 No_date      1:30      21.12 .623
[XIMP=.54:TIMP=.67]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
002:0068-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD      06:501c      39.10      4.131 No_date      1:30      20.22 .597
[XIMP=.51:TIMP=.64]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
002:0069-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD      07:MR1      3.32      .656 No_date      1:30      31.93 .942
[XIMP=.80:TIMP=.99]
[SLP=1.00:DT= 5.00]
[LOSS= 1 : HORTONS]
002:0070-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD      08:MR2      3.04      .603 No_date      1:30      31.93 .942
[XIMP=.80:TIMP=.99]
[SLP=1.00:DT= 5.00]
[LOSS= 1 : HORTONS]
002:0071-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:203d      1.26      .185 No_date      1:30      21.90 n/a
+ 05:501b      38.42      4.266 No_date      1:30      21.12 n/a
+ 07:MR1      3.32      .656 No_date      1:30      31.93 n/a
[DT= 5.00] SUM= 10:VALE      43.00      5.107 No_date      1:30      21.98 n/a
002:0072-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      04:TOPOND      9.32      1.537 No_date      1:30      28.94 n/a

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+ 06:501c      39.10      4.131 No_date      1:30      20.22 n/a
+ 08:MR2      3.04      .603 No_date      1:30      31.93 n/a
[DT= 5.00] SUM= 09:MET      51.46      6.271 No_date      1:30      22.50 n/a
002:0073-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD      01:POND3      11.89      1.050 No_date      1:35      24.68 .728
[XIMP=.64:TIMP=.80]
[SLP=.10:DT= 5.00]
[LOSS= 1 : HORTONS]
002:0074-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      10:VALE      43.00      5.107 No_date      1:30      21.98 n/a
+ 09:MET      51.46      6.271 No_date      1:30      22.50 n/a
+ 01:POND3      11.89      1.050 No_date      1:35      24.68 n/a
[DT= 5.00] SUM= 08:P3ADD      106.35      12.330 No_date      1:30      22.53 n/a
002:0075-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 08:P3ADD      106.35      12.330 No_date      1:30      22.53 n/a
[RD= 5.00] out<- 01:POND3      106.35      .175 No_date      4:05      22.53 n/a
overflow <= 02:E-OVF      .00      .000 No_date      0:00      .00 n/a
{MxStoUsed=.2262E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
** END OF RUN : 2

*****
RUN:COMMAND#
003:0001-----
START
[TZERO = .00 hrs on 0]
[METOUT= 2 (1=imperial, 2=metric output)]
[NSTORM= 1]
[NRUN = 3]
#*****
# Project Name: [Kanata North] Project Number: [112117]
# Date : 03-30-2016
# Modeller : [Kallie Auld]
# Company : NOVATECH ENGINEERING CONSULTANTS LTD
# License # : 5320763
#*****
#*****
003:0002-----
READ STORM
Filename = STORM.001
Comment =
[SDT=10.00:SDUR= 4.00:PTOT= 45.18]
003:0003-----
DEFAULT VALUES
Filename = M:\2012\112117\data\CALCUL-1\swmhymo\POSTDE-1\OTTAWA.DEF
ICASEdv = 1 (read and print data)
FileTitle= ----- ENTER YOUR COMMENTS ON THIS LINE AND THE NEXT ONE ---
----- PARAMETER VALUES MUST BE ENTERED AFTER COLUMN 60 -----
Horton's infiltration equation parameters:
[Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F= .00 mm]
Parameters for PERVIOUS surfaces in STANDHYD:
[IApex= 4.67 mm] [LGP=40.00 m] [MNP=.250]
Parameters for IMPERVIOUS surfaces in STANDHYD:
[IAimp= 1.57 mm] [CLI= 1.50] [MNI=.013]
Parameters used in NASHYD:
[IA= 4.67 mm] [N= 3.00]
003:0004-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      01:201      115.14      .049 No_date      5:45      6.69 .148
[CN= 65.0: N= 1.10]
[TP= 3.42:DT= 5.00]
003:0005-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:201      115.14      .049 No_date      5:45      6.69 n/a
[RD= 5.00] out<- 02:210      115.14      .049 No_date      6:10      6.69 n/a
[L/S/n= 558./ .890/.040]
[Vmax= .423:Dmax= .023]
003:0006-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      01:202      263.64      .110 No_date      7:20      9.60 .212

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SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

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[CN= 70.0: N= 1.10]
[TP= 5.14:DT= 5.00]
003:0007-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:202          263.64          .110 No_date          7:20          9.60          n/a
                + 02:210          115.14          .049 No_date          6:10          6.69          n/a
[DT= 5.00] SUM= 03:210add          378.78          .159 No_date          6:50          8.71          n/a
003:0008-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL   -> 03:210add          378.78          .159 No_date          6:50          8.71          n/a
[RD= 5.00] out<- 01:211          378.78          .159 No_date          7:20          8.71          n/a
[L/S/n= 450./1.000/.100]
[Vmax= .288:Dmax= .109]
003:0009-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD    02:211          1.87          .004 No_date          4:00          11.99          .265
[CN= 76.0: N= 1.10]
[TP= 1.17:DT= 5.00]
003:0010-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:211          378.78          .159 No_date          7:20          8.71          n/a
                + 02:211          1.87          .004 No_date          4:00          11.99          n/a
[DT= 5.00] SUM= 03:211add          380.65          .162 No_date          7:05          8.73          n/a
003:0011-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL   -> 03:211add          380.65          .162 No_date          7:05          8.73          n/a
[RD= 5.00] out<- 01:212          380.65          .162 No_date          7:20          8.73          n/a
[L/S/n= 230./1.000/.100]
[Vmax= .288:Dmax= .111]
003:0012-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD    02:212          .95          .003 No_date          4:00          7.91          .175
[CN= 66.0: N= 1.10]
[TP= .56:DT= 5.00]
003:0013-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:212          380.65          .162 No_date          7:20          8.73          n/a
                + 02:212          .95          .003 No_date          4:00          7.91          n/a
[DT= 5.00] SUM= 03:212add          381.60          .164 No_date          7:05          8.73          n/a
003:0014-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL   -> 03:212add          381.60          .164 No_date          7:05          8.73          n/a
[RD= 5.00] out<- 01:213          381.60          .164 No_date          7:30          8.73          n/a
[L/S/n= 330./1.000/.100]
[Vmax= .288:Dmax= .112]
003:0015-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD    02:213          1.43          .003 No_date          4:00          7.83          .173
[CN= 66.0: N= 1.10]
[TP= .67:DT= 5.00]
003:0016-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:213          381.60          .164 No_date          7:30          8.73          n/a
                + 02:213          1.43          .003 No_date          4:00          7.83          n/a
[DT= 5.00] SUM= 09:TRB2          383.03          .166 No_date          7:15          8.72          n/a
003:0017-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 01:203a          27.32          4.933 No_date          1:40          29.52          .653
[XIMP=.50:TIMP=.63]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
003:0018-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 02:203b          20.76          3.707 No_date          1:40          28.61          .633
[XIMP=.48:TIMP=.60]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
003:0019-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 03:203c          4.95          1.053 No_date          1:40          32.10          .711
[XIMP=.57:TIMP=.71]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
003:0020-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 04:POND1          2.68          .445 No_date          1:40          35.07          .776
[XIMP=.64:TIMP=.80]
[SLP= .10:DT= 5.00]
[LOSS= 1 : HORTONS]
003:0021-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          02:203b          20.76          3.707 No_date          1:40          28.61          n/a
                + 03:203c          4.95          1.053 No_date          1:40          32.10          n/a
[DT= 5.00] SUM= 05:T2CRS          25.71          4.760 No_date          1:40          29.28          n/a
003:0022-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:203a          27.32          4.933 No_date          1:40          29.52          n/a
```

```
+ 04:POND1          2.68          .445 No_date          1:40          35.07          n/a
+ 05:T2CRS          25.71          4.760 No_date          1:40          29.28          n/a
[DT= 5.00] SUM= 06:P1FLOW          55.71          10.138 No_date          1:40          29.68          n/a
003:0023-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 06:P1FLOW          55.71          10.138 No_date          1:40          29.68          n/a
[RD= 5.00] out<- 01:POND1          55.71          .152 No_date          4:00          29.68          n/a
overflow <= 02:P1-OVF          .00          .000 No_date          0:00          .00          n/a
{MxStoUsed=.1536E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
003:0024-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:POND1          55.71          .152 No_date          4:00          29.68          n/a
                + 09:TRB2          383.03          .166 No_date          7:15          8.72          n/a
[DT= 5.00] SUM= 02:213ADD          438.74          .300 No_date          5:25          11.38          n/a
003:0025-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL   -> 02:213ADD          438.74          .300 No_date          5:25          11.38          n/a
[RD= 5.00] out<- 01:214          438.74          .299 No_date          5:45          11.38          n/a
[L/S/n= 390./1.700/.100]
[Vmax= .376:Dmax= .157]
003:0026-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD    03:214          1.61          .012 No_date          2:30          9.74          .216
[CN= 72.0: N= 1.10]
[TP= .17:DT= 5.00]
003:0027-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:214          438.74          .299 No_date          5:45          11.38          n/a
                + 03:214          1.61          .012 No_date          2:30          9.74          n/a
[DT= 5.00] SUM= 02:214ADD          440.35          .303 No_date          5:35          11.38          n/a
003:0028-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL   -> 02:214ADD          440.35          .303 No_date          5:35          11.38          n/a
[RD= 5.00] out<- 01:215          440.35          .303 No_date          5:50          11.38          n/a
[L/S/n= 260./1.400/.100]
[Vmax= .347:Dmax= .166]
003:0029-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD    02:TRB215          1.12          .006 No_date          2:30          7.23          .160
[CN= 66.0: N= 1.10]
[TP= .17:DT= 5.00]
003:0030-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:215          440.35          .303 No_date          5:50          11.38          n/a
                + 02:TRB215          1.12          .006 No_date          2:30          7.23          n/a
[DT= 5.00] SUM= 03:215ADD          441.47          .304 No_date          5:45          11.37          n/a
003:0031-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL   -> 03:215ADD          441.47          .304 No_date          5:45          11.37          n/a
[RD= 5.00] out<- 01:216          441.47          .304 No_date          6:00          11.37          n/a
[L/S/n= 250./ .500/.100]
[Vmax= .238:Dmax= .220]
003:0032-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD    02:TRB216          1.12          .006 No_date          2:30          6.62          .146
[CN= 65.0: N= 1.10]
[TP= .17:DT= 5.00]
003:0033-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:216          441.47          .304 No_date          6:00          11.37          n/a
                + 02:TRB216          1.12          .006 No_date          2:30          6.62          n/a
[DT= 5.00] SUM= 10:T2-US          442.59          .306 No_date          5:55          11.36          n/a
003:0034-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD    01:301          86.43          .086 No_date          4:00          5.94          .131
[CN= 63.0: N= 1.10]
[TP= 1.24:DT= 5.00]
003:0035-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD    02:302          80.69          .063 No_date          4:20          6.63          .147
[CN= 64.0: N= 1.10]
[TP= 1.80:DT= 5.00]
003:0036-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:301          86.43          .086 No_date          4:00          5.94          n/a
                + 02:302          80.69          .063 No_date          4:20          6.63          n/a
[DT= 5.00] SUM= 03:300a          167.12          .150 No_date          4:05          6.27          n/a
003:0037-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL   -> 03:300a          167.12          .150 No_date          4:05          6.27          n/a
[RD= 5.00] out<- 01:310          167.12          .149 No_date          4:35          6.27          n/a
[L/S/n= 449./1.620/.040]
[Vmax= .449:Dmax= .069]
003:0038-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD    02:303          65.19          .091 No_date          4:00          8.75          .194
[CN= 69.0: N= 1.10]
```

SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

```
[Tp= 1.31:DT= 5.00]
003:0039-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:310          167.12          .149 No_date 4:35 6.27 n/a
+ 02:303          65.19          .091 No_date 4:00 8.75 n/a
[DT= 5.00] SUM= 03:300b          232.31          .239 No_date 4:25 6.97 n/a
003:0040-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300b          232.31          .239 No_date 4:25 6.97 n/a
[RDT= 5.00] out<- 01:311          232.31          .238 No_date 4:45 6.97 n/a
[L/S/n= 270./1.170/.100]
{Vmax= .312:Dmax= .151}
003:0041-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:TRB311          1.15          .003 No_date 4:00 7.45 .165
[CN= 65.0: N= 1.10]
[Tp= .52:DT= 5.00]
003:0042-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:311          232.31          .238 No_date 4:45 6.97 n/a
+ 02:TRB311          1.15          .003 No_date 4:00 7.45 n/a
[DT= 5.00] SUM= 03:311ADD          233.46          .241 No_date 4:45 6.97 n/a
003:0043-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:311ADD          233.46          .241 No_date 4:45 6.97 n/a
[RDT= 5.00] out<- 01:312          233.46          .240 No_date 5:00 6.97 n/a
[L/S/n= 270./1.170/.100]
{Vmax= .312:Dmax= .152}
003:0044-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:TRB312          1.30          .005 No_date 4:00 12.04 .267
[CN= 76.0: N= 1.10]
[Tp= .64:DT= 5.00]
003:0045-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:312          233.46          .240 No_date 5:00 6.97 n/a
+ 02:TRB312          1.30          .005 No_date 4:00 12.04 n/a
[DT= 5.00] SUM= 03:312ADD          234.76          .244 No_date 5:00 7.00 n/a
003:0046-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 01:304a          9.61          1.683 No_date 1:40 27.75 .614
[XIMP=.46:TIMP=.57]
[SLP=1.60:DT= 5.00]
[LOSS= 1 : HORTONS]
003:0047-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 02:402a          5.67          1.215 No_date 1:40 32.68 .723
[XIMP=.58:TIMP=.73]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
003:0048-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 03:POND2          1.85          .316 No_date 1:40 35.07 .776
[XIMP=.64:TIMP=.80]
[SLP=.10:DT= 5.00]
[LOSS= 1 : HORTONS]
003:0049-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:304a          9.61          1.683 No_date 1:40 27.75 n/a
+ 02:402a          5.67          1.215 No_date 1:40 32.68 n/a
+ 03:POND2          1.85          .316 No_date 1:40 35.07 n/a
[DT= 5.00] SUM= 04:P2FLOW          17.13          3.214 No_date 1:40 30.18 n/a
003:0050-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 04:P2FLOW          17.13          3.214 No_date 1:40 30.18 n/a
[RDT= 5.00] out<- 01:POND2          17.13          .025 No_date 4:05 30.17 n/a
overflow <= 02:P2OVF          .00          .000 No_date 0:00 .00 n/a
{MxStoUsed=.4981E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
003:0051-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 02:402b          6.07          1.297 No_date 1:40 32.68 .723
[XIMP=.58:TIMP=.73]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
003:0052-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 03:402c          1.19          .253 No_date 1:40 31.21 .691
[XIMP=.55:TIMP=.68]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
003:0053-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          02:402b          6.07          1.297 No_date 1:40 32.68 n/a
+ 03:402c          1.19          .253 No_date 1:40 31.21 n/a
[DT= 5.00] SUM= 04:400-OS          7.26          1.550 No_date 1:40 32.44 n/a
003:0054-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
```

```
ROUTE RESERVOIR -> 04:400-OS          7.26          1.550 No_date 1:40 32.44 n/a
[RDT= 5.00] out<- 02:OSSTOR          7.26          .803 No_date 1:50 32.44 n/a
overflow <= 03:OSOVF          .00          .000 No_date 0:00 .00 n/a
{MxStoUsed=.3891E-01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
003:0055-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     03:401          16.78          .119 No_date 3:45 9.24 .205
[CN= 68.0: N= 3.00]
[Tp= 1.66:DT= 5.00]
003:0056-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:POND2          17.13          .025 No_date 4:05 30.17 n/a
+ 02:OSSTOR          7.26          .803 No_date 1:50 32.44 n/a
+ 03:401          16.78          .119 No_date 3:45 9.24 n/a
+ 09:312ADD          234.76          .244 No_date 5:00 7.00 n/a
[DT= 5.00] SUM= 04:P2-T3          275.93          .868 No_date 2:00 9.24 n/a
003:0057-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 04:P2-T3          275.93          .868 No_date 2:00 9.24 n/a
[RDT= 5.00] out<- 01:313          275.93          .785 No_date 2:00 9.24 n/a
[L/S/n= 423./1.170/.100]
{Vmax= .499:Dmax= .331}
003:0058-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:TRB313          .72          .003 No_date 3:10 8.73 .193
[CN= 68.0: N= 1.10]
[Tp= .34:DT= 5.00]
003:0059-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:313          275.93          .785 No_date 2:00 9.24 n/a
+ 02:TRB313          .72          .003 No_date 3:10 8.73 n/a
[DT= 5.00] SUM= 03:313ADD          276.65          .788 No_date 2:00 9.24 n/a
003:0060-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     04:TRB314          .94          .003 No_date 3:45 8.73 .193
[CN= 68.0: N= 1.10]
[Tp= .46:DT= 5.00]
003:0061-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:313          275.93          .785 No_date 2:00 9.24 n/a
+ 02:TRB313          .72          .003 No_date 3:10 8.73 n/a
[DT= 5.00] SUM= 03:313ADD          276.65          .788 No_date 2:00 9.24 n/a
003:0062-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     04:403a          2.66          .017 No_date 2:45 11.16 .247
[CN= 70.0: N= 1.10]
[Tp= .27:DT= 5.00]
003:0063-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          10:T2-U2          442.59          .306 No_date 5:55 11.36 n/a
+ 03:313ADD          276.65          .788 No_date 2:00 9.24 n/a
+ 04:403a          2.66          .017 No_date 2:45 11.16 n/a
[DT= 5.00] SUM= 01:CONFLU          721.90          .827 No_date 2:00 10.54 n/a
003:0064-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 01:203d          1.26          .274 No_date 1:40 31.77 .703
[XIMP=.56:TIMP=.70]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
003:0065-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 02:501a          9.32          2.193 No_date 1:40 39.94 .884
[XIMP=.74:TIMP=.93]
[SLP=.80:DT= 5.00]
[LOSS= 1 : HORTONS]
003:0066-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
COMPUTE DUALHYD 02:501a          9.32          2.193 No_date 1:40 39.94 n/a
Major System / 03:OSSTOR          .00          .000 No_date 0:00 .00 n/a
Minor System \ 04:TPOPD          9.32          2.060 No_date 1:40 41.58 n/a
{MjSysSto=.3980E+02, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
003:0067-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 05:501b          38.42          7.060 No_date 1:40 30.88 .684
[XIMP=.54:TIMP=.67]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
003:0068-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 06:501c          39.10          6.947 No_date 1:40 29.85 .661
[XIMP=.51:TIMP=.64]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
003:0069-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 07:MR1          3.32          .908 No_date 1:40 43.21 .956
```

SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

```
[XIMP=.80:TIMP=.99]
[SLP=1.00:DT= 5.00]
[LOSS= 1 : HORTONS]
003:0070-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 08:MR2 3.04 .834 No_date 1:40 43.21 .956
[XIMP=.80:TIMP=.99]
[SLP=1.00:DT= 5.00]
[LOSS= 1 : HORTONS]
003:0071-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:203d 1.26 .274 No_date 1:40 31.77 n/a
+ 05:501b 38.42 7.060 No_date 1:40 30.88 n/a
+ 07:MR1 3.32 .908 No_date 1:40 43.21 n/a
[DT= 5.00] SUM= 10:VALE 43.00 8.242 No_date 1:40 31.86 n/a
003:0072-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 04:TOPOND 9.32 2.060 No_date 1:40 41.58 n/a
+ 06:501c 39.10 6.947 No_date 1:40 29.85 n/a
+ 08:MR2 3.04 .834 No_date 1:40 43.21 n/a
[DT= 5.00] SUM= 09:MET 51.46 9.841 No_date 1:40 32.76 n/a
003:0073-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 01:POND3 11.89 1.543 No_date 1:45 35.07 .776
[XIMP=.64:TIMP=.80]
[SLP=.10:DT= 5.00]
[LOSS= 1 : HORTONS]
003:0074-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 10:VALE 43.00 8.242 No_date 1:40 31.86 n/a
+ 09:MET 51.46 9.841 No_date 1:40 32.76 n/a
+ 01:POND3 11.89 1.543 No_date 1:45 35.07 n/a
[DT= 5.00] SUM= 08:P3ADD 106.35 19.492 No_date 1:40 32.66 n/a
003:0075-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 08:P3ADD 106.35 19.492 No_date 1:40 32.66 n/a
[RDT= 5.00] out<- 01:POND3 106.35 .349 No_date 4:00 32.66 n/a
overflow <= 02:E-OVF .00 .000 No_date 0:00 .00 n/a
{MxStoUsed=.3205E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
** END OF RUN : 4
```

RUN:COMMAND#

```
005:0001-----
START
[TZERO = .00 hrs on 0]
[METOUT= 2 (1=imperial, 2=metric output)]
[NSTORM= 1 ]
[NRUN = 5 ]
*****
# Project Name: [Kanata North] Project Number: [112117]
# Date : 03-30-2016
# Modeller : [Kallie Auld]
# Company : NOVATECH ENGINEERING CONSULTANTS LTD
# License # : 5320763
*****
005:0002-----
READ STORM
Filename = STORM.001
Comment =
[SDT=10.00:SDUR= 4.00:PTOT= 76.02]
005:0003-----
DEFAULT VALUES
Filename = M:\2012\112117\data\CALCUL-1\swmhyo\POSTDE-1\OTTAWA.DEF
ICASEdv = 1 (read and print data)
FileTitle= ----- ENTER YOUR COMMENTS ON THIS LINE AND THE NEXT ONE ---
----- PARAMETER VALUES MUST BE ENTERED AFTER COLUMN 60 -----
Horton's infiltration equation parameters:
[Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F= .00 mm]
Parameters for PVIOUS surfaces in STANDHYD:
[IAper= 4.67 mm] [LGP=40.00 m] [MNP= .250]
```

```
Parameters for IMPERVIOUS surfaces in STANDHYD:
[IAimp= 1.57 mm] [CLI= 1.50] [MNI= .013]
Parameters used in NASHYD:
[IA= 4.67 mm] [N= 3.00]
005:0004-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:201 115.14 .152 No_date 5:35 20.74 .273
[CN= 65.0: N= 1.10]
[TP= 3.42:DT= 5.00]
005:0005-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:201 115.14 .152 No_date 5:35 20.74 n/a
[RDT= 5.00] out<- 02:210 115.14 .152 No_date 6:05 20.74 n/a
[L/S/n= 558./ .890/.040]
{Vmax= .423:Dmax= .070}
005:0006-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:202 263.64 .301 No_date 7:15 26.35 .347
[CN= 70.0: N= 1.10]
[TP= 5.14:DT= 5.00]
005:0007-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:202 263.64 .301 No_date 7:15 26.35 n/a
+ 02:210 115.14 .152 No_date 6:05 20.74 n/a
[DT= 5.00] SUM= 03:210add 378.78 .453 No_date 6:40 24.64 n/a
005:0008-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:210add 378.78 .453 No_date 6:40 24.64 n/a
[RDT= 5.00] out<- 01:211 378.78 .453 No_date 7:00 24.64 n/a
[L/S/n= 450./1.000/.100]
{Vmax= .343:Dmax= .228}
005:0009-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:211 1.87 .010 No_date 4:00 31.50 .414
[CN= 76.0: N= 1.10]
[TP= 1.17:DT= 5.00]
005:0010-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:211 378.78 .453 No_date 7:00 24.64 n/a
+ 02:211 1.87 .010 No_date 4:00 31.50 n/a
[DT= 5.00] SUM= 03:211add 380.65 .462 No_date 6:45 24.67 n/a
005:0011-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:211add 380.65 .462 No_date 6:45 24.67 n/a
[RDT= 5.00] out<- 01:212 380.65 .462 No_date 6:55 24.67 n/a
[L/S/n= 230./1.000/.100]
{Vmax= .345:Dmax= .230}
005:0012-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:212 .95 .007 No_date 3:50 22.81 .300
[CN= 66.0: N= 1.10]
[TP= .56:DT= 5.00]
005:0013-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:212 380.65 .462 No_date 6:55 24.67 n/a
+ 02:212 .95 .007 No_date 3:50 22.81 n/a
[DT= 5.00] SUM= 03:212add 381.60 .467 No_date 6:35 24.67 n/a
005:0014-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:212add 381.60 .467 No_date 6:35 24.67 n/a
[RDT= 5.00] out<- 01:213 381.60 .467 No_date 6:20 24.67 n/a
[L/S/n= 330./1.000/.100]
{Vmax= .347:Dmax= .232}
005:0015-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:213 1.43 .009 No_date 4:00 22.70 .299
[CN= 66.0: N= 1.10]
[TP= .67:DT= 5.00]
005:0016-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:213 381.60 .467 No_date 6:20 24.67 n/a
+ 02:213 1.43 .009 No_date 4:00 22.70 n/a
[DT= 5.00] SUM= 09:TRIB2 383.03 .474 No_date 6:20 24.66 n/a
005:0017-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 01:203a 27.32 9.900 No_date 1:40 57.11 .751
[XIMP=.50:TIMP=.63]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
005:0018-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 02:203b 20.76 7.490 No_date 1:40 55.97 .736
[XIMP=.48:TIMP=.60]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
005:0019-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
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* DESIGN STANDHYD 03:203c 4.95 2.148 No_date 1:40 60.48 .795
[XIMP=.57:TIMP=.71]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
005:0020-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 04:POND1 2.68 .853 No_date 1:40 64.18 .844
[XIMP=.64:TIMP=.80]
[SLP=.10:DT= 5.00]
[LOSS= 1 : HORTONS]
005:0021-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 02:203b 20.76 7.490 No_date 1:40 55.97 n/a
+ 03:203c 4.95 2.148 No_date 1:40 60.48 n/a
[DT= 5.00] SUM= 05:T2CRS 25.71 9.638 No_date 1:40 56.84 n/a
005:0022-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:203a 27.32 9.900 No_date 1:40 57.11 n/a
+ 04:POND1 2.68 .853 No_date 1:40 64.18 n/a
+ 05:T2CRS 25.71 9.638 No_date 1:40 56.84 n/a
[DT= 5.00] SUM= 06:P1FLOW 55.71 20.391 No_date 1:40 57.33 n/a
005:0023-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 06:P1FLOW 55.71 20.391 No_date 1:40 57.33 n/a
[RDT= 5.00] out<- 01:POND1 55.71 .324 No_date 3:50 57.32 n/a
overflow <= 02:P1-OVF .00 .000 No_date 0:00 .00 n/a
{MxStoUsed=.2929E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
005:0024-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:POND1 55.71 .324 No_date 3:50 57.32 n/a
+ 09:TRIB2 383.03 .474 No_date 6:20 24.66 n/a
[DT= 5.00] SUM= 02:213ADD 438.74 .777 No_date 5:10 28.81 n/a
005:0025-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:213ADD 438.74 .777 No_date 5:10 28.81 n/a
[RDT= 5.00] out<- 01:214 438.74 .776 No_date 5:30 28.81 n/a
[L/S/n= 390./1.700/.100]
{Vmax= .509:Dmax= .272}
005:0026-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:214 1.61 .036 No_date 2:20 27.16 .357
[CN= 72.0: N= 1.10]
[TP= .17:DT= 5.00]
005:0027-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:214 438.74 .776 No_date 5:30 28.81 n/a
+ 03:214 1.61 .036 No_date 2:20 27.16 n/a
[DT= 5.00] SUM= 02:214ADD 440.35 .789 No_date 5:10 28.80 n/a
005:0028-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:214ADD 440.35 .789 No_date 5:10 28.80 n/a
[RDT= 5.00] out<- 01:215 440.35 .790 No_date 4:55 28.80 n/a
[L/S/n= 260./1.400/.100]
{Vmax= .496:Dmax= .294}
005:0029-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB215 1.12 .020 No_date 2:20 21.81 .287
[CN= 66.0: N= 1.10]
[TP= .17:DT= 5.00]
005:0030-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:215 440.35 .790 No_date 4:55 28.80 n/a
+ 02:TRB215 1.12 .020 No_date 2:20 21.81 n/a
[DT= 5.00] SUM= 03:215ADD 441.47 .798 No_date 4:55 28.79 n/a
005:0031-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:215ADD 441.47 .798 No_date 4:55 28.79 n/a
[RDT= 5.00] out<- 01:216 441.47 .797 No_date 5:00 28.79 n/a
[L/S/n= 250./ .500/.100]
{Vmax= .365:Dmax= .403}
005:0032-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB216 1.12 .019 No_date 2:20 20.63 .271
[CN= 65.0: N= 1.10]
[TP= .17:DT= 5.00]
005:0033-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:216 441.47 .797 No_date 5:00 28.79 n/a
+ 02:TRB216 1.12 .019 No_date 2:20 20.63 n/a
[DT= 5.00] SUM= 10:T2-US 442.59 .805 No_date 5:00 28.77 n/a
005:0034-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:301 86.43 .277 No_date 4:00 19.07 .251
[CN= 63.0: N= 1.10]
[TP= 1.24:DT= 5.00]
005:0035-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
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CALIB NASHYD 02:302 80.69 .194 No_date 4:15 20.39 .268
[CN= 64.0: N= 1.10]
[TP= 1.80:DT= 5.00]
005:0036-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:301 86.43 .277 No_date 4:00 19.07 n/a
+ 02:302 80.69 .194 No_date 4:15 20.39 n/a
[DT= 5.00] SUM= 03:300a 167.12 .472 No_date 4:00 19.71 n/a
005:0037-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300a 167.12 .472 No_date 4:00 19.71 n/a
[RDT= 5.00] out<- 01:310 167.12 .470 No_date 4:20 19.71 n/a
[L/S/n= 449./1.620/.040]
{Vmax= .655:Dmax= .130}
005:0038-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:303 65.19 .259 No_date 4:00 24.86 .327
[CN= 69.0: N= 1.10]
[TP= 1.31:DT= 5.00]
005:0039-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:310 167.12 .470 No_date 4:20 19.71 n/a
+ 02:303 65.19 .259 No_date 4:00 24.86 n/a
[DT= 5.00] SUM= 03:300b 232.31 .728 No_date 4:15 21.15 n/a
005:0040-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300b 232.31 .728 No_date 4:15 21.15 n/a
[RDT= 5.00] out<- 01:311 232.31 .728 No_date 4:20 21.15 n/a
[L/S/n= 270./1.170/.100]
{Vmax= .456:Dmax= .296}
005:0041-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB311 1.15 .009 No_date 3:40 21.88 .288
[CN= 65.0: N= 1.10]
[TP= .52:DT= 5.00]
005:0042-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:311 232.31 .728 No_date 4:20 21.15 n/a
+ 02:TRB311 1.15 .009 No_date 3:40 21.88 n/a
[DT= 5.00] SUM= 03:311ADD 233.46 .736 No_date 4:15 21.16 n/a
005:0043-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:311ADD 233.46 .736 No_date 4:15 21.16 n/a
[RDT= 5.00] out<- 01:312 233.46 .736 No_date 4:15 21.16 n/a
[L/S/n= 270./1.170/.100]
{Vmax= .460:Dmax= .299}
005:0044-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB312 1.30 .012 No_date 4:00 31.57 .415
[CN= 76.0: N= 1.10]
[TP= .64:DT= 5.00]
005:0045-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:312 233.46 .736 No_date 4:15 21.16 n/a
+ 02:TRB312 1.30 .012 No_date 4:00 31.57 n/a
[DT= 5.00] SUM= 09:312ADD 234.76 .748 No_date 4:15 21.22 n/a
005:0046-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 01:304a 9.61 3.414 No_date 1:40 54.79 .721
[XIMP=.46:TIMP=.57]
[SLP=1.60:DT= 5.00]
[LOSS= 1 : HORTONS]
005:0047-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 02:402a 5.67 2.462 No_date 1:40 61.23 .805
[XIMP=.58:TIMP=.73]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
005:0048-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 03:POND2 1.85 .626 No_date 1:40 64.18 .844
[XIMP=.64:TIMP=.80]
[SLP=.10:DT= 5.00]
[LOSS= 1 : HORTONS]
005:0049-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:304a 9.61 3.414 No_date 1:40 54.79 n/a
+ 02:402a 5.67 2.462 No_date 1:40 61.23 n/a
+ 03:POND2 1.85 .626 No_date 1:40 64.18 n/a
[DT= 5.00] SUM= 04:P2FLOW 17.13 6.502 No_date 1:40 57.94 n/a
005:0050-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 04:P2FLOW 17.13 6.502 No_date 1:40 57.94 n/a
[RDT= 5.00] out<- 01:POND2 17.13 .076 No_date 4:00 57.93 n/a
overflow <= 02:P2OVF .00 .000 No_date 0:00 .00 n/a
{MxStoUsed=.9335E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
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SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

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005:0051-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 02:402b      6.07    2.631 No_date 1:40 61.23 .805
  [XIMP=.58:TIMP=.73]
  [SLP=2.10:DT= 5.00]
  [LOSS= 1 : HORTONS]
005:0052-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 03:402c      1.19     .519 No_date 1:40 59.28 .780
  [XIMP=.55:TIMP=.68]
  [SLP=2.10:DT= 5.00]
  [LOSS= 1 : HORTONS]
005:0053-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD
  02:402b      6.07    2.631 No_date 1:40 61.23 n/a
  + 03:402c      1.19     .519 No_date 1:40 59.28 n/a
  [DT= 5.00] SUM= 04:400-OS      7.26    3.150 No_date 1:40 60.91 n/a
005:0054-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 04:400-OS      7.26    3.150 No_date 1:40 60.91 n/a
  [RDT= 5.00] out<- 02:OSSTOR      7.26     .813 No_date 1:55 60.92 n/a
  overflow <= 03:OSSOVF      .00     .000 No_date 0:00  .00 n/a
  {MxStoUsed=.1611E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
005:0055-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:401      16.78     .329 No_date 3:40 25.27 .332
  [CN= 68.0: N= 3.00]
  [Tp= 1.66:DT= 5.00]
005:0056-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD
  01:POND2      17.13     .076 No_date 4:00 57.93 n/a
  + 02:OSSTOR      7.26     .813 No_date 1:55 60.92 n/a
  + 03:401      16.78     .329 No_date 3:40 25.27 n/a
  + 09:312ADD      234.76    .748 No_date 4:15 21.22 n/a
  [DT= 5.00] SUM= 04:P2-T3      275.93    1.618 No_date 2:40 24.79 n/a
005:0057-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 04:P2-T3      275.93    1.618 No_date 2:40 24.79 n/a
  [RDT= 5.00] out<- 01:313      275.93    1.537 No_date 2:40 24.79 n/a
  [L/S/n= 423./1.170/.100]
  [Vmax= .636:Dmax= .482]
005:0058-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB313      .72     .009 No_date 3:00 24.55 .323
  [CN= 68.0: N= 1.10]
  [Tp= .34:DT= 5.00]
005:0059-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD
  01:313      275.93    1.537 No_date 2:40 24.79 n/a
  + 02:TRB313      .72     .009 No_date 3:00 24.55 n/a
  [DT= 5.00] SUM= 03:313ADD      276.65    1.545 No_date 2:40 24.78 n/a
005:0060-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 04:TRB314      .94     .009 No_date 3:25 24.55 .323
  [CN= 68.0: N= 1.10]
  [Tp= .46:DT= 5.00]
005:0061-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD
  01:313      275.93    1.537 No_date 2:40 24.79 n/a
  + 02:TRB313      .72     .009 No_date 3:00 24.55 n/a
  [DT= 5.00] SUM= 03:313ADD      276.65    1.545 No_date 2:40 24.78 n/a
005:0062-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 04:403a      2.66     .044 No_date 2:40 28.49 .375
  [CN= 70.0: N= 1.10]
  [Tp= .27:DT= 5.00]
005:0063-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD
  10:T2-US      442.59     .805 No_date 5:00 28.77 n/a
  + 03:313ADD      276.65    1.545 No_date 2:40 24.78 n/a
  + 04:403a      2.66     .044 No_date 2:40 28.49 n/a
  [DT= 5.00] SUM= 01:CONFLU      721.90    1.974 No_date 4:05 27.24 n/a
005:0064-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 01:203d      1.26     .556 No_date 1:40 60.03 .790
  [XIMP=.56:TIMP=.70]
  [SLP=2.30:DT= 5.00]
  [LOSS= 1 : HORTONS]
005:0065-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 02:501a      9.32    3.992 No_date 1:40 70.35 .925
  [XIMP=.74:TIMP=.93]
  [SLP=.80:DT= 5.00]
  [LOSS= 1 : HORTONS]
005:0066-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
COMPUTE DUALHYD 02:501a      9.32    3.992 No_date 1:40 70.35 n/a

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Major System / 03:OSSTOR      .15     .315 No_date 1:45 70.35 n/a
Minor System \ 04:TOPOND      9.17    2.060 No_date 2:05 73.73 n/a
{MjSysSto=.8900E+03, TotOvfVol=.1037E+03, N-Ovf= 1, TotDurOvf= 0.hrs}
005:0067-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 05:501b      38.42    14.036 No_date 1:40 58.84 .774
  [XIMP=.54:TIMP=.67]
  [SLP=2.30:DT= 5.00]
  [LOSS= 1 : HORTONS]
005:0068-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 06:501c      39.10    13.973 No_date 1:40 57.56 .757
  [XIMP=.51:TIMP=.64]
  [SLP=2.30:DT= 5.00]
  [LOSS= 1 : HORTONS]
005:0069-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 07:MR1      3.32    1.596 No_date 1:40 74.05 .974
  [XIMP=.80:TIMP=.99]
  [SLP=1.00:DT= 5.00]
  [LOSS= 1 : HORTONS]
005:0070-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 08:MR2      3.04    1.464 No_date 1:40 74.05 .974
  [XIMP=.80:TIMP=.99]
  [SLP=1.00:DT= 5.00]
  [LOSS= 1 : HORTONS]
005:0071-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD
  01:203d      1.26     .556 No_date 1:40 60.03 n/a
  + 05:501b      38.42    14.036 No_date 1:40 58.84 n/a
  + 07:MR1      3.32    1.596 No_date 1:40 74.05 n/a
  [DT= 5.00] SUM= 10:VALE      43.00    16.188 No_date 1:40 60.05 n/a
005:0072-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD
  04:TOPOND      9.17    2.060 No_date 2:05 73.73 n/a
  + 06:501c      39.10    13.973 No_date 1:40 57.56 n/a
  + 08:MR2      3.04    1.464 No_date 1:40 74.05 n/a
  [DT= 5.00] SUM= 09:MET      51.31    17.497 No_date 1:40 61.43 n/a
005:0073-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 01:POND3      11.89    3.139 No_date 1:45 64.18 .844
  [XIMP=.64:TIMP=.80]
  [SLP=.10:DT= 5.00]
  [LOSS= 1 : HORTONS]
005:0074-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD
  10:VALE      43.00    16.188 No_date 1:40 60.05 n/a
  + 09:MET      51.31    17.497 No_date 1:40 61.43 n/a
  + 01:POND3      11.89    3.139 No_date 1:45 64.18 n/a
  [DT= 5.00] SUM= 08:P3ADD      106.20    36.560 No_date 1:40 61.18 n/a
005:0075-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 08:P3ADD      106.20    36.560 No_date 1:40 61.18 n/a
  [RDT= 5.00] out<- 01:POND3      106.20     .962 No_date 3:20 61.18 n/a
  overflow <= 02:E-OVF      .00     .000 No_date 0:00  .00 n/a
  {MxStoUsed=.5776E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
** END OF RUN : 5

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RUN:COMMAND#

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006:0001-----
START
  [TZERO = .00 hrs on 0]
  [METOUT= 2 (1=imperial, 2=metric output)]
  [NSTORM= 1]
  [NRUN = 6]
#*****
# Project Name: [Kanata North] Project Number: [112117]
# Date : 03-30-2016
# Modeller : [Kallie Auld]
# Company : NOVATECH ENGINEERING CONSULTANTS LTD
# License # : 5320763
#*****

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006:0002-----
READ STORM
Filename = STORM.001
Comment =
[SDT=30.00:SDUR= 12.00:PTOT= 25.00]
006:0003-----
DEFAULT VALUES
Filename = M:\2012\112117\data\CALCUL-1\swmhy\m\POSTDE-1\OTTAWA.DEF
ICASEdv = 1 (read and print data)
FileTitle= ----- ENTER YOUR COMMENTS ON THIS LINE AND THE NEXT ONE ---
----- PARAMETER VALUES MUST BE ENTERED AFTER COLUMN 60 -----
Horton's infiltration equation parameters:
[Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F= .00 mm]
Parameters for PERVIOUS surfaces in STANDHYD:
[IAper= 4.67 mm] [LGP=40.00 m] [MNP= .250]
Parameters for IMPERVIOUS surfaces in STANDHYD:
[IAimp= 1.57 mm] [CLI= 1.50] [MNI= .013]
Parameters used in NASHYD:
[La= 4.67 mm] [N= 3.00]
006:0004-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:201 115.14 .009 No_date 12:25 1.23 .049
[CN= 65.0: N= 1.10]
[TP= 3.42:DT= 5.00]
006:0005-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:201 115.14 .009 No_date 12:25 1.23 n/a
[RD= 5.00] out<- 02:210 115.14 .009 No_date 13:05 1.23 n/a
[L/S/n= 558./ .890/.040]
[Vmax= .423:Dmax= .004]
006:0006-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:202 263.64 .027 No_date 13:20 2.37 .095
[CN= 70.0: N= 1.10]
[TP= 5.14:DT= 5.00]
006:0007-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:202 263.64 .027 No_date 13:20 2.37 n/a
+ 02:210 115.14 .009 No_date 13:05 1.23 n/a
[DT= 5.00] SUM= 03:210add 378.78 .036 No_date 13:10 2.03 n/a
006:0008-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:210add 378.78 .036 No_date 13:10 2.03 n/a
[RD= 5.00] out<- 01:211 378.78 .036 No_date 13:50 2.03 n/a
[L/S/n= 450./1.000/.100]
[Vmax= .288:Dmax= .025]
006:0009-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:211 1.87 .001 No_date 12:00 3.10 .124
[CN= 76.0: N= 1.10]
[TP= 1.17:DT= 5.00]
006:0010-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:211 378.78 .036 No_date 13:50 2.03 n/a
+ 02:211 1.87 .001 No_date 12:00 3.10 n/a
[DT= 5.00] SUM= 03:211add 380.65 .037 No_date 13:40 2.03 n/a
006:0011-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:211add 380.65 .037 No_date 13:40 2.03 n/a
[RD= 5.00] out<- 01:212 380.65 .037 No_date 13:55 2.03 n/a
[L/S/n= 230./1.000/.100]
[Vmax= .288:Dmax= .025]
006:0012-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:212 .95 .000 No_date 9:20 1.78 .071
[CN= 66.0: N= 1.10]
[TP= .56:DT= 5.00]
006:0013-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:212 380.65 .037 No_date 13:55 2.03 n/a
+ 02:212 .95 .000 No_date 9:20 1.78 n/a
[DT= 5.00] SUM= 03:212add 381.60 .037 No_date 13:50 2.03 n/a
006:0014-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:212add 381.60 .037 No_date 13:50 2.03 n/a
[RD= 5.00] out<- 01:213 381.60 .037 No_date 14:15 2.03 n/a
[L/S/n= 330./1.000/.100]
[Vmax= .288:Dmax= .025]
006:0015-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:213 1.43 .001 No_date 10:30 1.74 .070
[CN= 66.0: N= 1.10]
[TP= .67:DT= 5.00]

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006:0016-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:213 381.60 .037 No_date 14:15 2.03 n/a
+ 02:213 1.43 .001 No_date 10:30 1.74 n/a
[DT= 5.00] SUM= 09:TRIB2 383.03 .037 No_date 14:05 2.03 n/a
006:0017-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 01:203a 27.32 .778 No_date 6:00 11.76 .470
[XIMP=.50:TIMP=.63]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
006:0018-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 02:203b 20.76 .573 No_date 6:00 11.25 .450
[XIMP=.48:TIMP=.60]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
006:0019-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 03:203c 4.95 .168 No_date 6:00 13.60 .544
[XIMP=.57:TIMP=.71]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
006:0020-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 04:POND1 2.68 .094 No_date 6:00 15.80 .632
[XIMP=.64:TIMP=.80]
[SLP= .10:DT= 5.00]
[LOSS= 1 : HORTONS]
006:0021-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 02:203b 20.76 .573 No_date 6:00 11.25 n/a
+ 03:203c 4.95 .168 No_date 6:00 13.60 n/a
[DT= 5.00] SUM= 05:T2CRS 25.71 .741 No_date 6:00 11.70 n/a
006:0022-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:203a 27.32 .778 No_date 6:00 11.76 n/a
+ 04:POND1 2.68 .094 No_date 6:00 15.80 n/a
+ 05:T2CRS 25.71 .741 No_date 6:00 11.70 n/a
[DT= 5.00] SUM= 06:PIFLOW 55.71 1.613 No_date 6:00 11.93 n/a
006:0023-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 06:PIFLOW 55.71 1.613 No_date 6:00 11.93 n/a
[RD= 5.00] out<- 01:POND1 55.71 .030 No_date 12:05 11.93 n/a
overflow <= 02:P1-OVF .00 .000 No_date 0:00 .00 n/a
{MxStoUsed=.5992E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0 hrs}
006:0024-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:POND1 55.71 .030 No_date 12:05 11.93 n/a
+ 09:TRIB2 383.03 .037 No_date 14:05 2.03 n/a
[DT= 5.00] SUM= 02:213ADD 438.74 .066 No_date 13:25 3.29 n/a
006:0025-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:213ADD 438.74 .066 No_date 13:25 3.29 n/a
[RD= 5.00] out<- 01:214 438.74 .066 No_date 13:45 3.29 n/a
[L/S/n= 390./1.700/.100]
[Vmax= .376:Dmax= .035]
006:0026-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:214 1.61 .002 No_date 7:00 2.25 .090
[CN= 72.0: N= 1.10]
[TP= .17:DT= 5.00]
006:0027-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:214 438.74 .066 No_date 13:45 3.29 n/a
+ 03:214 1.61 .002 No_date 7:00 2.25 n/a
[DT= 5.00] SUM= 02:214ADD 440.35 .066 No_date 13:30 3.28 n/a
006:0028-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:214ADD 440.35 .066 No_date 13:30 3.28 n/a
[RD= 5.00] out<- 01:215 440.35 .066 No_date 13:45 3.28 n/a
[L/S/n= 260./1.400/.100]
[Vmax= .341:Dmax= .038]
006:0029-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB215 1.12 .001 No_date 7:00 1.42 .057
[CN= 66.0: N= 1.10]
[TP= .17:DT= 5.00]
006:0030-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:215 440.35 .066 No_date 13:45 3.28 n/a
+ 02:TRB215 1.12 .001 No_date 7:00 1.42 n/a
[DT= 5.00] SUM= 03:215ADD 441.47 .067 No_date 13:40 3.28 n/a
006:0031-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:215ADD 441.47 .067 No_date 13:40 3.28 n/a
[RD= 5.00] out<- 01:216 441.47 .067 No_date 14:05 3.28 n/a

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SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

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[L/S/n= 250./ .500/.100]
{Vmax= .204:Dmax=.064}
006:0032-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB216 1.12 .001 No_date 7:30 1.19 .048
[CN= 65.0: N= 1.10]
[TP= .17:DT= 5.00]
006:0033-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:216 441.47 .067 No_date 14:05 3.28 n/a
+ 02:TRB216 1.12 .001 No_date 7:30 1.19 n/a
[DT= 5.00] SUM= 10:T2-US 442.59 .067 No_date 14:00 3.27 n/a
006:0034-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:301 86.43 .013 No_date 12:00 1.00 .040
[CN= 63.0: N= 1.10]
[TP= 1.24:DT= 5.00]
006:0035-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:302 80.69 .011 No_date 12:00 1.27 .051
[CN= 64.0: N= 1.10]
[TP= 1.80:DT= 5.00]
006:0036-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:301 86.43 .013 No_date 12:00 1.00 n/a
+ 02:302 80.69 .011 No_date 12:00 1.27 n/a
[DT= 5.00] SUM= 03:300a 167.12 .024 No_date 12:00 1.13 n/a
006:0037-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300a 167.12 .024 No_date 12:00 1.13 n/a
[RDT= 5.00] out<- 01:310 167.12 .024 No_date 12:15 1.13 n/a
[L/S/n= 449./1.620/.040]
{Vmax= .430:Dmax=.013}
006:0038-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:303 65.19 .018 No_date 12:00 1.99 .080
[CN= 69.0: N= 1.10]
[TP= 1.31:DT= 5.00]
006:0039-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:310 167.12 .024 No_date 12:15 1.13 n/a
+ 02:303 65.19 .018 No_date 12:00 1.99 n/a
[DT= 5.00] SUM= 03:300b 232.31 .043 No_date 12:05 1.37 n/a
006:0040-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300b 232.31 .043 No_date 12:05 1.37 n/a
[RDT= 5.00] out<- 01:311 232.31 .043 No_date 12:20 1.37 n/a
[L/S/n= 270./1.170/.100]
{Vmax= .312:Dmax=.027}
006:0041-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB311 1.15 .000 No_date 9:10 1.61 .064
[CN= 65.0: N= 1.10]
[TP= .52:DT= 5.00]
006:0042-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:311 232.31 .043 No_date 12:20 1.37 n/a
+ 02:TRB311 1.15 .000 No_date 9:10 1.61 n/a
[DT= 5.00] SUM= 03:311ADD 233.46 .043 No_date 12:20 1.37 n/a
006:0043-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:311ADD 233.46 .043 No_date 12:20 1.37 n/a
[RDT= 5.00] out<- 01:312 233.46 .043 No_date 12:30 1.37 n/a
[L/S/n= 270./1.170/.100]
{Vmax= .312:Dmax=.027}
006:0044-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB312 1.30 .001 No_date 9:25 3.13 .125
[CN= 76.0: N= 1.10]
[TP= .64:DT= 5.00]
006:0045-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:312 233.46 .043 No_date 12:30 1.37 n/a
+ 02:TRB312 1.30 .001 No_date 9:25 3.13 n/a
[DT= 5.00] SUM= 09:312ADD 234.76 .044 No_date 12:30 1.38 n/a
006:0046-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 01:304a 9.61 .259 No_date 6:00 10.78 .431
[XIMP=.46:TIMP=.57]
[SLP=1.60:DT= 5.00]
[LOSS= 1 : HORTONS]
006:0047-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 02:402a 5.67 .196 No_date 6:00 13.96 .558
[XIMP=.58:TIMP=.73]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
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006:0048-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 03:POND2 1.85 .066 No_date 6:00 15.80 .632
[XIMP=.64:TIMP=.80]
[SLP=.10:DT= 5.00]
[LOSS= 1 : HORTONS]
006:0049-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:304a 9.61 .259 No_date 6:00 10.78 n/a
+ 02:402a 5.67 .196 No_date 6:00 13.96 n/a
+ 03:POND2 1.85 .066 No_date 6:00 15.80 n/a
[DT= 5.00] SUM= 04:P2FLOW 17.13 .521 No_date 6:00 12.37 n/a
006:0050-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 04:P2FLOW 17.13 .521 No_date 6:00 12.37 n/a
[RDT= 5.00] out<- 01:POND2 17.13 .003 No_date 12:10 12.37 n/a
overflow <= 02:P2OVF .00 .000 No_date 0:00 .00 n/a
{MxStoUsed=.2063E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0 hrs}
006:0051-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 02:402b 6.07 .209 No_date 6:00 13.96 .558
[XIMP=.58:TIMP=.73]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
006:0052-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 03:402c 1.19 .039 No_date 6:00 13.00 .520
[XIMP=.55:TIMP=.68]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
006:0053-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 02:402b 6.07 .209 No_date 6:00 13.96 n/a
+ 03:402c 1.19 .039 No_date 6:00 13.00 n/a
[DT= 5.00] SUM= 04:400-OS 7.26 .248 No_date 6:00 13.80 n/a
006:0054-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 04:400-OS 7.26 .248 No_date 6:00 13.80 n/a
[RDT= 5.00] out<- 02:OSSTOR 7.26 .248 No_date 6:00 13.80 n/a
overflow <= 03:OSOVF .00 .000 No_date 0:00 .00 n/a
{MxStoUsed=.1554E-02, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0 hrs}
006:0055-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:401 16.78 .022 No_date 8:10 2.36 .094
[CN= 68.0: N= 3.00]
[TP= 1.66:DT= 5.00]
006:0056-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:POND2 17.13 .003 No_date 12:10 12.37 n/a
+ 02:OSSTOR 7.26 .248 No_date 6:00 13.80 n/a
+ 03:401 16.78 .022 No_date 8:10 2.36 n/a
[DT= 5.00] SUM= 04:P2-T3 275.93 .252 No_date 6:00 2.45 n/a
006:0057-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 04:P2-T3 275.93 .252 No_date 6:00 2.45 n/a
[RDT= 5.00] out<- 01:313 275.93 .177 No_date 6:05 2.45 n/a
[L/S/n= 423./1.170/.100]
{Vmax= .312:Dmax=.158}
006:0058-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB313 .72 .001 No_date 8:00 2.06 .082
[CN= 68.0: N= 1.10]
[TP= .34:DT= 5.00]
006:0059-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:313 275.93 .177 No_date 6:05 2.45 n/a
+ 02:TRB313 .72 .001 No_date 8:00 2.06 n/a
[DT= 5.00] SUM= 03:313ADD 276.65 .177 No_date 6:05 2.45 n/a
006:0060-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 04:TRB314 .94 .001 No_date 9:00 2.06 .083
[CN= 68.0: N= 1.10]
[TP= .46:DT= 5.00]
006:0061-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:313 275.93 .177 No_date 6:05 2.45 n/a
+ 02:TRB313 .72 .001 No_date 8:00 2.06 n/a
[DT= 5.00] SUM= 03:313ADD 276.65 .177 No_date 6:05 2.45 n/a
006:0062-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 04:403a 2.66 .004 No_date 7:00 3.31 .132
[CN= 70.0: N= 1.10]
[TP= .27:DT= 5.00]
006:0063-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 10:T2-US 442.59 .067 No_date 14:00 3.27 n/a
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SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

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+ 03:313ADD      276.65      .177 No_date      6:05      2.45 n/a
+ 04:403a        2.66      .004 No_date      7:00      3.31 n/a
[DT= 5.00] SUM= 01:CONFLU      721.90      .186 No_date      6:05      2.96 n/a
006:0064-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 01:203d      1.26      .042 No_date      6:00      13.34 .534
[XIMP=.56:TIMP=.70]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
006:0065-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 02:501a      9.32      .464 No_date      6:00      19.69 .788
[XIMP=.74:TIMP=.93]
[SLP= .80:DT= 5.00]
[LOSS= 1 : HORTONS]
006:0066-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
COMPUTE DUALHYD 02:501a      9.32      .464 No_date      6:00      19.69 n/a
Major System / 03:OSSSTOR      .00      .000 No_date      0:00      .00 n/a
Minor System \ 04:TOPOND      9.32      .464 No_date      6:00      19.69 n/a
{MjSysSto=.0000E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
006:0067-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 05:501b      38.42      1.166 No_date      6:00      12.76 .510
[XIMP=.54:TIMP=.67]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
006:0068-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 06:501c      39.10      1.119 No_date      6:00      12.01 .480
[XIMP=.51:TIMP=.64]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
006:0069-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 07:MR1      3.32      .192 No_date      6:00      22.21 .889
[XIMP=.80:TIMP=.99]
[SLP=1.00:DT= 5.00]
[LOSS= 1 : HORTONS]
006:0070-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 08:MR2      3.04      .176 No_date      6:00      22.21 .889
[XIMP=.80:TIMP=.99]
[SLP=1.00:DT= 5.00]
[LOSS= 1 : HORTONS]
006:0071-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:203d      1.26      .042 No_date      6:00      13.34 n/a
+ 05:501b      38.42      1.166 No_date      6:00      12.76 n/a
+ 07:MR1      3.32      .192 No_date      6:00      22.21 n/a
[DT= 5.00] SUM= 10:VALE      43.00      1.400 No_date      6:00      13.50 n/a
006:0072-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 04:TOPOND      9.32      .464 No_date      6:00      19.69 n/a
+ 06:501c      39.10      1.119 No_date      6:00      12.01 n/a
+ 08:MR2      3.04      .176 No_date      6:00      22.21 n/a
[DT= 5.00] SUM= 09:MET      51.46      1.759 No_date      6:00      14.01 n/a
006:0073-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 01:POND3      11.89      .346 No_date      6:05      15.80 .632
[XIMP=.64:TIMP=.80]
[SLP= .10:DT= 5.00]
[LOSS= 1 : HORTONS]
006:0074-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 10:VALE      43.00      1.400 No_date      6:00      13.50 n/a
+ 09:MET      51.46      1.759 No_date      6:00      14.01 n/a
+ 01:POND3      11.89      .346 No_date      6:05      15.80 n/a
[DT= 5.00] SUM= 08:P3ADD      106.35      3.488 No_date      6:00      14.00 n/a
006:0075-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 08:P3ADD      106.35      3.488 No_date      6:00      14.00 n/a
[RD= 5.00] out<- 01:POND3      106.35      .050 No_date      12:10      14.00 n/a
overflow <= 02:E-OVF      .00      .000 No_date      0:00      .00 n/a
{MxStoUsed=.1380E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
** END OF RUN : 6

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RUN:COMMAND#
007:0001-----START-----
[TZERO = .00 hrs on 0]
[METOUT= 2 (1=imperial, 2=metric output)]
[NSTORM= 1]
[NRUN = 7]
*****
# Project Name: [Kanata North] Project Number: [112117]
# Date : 03-30-2016
# Modeller : [Kallie Auld]
# Company : NOVATECH ENGINEERING CONSULTANTS LTD
# License # : 5320763
*****
007:0002-----READ STORM-----
Filename = STORM.001
Comment =
[SDT=30.00:SDUR= 12.00:PTOT= 42.34]
007:0003-----DEFAULT VALUES-----
Filename = M:\2012\112117\data\CALCUL-1\swmhymo\POSTDE-1\OTTAWA.DEF
ICASEdv = 1 (read and print data)
FileTitle= ----- ENTER YOUR COMMENTS ON THIS LINE AND THE NEXT ONE -----
----- PARAMETER VALUES MUST BE ENTERED AFTER COLUMN 60 -----
Horton's infiltration equation parameters:
[Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F= .00 mm]
Parameters for PERVIOUS surfaces in STANDHYD:
[IAper= 4.67 mm] [LGP=40.00 m] [MNP= .250]
Parameters for IMPVIOUS surfaces in STANDHYD:
[IAimp= 1.57 mm] [CLI= 1.50] [MNI= .013]
Parameters used in NASHYD:
[La= 4.67 mm] [N= 3.00]
007:0004-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:201      115.14      .041 No_date      12:10      5.71 .135
[CN= 65.0: N= 1.10]
[TP= 3.42:DT= 5.00]
007:0005-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:201      115.14      .041 No_date      12:10      5.71 n/a
[RD= 5.00] out<- 02:210      115.14      .041 No_date      12:50      5.71 n/a
[L/S/n= 558./ .890/.040]
{Vmax= .423:Dmax= .019}
007:0006-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:202      263.64      .095 No_date      13:05      8.36 .197
[CN= 70.0: N= 1.10]
[TP= 5.14:DT= 5.00]
007:0007-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:202      263.64      .095 No_date      13:05      8.36 n/a
+ 02:210      115.14      .041 No_date      12:50      5.71 n/a
[DT= 5.00] SUM= 03:210add      378.78      .136 No_date      12:55      7.55 n/a
007:0008-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:210add      378.78      .136 No_date      12:55      7.55 n/a
[RD= 5.00] out<- 01:211      378.78      .136 No_date      13:35      7.55 n/a
[L/S/n= 450./1.000/.100]
{Vmax= .288:Dmax= .093}
007:0009-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:211      1.87      .003 No_date      10:50      10.49 .248
[CN= 76.0: N= 1.10]
[TP= 1.17:DT= 5.00]
007:0010-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:211      378.78      .136 No_date      13:35      7.55 n/a
+ 02:211      1.87      .003 No_date      10:50      10.49 n/a
[DT= 5.00] SUM= 03:211add      380.65      .139 No_date      13:25      7.57 n/a
007:0011-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:211add      380.65      .139 No_date      13:25      7.57 n/a
[RD= 5.00] out<- 01:212      380.65      .139 No_date      13:40      7.57 n/a
[L/S/n= 230./1.000/.100]
{Vmax= .288:Dmax= .095}
007:0012-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:212      .95      .002 No_date      9:00      6.83 .161

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SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

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[CN= 66.0: N= 1.10]
[TP= .56:DT= 5.00]
007:0013-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:212          380.65          .139 No_date 13:40 7.57 n/a
                + 02:212          .95          .002 No_date 9:00 6.83 n/a
[DT= 5.00] SUM= 03:212ADD          381.60          .140 No_date 13:35 7.57 n/a
007:0014-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL   -> 03:212ADD          381.60          .140 No_date 13:35 7.57 n/a
[RD= 5.00] out<- 01:213          381.60          .140 No_date 14:00 7.57 n/a
[L/S/n= 330./1.000/.100]
[Vmax= .288:Dmax= .095]
007:0015-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD    02:213          1.43          .002 No_date 9:00 6.76 .160
[CN= 66.0: N= 1.10]
[TP= .67:DT= 5.00]
007:0016-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:213          381.60          .140 No_date 14:00 7.57 n/a
                + 02:213          1.43          .002 No_date 9:00 6.76 n/a
[DT= 5.00] SUM= 09:TRB2          383.03          .141 No_date 13:55 7.56 n/a
007:0017-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 01:203a          27.32          1.734 No_date 6:00 24.30 .574
[XIMP=.50:TIMP=.63]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
007:0018-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 02:203b          20.76          1.259 No_date 6:00 23.23 .549
[XIMP=.48:TIMP=.60]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
007:0019-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 03:203c          4.95          .375 No_date 6:00 27.22 .643
[XIMP=.57:TIMP=.71]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
007:0020-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 04:POND1          2.68          .182 No_date 6:00 30.58 .722
[XIMP=.64:TIMP=.80]
[SLP= .10:DT= 5.00]
[LOSS= 1 : HORTONS]
007:0021-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          02:203b          20.76          1.259 No_date 6:00 23.23 n/a
                + 03:203c          4.95          .375 No_date 6:00 27.22 n/a
[DT= 5.00] SUM= 05:T2CRS          25.71          1.634 No_date 6:00 24.00 n/a
007:0022-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:203a          27.32          1.734 No_date 6:00 24.30 n/a
                + 04:POND1          2.68          .182 No_date 6:00 30.58 n/a
                + 05:T2CRS          25.71          1.634 No_date 6:00 24.00 n/a
[DT= 5.00] SUM= 06:P1FLOW          55.71          3.549 No_date 6:00 24.46 n/a
007:0023-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 06:P1FLOW          55.71          3.549 No_date 6:00 24.46 n/a
[RD= 5.00] out<- 01:POND1          55.71          .089 No_date 10:35 24.46 n/a
overflow <= 02:P1-OVF          .00          .000 No_date 0:00 .00 n/a
{MxStoUsed=.1181E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
007:0024-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:POND1          55.71          .089 No_date 10:35 24.46 n/a
                + 09:TRB2          383.03          .141 No_date 13:55 7.56 n/a
[DT= 5.00] SUM= 02:213ADD          438.74          .225 No_date 12:50 9.71 n/a
007:0025-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL   -> 02:213ADD          438.74          .225 No_date 12:50 9.71 n/a
[RD= 5.00] out<- 01:214          438.74          .224 No_date 13:10 9.71 n/a
[L/S/n= 390./1.700/.100]
[Vmax= .376:Dmax= .118]
007:0026-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD    03:214          1.61          .008 No_date 6:30 8.45 .200
[CN= 72.0: N= 1.10]
[TP= .17:DT= 5.00]
007:0027-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:214          438.74          .224 No_date 13:10 9.71 n/a
                + 03:214          1.61          .008 No_date 6:30 8.45 n/a
[DT= 5.00] SUM= 02:214ADD          440.35          .226 No_date 13:00 9.70 n/a
007:0028-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-

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ROUTE CHANNEL   -> 02:214ADD          440.35          .226 No_date 13:00 9.70 n/a
[RD= 5.00] out<- 01:215          440.35          .226 No_date 13:10 9.70 n/a
[L/S/n= 260./1.400/.100]
[Vmax= .341:Dmax= .131]
007:0029-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD    02:TRB215          1.12          .004 No_date 6:40 6.19 .146
[CN= 66.0: N= 1.10]
[TP= .17:DT= 5.00]
007:0030-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:215          440.35          .226 No_date 13:10 9.70 n/a
                + 02:TRB215          1.12          .004 No_date 6:40 6.19 n/a
[DT= 5.00] SUM= 03:215ADD          441.47          .227 No_date 13:05 9.69 n/a
007:0031-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL   -> 03:215ADD          441.47          .227 No_date 13:05 9.69 n/a
[RD= 5.00] out<- 01:216          441.47          .226 No_date 13:20 9.69 n/a
[L/S/n= 250./ .500/.100]
[Vmax= .218:Dmax= .186]
007:0032-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD    02:TRB216          1.12          .004 No_date 7:00 5.64 .133
[CN= 65.0: N= 1.10]
[TP= .17:DT= 5.00]
007:0033-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:216          441.47          .226 No_date 13:20 9.69 n/a
                + 02:TRB216          1.12          .004 No_date 7:00 5.64 n/a
[DT= 5.00] SUM= 10:T2-US          442.59          .227 No_date 13:15 9.68 n/a
007:0034-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD    01:301          86.43          .064 No_date 12:00 5.03 .119
[CN= 63.0: N= 1.10]
[TP= 1.24:DT= 5.00]
007:0035-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD    02:302          80.69          .050 No_date 12:00 5.67 .134
[CN= 64.0: N= 1.10]
[TP= 1.80:DT= 5.00]
007:0036-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:301          86.43          .064 No_date 12:00 5.03 n/a
                + 02:302          80.69          .050 No_date 12:00 5.67 n/a
[DT= 5.00] SUM= 03:300a          167.12          .114 No_date 12:00 5.34 n/a
007:0037-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL   -> 03:300a          167.12          .114 No_date 12:00 5.34 n/a
[RD= 5.00] out<- 01:310          167.12          .114 No_date 12:05 5.34 n/a
[L/S/n= 449./1.620/.040]
[Vmax= .431:Dmax= .061]
007:0038-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD    02:303          65.19          .069 No_date 12:00 7.58 .179
[CN= 69.0: N= 1.10]
[TP= 1.31:DT= 5.00]
007:0039-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:310          167.12          .114 No_date 12:05 5.34 n/a
                + 02:303          65.19          .069 No_date 12:00 7.58 n/a
[DT= 5.00] SUM= 03:300b          232.31          .183 No_date 12:00 5.97 n/a
007:0040-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL   -> 03:300b          232.31          .183 No_date 12:00 5.97 n/a
[RD= 5.00] out<- 01:311          232.31          .183 No_date 12:10 5.97 n/a
[L/S/n= 270./1.170/.100]
[Vmax= .312:Dmax= .116]
007:0041-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD    02:TRB311          1.15          .002 No_date 9:00 6.42 .152
[CN= 65.0: N= 1.10]
[TP= .52:DT= 5.00]
007:0042-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:311          232.31          .183 No_date 12:10 5.97 n/a
                + 02:TRB311          1.15          .002 No_date 9:00 6.42 n/a
[DT= 5.00] SUM= 03:311ADD          233.46          .184 No_date 12:05 5.97 n/a
007:0043-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL   -> 03:311ADD          233.46          .184 No_date 12:05 5.97 n/a
[RD= 5.00] out<- 01:312          233.46          .184 No_date 12:20 5.97 n/a
[L/S/n= 270./1.170/.100]
[Vmax= .312:Dmax= .117]
007:0044-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD    02:TRB312          1.30          .003 No_date 9:00 10.54 .249
[CN= 76.0: N= 1.10]

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SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

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[TP= .64:DT= 5.00]
007:0045-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:312          234.46          .184 No_date 12:20 5.97 n/a
                + 02:TRB312          1.30          .003 No_date 9:00 10.54 n/a
[DT= 5.00] SUM= 09:312ADD          234.76          .187 No_date 12:15 6.00 n/a
007:0046-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 01:304a          9.61          .557 No_date 6:00 22.29 .527
[XIMP=.46:TIMP=.57]
[SLP=1.60:DT= 5.00]
[LOSS= 1 : HORTONS]
007:0047-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 02:402a          5.67          .438 No_date 6:00 27.85 .658
[XIMP=.58:TIMP=.73]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
007:0048-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 03:POND2          1.85          .127 No_date 6:00 30.58 .722
[XIMP=.64:TIMP=.80]
[SLP=.10:DT= 5.00]
[LOSS= 1 : HORTONS]
007:0049-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:304a          9.61          .557 No_date 6:00 22.29 n/a
                + 02:402a          5.67          .438 No_date 6:00 27.85 n/a
                + 03:POND2          1.85          .127 No_date 6:00 30.58 n/a
[DT= 5.00] SUM= 04:P2FLOW          17.13          1.122 No_date 6:00 25.03 n/a
007:0050-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 04:P2FLOW          17.13          1.122 No_date 6:00 25.03 n/a
[RD= 5.00] out<- 01:POND2          17.13          .016 No_date 12:00 25.03 n/a
overflow <= 02:P2OVF          .00          .000 No_date 0:00 .00 n/a
{MxStoUsed=.3975E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
007:0051-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 02:402b          6.07          .469 No_date 6:00 27.85 .658
[XIMP=.58:TIMP=.73]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
007:0052-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 03:402c          1.19          .088 No_date 6:00 26.27 .621
[XIMP=.55:TIMP=.68]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
007:0053-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          02:402b          6.07          .469 No_date 6:00 27.85 n/a
                + 03:402c          1.19          .088 No_date 6:00 26.27 n/a
[DT= 5.00] SUM= 04:400-OS          7.26          .557 No_date 6:00 27.59 n/a
007:0054-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 04:400-OS          7.26          .557 No_date 6:00 27.59 n/a
[RD= 5.00] out<- 02:OSSTOR          7.26          .552 No_date 6:00 27.59 n/a
overflow <= 03:OSOVF          .00          .000 No_date 0:00 .00 n/a
{MxStoUsed=.3518E-02, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
007:0055-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     03:401          16.78          .079 No_date 8:00 8.06 .190
[CN= 68.0: N= 3.00]
[TP= 1.66:DT= 5.00]
007:0056-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:POND2          17.13          .016 No_date 12:00 25.03 n/a
                + 02:OSSTOR          7.26          .552 No_date 6:00 27.59 n/a
                + 03:401          16.78          .079 No_date 8:00 8.06 n/a
                + 09:312ADD          234.76          .187 No_date 12:15 6.00 n/a
[DT= 5.00] SUM= 04:P2-T3          275.93          .570 No_date 6:00 7.87 n/a
007:0057-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 04:P2-T3          275.93          .570 No_date 6:00 7.87 n/a
[RD= 5.00] out<- 01:313          275.93          .408 No_date 6:05 7.87 n/a
[L/S/n= 423./1.170/.100]
[Vmax= .396:Dmax= .251]
007:0058-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:TRB313          .72          .002 No_date 7:30 7.57 .179
[CN= 68.0: N= 1.10]
[TP= .34:DT= 5.00]
007:0059-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:313          275.93          .408 No_date 6:05 7.87 n/a
                + 02:TRB313          .72          .002 No_date 7:30 7.57 n/a

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[DT= 5.00] SUM= 03:313ADD          276.65          .410 No_date 6:05 7.87 n/a
007:0060-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     04:TRB314          .94          .002 No_date 8:00 7.58 .179
[CN= 68.0: N= 1.10]
[TP= .46:DT= 5.00]
007:0061-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:313          275.93          .408 No_date 6:05 7.87 n/a
                + 02:TRB313          .72          .002 No_date 7:30 7.57 n/a
[DT= 5.00] SUM= 03:313ADD          276.65          .410 No_date 6:05 7.87 n/a
007:0062-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     04:403a          2.66          .012 No_date 7:00 9.85 .233
[CN= 70.0: N= 1.10]
[TP= .27:DT= 5.00]
007:0063-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          10:T2-US          442.59          .227 No_date 13:15 9.68 n/a
                + 03:313ADD          276.65          .410 No_date 6:05 7.87 n/a
                + 04:403a          2.66          .012 No_date 7:00 9.85 n/a
[DT= 5.00] SUM= 01:CONFLU          721.90          .474 No_date 10:35 8.99 n/a
007:0064-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 01:203d          1.26          .095 No_date 6:00 26.84 .634
[XIMP=.56:TIMP=.70]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
007:0065-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 02:501a          9.32          .858 No_date 6:00 35.29 .834
[XIMP=.74:TIMP=.93]
[SLP=.80:DT= 5.00]
[LOSS= 1 : HORTONS]
007:0066-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
COMPUTE DUALHYD 02:501a          9.32          .858 No_date 6:00 35.29 n/a
Major System / 03:OSSTOR          .00          .000 No_date 0:00 .00 n/a
Minor System \ 04:TOPOND          9.32          .858 No_date 6:00 35.29 n/a
{MjSysSto=.0000E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
007:0067-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 05:501b          38.42          2.546 No_date 6:00 25.88 .611
[XIMP=.54:TIMP=.67]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
007:0068-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 06:501c          39.10          2.474 No_date 6:00 24.70 .583
[XIMP=.51:TIMP=.64]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
007:0069-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 07:MR1          3.32          .330 No_date 6:00 39.40 .931
[XIMP=.80:TIMP=.99]
[SLP=1.00:DT= 5.00]
[LOSS= 1 : HORTONS]
007:0070-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 08:MR2          3.04          .302 No_date 6:00 39.40 .931
[XIMP=.80:TIMP=.99]
[SLP=1.00:DT= 5.00]
[LOSS= 1 : HORTONS]
007:0071-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:203d          1.26          .095 No_date 6:00 26.84 n/a
                + 05:501b          38.42          2.546 No_date 6:00 25.88 n/a
                + 07:MR1          3.32          .330 No_date 6:00 39.40 n/a
[DT= 5.00] SUM= 10:VALE          43.00          2.971 No_date 6:00 26.95 n/a
007:0072-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          04:TOPOND          9.32          .858 No_date 6:00 35.29 n/a
                + 06:501c          39.10          2.474 No_date 6:00 24.70 n/a
                + 08:MR2          3.04          .302 No_date 6:00 39.40 n/a
[DT= 5.00] SUM= 09:MET          51.46          3.634 No_date 6:00 27.48 n/a
007:0073-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 01:POND3          11.89          .707 No_date 6:05 30.58 .722
[XIMP=.64:TIMP=.80]
[SLP=.10:DT= 5.00]
[LOSS= 1 : HORTONS]
007:0074-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          10:VALE          43.00          2.971 No_date 6:00 26.95 n/a
                + 09:MET          51.46          3.634 No_date 6:00 27.48 n/a

```

SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

```

+ 01:POND3      11.89      .707 No_date    6:05    30.58  n/a
[DT= 5.00] SUM= 08:P3ADD      106.35      7.300 No_date    6:00    27.61  n/a
007:0075-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
ROUTE RESERVOIR -> 08:P3ADD      106.35      7.300 No_date    6:00    27.61  n/a
[RD7= 5.00] out<- 01:POND3      106.35      .220 No_date    9:30    27.61  n/a
overflow <= 02:E-OVF      .00      .000 No_date    0:00      .00  n/a
{MxStoUsed=.2515E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
** END OF RUN : 7

```

RUN:COMMAND#

```

008:0001-----
START
[TZERO = .00 hrs on 0]
[METOUT= 2 (1=imperial, 2=metric output)]
[NSTORM= 1 ]
[NRUN = 8 ]

```

```

#*****
# Project Name: [Kanata North] Project Number: [112117]
# Date : 03-30-2016
# Modeller : [Kallie Auld]
# Company : NOVATECH ENGINEERING CONSULTANTS LTD
# License # : 5320763
#*****

```

```

008:0002-----
READ STORM
Filename = STORM.001
Comment =
[SDT=30.00:SDUR= 12.00:PTOT= 56.18]

```

```

008:0003-----
DEFAULT VALUES
Filename = M:\2012\112117\data\CALCUL-1\swmhy\POSTDE-1\OTTAWA.DEF
ICASEdv = 1 (read and print data)
FileTitle= ----- ENTER YOUR COMMENTS ON THIS LINE AND THE NEXT ONE ---
----- PARAMETER VALUES MUST BE ENTERED AFTER COLUMN 60 -----
Horton's infiltration equation parameters:
[Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F= .00 mm]
Parameters for PERVIOUS surfaces in STANDHYD:
[IAper= 4.67 mm] [LGP=40.00 m] [MNP= .250]
Parameters for IMPVIOUS surfaces in STANDHYD:
[IAimp= 1.57 mm] [CLI= 1.50] [MNI= .013]
Parameters used in NASHYD:
[IA= 4.67 mm] [N= 3.00]

```

```

008:0004-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
CALIB NASHYD 01:201 115.14 .080 No_date 12:05 11.05 .197
[CN= 65.0: N= 1.10]
[TP= 3.42:DT= 5.00]

```

```

008:0005-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
ROUTE CHANNEL -> 01:201 115.14 .080 No_date 12:05 11.05 n/a
[RD7= 5.00] out<- 02:210 115.14 .080 No_date 12:45 11.05 n/a
[L/S/n= 558./ .890/.040]
{Vmax= .423:Dmax= .037}

```

```

008:0006-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
CALIB NASHYD 01:202 263.64 .170 No_date 13:00 14.94 .266
[CN= 70.0: N= 1.10]
[TP= 5.14:DT= 5.00]

```

```

008:0007-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
ADD HYD 01:202 263.64 .170 No_date 13:00 14.94 n/a
+ 02:210 115.14 .080 No_date 12:45 11.05 n/a
[DT= 5.00] SUM= 03:210add 378.78 .249 No_date 12:50 13.75 n/a

```

```

008:0008-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
ROUTE CHANNEL -> 03:210add 378.78 .249 No_date 12:50 13.75 n/a
[RD7= 5.00] out<- 01:211 378.78 .249 No_date 13:25 13.75 n/a
[L/S/n= 450./1.000/.100]
{Vmax= .292:Dmax= .164}

```

```

008:0009-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
CALIB NASHYD 02:211 1.87 .005 No_date 10:30 18.32 .326
[CN= 76.0: N= 1.10]
[TP= 1.17:DT= 5.00]

```

```

008:0010-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
ADD HYD 01:211 378.78 .249 No_date 13:25 13.75 n/a
+ 02:211 1.87 .005 No_date 10:30 18.32 n/a
[DT= 5.00] SUM= 03:211add 380.65 .254 No_date 13:15 13.78 n/a

```

```

008:0011-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
ROUTE CHANNEL -> 03:211add 380.65 .254 No_date 13:15 13.78 n/a
[RD7= 5.00] out<- 01:212 380.65 .254 No_date 13:25 13.78 n/a
[L/S/n= 230./1.000/.100]
{Vmax= .293:Dmax= .165}

```

```

008:0012-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
CALIB NASHYD 02:212 .95 .003 No_date 9:00 12.59 .224
[CN= 66.0: N= 1.10]
[TP= .56:DT= 5.00]

```

```

008:0013-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
ADD HYD 01:212 380.65 .254 No_date 13:25 13.78 n/a
+ 02:212 .95 .003 No_date 9:00 12.59 n/a
[DT= 5.00] SUM= 03:212add 381.60 .256 No_date 13:15 13.77 n/a

```

```

008:0014-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
ROUTE CHANNEL -> 03:212add 381.60 .256 No_date 13:15 13.77 n/a
[RD7= 5.00] out<- 01:213 381.60 .256 No_date 13:40 13.77 n/a
[L/S/n= 330./1.000/.100]
{Vmax= .293:Dmax= .166}

```

```

008:0015-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
CALIB NASHYD 02:213 1.43 .004 No_date 9:00 12.50 .223
[CN= 66.0: N= 1.10]
[TP= .67:DT= 5.00]

```

```

008:0016-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
ADD HYD 01:213 381.60 .256 No_date 13:40 13.77 n/a
+ 02:213 1.43 .004 No_date 9:00 12.50 n/a
[DT= 5.00] SUM= 09:TRIB2 383.03 .259 No_date 13:35 13.77 n/a

```

```

008:0017-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
DESIGN STANDHYD 01:203a 27.32 2.754 No_date 6:00 35.54 .633
[XIMP=.50:TIMP=.63]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]

```

```

008:0018-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
DESIGN STANDHYD 02:203b 20.76 2.048 No_date 6:00 34.32 .611
[XIMP=.48:TIMP=.60]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]

```

```

008:0019-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
* DESIGN STANDHYD 03:203c 4.95 .561 No_date 6:00 39.04 .695
[XIMP=.57:TIMP=.71]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]

```

```

008:0020-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
DESIGN STANDHYD 04:POND1 2.68 .263 No_date 6:00 42.73 .761
[XIMP=.64:TIMP=.80]
[SLP= .10:DT= 5.00]
[LOSS= 1 : HORTONS]

```

```

008:0021-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
ADD HYD 02:203b 20.76 2.048 No_date 6:00 34.32 n/a
+ 03:203c 4.95 .561 No_date 6:00 39.04 n/a
[DT= 5.00] SUM= 05:T2CRS 25.71 2.609 No_date 6:00 35.23 n/a

```

```

008:0022-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
ADD HYD 01:203a 27.32 2.754 No_date 6:00 35.54 n/a
+ 04:POND1 2.68 .263 No_date 6:00 42.73 n/a
+ 05:T2CRS 25.71 2.609 No_date 6:00 35.23 n/a
[DT= 5.00] SUM= 06:P1FLOW 55.71 5.626 No_date 6:00 35.74 n/a

```

```

008:0023-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
ROUTE RESERVOIR -> 06:P1FLOW 55.71 5.626 No_date 6:00 35.74 n/a
[RD7= 5.00] out<- 01:POND1 55.71 .177 No_date 9:05 35.74 n/a
overflow <= 02:P1-OVF .00 .000 No_date 0:00 .00 n/a
{MxStoUsed=.1677E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}

```

```

008:0024-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
ADD HYD 01:POND1 55.71 .177 No_date 9:05 35.74 n/a
+ 09:TRIB2 383.03 .259 No_date 13:35 13.77 n/a

```

SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

```

[DT= 5.00] SUM= 02:213ADD 438.74 .417 No_date 12:15 16.56 n/a
008:0025-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:213ADD 438.74 .417 No_date 12:15 16.56 n/a
[RD= 5.00] out<- 01:214 438.74 .416 No_date 12:30 16.56 n/a
[L/S/n= 390./1.700/.100]
[Vmax= .401:Dmax= .186]
008:0026-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:214 1.61 .016 No_date 6:30 15.30 .272
[CN= 72.0: N= 1.10]
[TP= .17:DT= 5.00]
008:0027-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:214 438.74 .416 No_date 12:30 16.56 n/a
+ 03:214 1.61 .016 No_date 6:30 15.30 n/a
[DT= 5.00] SUM= 02:214ADD 440.35 .420 No_date 12:20 16.55 n/a
008:0028-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:214ADD 440.35 .420 No_date 12:20 16.55 n/a
[RD= 5.00] out<- 01:215 440.35 .420 No_date 12:25 16.55 n/a
[L/S/n= 260./1.400/.100]
[Vmax= .374:Dmax= .197]
008:0029-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB215 1.12 .008 No_date 6:30 11.77 .210
[CN= 66.0: N= 1.10]
[TP= .17:DT= 5.00]
008:0030-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:215 440.35 .420 No_date 12:25 16.55 n/a
+ 02:TRB215 1.12 .008 No_date 6:30 11.77 n/a
[DT= 5.00] SUM= 03:215ADD 441.47 .422 No_date 12:20 16.54 n/a
008:0031-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:215ADD 441.47 .422 No_date 12:20 16.54 n/a
[RD= 5.00] out<- 01:216 441.47 .422 No_date 12:30 16.54 n/a
[L/S/n= 250./1.500/.100]
[Vmax= .276:Dmax= .272]
008:0032-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB216 1.12 .007 No_date 6:30 10.96 .195
[CN= 65.0: N= 1.10]
[TP= .17:DT= 5.00]
008:0033-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:216 441.47 .422 No_date 12:30 16.54 n/a
+ 02:TRB216 1.12 .007 No_date 6:30 10.96 n/a
[DT= 5.00] SUM= 10:T2-US 442.59 .424 No_date 12:30 16.53 n/a
008:0034-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:301 86.43 .126 No_date 11:50 9.97 .178
[CN= 63.0: N= 1.10]
[TP= 1.24:DT= 5.00]
008:0035-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:302 80.69 .096 No_date 12:00 10.90 .194
[CN= 64.0: N= 1.10]
[TP= 1.80:DT= 5.00]
008:0036-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:301 86.43 .126 No_date 11:50 9.97 n/a
+ 02:302 80.69 .096 No_date 12:00 10.90 n/a
[DT= 5.00] SUM= 03:300a 167.12 .222 No_date 12:00 10.42 n/a
008:0037-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300a 167.12 .222 No_date 12:00 10.42 n/a
[RD= 5.00] out<- 01:310 167.12 .222 No_date 12:00 10.42 n/a
[L/S/n= 449./1.620/.040]
[Vmax= .491:Dmax= .084]
008:0038-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:303 65.19 .126 No_date 11:05 13.85 .247
[CN= 69.0: N= 1.10]
[TP= 1.31:DT= 5.00]
008:0039-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:310 167.12 .222 No_date 12:00 10.42 n/a
+ 02:303 65.19 .126 No_date 11:05 13.85 n/a
[DT= 5.00] SUM= 03:300b 232.31 .348 No_date 12:00 11.38 n/a
008:0040-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300b 232.31 .348 No_date 12:00 11.38 n/a
[RD= 5.00] out<- 01:311 232.31 .348 No_date 12:05 11.38 n/a
[L/S/n= 270./1.170/.100]
[Vmax= .333:Dmax= .186]
008:0041-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-

```

```

CALIB NASHYD 02:TRB311 1.15 .004 No_date 8:10 11.96 .213
[CN= 65.0: N= 1.10]
[TP= .52:DT= 5.00]
008:0042-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:311 232.31 .348 No_date 12:05 11.38 n/a
+ 02:TRB311 1.15 .004 No_date 8:10 11.96 n/a
[DT= 5.00] SUM= 03:311ADD 233.46 .351 No_date 12:00 11.38 n/a
008:0043-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:311ADD 233.46 .351 No_date 12:00 11.38 n/a
[RD= 5.00] out<- 01:312 233.46 .350 No_date 12:05 11.39 n/a
[L/S/n= 270./1.170/.100]
[Vmax= .334:Dmax= .187]
008:0044-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB312 1.30 .006 No_date 9:00 18.38 .327
[CN= 76.0: N= 1.10]
[TP= .64:DT= 5.00]
008:0045-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:312 233.46 .350 No_date 12:05 11.39 n/a
+ 02:TRB312 1.30 .006 No_date 9:00 18.38 n/a
[DT= 5.00] SUM= 09:312ADD 234.76 .355 No_date 12:05 11.42 n/a
008:0046-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 01:304a 9.61 .918 No_date 6:00 33.13 .590
[XIMP=.46:TIMP=.57]
[SLP=1.60:DT= 5.00]
[LOSS= 1 : HORTONS]
008:0047-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 02:402a 5.67 .638 No_date 6:00 39.76 .708
[XIMP=.58:TIMP=.73]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
008:0048-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 03:POND2 1.85 .190 No_date 6:00 42.73 .761
[XIMP=.64:TIMP=.80]
[SLP=.10:DT= 5.00]
[LOSS= 1 : HORTONS]
008:0049-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:304a 9.61 .918 No_date 6:00 33.13 n/a
+ 02:402a 5.67 .638 No_date 6:00 39.76 n/a
+ 03:POND2 1.85 .190 No_date 6:00 42.73 n/a
[DT= 5.00] SUM= 04:P2FLOW 17.13 1.746 No_date 6:00 36.36 n/a
008:0050-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 04:P2FLOW 17.13 1.746 No_date 6:00 36.36 n/a
[RD= 5.00] out<- 01:POND2 17.13 .031 No_date 10:50 36.36 n/a
overflow <= 02:P2OVF .00 .000 No_date 0:00 .00 n/a
{MxStoUsed=.5598E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0 hrs}
008:0051-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 02:402b 6.07 .683 No_date 6:00 39.76 .708
[XIMP=.58:TIMP=.73]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
008:0052-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 03:402c 1.19 .133 No_date 6:00 37.86 .674
[XIMP=.55:TIMP=.68]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
008:0053-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 02:402b 6.07 .683 No_date 6:00 39.76 n/a
+ 03:402c 1.19 .133 No_date 6:00 37.86 n/a
[DT= 5.00] SUM= 04:400-OS 7.26 .816 No_date 6:00 39.45 n/a
008:0054-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 04:400-OS 7.26 .816 No_date 6:00 39.45 n/a
[RD= 5.00] out<- 02:OSSTOR 7.26 .800 No_date 6:00 39.45 n/a
overflow <= 03:OSOVF .00 .000 No_date 0:00 .00 n/a
{MxStoUsed=.5466E-02, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0 hrs}
008:0055-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:401 16.78 .144 No_date 7:55 14.34 .255
[CN= 68.0: N= 3.00]
[TP= 1.66:DT= 5.00]
008:0056-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:POND2 17.13 .031 No_date 10:50 36.36 n/a
+ 02:OSSTOR 7.26 .800 No_date 6:00 39.45 n/a

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SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

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+ 03:401          16.78      .144 No_date      7:55      14.34      n/a
+ 09:312ADD      234.76      .355 No_date     12:05      11.42      n/a
[DT= 5.00] SUM= 04:P2-T3      275.93      .847 No_date      6:00      13.88      n/a
008:0057-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 04:P2-T3      275.93      .847 No_date      6:00      13.88      n/a
[RD= 5.00] out<- 01:313      275.93      .680 No_date      6:05      13.88      n/a
[L/S/n= 423./1.170/.100]
[Vmax= .496:Dmax= .327]
008:0058-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:TRB313      .72      .004 No_date      7:10      13.74      .245
[CN= 68.0: N= 1.10]
[TP= .34:DT= 5.00]
008:0059-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:313      275.93      .680 No_date      6:05      13.88      n/a
+ 02:TRB313      .72      .004 No_date      7:10      13.74      n/a
[DT= 5.00] SUM= 03:313ADD      276.65      .682 No_date      6:05      13.88      n/a
008:0060-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      04:TRB314      .94      .004 No_date      8:00      13.74      .245
[CN= 68.0: N= 1.10]
[TP= .46:DT= 5.00]
008:0061-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:313      275.93      .680 No_date      6:05      13.88      n/a
+ 02:TRB313      .72      .004 No_date      7:10      13.74      n/a
[DT= 5.00] SUM= 03:313ADD      276.65      .682 No_date      6:05      13.88      n/a
008:0062-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      04:403a      2.66      .020 No_date      7:00      16.74      .298
[CN= 70.0: N= 1.10]
[TP= .27:DT= 5.00]
008:0063-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          10:T2-US      442.59      .424 No_date     12:30      16.53      n/a
+ 03:313ADD      276.65      .682 No_date      6:05      13.88      n/a
+ 04:403a      2.66      .020 No_date      7:00      16.74      n/a
[DT= 5.00] SUM= 01:CONFLU      721.90      .898 No_date     10:30      15.52      n/a
008:0064-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 01:203d      1.26      .143 No_date      6:00      38.59      .687
[XIMP=.56:TIMP=.70]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
008:0065-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 02:501a      9.32      1.162 No_date      6:00      47.91      .853
[XIMP=.74:TIMP=.93]
[SLP= .80:DT= 5.00]
[LOSS= 1 : HORTONS]
008:0066-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
COMPUTE DUALHYD 02:501a      9.32      1.162 No_date      6:00      47.91      n/a
Major System / 03:OSSSTOR      .00      .000 No_date      0:00      .00      n/a
Minor System \ 04:TOPOND      9.32      1.162 No_date      6:00      47.91      n/a
{MjSysSto=.0000E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
008:0067-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 05:501b      38.42      3.980 No_date      6:00      37.40      .666
[XIMP=.54:TIMP=.67]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
008:0068-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 06:501c      39.10      3.939 No_date      6:00      36.01      .641
[XIMP=.51:TIMP=.64]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
008:0069-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 07:MR1      3.32      .439 No_date      6:00      53.21      .947
[XIMP=.80:TIMP=.99]
[SLP=1.00:DT= 5.00]
[LOSS= 1 : HORTONS]
008:0070-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 08:MR2      3.04      .402 No_date      6:00      53.21      .947
[XIMP=.80:TIMP=.99]
[SLP=1.00:DT= 5.00]
[LOSS= 1 : HORTONS]
008:0071-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:203d      1.26      .143 No_date      6:00      38.59      n/a
+ 05:501b      38.42      3.980 No_date      6:00      37.40      n/a

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+ 07:MR1          3.32      .439 No_date      6:00      53.21      n/a
[DT= 5.00] SUM= 10:VALE      43.00      4.563 No_date      6:00      38.66      n/a
008:0072-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          04:TOPOND      9.32      1.162 No_date      6:00      47.91      n/a
+ 06:501c      39.10      3.939 No_date      6:00      36.01      n/a
+ 08:MR2      3.04      .402 No_date      6:00      53.21      n/a
[DT= 5.00] SUM= 09:MET      51.46      5.503 No_date      6:00      39.18      n/a
008:0073-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 01:POND3      11.89      1.031 No_date      6:05      42.73      .761
[XIMP=.64:TIMP=.80]
[SLP= .10:DT= 5.00]
[LOSS= 1 : HORTONS]
008:0074-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          10:VALE      43.00      4.563 No_date      6:00      38.66      n/a
+ 09:MET      51.46      5.503 No_date      6:00      39.18      n/a
+ 01:POND3      11.89      1.031 No_date      6:05      42.73      n/a
[DT= 5.00] SUM= 08:P3ADD      106.35      11.074 No_date      6:00      39.36      n/a
008:0075-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 08:P3ADD      106.35      11.074 No_date      6:00      39.36      n/a
[RD= 5.00] out<- 01:POND3      106.35      .402 No_date      9:05      39.36      n/a
overflow <= 02:E-OVF      .00      .000 No_date      0:00      .00      n/a
{MxStoUsed=.3489E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
** END OF RUN : 11

*****
RUN:COMMAND#
012:0001-----
START
[TZERO = .00 hrs on 0]
[METOUT= 2 (1=imperial, 2=metric output)]
[NSTORM= 1]
[NRUN = 12]
*****
# Project Name: [Kanata North] Project Number: [112117]
# Date : 03-30-2016
# Modeller : [Kallie Auld]
# Company : NOVATECH ENGINEERING CONSULTANTS LTD
# License # : 5320763
*****
012:0002-----
READ STORM
Filename = STORM.001
Comment =
[SDT=10.00:SDUR= 12.00:PTOT= 93.91]
012:0003-----
DEFAULT VALUES
Filename = M:\2012\112117\data\CALCUL-1\swmhymo\POSTDE-1\OTTAWA.DEF
ICASEdv = 1 (read and print data)
FileTitle= ----- ENTER YOUR COMMENTS ON THIS LINE AND THE NEXT ONE -----
----- PARAMETER VALUES MUST BE ENTERED AFTER COLUMN 60 -----
Horton's infiltration equation parameters:
[Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F= .00 mm]
Parameters for PERVIOUS surfaces in STANDHYD:
[IAper= 4.67 mm] [LGP=40.00 m] [MNP= .250]
Parameters for IMPVIOUS surfaces in STANDHYD:
[IAimp= 1.57 mm] [CLI= 1.50] [MNI= .013]
Parameters used in NASHYD:
[IA= 4.67 mm] [N= 3.00]
012:0004-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      01:201      115.14      .224 No_date     12:00      31.04      .331
[CN= 65.0: N= 1.10]
[TP= 3.42:DT= 5.00]
012:0005-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:201      115.14      .224 No_date     12:00      31.04      n/a
[RD= 5.00] out<- 02:210      115.14      .224 No_date     12:35      31.04      n/a

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SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

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[L/S/n= 558./ .890/.040]
{Vmax= .432:Dmax=.094}
012:0006-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:202 263.64 .433 No_date 12:50 38.10 .406
[CN= 70.0: N= 1.10]
[TP= 5.14:DT= 5.00]
012:0007-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:202 263.64 .433 No_date 12:50 38.10 n/a
+ 02:210 115.14 .224 No_date 12:35 31.04 n/a
[DT= 5.00] SUM= 03:210add 378.78 .656 No_date 12:40 35.95 n/a
012:0008-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:210add 378.78 .656 No_date 12:40 35.95 n/a
[RDT= 5.00] out<- 01:211 378.78 .657 No_date 12:35 35.95 n/a
[L/S/n= 450./1.000/.100]
{Vmax= .415:Dmax=.291}
012:0009-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:211 1.87 .013 No_date 10:30 44.73 .476
[CN= 76.0: N= 1.10]
[TP= 1.17:DT= 5.00]
012:0010-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:211 378.78 .657 No_date 12:35 35.95 n/a
+ 02:211 1.87 .013 No_date 10:30 44.73 n/a
[DT= 5.00] SUM= 03:211add 380.65 .669 No_date 12:35 36.00 n/a
012:0011-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:211add 380.65 .669 No_date 12:35 36.00 n/a
[RDT= 5.00] out<- 01:212 380.65 .669 No_date 12:40 36.00 n/a
[L/S/n= 230./1.000/.100]
{Vmax= .420:Dmax=.295}
012:0012-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:212 .95 .008 No_date 8:00 33.54 .357
[CN= 66.0: N= 1.10]
[TP= .56:DT= 5.00]
012:0013-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:212 380.65 .669 No_date 12:40 36.00 n/a
+ 02:212 .95 .008 No_date 8:00 33.54 n/a
[DT= 5.00] SUM= 03:212add 381.60 .675 No_date 12:40 35.99 n/a
012:0014-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:212add 381.60 .675 No_date 12:40 35.99 n/a
[RDT= 5.00] out<- 01:213 381.60 .676 No_date 12:45 35.99 n/a
[L/S/n= 330./1.000/.100]
{Vmax= .423:Dmax=.297}
012:0015-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:213 1.43 .011 No_date 9:00 33.41 .356
[CN= 66.0: N= 1.10]
[TP= .67:DT= 5.00]
012:0016-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:213 381.60 .676 No_date 12:45 35.99 n/a
+ 02:213 1.43 .011 No_date 9:00 33.41 n/a
[DT= 5.00] SUM= 09:TRIB2 383.03 .685 No_date 12:45 35.98 n/a
012:0017-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 01:203a 27.32 5.412 No_date 6:00 66.29 .706
[XIMP=.50:TIMP=.63]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
012:0018-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 02:203b 20.76 4.089 No_date 6:00 64.96 .692
[XIMP=.48:TIMP=.60]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
012:0019-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 03:203c 4.95 1.025 No_date 6:00 70.45 .750
[XIMP=.57:TIMP=.71]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
012:0020-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 04:POND1 2.68 .501 No_date 6:00 75.32 .802
[XIMP=.64:TIMP=.80]
[SLP= .10:DT= 5.00]
[LOSS= 1 : HORTONS]
012:0021-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 02:203b 20.76 4.089 No_date 6:00 64.96 n/a
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+ 03:203c 4.95 1.025 No_date 6:00 70.45 n/a
[DT= 5.00] SUM= 05:T2CRS 25.71 5.114 No_date 6:00 66.02 n/a
012:0022-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:203a 27.32 5.412 No_date 6:00 66.29 n/a
+ 04:POND1 2.68 .501 No_date 6:00 75.32 n/a
+ 05:T2CRS 25.71 5.114 No_date 6:00 66.02 n/a
[DT= 5.00] SUM= 06:P1FLOW 55.71 11.026 No_date 6:00 66.60 n/a
012:0023-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 06:P1FLOW 55.71 11.026 No_date 6:00 66.60 n/a
[RDT= 5.00] out<- 01:POND1 55.71 .346 No_date 8:10 66.59 n/a
overflow <= 02:P1-OVF .00 .000 No_date 0:00 .00 n/a
{MxStoUsed=.3114E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
012:0024-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:POND1 55.71 .346 No_date 8:10 66.59 n/a
+ 09:TRIB2 383.03 .685 No_date 12:45 35.98 n/a
[DT= 5.00] SUM= 02:213ADD 438.74 1.006 No_date 12:05 39.87 n/a
012:0025-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:213ADD 438.74 1.006 No_date 12:05 39.87 n/a
[RDT= 5.00] out<- 01:214 438.74 1.005 No_date 12:15 39.87 n/a
[L/S/n= 390./1.700/.100]
{Vmax= .595:Dmax=.324}
012:0026-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:214 1.61 .042 No_date 6:30 39.32 .419
[CN= 72.0: N= 1.10]
[TP= .17:DT= 5.00]
012:0027-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:214 438.74 1.005 No_date 12:15 39.87 n/a
+ 03:214 1.61 .042 No_date 6:30 39.32 n/a
[DT= 5.00] SUM= 02:214ADD 440.35 1.014 No_date 12:10 39.87 n/a
012:0028-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:214ADD 440.35 1.014 No_date 12:10 39.87 n/a
[RDT= 5.00] out<- 01:215 440.35 1.013 No_date 12:20 39.86 n/a
[L/S/n= 260./1.400/.100]
{Vmax= .555:Dmax=.343}
012:0029-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB215 1.12 .024 No_date 6:30 32.40 .345
[CN= 66.0: N= 1.10]
[TP= .17:DT= 5.00]
012:0030-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:215 440.35 1.013 No_date 12:20 39.86 n/a
+ 02:TRB215 1.12 .024 No_date 6:30 32.40 n/a
[DT= 5.00] SUM= 03:215ADD 441.47 1.019 No_date 12:15 39.85 n/a
012:0031-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:215ADD 441.47 1.019 No_date 12:15 39.85 n/a
[RDT= 5.00] out<- 01:216 441.47 1.018 No_date 12:20 39.85 n/a
[L/S/n= 250./ .500/.100]
{Vmax= .411:Dmax=.472}
012:0032-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB216 1.12 .023 No_date 6:30 30.92 .329
[CN= 65.0: N= 1.10]
[TP= .17:DT= 5.00]
012:0033-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:216 441.47 1.018 No_date 12:20 39.85 n/a
+ 02:TRB216 1.12 .023 No_date 6:30 30.92 n/a
[DT= 5.00] SUM= 10:T2-US 442.59 1.023 No_date 12:15 39.82 n/a
012:0034-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:301 86.43 .363 No_date 10:40 28.86 .307
[CN= 63.0: N= 1.10]
[TP= 1.24:DT= 5.00]
012:0035-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:302 80.69 .268 No_date 12:00 30.50 .325
[CN= 64.0: N= 1.10]
[TP= 1.80:DT= 5.00]
012:0036-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:301 86.43 .363 No_date 10:40 28.86 n/a
+ 02:302 80.69 .268 No_date 12:00 30.50 n/a
[DT= 5.00] SUM= 03:300a 167.12 .629 No_date 11:20 29.65 n/a
012:0037-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300a 167.12 .629 No_date 11:20 29.65 n/a
[RDT= 5.00] out<- 01:310 167.12 .629 No_date 11:30 29.65 n/a
[L/S/n= 449./1.620/.040]
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SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

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{Vmax=.705:Dmax=.149}
012:0038-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:303      65.19      .330 No_date      10:35      36.29      .386
[CN= 69.0: N= 1.10]
[TP= 1.31:DT= 5.00]
012:0039-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           01:310      167.12      .629 No_date      11:30      29.65      n/a
+ 02:303          65.19      .330 No_date      10:35      36.29      n/a
[DT= 5.00] SUM= 03:300b      232.31      .958 No_date      11:05      31.51      n/a
012:0040-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300b      232.31      .958 No_date      11:05      31.51      n/a
[RDT= 5.00] out<- 01:311      232.31      .958 No_date      11:15      31.51      n/a
[L/S/n= 270./1.170/.100]
{Vmax=.512:Dmax=.349}
012:0041-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:TRB311      1.15      .010 No_date      8:00      32.33      .344
[CN= 65.0: N= 1.10]
[TP= .52:DT= 5.00]
012:0042-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           01:311      232.31      .958 No_date      11:15      31.51      n/a
+ 02:TRB311       1.15      .010 No_date      8:00      32.33      n/a
[DT= 5.00] SUM= 03:311ADD      233.46      .966 No_date      11:10      31.52      n/a
012:0043-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:311ADD      233.46      .966 No_date      11:10      31.52      n/a
[RDT= 5.00] out<- 01:312      233.46      .966 No_date      11:20      31.52      n/a
[L/S/n= 270./1.170/.100]
{Vmax=.514:Dmax=.351}
012:0044-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:TRB312      1.30      .014 No_date      8:00      44.81      .477
[CN= 76.0: N= 1.10]
[TP= .64:DT= 5.00]
012:0045-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           01:312      233.46      .966 No_date      11:20      31.52      n/a
+ 02:TRB312       1.30      .014 No_date      8:00      44.81      n/a
[DT= 5.00] SUM= 09:312ADD      234.76      .979 No_date      11:15      31.59      n/a
012:0046-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 01:304a      9.61      1.869 No_date      6:00      63.63      .678
[XIMP=.46:TIMP=.57]
[SLP=1.60:DT= 5.00]
[LOSS= 1 : HORTONS]
012:0047-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 02:402a      5.67      1.177 No_date      6:00      71.32      .760
[XIMP=.58:TIMP=.73]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
012:0048-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 03:POND2      1.85      .348 No_date      6:00      75.32      .802
[XIMP=.64:TIMP=.80]
[SLP=.10:DT= 5.00]
[LOSS= 1 : HORTONS]
012:0049-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           01:304a      9.61      1.869 No_date      6:00      63.63      n/a
+ 02:402a         5.67      1.177 No_date      6:00      71.32      n/a
+ 03:POND2        1.85      .348 No_date      6:00      75.32      n/a
[DT= 5.00] SUM= 04:P2FLOW      17.13      3.394 No_date      6:00      67.44      n/a
012:0050-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 04:P2FLOW      17.13      3.394 No_date      6:00      67.44      n/a
[RDT= 5.00] out<- 01:POND2      17.13      .084 No_date      9:05      67.43      n/a
overflow <= 02:P2OVF      .00      .000 No_date      0:00      .00      n/a
{MxStoUsed=.1002E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
012:0051-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 02:402b      6.07      1.259 No_date      6:00      71.32      .760
[XIMP=.58:TIMP=.73]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
012:0052-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 03:402c      1.19      .246 No_date      6:00      69.12      .736
[XIMP=.55:TIMP=.68]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
012:0053-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-

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ADD HYD           02:402b      6.07      1.259 No_date      6:00      71.32      n/a
+ 03:402c         1.19      .246 No_date      6:00      69.12      n/a
[DT= 5.00] SUM= 04:400-OS      7.26      1.505 No_date      6:00      70.96      n/a
012:0054-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 04:400-OS      7.26      1.505 No_date      6:00      70.96      n/a
[RDT= 5.00] out<- 02:OSSSTOR      7.26      .808 No_date      6:05      71.11      n/a
overflow <= 03:OSSOVF      .00      .000 No_date      0:00      .00      n/a
{MxStoUsed=.9819E-01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
012:0055-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      03:401      16.78      .379 No_date      7:50      36.59      .390
[CN= 68.0: N= 3.00]
[TP= 1.66:DT= 5.00]
012:0056-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           01:POND2      17.13      .084 No_date      9:05      67.43      n/a
+ 02:OSSSTOR      7.26      .808 No_date      6:05      71.11      n/a
+ 03:401          16.78      .379 No_date      7:50      36.59      n/a
+ 09:312ADD       234.76      .979 No_date      11:15      31.59      n/a
[DT= 5.00] SUM= 04:P2-T3      275.93      1.671 No_date      6:40      35.16      n/a
012:0057-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 04:P2-T3      275.93      1.671 No_date      6:40      35.16      n/a
[RDT= 5.00] out<- 01:313      275.93      1.581 No_date      6:45      35.16      n/a
[L/S/n= 423./1.170/.100]
{Vmax=.642:Dmax=.491}
012:0058-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:TRB313      .72      .010 No_date      7:00      35.79      .381
[CN= 68.0: N= 1.10]
[TP= .34:DT= 5.00]
012:0059-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           01:313      275.93      1.581 No_date      6:45      35.16      n/a
+ 02:TRB313       .72      .010 No_date      7:00      35.79      n/a
[DT= 5.00] SUM= 03:313ADD      276.65      1.591 No_date      6:45      35.16      n/a
012:0060-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      04:TRB314      .94      .010 No_date      7:30      35.79      .381
[CN= 68.0: N= 1.10]
[TP= .46:DT= 5.00]
012:0061-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           01:313      275.93      1.581 No_date      6:45      35.16      n/a
+ 02:TRB313       .72      .010 No_date      7:00      35.79      n/a
[DT= 5.00] SUM= 03:313ADD      276.65      1.591 No_date      6:45      35.16      n/a
012:0062-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      04:403a      2.66      .051 No_date      6:45      40.46      .431
[CN= 70.0: N= 1.10]
[TP= .27:DT= 5.00]
012:0063-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           10:T2-US      442.59      1.023 No_date      12:15      39.82      n/a
+ 03:313ADD       276.65      1.591 No_date      6:45      35.16      n/a
+ 04:403a         2.66      .051 No_date      6:45      40.46      n/a
[DT= 5.00] SUM= 01:CONFLU      721.90      2.367 No_date      9:00      38.04      n/a
012:0064-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 01:203d      1.26      .262 No_date      6:00      69.86      .744
[XIMP=.56:TIMP=.70]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
012:0065-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 02:501a      9.32      2.009 No_date      6:00      83.38      .888
[XIMP=.74:TIMP=.93]
[SLP=.80:DT= 5.00]
[LOSS= 1 : HORTONS]
012:0066-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
COMPUTE DUALHYD 02:501a      9.32      2.009 No_date      6:00      83.38      n/a
Major System / 03:OSSSTOR      .00      .000 No_date      0:00      .00      n/a
Minor System \ 04:TOPOND      9.32      2.009 No_date      6:00      83.38      n/a
{MjSysSto=.0000E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
012:0067-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 05:501b      38.42      7.538 No_date      6:00      68.56      .730
[XIMP=.54:TIMP=.67]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
012:0068-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 06:501c      39.10      7.579 No_date      6:00      66.85      .712
[XIMP=.51:TIMP=.64]

```

SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

```
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
012:0069-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 07:MR1 3.32 .739 No_date 6:00 90.88 .968
[XIMP=.80:TIMP=.99]
[SLP=1.00:DT= 5.00]
[LOSS= 1 : HORTONS]
012:0070-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 08:MR2 3.04 .677 No_date 6:00 90.88 .968
[XIMP=.80:TIMP=.99]
[SLP=1.00:DT= 5.00]
[LOSS= 1 : HORTONS]
012:0071-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:203d 1.26 .262 No_date 6:00 69.86 n/a
+ 05:501b 38.42 7.538 No_date 6:00 68.56 n/a
+ 07:MR1 3.32 .739 No_date 6:00 90.88 n/a
[DT= 5.00] SUM= 10:VALE 43.00 8.539 No_date 6:00 70.32 n/a
012:0072-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 04:TOPOND 9.32 2.009 No_date 6:00 83.38 n/a
+ 06:501c 39.10 7.579 No_date 6:00 66.85 n/a
+ 08:MR2 3.04 .677 No_date 6:00 90.88 n/a
[DT= 5.00] SUM= 09:MET 51.46 10.265 No_date 6:00 71.26 n/a
012:0073-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 01:POND3 11.89 2.029 No_date 6:00 75.32 .802
[XIMP=.64:TIMP=.80]
[SLP= .10:DT= 5.00]
[LOSS= 1 : HORTONS]
012:0074-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 10:VALE 43.00 8.539 No_date 6:00 70.32 n/a
+ 09:MET 51.46 10.265 No_date 6:00 71.26 n/a
+ 01:POND3 11.89 2.029 No_date 6:00 75.32 n/a
[DT= 5.00] SUM= 08:P3ADD 106.35 20.833 No_date 6:00 71.34 n/a
012:0075-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 08:P3ADD 106.35 20.833 No_date 6:00 71.34 n/a
[RD= 5.00] out<- 01:POND3 106.35 1.043 No_date 7:35 71.33 n/a
overflow <= 02:E-OVF .00 .000 No_date 0:00 .00 n/a
{MxStoUsed=.6107E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
** END OF RUN : 12
```

RUN:COMMAND#

```
013:0001-----
START
[TZERO = .00 hrs on 0]
[METOUT= 2 (1=imperial, 2=metric output)]
[NSTORM= 1]
[NRUN = 13]
```

```
# Project Name: [Kanata North] Project Number: [112117]
# Date : 03-30-2016
# Modeller : [Kallie Auld]
# Company : NOVATECH ENGINEERING CONSULTANTS LTD
# License # : 5320763
*****
```

```
013:0002-----
READ STORM
```

```
Filename = STORM.001
Comment =
[SDT=60.00:SDUR= 24.00:PTOT= 25.05]
```

```
013:0003-----
DEFAULT VALUES
```

```
Filename = M:\2012\112117\data\CALCUL-1\swmhyms\POSTDE-1\OTTAWA.DEF
ICASEdv = 1 (read and print data)
FileTitle= ----- ENTER YOUR COMMENTS ON THIS LINE AND THE NEXT ONE ---
```

```
----- PARAMETER VALUES MUST BE ENTERED AFTER COLUMN 60 -----
Horton's infiltration equation parameters:
[Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F= .00 mm]
Parameters for PERVIOUS surfaces in STANDHYD:
[IAper= 4.67 mm] [LGP=40.00 m] [MNP= .250]
Parameters for IMPVIOUS surfaces in STANDHYD:
[IAimp= 1.57 mm] [CLI= 1.50] [MNI= .013]
Parameters used in NASHYD:
[IA= 4.67 mm] [N= 3.00]
013:0004-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:201 115.14 .008 No_date 24:00 1.24 .049
[CN= 65.0: N= 1.10]
[TP= 3.42:DT= 5.00]
013:0005-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:201 115.14 .008 No_date 24:00 1.24 n/a
[RD= 5.00] out<- 02:210 115.14 .008 No_date 24:25 1.24 n/a
[L/S/n= 558./ .890/.040]
[Vmax= .423:Dmax= .004]
013:0006-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:202 263.64 .026 No_date 24:00 2.39 .095
[CN= 70.0: N= 1.10]
[TP= 5.14:DT= 5.00]
013:0007-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:202 263.64 .026 No_date 24:00 2.39 n/a
+ 02:210 115.14 .008 No_date 24:25 1.24 n/a
[DT= 5.00] SUM= 03:210add 378.78 .035 No_date 24:15 2.04 n/a
013:0008-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:210add 378.78 .035 No_date 24:15 2.04 n/a
[RD= 5.00] out<- 01:211 378.78 .035 No_date 24:50 2.04 n/a
[L/S/n= 450./1.000/.100]
[Vmax= .288:Dmax= .024]
013:0009-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:211 1.87 .001 No_date 18:05 3.11 .124
[CN= 76.0: N= 1.10]
[TP= 1.17:DT= 5.00]
013:0010-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:211 378.78 .035 No_date 24:50 2.04 n/a
+ 02:211 1.87 .001 No_date 18:05 3.11 n/a
[DT= 5.00] SUM= 03:211add 380.65 .035 No_date 24:45 2.04 n/a
013:0011-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:211add 380.65 .035 No_date 24:45 2.04 n/a
[RD= 5.00] out<- 01:212 380.65 .035 No_date 25:00 2.04 n/a
[L/S/n= 230./1.000/.100]
[Vmax= .288:Dmax= .024]
013:0012-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:212 .95 .000 No_date 16:00 1.78 .071
[CN= 66.0: N= 1.10]
[TP= .56:DT= 5.00]
013:0013-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:212 380.65 .035 No_date 25:00 2.04 n/a
+ 02:212 .95 .000 No_date 16:00 1.78 n/a
[DT= 5.00] SUM= 03:212add 381.60 .036 No_date 24:55 2.04 n/a
013:0014-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:212add 381.60 .036 No_date 24:55 2.04 n/a
[RD= 5.00] out<- 01:213 381.60 .035 No_date 25:20 2.04 n/a
[L/S/n= 330./1.000/.100]
[Vmax= .288:Dmax= .024]
013:0015-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:213 1.43 .000 No_date 18:00 1.74 .070
[CN= 66.0: N= 1.10]
[TP= .67:DT= 5.00]
013:0016-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:213 381.60 .035 No_date 25:20 2.04 n/a
+ 02:213 1.43 .000 No_date 18:00 1.74 n/a
[DT= 5.00] SUM= 09:TRIB2 383.03 .036 No_date 25:15 2.04 n/a
013:0017-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 01:203a 27.32 .403 No_date 12:00 11.74 .469
[XIMP=.50:TIMP= 63]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
013:0018-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
```

SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

```
* DESIGN STANDHYD 02:203b 20.76 .295 No_date 12:00 11.27 .450
[XIMP=.48:TIMP=.60]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
013:0019-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 03:203c 4.95 .084 No_date 12:00 13.38 .534
[XIMP=.57:TIMP=.71]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
013:0020-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 04:POND1 2.68 .050 No_date 12:00 15.11 .603
[XIMP=.64:TIMP=.80]
[SLP= .10:DT= 5.00]
[LOSS= 1 : HORTONS]
013:0021-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 02:203b 20.76 .295 No_date 12:00 11.27 n/a
+ 03:203c 4.95 .084 No_date 12:00 13.38 n/a
[DT= 5.00] SUM= 05:T2CRS 25.71 .379 No_date 12:00 11.68 n/a
013:0022-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:203a 27.32 .403 No_date 12:00 11.74 n/a
+ 04:POND1 2.68 .050 No_date 12:00 15.11 n/a
+ 05:T2CRS 25.71 .379 No_date 12:00 11.68 n/a
[DT= 5.00] SUM= 06:P1FLOW 55.71 .832 No_date 12:00 11.87 n/a
013:0023-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 06:P1FLOW 55.71 .832 No_date 12:00 11.87 n/a
[RD= 5.00] out<- 01:POND1 55.71 .027 No_date 21:10 11.87 n/a
overflow <= 02:P1-OVF .00 .000 No_date 0:00 .00 n/a
{MxStoUsed=.5459E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
013:0024-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:POND1 55.71 .027 No_date 21:10 11.87 n/a
+ 09:TRIB2 383.03 .036 No_date 25:15 2.04 n/a
[DT= 5.00] SUM= 02:213ADD 438.74 .062 No_date 24:35 3.29 n/a
013:0025-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:213ADD 438.74 .062 No_date 24:35 3.29 n/a
[RD= 5.00] out<- 01:214 438.74 .062 No_date 24:55 3.29 n/a
[L/S/n= 390./1.700/.100]
{Vmax= .376:Dmax= .033}
013:0026-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:214 1.61 .002 No_date 13:00 2.27 .090
[CN= 72.0: N= 1.10]
[TP= .17:DT= 5.00]
013:0027-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:214 438.74 .062 No_date 24:55 3.29 n/a
+ 03:214 1.61 .002 No_date 13:00 2.27 n/a
[DT= 5.00] SUM= 02:214ADD 440.35 .062 No_date 24:45 3.28 n/a
013:0028-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:214ADD 440.35 .062 No_date 24:45 3.28 n/a
[RD= 5.00] out<- 01:215 440.35 .062 No_date 24:55 3.28 n/a
[L/S/n= 260./1.400/.100]
{Vmax= .341:Dmax= .036}
013:0029-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB215 1.12 .001 No_date 13:00 1.43 .057
[CN= 66.0: N= 1.10]
[TP= .17:DT= 5.00]
013:0030-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:215 440.35 .062 No_date 24:55 3.28 n/a
+ 02:TRB215 1.12 .001 No_date 13:00 1.43 n/a
[DT= 5.00] SUM= 03:215ADD 441.47 .062 No_date 24:50 3.28 n/a
013:0031-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:215ADD 441.47 .062 No_date 24:50 3.28 n/a
[RD= 5.00] out<- 01:216 441.47 .062 No_date 25:10 3.28 n/a
[L/S/n= 250./ .500/.100]
{Vmax= .204:Dmax= .060}
013:0032-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB216 1.12 .000 No_date 13:05 1.20 .048
[CN= 65.0: N= 1.10]
[TP= .17:DT= 5.00]
013:0033-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:216 441.47 .062 No_date 25:10 3.28 n/a
+ 02:TRB216 1.12 .000 No_date 13:05 1.20 n/a
[DT= 5.00] SUM= 10:T2-US 442.59 .062 No_date 25:05 3.27 n/a
```

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013:0034-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:301 86.43 .010 No_date 22:00 1.00 .040
[CN= 63.0: N= 1.10]
[TP= 1.24:DT= 5.00]
013:0035-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:302 80.69 .010 No_date 24:00 1.28 .051
[CN= 64.0: N= 1.10]
[TP= 1.80:DT= 5.00]
013:0036-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:301 86.43 .010 No_date 22:00 1.00 n/a
+ 02:302 80.69 .010 No_date 24:00 1.28 n/a
[DT= 5.00] SUM= 03:300a 167.12 .020 No_date 22:50 1.13 n/a
013:0037-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300a 167.12 .020 No_date 22:50 1.13 n/a
[RD= 5.00] out<- 01:310 167.12 .020 No_date 23:15 1.13 n/a
[L/S/n= 449./1.620/.040]
{Vmax= .430:Dmax= .011}
013:0038-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:303 65.19 .015 No_date 21:00 2.00 .080
[CN= 69.0: N= 1.10]
[TP= 1.31:DT= 5.00]
013:0039-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:310 167.12 .020 No_date 23:15 1.13 n/a
+ 02:303 65.19 .015 No_date 21:00 2.00 n/a
[DT= 5.00] SUM= 03:300b 232.31 .035 No_date 22:00 1.38 n/a
013:0040-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300b 232.31 .035 No_date 22:00 1.38 n/a
[RD= 5.00] out<- 01:311 232.31 .035 No_date 22:10 1.38 n/a
[L/S/n= 270./1.170/.100]
{Vmax= .312:Dmax= .022}
013:0041-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB311 1.15 .000 No_date 16:00 1.62 .065
[CN= 65.0: N= 1.10]
[TP= .52:DT= 5.00]
013:0042-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:311 232.31 .035 No_date 22:10 1.38 n/a
+ 02:TRB311 1.15 .000 No_date 16:00 1.62 n/a
[DT= 5.00] SUM= 03:311ADD 233.46 .035 No_date 22:05 1.38 n/a
013:0043-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:311ADD 233.46 .035 No_date 22:05 1.38 n/a
[RD= 5.00] out<- 01:312 233.46 .035 No_date 22:20 1.38 n/a
[L/S/n= 270./1.170/.100]
{Vmax= .312:Dmax= .022}
013:0044-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB312 1.30 .001 No_date 16:00 3.14 .125
[CN= 76.0: N= 1.10]
[TP= .64:DT= 5.00]
013:0045-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:312 233.46 .035 No_date 22:20 1.38 n/a
+ 02:TRB312 1.30 .001 No_date 16:00 3.14 n/a
[DT= 5.00] SUM= 09:312ADD 234.76 .036 No_date 22:15 1.39 n/a
013:0046-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 01:304a 9.61 .131 No_date 12:00 10.80 .431
[XIMP=.46:TIMP=.57]
[SLP=1.60:DT= 5.00]
[LOSS= 1 : HORTONS]
013:0047-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 02:402a 5.67 .098 No_date 12:00 13.62 .544
[XIMP=.58:TIMP=.73]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
013:0048-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 03:POND2 1.85 .035 No_date 12:00 15.11 .603
[XIMP=.64:TIMP=.80]
[SLP= .10:DT= 5.00]
[LOSS= 1 : HORTONS]
013:0049-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:304a 9.61 .131 No_date 12:00 10.80 n/a
+ 02:402a 5.67 .098 No_date 12:00 13.62 n/a
+ 03:POND2 1.85 .035 No_date 12:00 15.11 n/a
```

SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

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[DT= 5.00] SUM= 04:P2FLOW 17.13 .263 No_date 12:00 12.20 n/a
013:0050-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 04:P2FLOW 17.13 .263 No_date 12:00 12.20 n/a
[RD= 5.00] out< 01:POND2 17.13 .002 No_date 24:10 12.20 n/a
overflow <= 02:P2OVF .00 .000 No_date 0:00 .00 n/a
{MxStoUsed=.1982E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
013:0051-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 02:402b 6.07 .105 No_date 12:00 13.62 .544
[XIMP=.58:TIMP=.73]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
013:0052-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 03:402c 1.19 .019 No_date 11:55 12.91 .516
[XIMP=.55:TIMP=.68]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
013:0053-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 02:402b 6.07 .105 No_date 12:00 13.62 n/a
+ 03:402c 1.19 .019 No_date 11:55 12.91 n/a
[DT= 5.00] SUM= 04:400-OS 7.26 .124 No_date 12:00 13.50 n/a
013:0054-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 04:400-OS 7.26 .124 No_date 12:00 13.50 n/a
[RD= 5.00] out< 02:OSSSTOR 7.26 .124 No_date 12:00 13.50 n/a
overflow <= 03:OSSOVF .00 .000 No_date 0:00 .00 n/a
{MxStoUsed=.7753E-03, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
013:0055-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:401 16.78 .017 No_date 14:05 2.37 .095
[CN= 68.0: N= 3.00]
[TP= 1.66:DT= 5.00]
013:0056-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:POND2 17.13 .002 No_date 24:10 12.20 n/a
+ 02:OSSSTOR 7.26 .124 No_date 12:00 13.50 n/a
+ 03:401 16.78 .017 No_date 14:05 2.37 n/a
+ 09:312ADD 234.76 .036 No_date 22:15 1.39 n/a
[DT= 5.00] SUM= 04:P2-T3 275.93 .130 No_date 12:00 2.44 n/a
013:0057-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 04:P2-T3 275.93 .130 No_date 12:00 2.44 n/a
[RD= 5.00] out< 01:313 275.93 .115 No_date 12:05 2.44 n/a
[L/S/n= 423./1.170/.100]
{Vmax= .312:Dmax=.082}
013:0058-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB313 .72 .000 No_date 14:00 2.07 .083
[CN= 68.0: N= 1.10]
[TP= .34:DT= 5.00]
013:0059-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:313 275.93 .115 No_date 12:05 2.44 n/a
+ 02:TRB313 .72 .000 No_date 14:00 2.07 n/a
[DT= 5.00] SUM= 03:313ADD 276.65 .115 No_date 12:05 2.44 n/a
013:0060-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 04:TRB314 .94 .000 No_date 14:20 2.07 .083
[CN= 68.0: N= 1.10]
[TP= .46:DT= 5.00]
013:0061-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:313 275.93 .115 No_date 12:05 2.44 n/a
+ 02:TRB313 .72 .000 No_date 14:00 2.07 n/a
[DT= 5.00] SUM= 03:313ADD 276.65 .115 No_date 12:05 2.44 n/a
013:0062-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 04:403a 2.66 .003 No_date 13:00 3.32 .133
[CN= 70.0: N= 1.10]
[TP= .27:DT= 5.00]
013:0063-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 10:T2-US 442.59 .062 No_date 25:05 3.27 n/a
+ 03:313ADD 276.65 .115 No_date 12:05 2.44 n/a
+ 04:403a 2.66 .003 No_date 13:00 3.32 n/a
[DT= 5.00] SUM= 01:CONFLU 721.90 .127 No_date 12:05 2.95 n/a
013:0064-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 01:203d 1.26 .021 No_date 11:55 13.15 .525
[XIMP=.56:TIMP=.70]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
013:0065-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-

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DESIGN STANDHYD 02:501a 9.32 .240 No_date 12:00 19.01 .759
[XIMP=.74:TIMP=.93]
[SLP=.80:DT= 5.00]
[LOSS= 1 : HORTONS]
013:0066-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
COMPUTE DUALHYD 02:501a 9.32 .240 No_date 12:00 19.01 n/a
Major System / 03:OSSSTOR .00 .000 No_date 0:00 .00 n/a
Minor System \ 04:TOPOND 9.32 .240 No_date 12:00 19.01 n/a
{MjSysSto=.0000E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
013:0067-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 05:501b 38.42 .608 No_date 12:00 12.68 .506
[XIMP=.54:TIMP=.67]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
013:0068-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 06:501c 39.10 .584 No_date 12:00 11.97 .478
[XIMP=.51:TIMP=.64]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
013:0069-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 07:MR1 3.32 .097 No_date 12:00 21.53 .859
[XIMP=.80:TIMP=.99]
[SLP=1.00:DT= 5.00]
[LOSS= 1 : HORTONS]
013:0070-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 08:MR2 3.04 .089 No_date 12:00 21.53 .859
[XIMP=.80:TIMP=.99]
[SLP=1.00:DT= 5.00]
[LOSS= 1 : HORTONS]
013:0071-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:203d 1.26 .021 No_date 11:55 13.15 n/a
+ 05:501b 38.42 .608 No_date 12:00 12.68 n/a
+ 07:MR2 3.32 .097 No_date 12:00 21.53 n/a
[DT= 5.00] SUM= 10:VALE 43.00 .726 No_date 12:00 13.38 n/a
013:0072-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 04:TOPOND 9.32 .240 No_date 12:00 19.01 n/a
+ 06:501c 39.10 .584 No_date 12:00 11.97 n/a
+ 08:MR2 3.04 .089 No_date 12:00 21.53 n/a
[DT= 5.00] SUM= 09:MET 51.46 .913 No_date 12:00 13.81 n/a
013:0073-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 01:POND3 11.89 .201 No_date 12:05 15.11 .603
[XIMP=.64:TIMP=.80]
[SLP=.10:DT= 5.00]
[LOSS= 1 : HORTONS]
013:0074-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 10:VALE 43.00 .726 No_date 12:00 13.38 n/a
+ 09:MET 51.46 .913 No_date 12:00 13.81 n/a
+ 01:POND3 11.89 .201 No_date 12:05 15.11 n/a
[DT= 5.00] SUM= 08:P3ADD 106.35 1.840 No_date 12:00 13.78 n/a
013:0075-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 08:P3ADD 106.35 1.840 No_date 12:00 13.78 n/a
[RD= 5.00] out< 01:POND3 106.35 .046 No_date 22:15 13.78 n/a
overflow <= 02:E-OVF .00 .000 No_date 0:00 .00 n/a
{MxStoUsed=.1264E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
** END OF RUN : 13

*****
RUN:COMMAND#
014:0001-----
START
[TZERO = .00 hrs on 0]
[METOUT= 2 (1=imperial, 2=metric output)]
[NSTORM= 1]
[NRUN = 14]
*****
# Project Name: [Kanata North] Project Number: [112117]

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SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

```
# Date       : 03-30-2016
# Modeller   : [Kallie Auld]
# Company    : NOVATECH ENGINEERING CONSULTANTS LTD
# License #   : 5320763
*****
014:0002-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
READ STORM
  Filename = STORM.001
  Comment =
  [SDT=60.00:SDUR= 24.00:PTOT= 48.02]
014:0003-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DEFAULT VALUES
  Filename = M:\2012\112117\data\CALCUL-1\swmhy-mo\POSTDE-1\OTTAWA.DEF
  ICASEdv = 1 (read and print data)
  FileTitle= ----- ENTER YOUR COMMENTS ON THIS LINE AND THE NEXT ONE ---
  ----- PARAMETER VALUES MUST BE ENTERED AFTER COLUMN 60 -----
  Horton's infiltration equation parameters:
  [Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F= .00 mm]
  Parameters for PERVIOUS surfaces in STANDHYD:
  [IAper= 4.67 mm] [LGP=40.00 m] [MNP= .250]
  Parameters for IMPERVIOUS surfaces in STANDHYD:
  [IAimp= 1.57 mm] [CLI= 1.50] [MNI= .013]
  Parameters used in NASHYD:
  [Ia= 4.67 mm] [N= 3.00]
014:0004-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:201 115.14 .052 No_date 24:00 7.73 .161
  [CN= 65.0: N= 1.10]
  [Tp= 3.42:DT= 5.00]
014:0005-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:201 115.14 .052 No_date 24:00 7.73 n/a
  [RDT= 5.00] out<- 02:210 115.14 .052 No_date 24:15 7.73 n/a
  [L/S/n= 558./ .890/.040]
  [Vmax= .423:Dmax= .024]
014:0006-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:202 263.64 .120 No_date 24:00 10.90 .227
  [CN= 70.0: N= 1.10]
  [Tp= 5.14:DT= 5.00]
014:0007-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:202 263.64 .120 No_date 24:00 10.90 n/a
  + 02:210 115.14 .052 No_date 24:15 7.73 n/a
  [DT= 5.00] SUM= 03:210add 378.78 .172 No_date 24:05 9.94 n/a
014:0008-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:210add 378.78 .172 No_date 24:05 9.94 n/a
  [RDT= 5.00] out<- 01:211 378.78 .172 No_date 24:35 9.94 n/a
  [L/S/n= 450./1.000/.100]
  [Vmax= .288:Dmax= .117]
014:0009-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:211 1.87 .003 No_date 18:00 13.54 .282
  [CN= 76.0: N= 1.10]
  [Tp= 1.17:DT= 5.00]
014:0010-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:211 378.78 .172 No_date 24:35 9.94 n/a
  + 02:211 1.87 .003 No_date 18:00 13.54 n/a
  [DT= 5.00] SUM= 03:211add 380.65 .174 No_date 24:30 9.95 n/a
014:0011-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:211add 380.65 .174 No_date 24:30 9.95 n/a
  [RDT= 5.00] out<- 01:212 380.65 .174 No_date 24:45 9.95 n/a
  [L/S/n= 230./1.000/.100]
  [Vmax= .288:Dmax= .119]
014:0012-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:212 .95 .002 No_date 14:00 9.03 .188
  [CN= 66.0: N= 1.10]
  [Tp= .56:DT= 5.00]
014:0013-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:212 380.65 .174 No_date 24:45 9.95 n/a
  + 02:212 .95 .002 No_date 14:00 9.03 n/a
  [DT= 5.00] SUM= 03:212add 381.60 .175 No_date 24:40 9.95 n/a
014:0014-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:212add 381.60 .175 No_date 24:40 9.95 n/a
  [RDT= 5.00] out<- 01:213 381.60 .175 No_date 25:00 9.95 n/a
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[L/S/n= 330./1.000/.100]
[Vmax= .288:Dmax= .120]
014:0015-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:213 1.43 .002 No_date 15:00 8.96 .187
  [CN= 66.0: N= 1.10]
  [Tp= .67:DT= 5.00]
014:0016-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:213 381.60 .175 No_date 25:00 9.95 n/a
  + 02:213 1.43 .002 No_date 15:00 8.96 n/a
  [DT= 5.00] SUM= 09:TRIB2 383.03 .176 No_date 24:55 9.95 n/a
014:0017-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 01:203a 27.32 1.005 No_date 12:00 26.23 .546
  [XIMP=.50:TIMP=.63]
  [SLP=2.30:DT= 5.00]
  [LOSS= 1 : HORTONS]
014:0018-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 02:203b 20.76 .730 No_date 12:00 25.11 .523
  [XIMP=.48:TIMP=.60]
  [SLP=2.30:DT= 5.00]
  [LOSS= 1 : HORTONS]
014:0019-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 03:203c 4.95 .212 No_date 12:00 29.74 .619
  [XIMP=.57:TIMP=.71]
  [SLP=2.30:DT= 5.00]
  [LOSS= 1 : HORTONS]
014:0020-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 04:POND1 2.68 .113 No_date 12:00 33.72 .702
  [XIMP=.64:TIMP=.80]
  [SLP= .10:DT= 5.00]
  [LOSS= 1 : HORTONS]
014:0021-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 02:203b 20.76 .730 No_date 12:00 25.11 n/a
  + 03:203c 4.95 .212 No_date 12:00 29.74 n/a
  [DT= 5.00] SUM= 05:T2CRS 25.71 .941 No_date 12:00 26.00 n/a
014:0022-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:203a 27.32 1.005 No_date 12:00 26.23 n/a
  + 04:POND1 2.68 .113 No_date 12:00 33.72 n/a
  + 05:T2CRS 25.71 .941 No_date 12:00 26.00 n/a
  [DT= 5.00] SUM= 06:P1FLOW 55.71 2.059 No_date 12:00 26.48 n/a
014:0023-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 06:P1FLOW 55.71 2.059 No_date 12:00 26.48 n/a
  [RDT= 5.00] out<- 01:POND1 55.71 .088 No_date 16:15 26.48 n/a
  overflow <= 02:P1-OVF .00 .000 No_date 0:00 .00 n/a
  {MxStoUsed=.1170E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
014:0024-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:POND1 55.71 .088 No_date 16:15 26.48 n/a
  + 09:TRIB2 383.03 .176 No_date 24:55 9.95 n/a
  [DT= 5.00] SUM= 02:213ADD 438.74 .254 No_date 24:05 12.05 n/a
014:0025-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:213ADD 438.74 .254 No_date 24:05 12.05 n/a
  [RDT= 5.00] out<- 01:214 438.74 .254 No_date 24:15 12.05 n/a
  [L/S/n= 390./1.700/.100]
  [Vmax= .376:Dmax= .133]
014:0026-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:214 1.61 .009 No_date 13:00 11.10 .231
  [CN= 72.0: N= 1.10]
  [Tp= .17:DT= 5.00]
014:0027-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD 01:214 438.74 .254 No_date 24:15 12.05 n/a
  + 03:214 1.61 .009 No_date 13:00 11.10 n/a
  [DT= 5.00] SUM= 02:214ADD 440.35 .255 No_date 24:00 12.04 n/a
014:0028-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:214ADD 440.35 .255 No_date 24:00 12.04 n/a
  [RDT= 5.00] out<- 01:215 440.35 .255 No_date 24:10 12.04 n/a
  [L/S/n= 260./1.400/.100]
  [Vmax= .341:Dmax= .147]
014:0029-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB215 1.12 .004 No_date 13:00 8.32 .173
  [CN= 66.0: N= 1.10]
  [Tp= .17:DT= 5.00]
014:0030-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
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SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

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ADD HYD          01:215          440.35      .255 No_date  24:10  12.04  n/a
+ 02:TRB215          1.12      .004 No_date  13:00   8.32  n/a
[DT= 5.00] SUM= 03:215ADD          441.47      .255 No_date  24:00  12.03  n/a
014:0031-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:215ADD          441.47      .255 No_date  24:00  12.03  n/a
[RD= 5.00] out<- 01:216          441.47      .255 No_date  24:10  12.03  n/a
[L/S/n= 250./ .500/.100]
[Vmax= .225:Dmax= .199]
014:0032-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:TRB216          1.12      .004 No_date  13:00   7.65  .159
[CN= 65.0: N= 1.10]
[TP= .17:DT= 5.00]
014:0033-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:216          441.47      .255 No_date  24:10  12.03  n/a
+ 02:TRB216          1.12      .004 No_date  13:00   7.65  n/a
[DT= 5.00] SUM= 10:T2-US          442.59      .256 No_date  24:05  12.02  n/a
014:0034-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      01:301           86.43      .072 No_date  18:00   6.90  .144
[CN= 63.0: N= 1.10]
[TP= 1.24:DT= 5.00]
014:0035-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:302           80.69      .058 No_date  21:00   7.66  .159
[CN= 64.0: N= 1.10]
[TP= 1.80:DT= 5.00]
014:0036-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:301           86.43      .072 No_date  18:00   6.90  n/a
+ 02:302           80.69      .058 No_date  21:00   7.66  n/a
[DT= 5.00] SUM= 03:300a          167.12      .128 No_date  19:00   7.27  n/a
014:0037-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300a          167.12      .128 No_date  19:00   7.27  n/a
[RD= 5.00] out<- 01:310          167.12      .128 No_date  19:05   7.27  n/a
[L/S/n= 449./1.620/.040]
[Vmax= .438:Dmax= .064]
014:0038-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:303           65.19      .076 No_date  18:00   9.99  .208
[CN= 69.0: N= 1.10]
[TP= 1.31:DT= 5.00]
014:0039-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:310          167.12      .128 No_date  19:05   7.27  n/a
+ 02:303           65.19      .076 No_date  18:00   9.99  n/a
[DT= 5.00] SUM= 03:300b          232.31      .204 No_date  18:30   8.03  n/a
014:0040-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300b          232.31      .204 No_date  18:30   8.03  n/a
[RD= 5.00] out<- 01:311          232.31      .204 No_date  18:55   8.03  n/a
[L/S/n= 270./1.170/.100]
[Vmax= .312:Dmax= .129]
014:0041-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:TRB311          1.15      .002 No_date  14:00   8.54  .178
[CN= 65.0: N= 1.10]
[TP= .52:DT= 5.00]
014:0042-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:311          232.31      .204 No_date  18:55   8.03  n/a
+ 02:TRB311          1.15      .002 No_date  14:00   8.54  n/a
[DT= 5.00] SUM= 03:311ADD          233.46      .206 No_date  18:50   8.03  n/a
014:0043-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:311ADD          233.46      .206 No_date  18:50   8.03  n/a
[RD= 5.00] out<- 01:312          233.46      .205 No_date  19:05   8.03  n/a
[L/S/n= 270./1.170/.100]
[Vmax= .312:Dmax= .130]
014:0044-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:TRB312          1.30      .004 No_date  14:05  13.59  .283
[CN= 76.0: N= 1.10]
[TP= .64:DT= 5.00]
014:0045-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:312          233.46      .205 No_date  19:05   8.03  n/a
+ 02:TRB312          1.30      .004 No_date  14:05  13.59  n/a
[DT= 5.00] SUM= 09:312ADD          234.76      .208 No_date  19:05   8.06  n/a
014:0046-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  01:304a          9.61      .320 No_date  12:00  23.99  .500
[XIMP=.46:TIMP=.57]
[SLP=1.60:DT= 5.00]

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[LOSS= 1 : HORTONS]
014:0047-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  02:402a          5.67      .248 No_date  12:00  30.47  .634
[XIMP=.58:TIMP=.73]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
014:0048-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  03:POND2          1.85      .079 No_date  12:00  33.72  .702
[XIMP=.64:TIMP=.80]
[SLP=.10:DT= 5.00]
[LOSS= 1 : HORTONS]
014:0049-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:304a          9.61      .320 No_date  12:00  23.99  n/a
+ 02:402a          5.67      .248 No_date  12:00  30.47  n/a
+ 03:POND2          1.85      .079 No_date  12:00  33.72  n/a
[DT= 5.00] SUM= 04:P2FLOW          17.13      .647 No_date  12:00  27.18  n/a
014:0050-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 04:P2FLOW          17.13      .647 No_date  12:00  27.18  n/a
[RD= 5.00] out<- 01:POND2          17.13      .016 No_date  21:05  27.18  n/a
overflow <= 02:P2OVF          .00      .000 No_date   0:00   .00  n/a
{MxStoUsed=.4018E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
014:0051-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  02:402b          6.07      .266 No_date  12:00  30.47  .634
[XIMP=.58:TIMP=.73]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
014:0052-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD  03:402c          1.19      .049 No_date  12:00  28.56  .595
[XIMP=.55:TIMP=.68]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
014:0053-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          02:402b          6.07      .266 No_date  12:00  30.47  n/a
+ 03:402c          1.19      .049 No_date  12:00  28.56  n/a
[DT= 5.00] SUM= 04:400-OS          7.26      .315 No_date  12:00  30.15  n/a
014:0054-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 04:400-OS          7.26      .315 No_date  12:00  30.15  n/a
[RD= 5.00] out<- 02:OSSTOR          7.26      .314 No_date  12:00  30.15  n/a
overflow <= 03:OSOVF          .00      .000 No_date   0:00   .00  n/a
{MxStoUsed=.1978E-02, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
014:0055-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      03:401          16.78      .085 No_date  13:50  10.48  .218
[CN= 68.0: N= 3.00]
[TP= 1.66:DT= 5.00]
014:0056-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:POND2          17.13      .016 No_date  21:05  27.18  n/a
+ 02:OSSTOR          7.26      .314 No_date  12:00  30.15  n/a
+ 03:401          16.78      .085 No_date  13:50  10.48  n/a
+ 09:312ADD          234.76      .208 No_date  19:05   8.06  n/a
[DT= 5.00] SUM= 04:P2-T3          275.93      .370 No_date  12:00   9.98  n/a
014:0057-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 04:P2-T3          275.93      .370 No_date  12:00   9.98  n/a
[RD= 5.00] out<- 01:313          275.93      .305 No_date  12:05   9.98  n/a
[L/S/n= 423./1.170/.100]
[Vmax= .338:Dmax= .193]
014:0058-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:TRB313          .72      .002 No_date  13:00   9.94  .207
[CN= 68.0: N= 1.10]
[TP= .34:DT= 5.00]
014:0059-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:313          275.93      .305 No_date  12:05   9.98  n/a
+ 02:TRB313          .72      .002 No_date  13:00   9.94  n/a
[DT= 5.00] SUM= 03:313ADD          276.65      .307 No_date  12:05   9.98  n/a
014:0060-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      04:TRB314          .94      .002 No_date  14:00   9.94  .207
[CN= 68.0: N= 1.10]
[TP= .46:DT= 5.00]
014:0061-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:313          275.93      .305 No_date  12:05   9.98  n/a
+ 02:TRB313          .72      .002 No_date  13:00   9.94  n/a
[DT= 5.00] SUM= 03:313ADD          276.65      .307 No_date  12:05   9.98  n/a

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SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

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014:0062-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      04:403a      2.66      .013 No_date  13:00  12.53 .261
[CN= 70.0: N= 1.10]
[TP= .27:DT= 5.00]
014:0063-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           10:T2-US      442.59      .256 No_date  24:05  12.02 n/a
+ 03:313ADD      276.65      .307 No_date  12:05   9.98 n/a
+ 04:403a        2.66      .013 No_date  13:00  12.53 n/a
[DT= 5.00] SUM= 01:CONFLU      721.90      .509 No_date  18:05  11.24 n/a
014:0064-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 01:203d      1.26      .054 No_date  12:00  29.26 .609
[XIMP=.56:TIMP=.70]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
014:0065-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  02:501a      9.32      .498 No_date  12:00  39.23 .817
[XIMP=.74:TIMP=.93]
[SLP=.80:DT= 5.00]
[LOSS= 1 : HORTONS]
014:0066-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
COMPUTE DUALHYD  02:501a      9.32      .498 No_date  12:00  39.23 n/a
Major System /   03:OSSOR      .00      .000 No_date  0:00   .00 n/a
Minor System \   04:TOPOND      9.32      .498 No_date  12:00  39.23 n/a
{MjSysSto=.0000E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
014:0067-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  05:501b      38.42      1.494 No_date  12:00  28.10 .585
[XIMP=.54:TIMP=.67]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
014:0068-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  06:501c      39.10      1.453 No_date  12:00  26.70 .556
[XIMP=.51:TIMP=.64]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
014:0069-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  07:MR1       3.32      .188 No_date  12:00  43.77 .912
[XIMP=.80:TIMP=.99]
[SLP=1.00:DT= 5.00]
[LOSS= 1 : HORTONS]
014:0070-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  08:MR2       3.04      .172 No_date  12:00  43.77 .912
[XIMP=.80:TIMP=.99]
[SLP=1.00:DT= 5.00]
[LOSS= 1 : HORTONS]
014:0071-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           01:203d      1.26      .054 No_date  12:00  29.26 n/a
+ 05:501b      38.42      1.494 No_date  12:00  28.10 n/a
+ 07:MR1       3.32      .188 No_date  12:00  43.77 n/a
[DT= 5.00] SUM= 10:VALE      43.00      1.736 No_date  12:00  29.34 n/a
014:0072-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           04:TOPOND      9.32      .498 No_date  12:00  39.23 n/a
+ 06:501c      39.10      1.453 No_date  12:00  26.70 n/a
+ 08:MR2       3.04      .172 No_date  12:00  43.77 n/a
[DT= 5.00] SUM= 09:MET      51.46      2.123 No_date  12:00  29.98 n/a
014:0073-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  01:POND3      11.89      .471 No_date  12:00  33.72 .702
[XIMP=.64:TIMP=.80]
[SLP=.10:DT= 5.00]
[LOSS= 1 : HORTONS]
014:0074-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           10:VALE      43.00      1.736 No_date  12:00  29.34 n/a
+ 09:MET      51.46      2.123 No_date  12:00  29.98 n/a
+ 01:POND3     11.89      .471 No_date  12:00  33.72 n/a
[DT= 5.00] SUM= 08:P3ADD     106.35      4.330 No_date  12:00  30.14 n/a
014:0075-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 08:P3ADD     106.35      4.330 No_date  12:00  30.14 n/a
[RD= 5.00] out<- 01:POND3     106.35      .220 No_date  16:05  30.14 n/a
overflow <= 02:E-OVF      .00      .000 No_date  0:00   .00 n/a
{MxStoUsed=.2517E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
** END OF RUN : 14

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RUN:COMMAND#
015:0001-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
START
[TZERO = .00 hrs on 0]
[METOUT= 2 (1=imperial, 2=metric output)]
[NSTORM= 1 ]
[NRUN = 15 ]
*****
# Project Name: [Kanata North] Project Number: [112117]
# Date : 03-30-2016
# Modeller : [Kallie Auld]
# Company : NOVATECH ENGINEERING CONSULTANTS LTD
# License # : 5320763
*****
015:0002-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
READ STORM
Filename = STORM.001
Comment =
[SDT=60.00:SDUR= 24.00:PTOT= 61.92]
015:0003-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DEFAULT VALUES
Filename = M:\2012\112117\data\CALCUL-1\swmhyo\POSTDE-1\OTTAWA.DEF
ICASEdv = 1 (read and print data)
FileTitle= ----- ENTER YOUR COMMENTS ON THIS LINE AND THE NEXT ONE -----
----- PARAMETER VALUES MUST BE ENTERED AFTER COLUMN 60 -----
Horton's infiltration equation parameters:
[Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F= .00 mm]
Parameters for PERVIOUS surfaces in STANDHYD:
[Iaper= 4.67 mm] [LGP=40.00 m] [MNP= .250]
Parameters for IMPERVIOUS surfaces in STANDHYD:
[Iaimp= 1.57 mm] [CLI= 1.50] [MNI= .013]
Parameters used in NASHYD:
[Ia= 4.67 mm] [N= 3.00]
015:0004-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      01:201      115.14      .091 No_date  24:00  13.63 .220
[CN= 65.0: N= 1.10]
[TP= 3.42:DT= 5.00]
015:0005-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:201      115.14      .091 No_date  24:00  13.63 n/a
[RD= 5.00] out<- 02:210      115.14      .091 No_date  24:10  13.63 n/a
[L/S/n= 558./ .890/.040]
[Vmax= .423:Dmax= .042]
015:0006-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      01:202      263.64      .198 No_date  24:00  18.03 .291
[CN= 70.0: N= 1.10]
[TP= 5.14:DT= 5.00]
015:0007-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           01:202      263.64      .198 No_date  24:00  18.03 n/a
+ 02:210      115.14      .091 No_date  24:10  13.63 n/a
[DT= 5.00] SUM= 03:210add     378.78      .289 No_date  24:00  16.69 n/a
015:0008-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:210add     378.78      .289 No_date  24:00  16.69 n/a
[RD= 5.00] out<- 01:211      378.78      .289 No_date  24:25  16.69 n/a
[L/S/n= 450./1.000/.100]
[Vmax= .301:Dmax= .176]
015:0009-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:211      1.87      .005 No_date  16:20  21.93 .354
[CN= 76.0: N= 1.10]
[TP= 1.17:DT= 5.00]
015:0010-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD           01:211      378.78      .289 No_date  24:25  16.69 n/a
+ 02:211      1.87      .005 No_date  16:20  21.93 n/a
[DT= 5.00] SUM= 03:211add     380.65      .293 No_date  24:25  16.72 n/a
015:0011-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-

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SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

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ROUTE CHANNEL -> 03:211add      380.65      .293 No_date  24:25  16.72  n/a
[RD= 5.00] out<- 01:212      380.65      .293 No_date  24:35  16.72  n/a
[L/S/n= 230./1.000/.100]
[Vmax= .302:Dmax= .177]
015:0012-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:212      .95      .003 No_date  14:00  15.33  .248
[CN= 66.0: N= 1.10]
[TP= .56:DT= 5.00]
015:0013-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:212      380.65      .293 No_date  24:35  16.72  n/a
+      02:212      .95      .003 No_date  14:00  15.33  n/a
[DT= 5.00] SUM= 03:212add      381.60      .295 No_date  24:30  16.71  n/a
015:0014-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:212add      381.60      .295 No_date  24:30  16.71  n/a
[RD= 5.00] out<- 01:213      381.60      .295 No_date  24:45  16.71  n/a
[L/S/n= 330./1.000/.100]
[Vmax= .302:Dmax= .178]
015:0015-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:213      1.43      .004 No_date  14:20  15.23  .246
[CN= 66.0: N= 1.10]
[TP= .67:DT= 5.00]
015:0016-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:213      381.60      .295 No_date  24:45  16.71  n/a
+      02:213      1.43      .004 No_date  14:20  15.23  n/a
[DT= 5.00] SUM= 09:TRB2      383.03      .297 No_date  24:40  16.71  n/a
015:0017-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  01:203a      27.32      1.537 No_date  12:00  37.07  .599
[XIMP=.50:TIMP=.63]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
015:0018-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  02:203b      20.76      1.136 No_date  12:00  35.67  .576
[XIMP=.48:TIMP=.60]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
015:0019-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD  03:203c      4.95      .305 No_date  12:00  41.02  .663
[XIMP=.57:TIMP=.71]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
015:0020-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  04:POND1      2.68      .161 No_date  12:00  45.30  .732
[XIMP=.64:TIMP=.80]
[SLP= .10:DT= 5.00]
[LOSS= 1 : HORTONS]
015:0021-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      02:203b      20.76      1.136 No_date  12:00  35.67  n/a
+      03:203c      4.95      .305 No_date  12:00  41.02  n/a
[DT= 5.00] SUM= 05:T2CRS      25.71      1.441 No_date  12:00  36.70  n/a
015:0022-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:203a      27.32      1.537 No_date  12:00  37.07  n/a
+      04:POND1      2.68      .161 No_date  12:00  45.30  n/a
+      05:T2CRS      25.71      1.441 No_date  12:00  36.70  n/a
[DT= 5.00] SUM= 06:P1FLOW      55.71      3.138 No_date  12:00  37.29  n/a
015:0023-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 06:P1FLOW      55.71      3.138 No_date  12:00  37.29  n/a
[RD= 5.00] out<- 01:POND1      55.71      .166 No_date  14:20  37.29  n/a
overflow <= 02:P1-OVF      .00      .000 No_date  0:00      .00  n/a
{MxStoUsed=.1614E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
015:0024-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:POND1      55.71      .166 No_date  14:20  37.29  n/a
+      09:TRB2      383.03      .297 No_date  24:40  16.71  n/a
[DT= 5.00] SUM= 02:213ADD      438.74      .427 No_date  21:40  19.32  n/a
015:0025-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:213ADD      438.74      .427 No_date  21:40  19.32  n/a
[RD= 5.00] out<- 01:214      438.74      .427 No_date  21:55  19.32  n/a
[L/S/n= 390./1.700/.100]
[Vmax= .403:Dmax= .188]
015:0026-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      03:214      1.61      .015 No_date  13:00  18.52  .299
[CN= 72.0: N= 1.10]

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[TP= .17:DT= 5.00]
015:0027-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:214      438.74      .427 No_date  21:55  19.32  n/a
+      03:214      1.61      .015 No_date  13:00  18.52  n/a
[DT= 5.00] SUM= 02:214ADD      440.35      .429 No_date  21:55  19.32  n/a
015:0028-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:214ADD      440.35      .429 No_date  21:55  19.32  n/a
[RD= 5.00] out<- 01:215      440.35      .429 No_date  22:00  19.32  n/a
[L/S/n= 260./1.400/.100]
[Vmax= .376:Dmax= .199]
015:0029-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:TRB215      1.12      .008 No_date  13:00  14.45  .233
[CN= 66.0: N= 1.10]
[TP= .17:DT= 5.00]
015:0030-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:215      440.35      .429 No_date  22:00  19.32  n/a
+      02:TRB215      1.12      .008 No_date  13:00  14.45  n/a
[DT= 5.00] SUM= 03:215ADD      441.47      .430 No_date  22:00  19.30  n/a
015:0031-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:215ADD      441.47      .430 No_date  22:00  19.30  n/a
[RD= 5.00] out<- 01:216      441.47      .431 No_date  22:05  19.30  n/a
[L/S/n= 250./1.500/.100]
[Vmax= .279:Dmax= .276]
015:0032-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:TRB216      1.12      .007 No_date  13:00  13.53  .219
[CN= 65.0: N= 1.10]
[TP= .17:DT= 5.00]
015:0033-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:216      441.47      .431 No_date  22:05  19.30  n/a
+      02:TRB216      1.12      .007 No_date  13:00  13.53  n/a
[DT= 5.00] SUM= 10:T2-US      442.59      .432 No_date  22:05  19.29  n/a
015:0034-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      01:301      86.43      .130 No_date  18:00  12.39  .200
[CN= 63.0: N= 1.10]
[TP= 1.24:DT= 5.00]
015:0035-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:302      80.69      .101 No_date  21:00  13.42  .217
[CN= 64.0: N= 1.10]
[TP= 1.80:DT= 5.00]
015:0036-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:301      86.43      .130 No_date  18:00  12.39  n/a
+      02:302      80.69      .101 No_date  21:00  13.42  n/a
[DT= 5.00] SUM= 03:300a      167.12      .230 No_date  18:05  12.89  n/a
015:0037-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300a      167.12      .230 No_date  18:05  12.89  n/a
[RD= 5.00] out<- 01:310      167.12      .230 No_date  18:30  12.89  n/a
[L/S/n= 449./1.620/.040]
[Vmax= .496:Dmax= .086]
015:0038-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:303      65.19      .129 No_date  18:00  16.82  .272
[CN= 69.0: N= 1.10]
[TP= 1.31:DT= 5.00]
015:0039-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:310      167.12      .230 No_date  18:30  12.89  n/a
+      02:303      65.19      .129 No_date  18:00  16.82  n/a
[DT= 5.00] SUM= 03:300b      232.31      .359 No_date  18:10  13.99  n/a
015:0040-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300b      232.31      .359 No_date  18:10  13.99  n/a
[RD= 5.00] out<- 01:311      232.31      .358 No_date  18:25  13.99  n/a
[L/S/n= 270./1.170/.100]
[Vmax= .336:Dmax= .189]
015:0041-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:TRB311      1.15      .004 No_date  14:00  14.61  .236
[CN= 65.0: N= 1.10]
[TP= .52:DT= 5.00]
015:0042-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:311      232.31      .358 No_date  18:25  13.99  n/a
+      02:TRB311      1.15      .004 No_date  14:00  14.61  n/a
[DT= 5.00] SUM= 03:311ADD      233.46      .361 No_date  18:25  13.99  n/a
015:0043-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:311ADD      233.46      .361 No_date  18:25  13.99  n/a

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SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

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[RDT= 5.00] out<- 01:312      233.46      .361 No_date  18:40  13.99  n/a
[L/S/n= 270./1.170/.100]
[Vmax= .336:Dmax= .190]
015:0044-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      02:TRB312      1.30      .006 No_date  14:00  21.99  .355
[CN= 76.0: N= 1.10]
[TP= .64:DT= 5.00]
015:0045-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:312      233.46      .361 No_date  18:40  13.99  n/a
+ 02:TRB312      1.30      .006 No_date  14:00  21.99  n/a
[DT= 5.00] SUM= 09:312ADD      234.76      .366 No_date  18:35  14.04  n/a
015:0046-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  01:304a      9.61      .507 No_date  12:00  34.23  .553
[XIMP=.46:TIMP=.57]
[SLP=1.60:DT= 5.00]
[LOSS= 1 : HORTONS]
015:0047-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  02:402a      5.67      .354 No_date  12:00  41.82  .675
[XIMP=.58:TIMP=.73]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
015:0048-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  03:POND2      1.85      .111 No_date  12:00  45.30  .732
[XIMP=.64:TIMP=.80]
[SLP= .10:DT= 5.00]
[LOSS= 1 : HORTONS]
015:0049-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:304a      9.61      .507 No_date  12:00  34.23  n/a
+ 02:402a      5.67      .354 No_date  12:00  41.82  n/a
+ 03:POND2      1.85      .111 No_date  12:00  45.30  n/a
[DT= 5.00] SUM= 04:P2FLOW      17.13      .972 No_date  12:00  37.94  n/a
015:0050-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 04:P2FLOW      17.13      .972 No_date  12:00  37.94  n/a
[RDT= 5.00] out<- 01:POND2      17.13      .030 No_date  18:05  37.93  n/a
overflow <= 02:P2OVF      .00      .000 No_date  0:00      .00  n/a
{MxStoUsed=.5445E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
015:0051-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  02:402b      6.07      .379 No_date  12:00  41.82  .675
[XIMP=.58:TIMP=.73]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
015:0052-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD  03:402c      1.19      .072 No_date  12:00  39.70  .641
[XIMP=.55:TIMP=.68]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
015:0053-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      02:402b      6.07      .379 No_date  12:00  41.82  n/a
+ 03:402c      1.19      .072 No_date  12:00  39.70  n/a
[DT= 5.00] SUM= 04:400-OS      7.26      .451 No_date  12:00  41.47  n/a
015:0054-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 04:400-OS      7.26      .451 No_date  12:00  41.47  n/a
[RDT= 5.00] out<- 02:OSSSTOR      7.26      .450 No_date  12:00  41.47  n/a
overflow <= 03:OSSOVF      .00      .000 No_date  0:00      .00  n/a
{MxStoUsed=.2824E-02, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
015:0055-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      03:401      16.78      .144 No_date  13:45  17.29  .279
[CN= 68.0: N= 3.00]
[TP= 1.66:DT= 5.00]
015:0056-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:POND2      17.13      .030 No_date  18:05  37.93  n/a
+ 02:OSSSTOR      7.26      .450 No_date  12:00  41.47  n/a
+ 03:401      16.78      .144 No_date  13:45  17.29  n/a
+ 09:312ADD      234.76      .366 No_date  18:35  14.04  n/a
[DT= 5.00] SUM= 04:P2-T3      275.93      .566 No_date  12:00  16.44  n/a
015:0057-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 04:P2-T3      275.93      .566 No_date  12:00  16.44  n/a
[RDT= 5.00] out<- 01:313      275.93      .502 No_date  14:45  16.44  n/a
[L/S/n= 423./1.170/.100]
[Vmax= .394:Dmax= .250]
015:0058-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
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CALIB NASHYD      02:TRB313      .72      .004 No_date  13:00  16.65  .269
[CN= 68.0: N= 1.10]
[TP= .34:DT= 5.00]
015:0059-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:313      275.93      .502 No_date  14:45  16.44  n/a
+ 02:TRB313      .72      .004 No_date  13:00  16.65  n/a
[DT= 5.00] SUM= 03:313ADD      276.65      .505 No_date  14:45  16.44  n/a
015:0060-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      04:TRB314      .94      .004 No_date  13:55  16.65  .269
[CN= 68.0: N= 1.10]
[TP= .46:DT= 5.00]
015:0061-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:313      275.93      .502 No_date  14:45  16.44  n/a
+ 02:TRB313      .72      .004 No_date  13:00  16.65  n/a
[DT= 5.00] SUM= 03:313ADD      276.65      .505 No_date  14:45  16.44  n/a
015:0062-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD      04:403a      2.66      .020 No_date  13:00  19.94  .322
[CN= 70.0: N= 1.10]
[TP= .27:DT= 5.00]
015:0063-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      10:T2-US      442.59      .432 No_date  22:05  19.29  n/a
+ 03:313ADD      276.65      .505 No_date  14:45  16.44  n/a
+ 04:403a      2.66      .020 No_date  13:00  19.94  n/a
[DT= 5.00] SUM= 01:CONFLU      721.90      .895 No_date  16:00  18.20  n/a
015:0064-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD  01:203d      1.26      .077 No_date  12:00  40.48  .654
[XIMP=.56:TIMP=.70]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
015:0065-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  02:501a      9.32      .658 No_date  12:00  51.52  .832
[XIMP=.74:TIMP=.93]
[SLP= .80:DT= 5.00]
[LOSS= 1 : HORTONS]
015:0066-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
COMPUTE DUALHYD  02:501a      9.32      .658 No_date  12:00  51.52  n/a
Major System / 03:OSSSTOR      .00      .000 No_date  0:00      .00  n/a
Minor System \ 04:TOPOND      9.32      .658 No_date  12:00  51.52  n/a
{MjSysSto=.0000E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
015:0067-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  05:501b      38.42      2.229 No_date  12:00  39.17  .633
[XIMP=.54:TIMP=.67]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
015:0068-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  06:501c      39.10      2.208 No_date  12:00  37.60  .607
[XIMP=.51:TIMP=.64]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
015:0069-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  07:MR1      3.32      .245 No_date  12:00  57.57  .930
[XIMP=.80:TIMP=.99]
[SLP=1.00:DT= 5.00]
[LOSS= 1 : HORTONS]
015:0070-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  08:MR2      3.04      .224 No_date  12:00  57.57  .930
[XIMP=.80:TIMP=.99]
[SLP=1.00:DT= 5.00]
[LOSS= 1 : HORTONS]
015:0071-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:203d      1.26      .077 No_date  12:00  40.48  n/a
+ 05:501b      38.42      2.229 No_date  12:00  39.17  n/a
+ 07:MR1      3.32      .245 No_date  12:00  57.57  n/a
[DT= 5.00] SUM= 10:VALE      43.00      2.551 No_date  12:00  40.63  n/a
015:0072-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      04:TOPOND      9.32      .658 No_date  12:00  51.52  n/a
+ 06:501c      39.10      2.208 No_date  12:00  37.60  n/a
+ 08:MR2      3.04      .224 No_date  12:00  57.57  n/a
[DT= 5.00] SUM= 09:MET      51.46      3.091 No_date  12:00  41.30  n/a
015:0073-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  01:POND3      11.89      .670 No_date  12:00  45.30  .732
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SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

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[XIMP=.64:TIMP=.80]
[SLP=.10:DT= 5.00]
[LOSS= 1 : HORTONS]
015:0074-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          10:VALE          43.00    2.551 No_date    12:00    40.63  n/a
                + 09:MET          51.46    3.091 No_date    12:00    41.30  n/a
                + 01:POND3         11.89    .670 No_date    12:00    45.30  n/a
[DT= 5.00] SUM=   08:P3ADD         106.35    6.312 No_date    12:00    41.47  n/a
015:0075-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 08:P3ADD         106.35    6.312 No_date    12:00    41.47  n/a
[RD= 5.00] out<- 01:POND3         106.35    .383 No_date    14:20    41.47  n/a
                overflow <= 02:E-OVF          .00    .000 No_date    0:00    .00  n/a
{MxStoUsed=.3389E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
** END OF RUN : 15

*****

RUN:COMMAND#
016:0001-----
START
[TZERO = .00 hrs on 0]
[METOUT= 2 (1=imperial, 2=metric output)]
[NSTORM= 1]
[NRUN = 16]
*****
# Project Name: [Kanata North] Project Number: [112117]
# Date : 03-30-2016
# Modeller : [Kallie Auld]
# Company : NOVATECH ENGINEERING CONSULTANTS LTD
# License # : 5320763
*****
016:0002-----
READ STORM
Filename = STORM.001
Comment =
[SDT=60.00:SDUR= 24.00:PTOT= 105.74]
016:0003-----
DEFAULT VALUES
Filename = M:\2012\112117\data\CALCUL-1\swmhy\POSTDE-1\OTTAWA.DEF
ICASEdv = 1 (read and print data)
FileTitle= ----- ENTER YOUR COMMENTS ON THIS LINE AND THE NEXT ONE ---
                ----- PARAMETER VALUES MUST BE ENTERED AFTER COLUMN 60 -----
Horton's infiltration equation parameters:
[Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F= .00 mm]
Parameters for PERVIOUS surfaces in STANDHYD:
[IAper= 4.67 mm] [LGP=40.00 m] [MNP= .250]
Parameters for IMPVIOUS surfaces in STANDHYD:
[IAimp= 1.57 mm] [CLI= 1.50] [MNI= .013]
Parameters used in NASHYD:
[IA= 4.67 mm] [N= 3.00]
016:0004-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     01:201          115.14    .257 No_date    24:00    38.51 .364
[CN= 65.0: N= 1.10]
[TP= 3.42:DT= 5.00]
016:0005-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 01:201          115.14    .257 No_date    24:00    38.51 n/a
[RD= 5.00] out<- 02:210          115.14    .257 No_date    24:05    38.51 n/a
[L/S/n= 558./ .890/.040]
[Vmax= .442:Dmax= .101]
016:0006-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     01:202          263.64    .510 No_date    24:00    46.46 .439
[CN= 70.0: N= 1.10]
[TP= 5.14:DT= 5.00]
016:0007-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:202          263.64    .510 No_date    24:00    46.46 n/a
                + 02:210          115.14    .257 No_date    24:05    38.51 n/a
```

```
[DT= 5.00] SUM=   03:210add         378.78    .766 No_date    24:00    44.04 n/a
016:0008-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:210add         378.78    .766 No_date    24:00    44.04 n/a
[RD= 5.00] out<- 01:211          378.78    .766 No_date    24:10    44.04 n/a
[L/S/n= 450./1.000/.100]
[Vmax= .456:Dmax= .323]
016:0009-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:211          1.87    .013 No_date    16:00    54.00 .511
[CN= 76.0: N= 1.10]
[TP= 1.17:DT= 5.00]
016:0010-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:211          378.78    .766 No_date    24:10    44.04 n/a
                + 02:211          1.87    .013 No_date    16:00    54.00 n/a
[DT= 5.00] SUM=   03:211add         380.65    .777 No_date    24:10    44.09 n/a
016:0011-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:211add         380.65    .777 No_date    24:10    44.09 n/a
[RD= 5.00] out<- 01:212          380.65    .776 No_date    24:15    44.09 n/a
[L/S/n= 230./1.000/.100]
[Vmax= .457:Dmax= .325]
016:0012-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:212          .95    .009 No_date    14:00    41.25 .390
[CN= 66.0: N= 1.10]
[TP= .56:DT= 5.00]
016:0013-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:212          380.65    .776 No_date    24:15    44.09 n/a
                + 02:212          .95    .009 No_date    14:00    41.25 n/a
[DT= 5.00] SUM=   03:212add         381.60    .780 No_date    24:15    44.08 n/a
016:0014-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:212add         381.60    .780 No_date    24:15    44.08 n/a
[RD= 5.00] out<- 01:213          381.60    .780 No_date    24:25    44.08 n/a
[L/S/n= 330./1.000/.100]
[Vmax= .458:Dmax= .326]
016:0015-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:213          1.43    .012 No_date    14:00    41.12 .389
[CN= 66.0: N= 1.10]
[TP= .67:DT= 5.00]
016:0016-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:213          381.60    .780 No_date    24:25    44.08 n/a
                + 02:213          1.43    .012 No_date    14:00    41.12 n/a
[DT= 5.00] SUM=   09:TRIB2         383.03    .786 No_date    24:20    44.07 n/a
016:0017-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  01:203a         27.32    3.051 No_date    12:00    70.88 .670
[XIMP=.50:TIMP=.63]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
016:0018-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  02:203b         20.76    2.296 No_date    12:00    69.11 .654
[XIMP=.48:TIMP=.60]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
016:0019-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 03:203c          4.95    .572 No_date    12:00    76.34 .722
[XIMP=.57:TIMP=.71]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
016:0020-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  04:POND1          2.68    .299 No_date    12:00    82.03 .776
[XIMP=.64:TIMP=.80]
[SLP=.10:DT= 5.00]
[LOSS= 1 : HORTONS]
016:0021-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          02:203b         20.76    2.296 No_date    12:00    69.11 n/a
                + 03:203c          4.95    .572 No_date    12:00    76.34 n/a
[DT= 5.00] SUM=   05:T2CRS         25.71    2.868 No_date    12:00    70.50 n/a
016:0022-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:203a         27.32    3.051 No_date    12:00    70.88 n/a
                + 04:POND1          2.68    .299 No_date    12:00    82.03 n/a
                + 05:T2CRS         25.71    2.868 No_date    12:00    70.50 n/a
[DT= 5.00] SUM=   06:P1FLOW         55.71    6.218 No_date    12:00    71.24 n/a
016:0023-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 06:P1FLOW         55.71    6.218 No_date    12:00    71.24 n/a
```

SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

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[ RDT= 5.00] out<- 01:POND1      55.71      .344 No_date  14:05  71.24  n/a
overflow <= 02:P1-OVF      .00      .000 No_date  0:00      .00  n/a
{MxStoUsed=.3100E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
016:0024-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:POND1      55.71      .344 No_date  14:05  71.24  n/a
+ 09:TRIB2      383.03      .786 No_date  24:20  44.07  n/a
[DT= 5.00] SUM= 02:213ADD      438.74      1.068 No_date  22:00  47.52  n/a
016:0025-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:213ADD      438.74      1.068 No_date  22:00  47.52  n/a
[ RDT= 5.00] out<- 01:214      438.74      1.068 No_date  22:05  47.52  n/a
[L/S/n= 390./1.700/.100]
{Vmax= .604:Dmax= .335}
016:0026-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 03:214      1.61      .041 No_date  12:10  47.94 .453
[CN= 72.0: N= 1.10]
[TP= .17:DT= 5.00]
016:0027-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:214      438.74      1.068 No_date  22:05  47.52  n/a
+ 03:214      1.61      .041 No_date  12:10  47.94  n/a
[DT= 5.00] SUM= 02:214ADD      440.35      1.073 No_date  21:15  47.52  n/a
016:0028-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 02:214ADD      440.35      1.073 No_date  21:15  47.52  n/a
[ RDT= 5.00] out<- 01:215      440.35      1.073 No_date  21:30  47.52  n/a
[L/S/n= 260./1.400/.100]
{Vmax= .565:Dmax= .354}
016:0029-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB215      1.12      .023 No_date  12:15  40.05 .379
[CN= 66.0: N= 1.10]
[TP= .17:DT= 5.00]
016:0030-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:215      440.35      1.073 No_date  21:30  47.52  n/a
+ 02:TRB215      1.12      .023 No_date  12:15  40.05  n/a
[DT= 5.00] SUM= 03:215ADD      441.47      1.077 No_date  21:25  47.50  n/a
016:0031-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:215ADD      441.47      1.077 No_date  21:25  47.50  n/a
[ RDT= 5.00] out<- 01:216      441.47      1.077 No_date  21:35  47.50  n/a
[L/S/n= 250./1.500/.100]
{Vmax= .418:Dmax= .487}
016:0032-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB216      1.12      .022 No_date  12:15  38.38 .363
[CN= 65.0: N= 1.10]
[TP= .17:DT= 5.00]
016:0033-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:216      441.47      1.077 No_date  21:35  47.50  n/a
+ 02:TRB216      1.12      .022 No_date  12:15  38.38  n/a
[DT= 5.00] SUM= 10:T2-US      442.59      1.080 No_date  21:35  47.48  n/a
016:0034-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 01:301      86.43      .383 No_date  18:00  35.99 .340
[CN= 63.0: N= 1.10]
[TP= 1.24:DT= 5.00]
016:0035-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:302      80.69      .287 No_date  18:25  37.84 .358
[CN= 64.0: N= 1.10]
[TP= 1.80:DT= 5.00]
016:0036-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:301      86.43      .383 No_date  18:00  35.99  n/a
+ 02:302      80.69      .287 No_date  18:25  37.84  n/a
[DT= 5.00] SUM= 03:300a      167.12      .670 No_date  18:00  36.88  n/a
016:0037-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300a      167.12      .670 No_date  18:00  36.88  n/a
[ RDT= 5.00] out<- 01:310      167.12      .669 No_date  18:05  36.88  n/a
[L/S/n= 449./1.620/.040]
{Vmax= .720:Dmax= .154}
016:0038-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:303      65.19      .346 No_date  17:40  44.45 .420
[CN= 69.0: N= 1.10]
[TP= 1.31:DT= 5.00]
016:0039-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:310      167.12      .669 No_date  18:05  36.88  n/a
+ 02:303      65.19      .346 No_date  17:40  44.45  n/a
[DT= 5.00] SUM= 03:300b      232.31      1.015 No_date  18:00  39.01  n/a

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016:0040-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:300b      232.31      1.015 No_date  18:00  39.01  n/a
[ RDT= 5.00] out<- 01:311      232.31      1.014 No_date  18:05  39.01  n/a
[L/S/n= 270./1.170/.100]
{Vmax= .522:Dmax= .361}
016:0041-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB311      1.15      .011 No_date  14:00  39.88 .377
[CN= 65.0: N= 1.10]
[TP= .52:DT= 5.00]
016:0042-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:311      232.31      1.014 No_date  18:05  39.01  n/a
+ 02:TRB311      1.15      .011 No_date  14:00  39.88  n/a
[DT= 5.00] SUM= 03:311ADD      233.46      1.022 No_date  18:05  39.01  n/a
016:0043-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 03:311ADD      233.46      1.022 No_date  18:05  39.01  n/a
[ RDT= 5.00] out<- 01:312      233.46      1.022 No_date  18:10  39.01  n/a
[L/S/n= 270./1.170/.100]
{Vmax= .523:Dmax= .363}
016:0044-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD 02:TRB312      1.30      .015 No_date  14:00  54.08 .511
[CN= 76.0: N= 1.10]
[TP= .64:DT= 5.00]
016:0045-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:312      233.46      1.022 No_date  18:10  39.01  n/a
+ 02:TRB312      1.30      .015 No_date  14:00  54.08  n/a
[DT= 5.00] SUM= 09:312ADD      234.76      1.034 No_date  18:10  39.09  n/a
016:0046-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 01:304a      9.61      1.049 No_date  12:00  67.31 .637
[XIMP=.46:TIMP=.57]
[SLP=1.60:DT= 5.00]
[LOSS= 1 : HORTONS]
016:0047-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 02:402a      5.67      .660 No_date  12:00  77.35 .732
[XIMP=.58:TIMP=.73]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
016:0048-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD 03:POND2      1.85      .207 No_date  12:00  82.03 .776
[XIMP=.64:TIMP=.80]
[SLP=.10:DT= 5.00]
[LOSS= 1 : HORTONS]
016:0049-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:304a      9.61      1.049 No_date  12:00  67.31  n/a
+ 02:402a      5.67      .660 No_date  12:00  77.35  n/a
+ 03:POND2      1.85      .207 No_date  12:00  82.03  n/a
[DT= 5.00] SUM= 04:P2FLOW      17.13      1.916 No_date  12:00  72.22  n/a
016:0050-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 04:P2FLOW      17.13      1.916 No_date  12:00  72.22  n/a
[ RDT= 5.00] out<- 01:POND2      17.13      .083 No_date  15:00  72.21  n/a
overflow <= 02:P2OVF      .00      .000 No_date  0:00      .00  n/a
{MxStoUsed=.9986E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
016:0051-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 02:402b      6.07      .706 No_date  12:00  77.35 .732
[XIMP=.58:TIMP=.73]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
016:0052-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 03:402c      1.19      .137 No_date  12:00  74.58 .705
[XIMP=.55:TIMP=.68]
[SLP=2.10:DT= 5.00]
[LOSS= 1 : HORTONS]
016:0053-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      02:402b      6.07      .706 No_date  12:00  77.35  n/a
+ 03:402c      1.19      .137 No_date  12:00  74.58  n/a
[DT= 5.00] SUM= 04:400-OS      7.26      .843 No_date  12:00  76.90  n/a
016:0054-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 04:400-OS      7.26      .843 No_date  12:00  76.90  n/a
[ RDT= 5.00] out<- 02:OSSSTOR      7.26      .800 No_date  12:00  76.90  n/a
overflow <= 03:OSSOVF      .00      .000 No_date  0:00      .00  n/a
{MxStoUsed=.1074E-01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
016:0055-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-

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SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

```

CALIB NASHYD      03:401      16.78      .386 No_date  13:40  44.67 .422
[CN= 68.0: N= 3.00]
[TP= 1.66:DT= 5.00]
016:0056-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:POND2      17.13      .083 No_date  15:00  72.21 n/a
                + 02:OSSTOR      7.26      .800 No_date  12:00  76.90 n/a
                + 03:401        16.78      .386 No_date  13:40  44.67 n/a
                + 09:312ADD     234.76     1.034 No_date  18:10  39.09 n/a
[DT= 5.00] SUM= 04:P2-T3      275.93     1.449 No_date  14:00  42.48 n/a
016:0057-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE CHANNEL -> 04:P2-T3      275.93     1.449 No_date  14:00  42.48 n/a
[RDT= 5.00] out<- 01:313      275.93     1.443 No_date  14:05  42.48 n/a
[L/S/n= 423./1.170/.100]
{Vmax= .604:Dmax= .450}
016:0058-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     02:TRB313      .72      .011 No_date  13:00  43.82 .414
[CN= 68.0: N= 1.10]
[TP= .34:DT= 5.00]
016:0059-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:313        275.93     1.443 No_date  14:05  42.48 n/a
                + 02:TRB313      .72      .011 No_date  13:00  43.82 n/a
[DT= 5.00] SUM= 03:313ADD     276.65     1.452 No_date  14:05  42.48 n/a
016:0060-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     04:TRB314      .94      .011 No_date  13:10  43.82 .414
[CN= 68.0: N= 1.10]
[TP= .46:DT= 5.00]
016:0061-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:313        275.93     1.443 No_date  14:05  42.48 n/a
                + 02:TRB313      .72      .011 No_date  13:00  43.82 n/a
[DT= 5.00] SUM= 03:313ADD     276.65     1.452 No_date  14:05  42.48 n/a
016:0062-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CALIB NASHYD     04:403a        2.66      .051 No_date  13:00  48.93 .463
[CN= 70.0: N= 1.10]
[TP= .27:DT= 5.00]
016:0063-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          10:T2-US      442.59     1.080 No_date  21:35  47.48 n/a
                + 03:313ADD     276.65     1.452 No_date  14:05  42.48 n/a
                + 04:403a        2.66      .051 No_date  13:00  48.93 n/a
[DT= 5.00] SUM= 01:CONFLU     721.90     2.457 No_date  14:50  45.57 n/a
016:0064-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 01:203d        1.26      .146 No_date  12:00  75.60 .715
[XIMP=.56:TIMP=.70]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
016:0065-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  02:501a        9.32     1.153 No_date  12:00  91.14 .862
[XIMP=.74:TIMP=.93]
[SLP= .80:DT= 5.00]
[LOSS= 1 : HORTONS]
016:0066-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
COMPUTE DUALHYD  02:501a        9.32     1.153 No_date  12:00  91.14 n/a
Major System / 03:OSSTOR      .00      .000 No_date  0:00   .00 n/a
Minor System \ 04:TOPOND      9.32     1.153 No_date  12:00  91.14 n/a
{MjSysSto=.0000E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
016:0067-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  05:501b       38.42     4.345 No_date  12:00  73.84 .698
[XIMP=.54:TIMP=.67]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
016:0068-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  06:501c       39.10     4.372 No_date  12:00  71.62 .677
[XIMP=.51:TIMP=.64]
[SLP=2.30:DT= 5.00]
[LOSS= 1 : HORTONS]
016:0069-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 07:MR1        3.32      .420 No_date  12:00  101.30 .958
[XIMP=.80:TIMP=.99]
[SLP=1.00:DT= 5.00]
[LOSS= 1 : HORTONS]
016:0070-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* DESIGN STANDHYD 08:MR2        3.04      .385 No_date  12:00  101.30 .958

```

```

[XIMP=.80:TIMP=.99]
[SLP=1.00:DT= 5.00]
[LOSS= 1 : HORTONS]
016:0071-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:203d        1.26      .146 No_date  12:00  75.60 n/a
                + 05:501b       38.42     4.345 No_date  12:00  73.84 n/a
                + 07:MR1        3.32      .420 No_date  12:00  101.30 n/a
[DT= 5.00] SUM= 10:VALE       43.00     4.911 No_date  12:00  76.01 n/a
016:0072-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          04:TOPOND      9.32     1.153 No_date  12:00  91.14 n/a
                + 06:501c       39.10     4.372 No_date  12:00  71.62 n/a
                + 08:MR2        3.04      .385 No_date  12:00  101.30 n/a
[DT= 5.00] SUM= 09:MET       51.46     5.909 No_date  12:00  76.91 n/a
016:0073-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
DESIGN STANDHYD  01:POND3       11.89     1.279 No_date  12:00  82.03 .776
[XIMP=.64:TIMP=.80]
[SLP= .10:DT= 5.00]
[LOSS= 1 : HORTONS]
016:0074-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          10:VALE       43.00     4.911 No_date  12:00  76.01 n/a
                + 09:MET       51.46     5.909 No_date  12:00  76.91 n/a
                + 01:POND3       11.89     1.279 No_date  12:00  82.03 n/a
[DT= 5.00] SUM= 08:P3ADD     106.35     12.099 No_date  12:00  77.12 n/a
016:0075-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 08:P3ADD     106.35     12.099 No_date  12:00  77.12 n/a
[RDT= 5.00] out<- 01:POND3     106.35     1.044 No_date  13:35  77.12 n/a
overflow <= 02:E-OVF         .00      .000 No_date  0:00   .00 n/a
{MxStoUsed=.611E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
016:0002-----
FINISH
*****
WARNINGS / ERRORS / NOTES
*****
001:0019 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
001:0046 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
001:0047 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
001:0051 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
001:0052 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
001:0054 ROUTE RESERVOIR
*** WARNING: Inflow peak was not reduced!
Check OUTFLOW/STORAGE table or reduce DT.
001:0064 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
001:0069 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
001:0070 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
002:0018 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
002:0019 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
002:0046 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
002:0047 DESIGN STANDHYD

```

```

005:0051 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
           Use a smaller DT or a larger area.
005:0052 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
           Use a smaller DT or a larger area.
005:0064 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
           Use a smaller DT or a larger area.
005:0065 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
           Use a smaller DT or a larger area.
005:0067 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
           Use a smaller DT or a larger area.
005:0068 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
           Use a smaller DT or a larger area.
005:0069 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
           Use a smaller DT or a larger area.
005:0070 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
           Use a smaller DT or a larger area.
006:0018 DESIGN STANDHYD
*** NOTE: The pervious area has no runoff.
006:0046 DESIGN STANDHYD
*** NOTE: The pervious area has no runoff.
006:0052 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
           Use a smaller DT or a larger area.
006:0064 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
           Use a smaller DT or a larger area.
007:0019 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
           Use a smaller DT or a larger area.
007:0047 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
           Use a smaller DT or a larger area.
007:0051 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
           Use a smaller DT or a larger area.
007:0052 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
           Use a smaller DT or a larger area.
007:0064 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
           Use a smaller DT or a larger area.
007:0069 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
           Use a smaller DT or a larger area.
007:0070 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
           Use a smaller DT or a larger area.
008:0019 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
           Use a smaller DT or a larger area.
008:0047 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
           Use a smaller DT or a larger area.
008:0051 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
           Use a smaller DT or a larger area.
008:0052 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
           Use a smaller DT or a larger area.
008:0064 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
           Use a smaller DT or a larger area.
008:0069 DESIGN STANDHYD

```

SWMHYMO OUTPUT FILE (Post-Development, Event-based) – KNPOST.sum

```

*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
008:0070 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
012:0018 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
012:0019 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
012:0046 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
012:0047 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
012:0051 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
012:0052 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
012:0064 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
012:0069 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
012:0070 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
013:0017 DESIGN STANDHYD
*** NOTE: The pervious area has no runoff.
013:0018 DESIGN STANDHYD
*** NOTE: The pervious area has no runoff.
013:0019 DESIGN STANDHYD
*** NOTE: The pervious area has no runoff.
013:0046 DESIGN STANDHYD
*** NOTE: The pervious area has no runoff.
013:0047 DESIGN STANDHYD
*** NOTE: The pervious area has no runoff.
013:0051 DESIGN STANDHYD
*** NOTE: The pervious area has no runoff.
013:0052 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
*** NOTE: The pervious area has no runoff.
013:0064 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
*** NOTE: The pervious area has no runoff.
013:0067 DESIGN STANDHYD
*** NOTE: The pervious area has no runoff.
013:0068 DESIGN STANDHYD
*** NOTE: The pervious area has no runoff.
014:0052 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
014:0064 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
015:0019 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
015:0052 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
015:0064 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.

```

```

016:0019 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
016:0047 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
016:0051 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
016:0052 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
016:0064 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
016:0069 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
016:0070 DESIGN STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
Simulation ended on 2016-05-20 at 09:55:43
=====

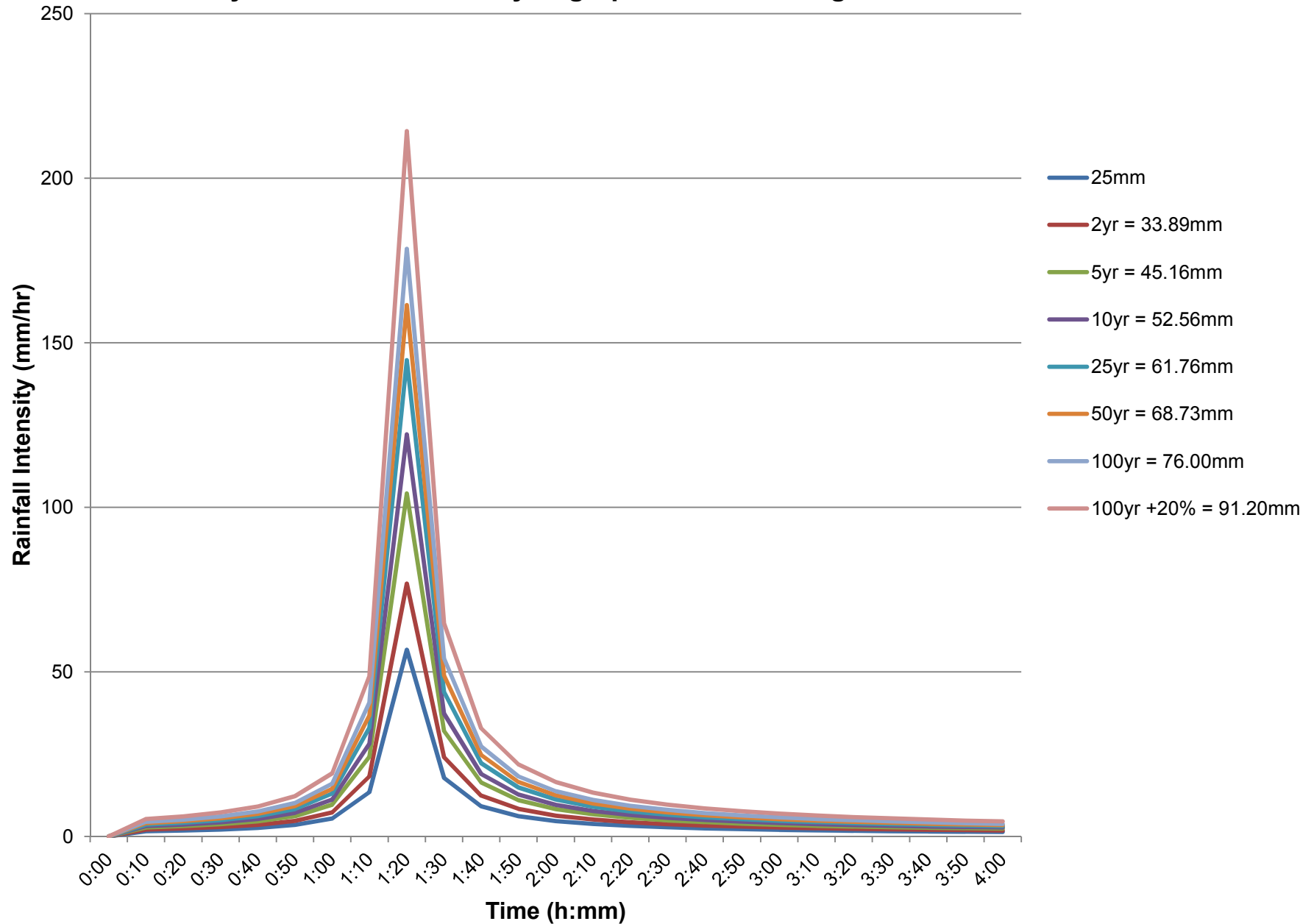
```


Kanata North Community Design Plan
Pre vs. Post-Development Peak Flows
SWMHYMO Model Results

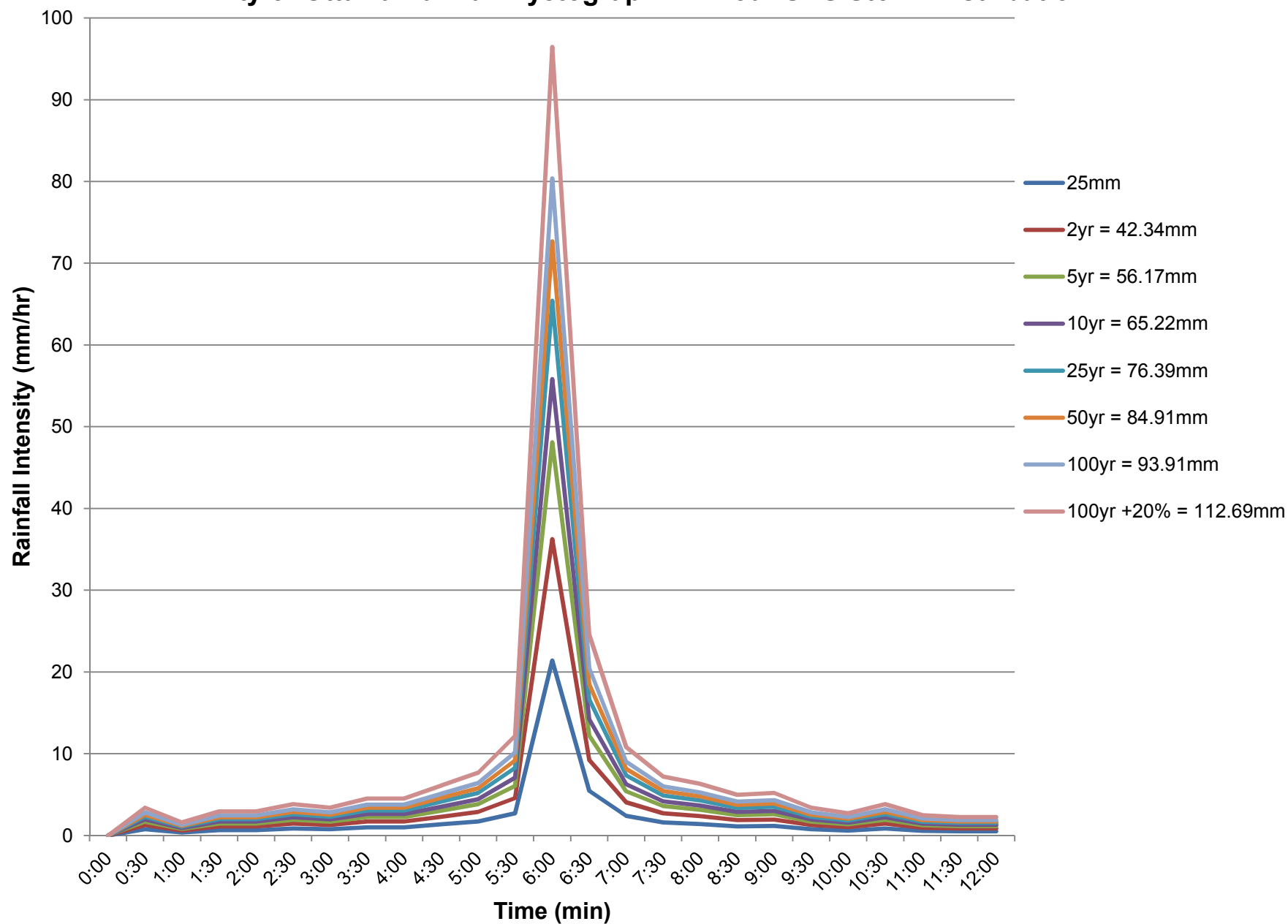


Storm Distribution ->		Chicago 4-Hour				SCS 12-Hour				SCS 24-Hour			
Return Period ->		25mm	2 year	5 year	100 year	25mm	2 year	5 year	100 year	25mm	2 year	5 year	100 year
Shirley's Brook Northwest Branch													
Tributary 2	Pre	0.082	0.167	0.338	0.977	0.063	0.229	0.417	1.129	0.057	0.266	0.441	1.144
	Post	0.073	0.155	0.306	0.805	0.121	0.227	0.424	1.023	0.062	0.256	0.432	1.080
Tributary 3	Pre	0.063	0.147	0.298	0.883	0.055	0.222	0.416	1.126	0.044	0.245	0.426	1.180
	Post	0.315	0.486	0.788	1.392	0.168	0.383	0.649	1.591	0.114	0.299	0.505	1.451
Confluence of Tributaries 2 & 3	Pre	0.155	0.343	0.683	1.943	0.132	0.495	0.900	2.345	0.110	0.549	0.929	2.481
	Post	0.319	0.501	0.827	1.967	0.176	0.474	0.898	2.367	0.125	0.509	0.895	2.457
Flows from East Pond (to Shirley's Brook Main Branch)	Pre	0.076	0.167	0.323	0.892	0.058	0.220	0.402	1.045	0.045	0.237	0.407	1.102
	Post	0.058	0.174	0.349	0.962	0.050	0.220	0.402	1.043	0.046	0.220	0.383	1.044

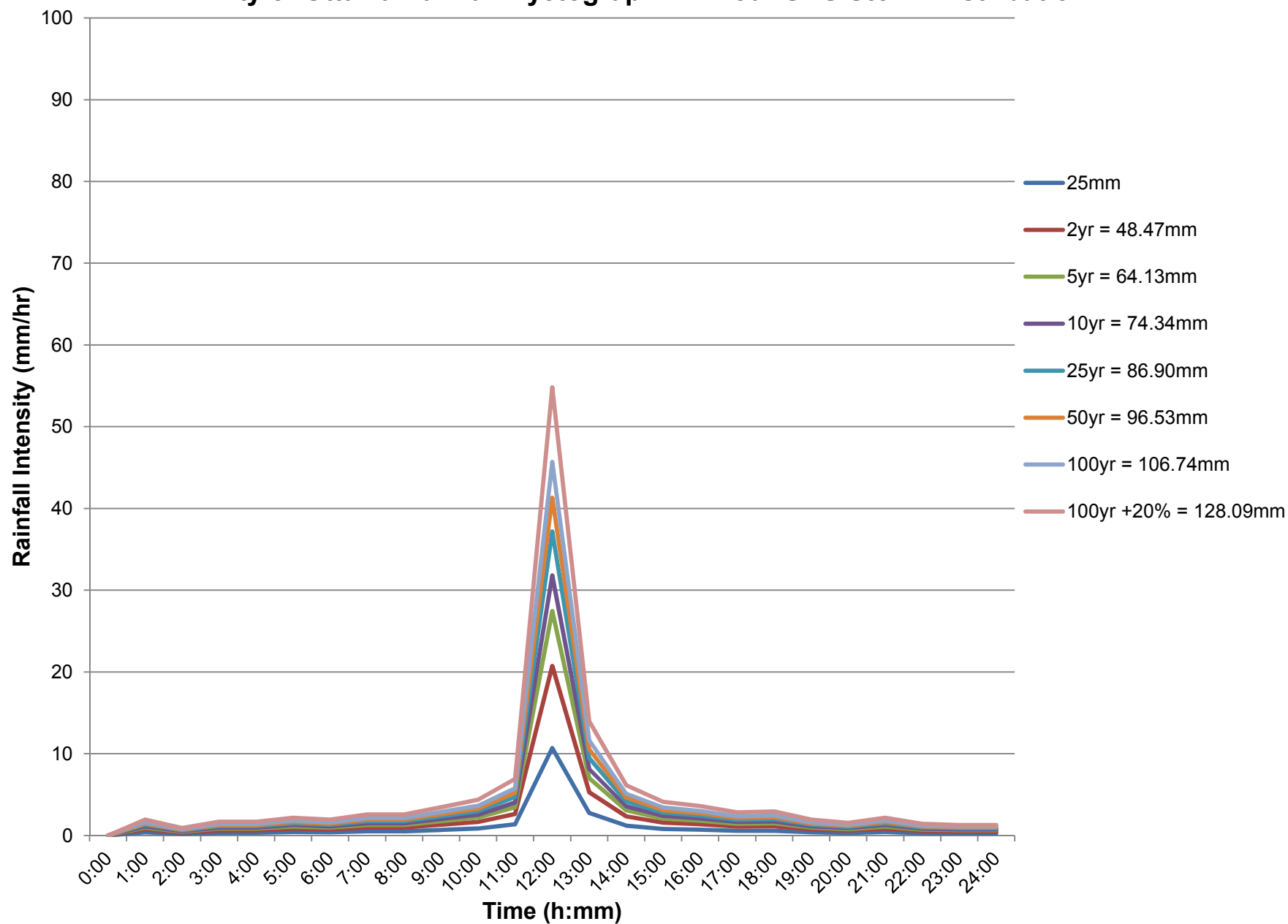
City of Ottawa Rainfall Hyetograph: 4-hour Chicago Storm Distribution



City of Ottawa Rainfall Hyetograph: 12-hour SCS Storm Distribution



City of Ottawa Rainfall Hyetograph: 24-hour SCS Storm Distribution



Appendix E

Results of Continuous Hydrologic Analysis

SWMHYMO INPUT FILE (Pre-Development, Continuous) – PRECON.dat

```

2      Metric units
*****
*# Project Name: [Kanata North]      Project Number: [112117]
*# Date       : 21-09-2015
*# Modeller   : [Kallie Auld]
*# Company    : NOVATECH ENGINEERING CONSULTANTS LTD
*# License #   : 5320763
*****
*Shirleys Brook - Pre-Development Model - CONTINUOUS STORM MODEL
*Model parameters based on original AECOM model
*See "20150911 - Shirley's Brook Modeling Parameters.xls"
*****
START      TZERO=[2014.0417], METOUT=[2], NSTORM=[0], NRUN=[1]
*#-----
READ AES DATA  AES_FILENAME=[*6106000.123*], IELEM=[123],
                START_DATE=[0], END_DATE=[-213.0]
*#-----
DEFAULT VALUES ICASDef=[1], read and print values
                DEFVAL_FILENAME=[*ottawa.def*]
*#-----
COMPUTE API     APII=[20], APIK=[0.90]/day
*#-----
*****PEAK FLOW FOR TRIBUTARY 2*****
*#-----
CONTINUOUS NASHYD ID=[2], NHYD=[*201*], DT=[30]min, AREA=[115.14](ha),
                  DWF=[0](cms), CN/C=[65], IA=[11.4](mm),
                  N=[1.1], TP=[3.42](hrs),
                  Continuous simulation parameters:
                  IaRECper=[96](hrs),
                  SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
                  InterEventTime=[96](hrs),
                  Baseflow simulation parameters:
                  BaseFlowOption=[1],
                  InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
                  VHydCond=[0.05](mm/hr), END=-1
*#-----
SHIFT HYD        IDout=[1], NHYD=[*210*], IDin=[2], TLAG=[40](min)
*#-----
CONTINUOUS NASHYD ID=[3], NHYD=[*202*], DT=[30]min, AREA=[263.64](ha),
                  DWF=[0](cms), CN/C=[70], IA=[7.7](mm),
                  N=[1.1], TP=[5.14](hrs),
                  Continuous simulation parameters:
                  IaRECper=[96](hrs),
                  SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
                  InterEventTime=[96](hrs),
                  Baseflow simulation parameters:
                  BaseFlowOption=[1],
                  InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
                  VHydCond=[0.05](mm/hr), END=-1
*#-----
ADD HYD          IDsum=[3], NHYD=[*200a*], IDs to add=[1,2]
*#-----
SHIFT HYD        IDout=[1], NHYD=[*211*], IDin=[3], TLAG=[5](min)
*#-----
SHIFT HYD        IDout=[2], NHYD=[*212*], IDin=[1], TLAG=[25](min)
*#-----
CONTINUOUS NASHYD ID=[1], NHYD=[*203*], DT=[30]min, AREA=[46.74](ha),
                  DWF=[0](cms), CN/C=[76], IA=[7.6](mm),
                  N=[1.1], TP=[2.52]hrs,
                  Continuous simulation parameters:
                  IaRECper=[96](hrs),
                  SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
                  InterEventTime=[96](hrs),
                  Baseflow simulation parameters:
                  BaseFlowOption=[1],
                  InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
                  VHydCond=[0.05](mm/hr), END=-1
*#-----
ADD HYD          IDsum=[3], NHYD=[*200b*], IDs to add=[1,2]
*#-----

```

```

SHIFT HYD        IDout=[1], NHYD=[*212*], IDin=[3], TLAG=[25](min)
*#-----
CONTINUOUS NASHYD ID=[2], NHYD=[*204*], DT=[30]min, AREA=[29.39](ha),
                  DWF=[0](cms), CN/C=[76], IA=[7.6](mm),
                  N=[1.1], TP=[1.42]hrs,
                  Continuous simulation parameters:
                  IaRECper=[96](hrs),
                  SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
                  InterEventTime=[96](hrs),
                  Baseflow simulation parameters:
                  BaseFlowOption=[1],
                  InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
                  VHydCond=[0.05](mm/hr), END=-1
*#-----
CONTINUOUS NASHYD ID=[3], NHYD=[*205*], DT=[30]min, AREA=[10.84](ha),
                  DWF=[0](cms), CN/C=[78], IA=[6.0](mm),
                  N=[1.1], TP=[0.80]hrs,
                  Continuous simulation parameters:
                  IaRECper=[96](hrs),
                  SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
                  InterEventTime=[96](hrs),
                  Baseflow simulation parameters:
                  BaseFlowOption=[1],
                  InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
                  VHydCond=[0.05](mm/hr), END=-1
*#-----
*****PEAK FLOW IN TRIB 2 AT MARCH ROAD*****
ADD HYD          IDsum=[10], NHYD=[*200*], IDs to add=[1,2,3]
*#-----
EROSION INDEX    INDEX_METHOD=[1], QCE=[0.73](cms)
                  IDSerotion=[10]
*#-----
*PRINT HYD       ID=[10], # OF PCYCLES=[3]
*#-----
*****PEAK FLOW FOR TRIBUTARY 3*****
*#-----
CONTINUOUS NASHYD ID=[1], NHYD=[*301*], DT=[30]min, AREA=[86.43](ha),
                  DWF=[0](cms), CN/C=[63], IA=[12.3](mm),
                  N=[1.1], TP=[1.24]hrs,
                  Continuous simulation parameters:
                  IaRECper=[96](hrs),
                  SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
                  InterEventTime=[96](hrs),
                  Baseflow simulation parameters:
                  BaseFlowOption=[1],
                  InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
                  VHydCond=[0.05](mm/hr), END=-1
*#-----
CONTINUOUS NASHYD ID=[2], NHYD=[*302*], DT=[30]min, AREA=[80.69](ha),
                  DWF=[0](cms), CN/C=[64], IA=[10.9](mm),
                  N=[1.1], TP=[1.80]hrs,
                  Continuous simulation parameters:
                  IaRECper=[96](hrs),
                  SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
                  InterEventTime=[96](hrs),
                  Baseflow simulation parameters:
                  BaseFlowOption=[1],
                  InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
                  VHydCond=[0.05](mm/hr), END=-1
*#-----
ADD HYD          IDsum=[3], NHYD=[*300a*], IDs to add=[1,2]
*#-----
SHIFT HYD        IDout=[1], NHYD=[*310*], IDin=[3], TLAG=[30](min)
*#-----
CONTINUOUS NASHYD ID=[2], NHYD=[*303*], DT=[30]min, AREA=[65.16](ha),
                  DWF=[0](cms), CN/C=[69], IA=[8.9](mm),
                  N=[1.1], TP=[1.31]hrs,
                  Continuous simulation parameters:

```

SWMHYMO INPUT FILE (Pre-Development, Continuous) – PRECON.dat

```

IaRECper=[96](hrs),
SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
InterEventTime=[96](hrs),
Baseflow simulation parameters:
BaseFlowOption=[1],
InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
VHydCond=[0.05](mm/hr), END=-1
*%-----
ADD HYD IDsum=[3], NHYD=["300b"], IDs to add=[1,2]
*%-----
SHIFT HYD IDout=[1], NHYD=["311"], IDin=[3], TLAG=[20](min)
*%-----
CONTINUOUS NASHYD ID=[2], NHYD=["304"], DT=[30]min, AREA=[18.78](ha),
DWF=[0](cms), CN/C=[77], IA=[7.0](mm),
N=[1.1], TP=[1.04]hrs,
Continuous simulation parameters:
IaRECper=[96](hrs),
SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
InterEventTime=[96](hrs),
Baseflow simulation parameters:
BaseFlowOption=[1],
InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
VHydCond=[0.05](mm/hr), END=-1
*%-----
*ADD HYD IDsum=[3], NHYD=["300c"], IDs to add=[1,2]
*%-----
SHIFT HYD IDout=[1], NHYD=["312"], IDin=[3], TLAG=[5](min)
*%-----
CONTINUOUS NASHYD ID=[2], NHYD=["305"], DT=[30]min, AREA=[2.61](ha),
DWF=[0](cms), CN/C=[72], IA=[5.6](mm),
N=[1.1], TP=[0.22]hrs,
Continuous simulation parameters:
IaRECper=[96](hrs),
SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
InterEventTime=[96](hrs),
Baseflow simulation parameters:
BaseFlowOption=[1],
InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
VHydCond=[0.05](mm/hr), END=-1
*%-----
ADD HYD IDsum=[9], NHYD=["300"], IDs to add=[1,2]
*%-----
CONTINUOUS NASHYD ID=[1], NHYD=["401"], DT=[30]min, AREA=[16.78](ha),
DWF=[0](cms), CN/C=[68], IA=[7.0](mm),
N=[3.0], TP=[1.66]hrs,
Continuous simulation parameters:
IaRECper=[96](hrs),
SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
InterEventTime=[96](hrs),
Baseflow simulation parameters:
BaseFlowOption=[1],
InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
VHydCond=[0.05](mm/hr), END=-1
*%-----
CONTINUOUS NASHYD ID=[2], NHYD=["402"], DT=[30]min, AREA=[10.89](ha),
DWF=[0](cms), CN/C=[78], IA=[6.8](mm),
N=[1.1], TP=[0.85]hrs,
Continuous simulation parameters:
IaRECper=[96](hrs),
SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
InterEventTime=[96](hrs),
Baseflow simulation parameters:
BaseFlowOption=[1],
InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
VHydCond=[0.05](mm/hr), END=-1
*%-----
CONTINUOUS NASHYD ID=[3], NHYD=["403"], DT=[30]min, AREA=[2.37](ha),
DWF=[0](cms), CN/C=[70], IA=[4.3](mm),
N=[1.1], TP=[0.27]hrs,
Continuous simulation parameters:
IaRECper=[96](hrs),

```

```

SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
InterEventTime=[96](hrs),
Baseflow simulation parameters:
BaseFlowOption=[1],
InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
VHydCond=[0.05](mm/hr), END=-1
*%-----
ADD HYD IDsum=[8], NHYD=["400"], IDs to add=[1,2,3]
*%-----
*****TRIBUTARY 3 PEAK FLOWS*****
ADD HYD IDsum=[1], NHYD=["TRIB3"], IDs to add=[8,9]
*%-----
*PRINT HYD ID=[1], # OF PCYCLES=[3]
*%-----
EROSION INDEX INDEX_METHOD=[1], QCE=[0.57](cms)
IDSerotion=[1]
*%-----
*****PEAK FLOW AT CONFLUENCE*****
ADD HYD IDsum=[7], NHYD=["CONFL"], IDs to add=[10,1]
*%-----
EROSION INDEX INDEX_METHOD=[1], QCE=[0.57](cms)
IDSerotion=[7]
*%-----
*PRINT HYD ID=[7], # OF PCYCLES=[3]
*****PEAK FLOW FROM EAST SIDE OF MARCH ROAD*****
CONTINUOUS NASHYD ID=[1], NHYD=["501"], DT=[30]min, AREA=[62.65](ha),
DWF=[0](cms), CN/C=[74], IA=[8.5](mm),
N=[1.1], TP=[0.60]hrs,
Continuous simulation parameters:
IaRECper=[96](hrs),
SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
InterEventTime=[96](hrs),
Baseflow simulation parameters:
BaseFlowOption=[1],
InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
VHydCond=[0.05](mm/hr), END=-1
*%-----
CONTINUOUS NASHYD ID=[2], NHYD=["502"], DT=[30]min, AREA=[51.84](ha),
DWF=[0](cms), CN/C=[68], IA=[9.6](mm),
N=[1.1], TP=[0.75]hrs,
Continuous simulation parameters:
IaRECper=[96](hrs),
SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
InterEventTime=[96](hrs),
Baseflow simulation parameters:
BaseFlowOption=[1],
InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
VHydCond=[0.05](mm/hr), END=-1
*%-----
ADD HYD IDsum=[6], NHYD=["500"], IDs to add=[1,2]
*%-----
*EROSION INDEX INDEX_METHOD=[1], QCE=[6](cms)
IDSerotion=[3.76]
*%-----
*PRINT HYD ID=[6], # OF PCYCLES=[3]
*****TOTAL PEAK FLOW FOR KNUEA*****
ADD HYD IDsum=[5], NHYD=["TOTAL"], IDs to add=[7,6]
*%-----
FINISH

```

```

License #      : 5320763
#*****
#*****
#*****
RUN:COMMAND#
001:0001-----
START
[TZERO =      .00 hrs on 20140417]
[METOUT=   2      (1=imperial, 2=metric output)]
[NSTORM=   0 ]
[NRUN =   1 ]

001:0002-----
* READ AES DATA
[Filename = 6106000.123 ]
[Start_date= 2014.0417: End_date= 2014.1116]
[DT= 60.min: Length= 5112.hrs: WetHrs= 456: DryHrs= 4656: PTOT= 592.20]
Maximum average rainfall intensities over
  1 hr   2 hrs   3 hrs   6 hrs  12 hrs  24 hrs
  20.4   15.4   10.7   6.3   4.4   2.5   mm/hr
20140624 20140624 20140624 20140624 20140624 20140625 date
Number of rainfall events per following interevent time
  1 hr   2 hrs   3 hrs   6 hrs  12 hrs  24 hrs
  184   153   134   97   71   48
Number of events with at least the following durations
  1 hr   2 hrs   3 hrs   6 hrs  12 hrs  24 hrs
  183   87   51   17   3   0

001:0003-----
DEFAULT VALUES
Filename = M:\2012\112117\data\CALCUL-1\swmhymo\CONTIN-1\ottawa.def
ICASEdv = 1 (read and print data)
FileType= ----- ENTER YOUR COMMENTS ON THIS LINE AND THE NEXT ONE ---
          ----- PARAMETER VALUES MUST BE ENTERED AFTER COLUMN 60 -----
Horton's infiltration equation parameters:
[Fo= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAY= 4.14 /hr] [F= .00 mm]
Parameters for PEROVIOUS surfaces in STANDHYD:
[IAper= 4.67 mm] [LGP=40.00 m] [MNP= .250]
Parameters for IMPEROVIOUS surfaces in STANDHYD:
[IAimp= 1.57 mm] [CLI= 1.50] [MNI= .013]
Parameters used in NASHYD:
[la= 4.67 mm] [N= 3.00]

001:0004-----
COMPUTE API
[APIini= 20.00: APIkdy= .9000: APIkdt= .9956]
[APImax= 82.38: APIavg= 26.95: APImin= 7.91]

001:0005-----
CONTINUOUS NASHYD 02:201 115.14 .160 2014.0624_22:00 90.32 .153
[CN= 65.0: N= 1.10]
[TP= 3.42:DT=30.00]
[laREC=96.00: SMIN= 54.78: SMAX=365.23: SK=1.000]
[InterEventTime= 96.00]

001:0006-----
SHIFT HYD -> 02:201 115.14 .160 2014.0624_22:30 90.32 n/a
[LAG= 40.0 min]<- 01:210 115.14 .160 2014.0624_22:30 90.32 n/a

001:0007-----
CONTINUOUS NASHYD 03:202 263.64 .308 2014.0624_23:30 149.09 .252
[CN= 70.0: N= 1.10]
[TP= 50.14:DT=30.00]
[laREC=96.00: SMIN= 43.07: SMAX=287.10: SK=1.000]
[InterEventTime= 96.00]

001:0008-----
ADD HYD + 02:201 115.14 .160 2014.0624_22:30 90.32 n/a
          02:201 115.14 .160 2014.0624_22:00 90.32 n/a
[DT=30.00] SUM= 03:200a 230.28 .319 2014.0624_22:30 90.31 n/a

001:0009-----
SHIFT HYD -> 03:200a 230.28 .319 2014.0624_22:30 90.31 n/a
[LAG= .0 min]<- 01:211 230.28 .319 2014.0624_22:30 90.31 n/a

001:0010-----
SHIFT HYD -> 01:211 230.28 .319 2014.0624_22:30 90.31 n/a
[LAG= 30.0 min]<- 02:212 230.28 .319 2014.0624_23:00 90.31 n/a

001:0011-----
CONTINUOUS NASHYD 01:203 46.74 .123 2014.0624_21:30 172.70 .292
[CN= 76.0: N= 1.10]

```

SWMHYMO OUTPUT FILE (Pre-Development, Continuous) – PRECON.sum

```

[TP= 2.52:DT=30.00]
[IaREC=96.00: SMIN= 32.46: SMAX=216.39: SK=1.000]
[InterEventTime= 96.00]
001:0012-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:203          46.74          .123 2014.0624_21:30 172.70 n/a
                  + 02:212          230.28          .319 2014.0624_23:00 90.31 n/a
[DT=30.00] SUM= 03:200b          277.02          .441 2014.0624_22:30 104.22 n/a
001:0013-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
SHIFT HYD        -> 03:200b          277.02          .441 2014.0624_22:30 104.22 n/a
[LAG= 30.0 min]<- 01:212          277.02          .441 2014.0624_23:00 104.22 n/a
001:0014-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CONTINUOUS NASHYD 02:204          29.39          .132 2014.0624_21:00 172.70 .292
[CN= 76.0: N= 1.10]
[TP= 1.42:DT=30.00]
[IaREC=96.00: SMIN= 32.46: SMAX=216.39: SK=1.000]
[InterEventTime= 96.00]
001:0015-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS NASHYD 03:205          10.84          .087 2014.0624_20:00 208.26 .352
[CN= 78.0: N= 1.10]
[TP= .80:DT=30.00]
[IaREC=96.00: SMIN= 29.88: SMAX=199.22: SK=1.000]
[InterEventTime= 96.00]
001:0016-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:212          277.02          .441 2014.0624_23:00 104.22 n/a
                  + 02:204          29.39          .132 2014.0624_21:00 172.70 n/a
                  + 03:205          10.84          .087 2014.0624_20:00 208.26 n/a
[DT=30.00] SUM= 10:200          317.25          .640 2014.0624_22:00 114.11 n/a
001:0017-----ID:NHYD-----QPEAK-----QAVG--DUR.HRS--ERO.HRS-----EXC.%-
EROSION INDEX    10:200          .640          .020 5114.00          .00          .00
[QCE= .730]
001:0018-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CONTINUOUS NASHYD 01:301          86.43          .297 2014.0624_21:00 78.59 .133
[CN= 63.0: N= 1.10]
[TP= 1.24:DT=30.00]
[IaREC=96.00: SMIN= 59.42: SMAX=396.11: SK=1.000]
[InterEventTime= 96.00]
001:0019-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CONTINUOUS NASHYD 02:302          80.69          .208 2014.0624_21:00 92.59 .156
[CN= 64.0: N= 1.10]
[TP= 1.80:DT=30.00]
[IaREC=96.00: SMIN= 57.05: SMAX=380.32: SK=1.000]
[InterEventTime= 96.00]
001:0020-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:301          86.43          .297 2014.0624_21:00 78.59 n/a
                  + 02:302          80.69          .208 2014.0624_21:00 92.59 n/a
[DT=30.00] SUM= 03:300a          167.12          .504 2014.0624_21:00 85.35 n/a
001:0021-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
SHIFT HYD        -> 03:300a          167.12          .504 2014.0624_21:00 85.35 n/a
[LAG= 30.0 min]<- 01:310          167.12          .504 2014.0624_21:30 85.35 n/a
001:0022-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CONTINUOUS NASHYD 02:303          65.16          .268 2014.0624_21:00 129.61 .219
[CN= 69.0: N= 1.10]
[TP= 1.31:DT=30.00]
[IaREC=96.00: SMIN= 44.82: SMAX=298.82: SK=1.000]
[InterEventTime= 96.00]
001:0023-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:310          167.12          .504 2014.0624_21:30 85.35 n/a
                  + 02:303          65.16          .268 2014.0624_21:00 129.61 n/a
[DT=30.00] SUM= 03:300b          232.28          .769 2014.0624_21:00 97.77 n/a
001:0024-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
SHIFT HYD        -> 03:300b          232.28          .769 2014.0624_21:00 97.77 n/a
[LAG= 30.0 min]<- 01:311          232.28          .769 2014.0624_21:30 97.77 n/a
001:0025-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CONTINUOUS NASHYD 02:304          18.78          .115 2014.0624_20:30 186.22 .314
[CN= 77.0: N= 1.10]
[TP= 1.04:DT=30.00]
[IaREC=96.00: SMIN= 31.15: SMAX=207.66: SK=1.000]
[InterEventTime= 96.00]
001:0026-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
SHIFT HYD        -> 03:300b          232.28          .769 2014.0624_21:00 97.77 n/a
[LAG= .0 min]<- 01:312          232.28          .769 2014.0624_21:00 97.77 n/a

```

```

001:0027-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS NASHYD 02:305          2.61          .052 2014.0624_20:00 190.02 .321
[CN= 72.0: N= 1.10]
[TP= .22:DT=30.00]
[IaREC=96.00: SMIN= 39.75: SMAX=264.99: SK=1.000]
[InterEventTime= 96.00]
001:0028-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:312          232.28          .769 2014.0624_21:00 97.77 n/a
                  + 02:305          2.61          .052 2014.0624_20:00 190.02 n/a
[DT=30.00] SUM= 09:300          234.89          .807 2014.0624_21:00 98.79 n/a
001:0029-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CONTINUOUS NASHYD 01:401          16.78          .297 2014.0624_21:00 149.79 .253
[CN= 68.0: N= 3.00]
[TP= 1.66:DT=30.00]
[IaREC=96.00: SMIN= 48.56: SMAX=323.73: SK=1.000]
[InterEventTime= 96.00]
001:0030-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS NASHYD 02:402          10.89          .081 2014.0624_20:00 193.25 .326
[CN= 78.0: N= 1.10]
[TP= .85:DT=30.00]
[IaREC=96.00: SMIN= 29.88: SMAX=199.22: SK=1.000]
[InterEventTime= 96.00]
001:0031-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS NASHYD 03:403          2.37          .040 2014.0624_20:00 205.87 .348
[CN= 70.0: N= 1.10]
[TP= .27:DT=30.00]
[IaREC=96.00: SMIN= 43.07: SMAX=287.10: SK=1.000]
[InterEventTime= 96.00]
001:0032-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:401          16.78          .297 2014.0624_21:00 149.79 n/a
                  + 02:402          10.89          .081 2014.0624_20:00 193.25 n/a
                  + 03:403          2.37          .040 2014.0624_20:00 205.87 n/a
[DT=30.00] SUM= 08:400          30.04          .410 2014.0624_20:30 169.97 n/a
001:0033-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          08:400          30.04          .410 2014.0624_20:30 169.97 n/a
                  + 09:300          234.89          .807 2014.0624_21:00 98.79 n/a
[DT=30.00] SUM= 01:TRIB3          264.93          1.214 2014.0624_21:00 106.86 n/a
001:0034-----ID:NHYD-----QPEAK-----QAVG--DUR.HRS--ERO.HRS-----EXC.%-
EROSION INDEX    01:TRIB3          1.214          .015 5113.00          9.50          .19
[QCE= .570]
001:0035-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          10:200          317.25          .640 2014.0624_22:00 114.11 n/a
                  + 01:TRIB3          264.93          1.214 2014.0624_21:00 106.86 n/a
[DT=30.00] SUM= 07:CONFL          582.18          1.802 2014.0624_21:30 110.82 n/a
001:0036-----ID:NHYD-----QPEAK-----QAVG--DUR.HRS--ERO.HRS-----EXC.%-
EROSION INDEX    07:CONFL          1.802          .035 5114.00          44.50          .87
[QCE= .570]
001:0037-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS NASHYD 01:501          62.65          .571 2014.0624_20:00 149.48 .252
[CN= 74.0: N= 1.10]
[TP= .60:DT=30.00]
[IaREC=96.00: SMIN= 36.67: SMAX=244.49: SK=1.000]
[InterEventTime= 96.00]
001:0038-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS NASHYD 02:502          51.84          .336 2014.0624_20:00 115.66 .195
[CN= 68.0: N= 1.10]
[TP= .75:DT=30.00]
[IaREC=96.00: SMIN= 48.56: SMAX=323.73: SK=1.000]
[InterEventTime= 96.00]
001:0039-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:501          62.65          .571 2014.0624_20:00 149.48 n/a
                  + 02:502          51.84          .336 2014.0624_20:00 115.66 n/a
[DT=30.00] SUM= 06:500          114.49          .906 2014.0624_20:00 134.16 n/a
001:0040-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          07:CONFL          582.18          1.802 2014.0624_21:30 110.82 n/a
                  + 06:500          114.49          .906 2014.0624_20:00 134.16 n/a
[DT=30.00] SUM= 05:TOTAL          696.67          2.658 2014.0624_21:00 114.65 n/a
001:0041-----
FINISH

```

SWMHYMO OUTPUT FILE (Pre-Development, Continuous) – PRECON.sum

```
WARNINGS / ERRORS / NOTES
-----
001:0002 READ AES DATA
*** WARNING: Specified end date is beyond the end
              date in file.
001:0009 [LAG= .0 min]<-
*** WARNING: Hydrograph was not shifted.
001:0015 CONTINUOUS NASHYD
*** WARNING: Time step is too large for value of TP.
              R.V. may be ok. Peak flow could be off.
001:0026 [LAG= .0 min]<-
*** WARNING: Hydrograph was not shifted.
001:0027 CONTINUOUS NASHYD
*** WARNING: Time step is too large for value of TP.
              R.V. may be ok. Peak flow could be off.
001:0030 CONTINUOUS NASHYD
*** WARNING: Time step is too large for value of TP.
              R.V. may be ok. Peak flow could be off.
001:0031 CONTINUOUS NASHYD
*** WARNING: Time step is too large for value of TP.
              R.V. may be ok. Peak flow could be off.
001:0037 CONTINUOUS NASHYD
*** WARNING: Time step is too large for value of TP.
              R.V. may be ok. Peak flow could be off.
001:0038 CONTINUOUS NASHYD
*** WARNING: Time step is too large for value of TP.
              R.V. may be ok. Peak flow could be off.
Simulation ended on 2016-05-20 at 09:59:31
=====
```


SWMHYMO INPUT FILE (Post-Development, Continuous) – PSTCON.dat

```

2      Metric units
**-----
** Project Name: [Kanata North]      Project Number: [112117]
** Date       : 02-02-2016
** Modeller   : [Kallie Auld]
** Company    : NOVATECH ENGINEERING CONSULTANTS LTD
** License #   : 5320763
**-----
**Shirleys Brook - Post-Development Model **CONTINUOUS**
**Model parameters based on original AECOM model
**See "20150911 - Shirley's Brook Modeling Parameters.xlsx"
**-----
START      TZERO=[2014.0417], METOUT=[2], NSTORM=[0], NRUN=[1]
**-----
READ AES DATA  AES_FILENAME=[*6106000.123*], IELEM=[123],
                START_DATE=[0], END_DATE=[-213.0]
**-----
DEFAULT VALUES ICASDef=[1], read and print values
                DEFVAL_FILENAME=[*ottawa.def*]
**-----
COMPUTE API     APII=[20], APIK=[0.90]/day
**-----
*****PEAK FLOW TO TRIBUTARY 2*****
**-----
**FLOW FROM UPSTREAM AREA/ THROUGH TRIBUTARY 2 UP TO MARCH ROAD**
**-----
CONTINUOUS NASHYD ID=[2], NHYD=["201"], DT=[30]min, AREA=[115.14](ha),
                  DWF=[0](cms), CN/C=[65], IA=[11.4](mm),
                  N=[1.1], TP=[3.42](hrs),
                  Continuous simulation parameters:
                  IaRECper=[96](hrs),
                  SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
                  InterEventTime=[96](hrs),
                  Baseflow simulation parameters:
                  BaseFlowOption=[1],
                  InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
                  VHydCond=[0.05](mm/hr), END=-1
**-----
SHIFT HYD        IDout=[1], NHYD=["210"], IDin=[2], TLAG=[40](min)
**-----
CONTINUOUS NASHYD ID=[3], NHYD=["202"], DT=[30]min, AREA=[263.64](ha),
                  DWF=[0](cms), CN/C=[70], IA=[7.7](mm),
                  N=[1.1], TP=[5.14](hrs),
                  Continuous simulation parameters:
                  IaRECper=[96](hrs),
                  SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
                  InterEventTime=[96](hrs),
                  Baseflow simulation parameters:
                  BaseFlowOption=[1],
                  InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
                  VHydCond=[0.05](mm/hr), END=-1
**-----
ADD HYD          IDsum=[3], NHYD=["210add"], IDs to add=[1,2]
**-----
SHIFT HYD        IDout=[1], NHYD=["211"], IDin=[3], TLAG=[5](min)
**-----
CONTINUOUS NASHYD ID=[2], NHYD=["211"], DT=[30]min, AREA=[1.87](ha),
                  DWF=[0](cms), CN/C=[76], IA=[7.6](mm),
                  N=[1.1], TP=[1.17]hrs,
                  Continuous simulation parameters:
                  IaRECper=[96](hrs),
                  SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
                  InterEventTime=[96](hrs),
                  Baseflow simulation parameters:
                  BaseFlowOption=[1],
                  InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
                  VHydCond=[0.05](mm/hr), END=-1
**-----
ADD HYD          IDsum=[3], NHYD=["211add"], IDs to add=[1,2]
**-----

```

```

SHIFT HYD        IDout=[1], NHYD=["212"], IDin=[3], TLAG=[25](min)
**-----
CONTINUOUS NASHYD ID=[2], NHYD=["212"], DT=[30]min, AREA=[0.95](ha),
                  DWF=[0](cms), CN/C=[66], IA=[8.8](mm),
                  N=[1.1], TP=[0.56]hrs,
                  Continuous simulation parameters:
                  IaRECper=[96](hrs),
                  SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
                  InterEventTime=[96](hrs),
                  Baseflow simulation parameters:
                  BaseFlowOption=[1],
                  InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
                  VHydCond=[0.05](mm/hr), END=-1
**-----
ADD HYD          IDsum=[3], NHYD=["212add"], IDs to add=[1,2]
**-----
SHIFT HYD        IDout=[1], NHYD=["213"], IDin=[3], TLAG=[25](min)
**-----
CONTINUOUS NASHYD ID=[2], NHYD=["213"], DT=[30]min, AREA=[1.43](ha),
                  DWF=[0](cms), CN/C=[66], IA=[9.0](mm),
                  N=[1.1], TP=[0.67]hrs,
                  Continuous simulation parameters:
                  IaRECper=[96](hrs),
                  SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
                  InterEventTime=[96](hrs),
                  Baseflow simulation parameters:
                  BaseFlowOption=[1],
                  InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
                  VHydCond=[0.05](mm/hr), END=-1
**-----
*****
**Flow from upstream area in Trib 2 up to March Road
*****
ADD HYD          IDsum=[10], NHYD=["TRIB2"], IDs to add=[1,2]
**-----
*****
**FLOW FROM DEVELOPMENT AREA TO POND 1**
*****
CONTINUOUS STANDHYD ID=[1], NHYD=["203a"], DT=[30]min, AREA=[27.32](ha),
                    XIMP=[0.50], TIMP=[0.63], DWF=[0](cms), LOSS=[1],
                    Horton: Fo=[76.20](mm/hr), Fc=[13.20](mm/hr),
                           DCAY=[4.14]/(hr), F=[0.0](mm),
                    Pervious surfaces: IAper=[4.67](mm), SLPP=[2.3](%),
                           LGP=[40](m), MNP=[0.25], SCP=[0](min),
                    Impervious surfaces: IAimp=[1.57](mm), SLPI=[2.3](%),
                           LGI=[40](m), MNI=[0.013], SCI=[0](min),
                    Continuous simulation parameters:
                    IaRECper=[96](hrs), IaRECimp=[96](hrs),
                    InterEventTime=[96](hrs), END=-1
**-----
CONTINUOUS STANDHYD ID=[2], NHYD=["203b"], DT=[30]min, AREA=[20.76](ha),
                    XIMP=[0.48], TIMP=[0.60], DWF=[0](cms), LOSS=[1],
                    Horton: Fo=[76.20](mm/hr), Fc=[13.20](mm/hr),
                           DCAY=[4.14]/(hr), F=[0.0](mm),
                    Pervious surfaces: IAper=[4.67](mm), SLPP=[2.3](%),
                           LGP=[40](m), MNP=[0.25], SCP=[0](min),
                    Impervious surfaces: IAimp=[1.57](mm), SLPI=[2.3](%),
                           LGI=[40](m), MNI=[0.013], SCI=[0](min),
                    Continuous simulation parameters:
                    IaRECper=[96](hrs), IaRECimp=[96](hrs),
                    InterEventTime=[96](hrs), END=-1
**-----
CONTINUOUS STANDHYD ID=[3], NHYD=["203c"], DT=[30]min, AREA=[4.95](ha),
                    XIMP=[0.57], TIMP=[0.71], DWF=[0](cms), LOSS=[1],
                    Horton: Fo=[76.20](mm/hr), Fc=[13.20](mm/hr),
                           DCAY=[4.14]/(hr), F=[0.0](mm),
                    Pervious surfaces: IAper=[4.67](mm), SLPP=[2.3](%),
                           LGP=[40](m), MNP=[0.25], SCP=[0](min),
                    Impervious surfaces: IAimp=[1.57](mm), SLPI=[2.3](%),
                           LGI=[40](m), MNI=[0.013], SCI=[0](min),

```

SWMHYMO INPUT FILE (Post-Development, Continuous) – PSTCON.dat

```

Continuous simulation parameters:
IaREcper=[96](hrs), IaRECimp=[96](hrs),
InterEventTime=[96](hrs), END=-1
*%-----
CONTINUOUS STANDHYD ID=[4], NHYD=["POND1"], DT=[30]min, AREA=[2.68](ha),
XIMP=[0.64], TIMP=[0.80], DWF=[0](cms), LOSS=[1],
Horton: Fo=[76.20](mm/hr), Fc=[13.20](mm/hr),
DCAY=[4.14](/hr), F=[0.0](mm),
Pervious surfaces: IAper=[4.67](mm), SLPP=[0.01](%),
LGP=[40](m), MNP=[0.25], SCP=[0](min),
Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.01](%),
LGI=[40](m), MNI=[0.013], SCI=[0](min),
Continuous simulation parameters:
IaREcper=[96](hrs), IaRECimp=[96](hrs),
InterEventTime=[96](hrs), END=-1
*%-----
**Flow to cross under Tributary 2
ADD HYD IDsum=[5], NHYD=["T2CRS"], IDs to add=[2,3,4]
*%-----
**Total flow to Pond 1
ADD HYD IDsum=[6], NHYD=["P1FLOW"], IDs to add=[1,5]
*%-----
*****
***POND 1 SIZING***
*****
ROUTE RESERVOIR IDout=[1], NHYD=["POND1"], IDin=[6],
RDT=[30](min),
TABLE of ( OUTFLOW-STORAGE ) values
(cms) - (ha-m)
[ 0.000 , 0.000 ]
[ 0.016 , 0.745 ]
[ 0.059 , 1.240 ]
[ 0.107 , 1.770 ]
[ 0.276 , 3.210 ]
[ -1 , -1 ] (max twenty pts)
IDovf=[2], NHYDovf=["P1-OVF"]
*****
*%-----
*****
**TOTAL FLOW IN TRIB 2 AT MARCH ROAD**
*****
ADD HYD IDsum=[2], NHYD=["213ADD"], IDs to add=[1,10]
*%-----
SHIFT HYD IDout=[1], NHYD=["214"], IDin=[2], TLAG=[5](min)
*%-----
CONTINUOUS NASHYD ID=[3], NHYD=["214"], DT=[30]min, AREA=[1.61](ha),
DWF=[0](cms), CN/C=[72], IA=[8.9](mm),
N=[1.1], TP=[0.17]hrs,
Continuous simulation parameters:
IaREcper=[96](hrs),
SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
InterEventTime=[96](hrs),
Baseflow simulation parameters:
BaseFlowOption=[1],
InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
VHydCond=[0.05](mm/hr), END=-1
*%-----
ADD HYD IDsum=[4], NHYD=["214ADD"], IDs to add=[1,3]
*%-----
SHIFT HYD IDout=[1], NHYD=["215"], IDin=[4], TLAG=[15](min)
*%-----
CONTINUOUS NASHYD ID=[2], NHYD=["TRB215"], DT=[30]min, AREA=[1.12](ha),
DWF=[0](cms), CN/C=[66], IA=[10.6](mm),
N=[1.1], TP=[0.17]hrs,
Continuous simulation parameters:
IaREcper=[96](hrs),
SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
InterEventTime=[96](hrs),
Baseflow simulation parameters:
BaseFlowOption=[1],
InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),

```

```

VHydCond=[0.05](mm/hr), END=-1
*%-----
ADD HYD IDsum=[3], NHYD=["215ADD"], IDs to add=[1,2]
*%-----
SHIFT HYD IDout=[1], NHYD=["216"], IDin=[3], TLAG=[20](min)
*%-----
CONTINUOUS NASHYD ID=[2], NHYD=["TRB216"], DT=[30]min, AREA=[1.12](ha),
DWF=[0](cms), CN/C=[65], IA=[11.6](mm),
N=[1.1], TP=[0.17]hrs,
Continuous simulation parameters:
IaREcper=[96](hrs),
SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
InterEventTime=[96](hrs),
Baseflow simulation parameters:
BaseFlowOption=[1],
InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
VHydCond=[0.05](mm/hr), END=-1
*%-----
*****
**FLOW IN TRIB 2 UPSTREAM OF CONFLUENCE**
*****
ADD HYD IDsum=[10], NHYD=["T2-US"], IDs to add=[1,2]
*%-----
EROSION INDEX INDEX_METHOD=[1], QCE=[0.73](cms)
IDSerosion=[10]
*%-----
*PRINT HYD ID=[10], # OF PCYCLES=[3]
*%-----
*****PEAK FLOW TO TRIBUTARY 3*****
*****
**FLOW FROM UPSTREAM AREA/ THROUGH TRIBUTARY 3 UP TO MARCH ROAD**
*%-----
CONTINUOUS NASHYD ID=[1], NHYD=["301"], DT=[30]min, AREA=[86.43](ha),
DWF=[0](cms), CN/C=[63], IA=[12.3](mm),
N=[1.1], TP=[1.24]hrs,
Continuous simulation parameters:
IaREcper=[96](hrs),
SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
InterEventTime=[96](hrs),
Baseflow simulation parameters:
BaseFlowOption=[1],
InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
VHydCond=[0.05](mm/hr), END=-1
*%-----
CONTINUOUS NASHYD ID=[2], NHYD=["302"], DT=[30]min, AREA=[80.69](ha),
DWF=[0](cms), CN/C=[64], IA=[10.9](mm),
N=[1.1], TP=[1.80]hrs,
Continuous simulation parameters:
IaREcper=[96](hrs),
SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
InterEventTime=[96](hrs),
Baseflow simulation parameters:
BaseFlowOption=[1],
InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
VHydCond=[0.05](mm/hr), END=-1
*%-----
ADD HYD IDsum=[3], NHYD=["300a"], IDs to add=[1,2]
*%-----
SHIFT HYD IDout=[1], NHYD=["310"], IDin=[3], TLAG=[30](min)
*%-----
CONTINUOUS NASHYD ID=[2], NHYD=["303"], DT=[30]min, AREA=[65.16](ha),
DWF=[0](cms), CN/C=[69], IA=[8.9](mm),
N=[1.1], TP=[1.31]hrs,
Continuous simulation parameters:
IaREcper=[96](hrs),
SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
InterEventTime=[96](hrs),
Baseflow simulation parameters:
BaseFlowOption=[1],
InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
VHydCond=[0.05](mm/hr), END=-1

```

SWMHYMO INPUT FILE (Post-Development, Continuous) – PSTCON.dat

```

*%-----|-----|
ADD HYD      IDsum=[3], NHYD=["300b"], IDs to add=[1,2]
*%-----|-----|
SHIFT HYD     IDout=[1], NHYD=["311"], IDin=[3], TLAG=[20](min)
*%-----|-----|
CONTINUOUS NASHYD ID=[2], NHYD=["TRB311"], DT=[30]min, AREA=[1.15](ha),
              DWF=[0](cms), CN/C=[65], IA=[9.3](mm),
              N=[1.1], TP=[0.52]hrs,
              Continuous simulation parameters:
              IaREcper=[96](hrs),
              SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
              InterEventTime=[96](hrs),
              Baseflow simulation parameters:
              BaseFlowOption=[1],
              InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
              VHydCond=[0.05](mm/hr), END=-1
*%-----|-----|
ADD HYD      IDsum=[3], NHYD=["311ADD"], IDs to add=[1,2]
*%-----|-----|
CONTINUOUS NASHYD ID=[1], NHYD=["TRB312"], DT=[30]min, AREA=[1.304](ha),
              DWF=[0](cms), CN/C=[76], IA=[7.5](mm),
              N=[1.1], TP=[0.64]hrs,
              Continuous simulation parameters:
              IaREcper=[96](hrs),
              SMIN=[-1](mm), SMAX=[-1](mm), SK=[1]/(mm),
              InterEventTime=[96](hrs),
              Baseflow simulation parameters:
              BaseFlowOption=[1],
              InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
              VHydCond=[0.05](mm/hr), END=-1
*%-----|-----|
ADD HYD      IDsum=[7], NHYD=["312ADD"], IDs to add=[3,1]
*%-----|-----|
*****
**FLOW FROM DEVELOPMENT AREA TO POND 2**
*****
*%-----|-----|
CONTINUOUS STANDHYD ID=[1], NHYD=["304a"], DT=[30]min, AREA=[9.61](ha),
              XIMP=[0.46], TIMP=[0.57], DWF=[0](cms), LOSS=[1],
              Horton: Fo=[76.20](mm/hr), Fc=[13.20](mm/hr),
              DCAY=[4.14]/(hr), F=[0.0](mm),
              Pervious surfaces: IAper=[4.67](mm), SLPP=[1.6](%),
              LGP=[40](m), MNP=[0.25], SCP=[0](min),
              Impervious surfaces: IAimp=[1.57](mm), SLPI=[1.6](%),
              LGI=[40](m), MNI=[0.013], SCI=[0](min),
              Continuous simulation parameters:
              IaREcper=[96](hrs), IaREcimp=[96](hrs),
              InterEventTime=[96](hrs), END=-1
*%-----|-----|
CONTINUOUS STANDHYD ID=[2], NHYD=["402a"], DT=[30](min), AREA=[5.67](ha),
              XIMP=[0.58], TIMP=[0.73], DWF=[0](cms), LOSS=[1],
              Horton: Fo=[76.2](mm/hr), Fc=[13.2](mm/hr),
              DCAY=[4.14]/(hr), F=[0](mm),
              Pervious surfaces: IAper=[4.67](mm), SLPP=[2.1](%),
              LGP=[40](m), MNP=[0.25], SCP=[0](min),
              Impervious surfaces: IAimp=[1.57](mm), SLPI=[2.1](%),
              LGI=[40](m), MNI=[0.013], SCI=[0](min),
              Continuous simulation parameters:
              IaREcper=[96](hrs), IaREcimp=[96](hrs),
              InterEventTime=[96](hrs), END=-1
*%-----|-----|
CONTINUOUS STANDHYD ID=[3], NHYD=["POND2"], DT=[30]min, AREA=[1.85](ha),
              XIMP=[0.64], TIMP=[0.80], DWF=[0](cms), LOSS=[1],
              Horton: Fo=[76.2](mm/hr), Fc=[13.2](mm/hr),
              DCAY=[4.14]/(hr), F=[0](mm),
              Pervious surfaces: IAper=[4.67](mm), SLPP=[0.01](%),
              LGP=[40](m), MNP=[0.25], SCP=[0](min),
              Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.01](%),
              LGI=[40](m), MNI=[0.013], SCI=[0](min),
              Continuous simulation parameters:
              IaREcper=[96](hrs), IaREcimp=[96](hrs),

```

```

InterEventTime=[96](hrs), END=-1
*%-----|-----|
*****FLOW TO POND 2*****
*%-----|-----|
ADD HYD      IDsum=[4], NHYD=["P2FLOW"], IDs to add=[1,2,3]
*%-----|-----|
*****SIZING FOR POND 2***
*****
ROUTE RESERVOIR IDout=[1], NHYD=["POND2"], IDin=[4],
              RDT=[30](min),
              TABLE of ( OUTFLOW-STORAGE ) values
              (cms) - (ha-m)
              [ 0.000 , 0.000 ]
              [ 0.003 , 0.240 ]
              [ 0.016 , 0.398 ]
              [ 0.031 , 0.560 ]
              [ 0.084 , 1.003 ]
              [ -1 , -1 ] (max twenty pts)
              IDovf=[2], NHYDovf=["P2OVF"]
*%-----|-----|
*****
**FLOW FROM DEVELOPMENT AREA TO ON SITE STORAGE**
*****
*%-----|-----|
CONTINUOUS STANDHYD ID=[2], NHYD=["402b"], DT=[30]min, AREA=[6.07](ha),
              XIMP=[0.58], TIMP=[0.73], DWF=[0](cms), LOSS=[1],
              Horton: Fo=[76.20](mm/hr), Fc=[13.20](mm/hr),
              DCAY=[4.14]/(hr), F=[0](mm),
              Pervious surfaces: IAper=[4.67](mm), SLPP=[2.1](%),
              LGP=[40](m), MNP=[0.25], SCP=[0](min),
              Impervious surfaces: IAimp=[1.57](mm), SLPI=[2.1](%),
              LGI=[40](m), MNI=[0.013], SCI=[0](min),
              Continuous simulation parameters:
              IaREcper=[96](hrs), IaREcimp=[96](hrs),
              InterEventTime=[96](hrs), END=-1
*%-----|-----|
CONTINUOUS STANDHYD ID=[3], NHYD=["402c"], DT=[30]min, AREA=[1.19](ha),
              XIMP=[0.55], TIMP=[0.68], DWF=[0](cms), LOSS=[1],
              Horton: Fo=[76.20](mm/hr), Fc=[13.20](mm/hr),
              DCAY=[4.14]/(hr), F=[0.0](mm),
              Pervious surfaces: IAper=[4.67](mm), SLPP=[2.1](%),
              LGP=[40](m), MNP=[0.25], SCP=[0](min),
              Impervious surfaces: IAimp=[1.57](mm), SLPI=[2.1](%),
              LGI=[40](m), MNI=[0.013], SCI=[0](min),
              Continuous simulation parameters:
              IaREcper=[96](hrs), IaREcimp=[96](hrs),
              InterEventTime=[96](hrs), END=-1
*%-----|-----|
**On-site storage for SouthWest area**
ADD HYD      IDsum=[4], NHYD=["400-OS"], IDs to add=[2,3]
*%-----|-----|
*****On-Site Storage Required***
*****
ROUTE RESERVOIR IDout=[2], NHYD=["OSSTOR"], IDin=[4],
              RDT=[30](min),
              TABLE of ( OUTFLOW-STORAGE ) values
              (cms) - (ha-m)
              [ 0.000 , 0.000 ]
              [ 0.800 , 0.005 ]
              [ 0.816 , 0.200 ]
              [ -1 , -1 ] (max twenty pts)
              IDovf=[3], NHYDovf=["OSOVSF"]
*%-----|-----|
*****
**FLOW FROM UPSTREAM AREA - MB CIRCLE**
*****
*%-----|-----|
CONTINUOUS NASHYD ID=[3], NHYD=["401"], DT=[30]min, AREA=[16.78](ha),
              DWF=[0](cms), CN/C=[68], IA=[7.0](mm),

```

SWMHYMO INPUT FILE (Post-Development, Continuous) – PSTCON.dat

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N=[1.1], TP=[1.66]hrs,
Continuous simulation parameters:
IaREcper=[96](hrs),
SMIN=[-1](mm), SMAx=[-1](mm), SK=[1]/(mm),
InterEventTime=[96](hrs),
Baseflow simulation parameters:
BaseFlowOption=[1],
InitGWResVol=[100](mm), GWResK=[1](mm/day/mm),
VHydCond=[0.05](mm/hr), END=-1
*%-----
*****
**FLOW IN TRIB 3 UPSTREAM OF CONFL**
*****
ADD HYD IDsum=[5], NHYD=["P2-T3"], IDs to add=[1,2,3,7]
*%-----
EROSION INDEX INDEX_METHOD=[1], QCE=[0.57](cms)
IDSerotion=[5]
*%-----
*PRINT HYD ID=[5], # OF PCYCLES=[3]
*%-----
CONTINUOUS STANDHYD ID=[2], NHYD=["403a"], DT=[30]min, AREA=[2.66](ha),
XIMP=[0.51], TIMP=[0.64], DWF=[0](cms), LOSS=[1],
Horton: Fo=[76.20](mm/hr), Fc=[13.20](mm/hr),
DCAY=[4.14]/(hr), F=[0.0](mm),
Pervious surfaces: IAper=[4.67](mm), SLPP=[1.0](%),
LGP=[40](m), MNP=[0.25], SCP=[0](min),
Impervious surfaces: IAimp=[1.57](mm), SLPI=[1.0](%),
LGI=[40](m), MNI=[0.013], SCI=[0](min),
Continuous simulation parameters:
IaREcper=[96](hrs), IaREcimp=[96](hrs),
InterEventTime=[96](hrs), END=-1
*%-----
ADD HYD IDsum=[1], NHYD=["234TOT"], IDs to add=[2,5,10]
*%-----
EROSION INDEX INDEX_METHOD=[1], QCE=[0.57](cms)
IDSerotion=[1]
*%-----
*****
**FLOW AT CONFLUENCE**
*****
*PRINT HYD ID=[1], # OF PCYCLES=[3]
*%-----
*****PEAK FLOW FROM EAST SIDE OF MARCH ROAD*****
*%-----
CONTINUOUS STANDHYD ID=[1], NHYD=["203d"], DT=[30]min, AREA=[1.26](ha),
XIMP=[0.56], TIMP=[0.70], DWF=[0](cms), LOSS=[1],
Horton: Fo=[76.2](mm/hr), Fc=[13.2](mm/hr),
DCAY=[4.14]/(hr), F=[0](mm),
Pervious surfaces: IAper=[4.67](mm), SLPP=[2.3](%),
LGP=[40](m), MNP=[0.25], SCP=[0](min),
Impervious surfaces: IAimp=[1.57](mm), SLPI=[2.3](%),
LGI=[40](m), MNI=[0.013], SCI=[0](min),
Continuous simulation parameters:
IaREcper=[96](hrs), IaREcimp=[96](hrs),
InterEventTime=[96](hrs), END=-1
*%-----
CONTINUOUS STANDHYD ID=[2], NHYD=["501a"], DT=[30]min, AREA=[9.32](ha),
XIMP=[0.74], TIMP=[0.93], DWF=[0](cms), LOSS=[1],
Horton: Fo=[76.2](mm/hr), Fc=[13.2](mm/hr),
DCAY=[4.14]/(hr), F=[0](mm),
Pervious surfaces: IAper=[4.67](mm), SLPP=[2.3](%),
LGP=[40](m), MNP=[0.25], SCP=[0](min),
Impervious surfaces: IAimp=[1.57](mm), SLPI=[2.3](%),
LGI=[40](m), MNI=[0.013], SCI=[0](min),
Continuous simulation parameters:
IaREcper=[96](hrs), IaREcimp=[96](hrs),
InterEventTime=[96](hrs), END=-1
*%-----
*****
***5-year peak flow to pond***

```

```

*****
COMPUTE DUALHYD IDin=[2], CINLET=[2.06](cms), NINLET=[1],
MAJID=[3], MajNHYD=["OSSTOR"],
MINID=[4], MinNHYD=["TOPOND"],
TMJSTO=[890](cu-m)
*%-----
CONTINUOUS STANDHYD ID=[5], NHYD=["502"], DT=[30]min, AREA=[38.42](ha),
XIMP=[0.54], TIMP=[0.67], DWF=[0](cms), LOSS=[1],
Horton: Fo=[76.20](mm/hr), Fc=[13.20](mm/hr),
DCAY=[4.14]/(hr), F=[0.0](mm),
Pervious surfaces: IAper=[4.67](mm), SLPP=[2.3](%),
LGP=[40](m), MNP=[0.25], SCP=[0](min),
Impervious surfaces: IAimp=[1.57](mm), SLPI=[2.3](%),
LGI=[40](m), MNI=[0.013], SCI=[0](min),
Continuous simulation parameters:
IaREcper=[96](hrs), IaREcimp=[96](hrs),
InterEventTime=[96](hrs), END=-1
*%-----
CONTINUOUS STANDHYD ID=[6], NHYD=["503"], DT=[30]min, AREA=[39.10](ha),
XIMP=[0.51], TIMP=[0.64], DWF=[0](cms), LOSS=[1],
Horton: Fo=[76.20](mm/hr), Fc=[13.20](mm/hr),
DCAY=[4.14]/(hr), F=[0.0](mm),
Pervious surfaces: IAper=[4.67](mm), SLPP=[2.3](%),
LGP=[40](m), MNP=[0.25], SCP=[0](min),
Impervious surfaces: IAimp=[1.57](mm), SLPI=[2.3](%),
LGI=[40](m), MNI=[0.013], SCI=[0](min),
Continuous simulation parameters:
IaREcper=[96](hrs), IaREcimp=[96](hrs),
InterEventTime=[96](hrs), END=-1
*%-----
CONTINUOUS STANDHYD ID=[7], NHYD=["MR1"], DT=[30]min, AREA=[3.32](ha),
XIMP=[0.80], TIMP=[0.99], DWF=[0](cms), LOSS=[1],
Horton: Fo=[76.20](mm/hr), Fc=[13.20](mm/hr),
DCAY=[4.14]/(hr), F=[0.0](mm),
Pervious surfaces: IAper=[4.67](mm), SLPP=[1.0](%),
LGP=[40](m), MNP=[0.25], SCP=[0](min),
Impervious surfaces: IAimp=[1.57](mm), SLPI=[1.0](%),
LGI=[40](m), MNI=[0.013], SCI=[0](min),
Continuous simulation parameters:
IaREcper=[96](hrs), IaREcimp=[96](hrs),
InterEventTime=[96](hrs), END=-1
*%-----
CONTINUOUS STANDHYD ID=[8], NHYD=["MR2"], DT=[30]min, AREA=[3.04](ha),
XIMP=[0.80], TIMP=[0.99], DWF=[0](cms), LOSS=[1],
Horton: Fo=[76.20](mm/hr), Fc=[13.20](mm/hr),
DCAY=[4.14]/(hr), F=[0.0](mm),
Pervious surfaces: IAper=[4.67](mm), SLPP=[1.0](%),
LGP=[40](m), MNP=[0.25], SCP=[0](min),
Impervious surfaces: IAimp=[1.57](mm), SLPI=[1.0](%),
LGI=[40](m), MNI=[0.013], SCI=[0](min),
Continuous simulation parameters:
IaREcper=[96](hrs), IaREcimp=[96](hrs),
InterEventTime=[96](hrs), END=-1
*%-----
ADD HYD IDsum=[10], NHYD=["VALE"], IDs to add=[1,5,7]
*%-----
ADD HYD IDsum=[9], NHYD=["MET"], IDs to add=[4,6,8]
*%-----
CONTINUOUS STANDHYD ID=[1], NHYD=["POND3"], DT=[30]min, AREA=[11.89](ha),
XIMP=[0.64], TIMP=[0.80], DWF=[0](cms), LOSS=[1],
Horton: Fo=[76.20](mm/hr), Fc=[13.20](mm/hr),
DCAY=[4.14]/(hr), F=[0.0](mm),
Pervious surfaces: IAper=[4.67](mm), SLPP=[0.01](%),
LGP=[40](m), MNP=[0.25], SCP=[0](min),
Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.01](%),
LGI=[40](m), MNI=[0.013], SCI=[0](min),
Continuous simulation parameters:
IaREcper=[96](hrs), IaREcimp=[96](hrs),
InterEventTime=[96](hrs), END=-1
*%-----
ADD HYD IDsum=[8], NHYD=["P3ADD"], IDs to add=[10,9,1]

```

SWMHYMO INPUT FILE (Post-Development, Continuous) – PSTCON.dat

```
*%-----|-----|
*****
***SIZING FOR POND 3***
*****
ROUTE RESERVOIR      IDout=[1],  NHYD=["POND3"],  IDin=[9],
                      RDT=[30](min),
                      TABLE of ( OUTFLOW-STORAGE ) values
                                (cms) - (ha-m)
                                [ 0.000 , 0.000 ]
                                [ 0.058 , 1.610 ]
                                [ 0.220 , 2.515 ]
                                [ 0.402 , 3.488 ]
                                [ 1.045 , 6.115 ]
                                [  -1   ,  -1   ] (max twenty pts)
                      IDovf=[2], NHYDovf=["E-OVF"]
*%-----|-----|
*****
**FLOW FROM EAST LANDS**
*****
*PRINT HYD           ID=[1],    # OF PCYCLES=[3]
*%-----|-----|
FINISH
```



```
#####
# Project Name: [Kanata North]      Project Number: [112117]
# Date          : 02-02-2016
# Modeller      : [Kallie Auld]
# Company       : NOVATECH ENGINEERING CONSULTANTS LTD
```

Page 1 of 4

SWMHYMO OUTPUT FILE (Post-Development, Continuous) – PSTCON.sum

```

001:0011-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:211      230.28      .319 2014.0624_22:30      90.31 n/a
                + 02:211      1.87       .010 2014.0624_20:30      172.70 n/a
[DT=30.00] SUM= 03:211add      232.15      .329 2014.0624_22:30      90.98 n/a
001:0012-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
SHIFT HYD        -> 03:211add      232.15      .329 2014.0624_22:30      90.98 n/a
[LAG= 30.0 min]<- 01:212      232.15      .329 2014.0624_23:00      90.98 n/a
001:0013-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS NASHYD 02:212          .95       .008 2014.0624_20:00      119.76 .202
[CN= 66.0: N= 1.10]
[TP= .56:DT=30.00]
[IaREC=96.00: SMIN= 52.62: SMAX=350.79: SK=1.000]
[InterEventTime= 96.00]
001:0014-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:212      232.15      .329 2014.0624_23:00      90.98 n/a
                + 02:212          .95       .008 2014.0624_20:00      119.76 n/a
[DT=30.00] SUM= 03:212add      233.10      .334 2014.0624_22:30      91.10 n/a
001:0015-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
SHIFT HYD        -> 03:212add      233.10      .334 2014.0624_22:30      91.10 n/a
[LAG= 30.0 min]<- 01:213      233.10      .334 2014.0624_23:00      91.10 n/a
001:0016-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS NASHYD 02:213          1.43       .010 2014.0624_20:00      117.36 .198
[CN= 66.0: N= 1.10]
[TP= .67:DT=30.00]
[IaREC=96.00: SMIN= 52.62: SMAX=350.79: SK=1.000]
[InterEventTime= 96.00]
001:0017-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:213      233.10      .334 2014.0624_23:00      91.10 n/a
                + 02:213          1.43       .010 2014.0624_20:00      117.36 n/a
[DT=30.00] SUM= 10:TRIB2      234.53      .342 2014.0624_23:00      91.26 n/a
001:0018-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS STANDHYD01:203a      27.32      1.167 2014.0624_20:00      274.11 .463
[XIMP=.50:TIMP=.63]
[Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14: F= .00]
[Pervious area: IaPer= 4.67:SLPP=2.30:LGP= 40.:MNP=.250:SCP= .0]
[Impervious area: IaImp= 1.57:SLPI=2.30:LGI= 40.:MMNI=.013:SCI= .0]
[IaRECcimp= 96.00: IaRECper= 96.00]
001:0019-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS STANDHYD02:203b      20.76      .862 2014.0624_20:00      262.92 .444
[XIMP=.48:TIMP=.60]
[Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14: F= .00]
[Pervious area: IaPer= 4.67:SLPP=2.30:LGP= 40.:MNP=.250:SCP= .0]
[Impervious area: IaImp= 1.57:SLPI=2.30:LGI= 40.:MMNI=.013:SCI= .0]
[IaRECcimp= 96.00: IaRECper= 96.00]
001:0020-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS STANDHYD03:203c      4.95       .227 2014.0624_20:00      312.03 .527
[XIMP=.57:TIMP=.71]
[Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14: F= .00]
[Pervious area: IaPer= 4.67:SLPP=2.30:LGP= 40.:MNP=.250:SCP= .0]
[Impervious area: IaImp= 1.57:SLPI=2.30:LGI= 40.:MMNI=.013:SCI= .0]
[IaRECcimp= 96.00: IaRECper= 96.00]
001:0021-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS STANDHYD04:POND1      2.68       .109 2014.0624_20:00      352.26 .595
[XIMP=.64:TIMP=.80]
[Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14: F= .00]
[Pervious area: IaPer= 4.67:SLPP=.01:LGP= 40.:MNP=.250:SCP= .0]
[Impervious area: IaImp= 1.57:SLPI=.01:LGI= 40.:MMNI=.013:SCI= .0]
[IaRECcimp= 96.00: IaRECper= 96.00]
001:0022-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          02:203b      20.76      .862 2014.0624_20:00      262.92 n/a
                + 03:203c      4.95       .227 2014.0624_20:00      312.03 n/a
                + 04:POND1      2.68       .109 2014.0624_20:00      352.26 n/a
[DT=30.00] SUM= 05:T2CRS      28.39      1.198 2014.0624_20:00      279.91 n/a
001:0023-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:203a      27.32      1.167 2014.0624_20:00      274.11 n/a
                + 05:T2CRS      28.39      1.198 2014.0624_20:00      279.91 n/a
[DT=30.00] SUM= 06:P1FLOW      55.71      2.364 2014.0624_20:00      277.07 n/a
001:0024-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 06:P1FLOW      55.71      2.364 2014.0624_20:00      277.07 n/a
[RDT=30.00] out<- 01:POND1      55.71      .137 2014.0624_21:00      277.06 n/a
overflow <= 02:P1-OVF          .00       .000 2014.0417_ 0:00          .00 n/a

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{MxStoUsed=.2030E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
001:0025-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:POND1      55.71      .137 2014.0624_21:00      277.06 n/a
                + 10:TRIB2      234.53      .342 2014.0624_23:00      91.26 n/a
[DT=30.00] SUM= 02:213ADD      290.24      .472 2014.0624_22:30      126.92 n/a
001:0026-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
SHIFT HYD        -> 02:213ADD      290.24      .472 2014.0624_22:30      126.92 n/a
[LAG= .0 min]<- 01:214      290.24      .472 2014.0624_22:30      126.92 n/a
001:0027-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS NASHYD 03:214          1.61       .037 2014.0624_20:00      138.03 .233
[CN= 72.0: N= 1.10]
[TP= .17:DT=30.00]
[IaREC=96.00: SMIN= 39.75: SMAX=264.99: SK=1.000]
[InterEventTime= 96.00]
001:0028-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:214      290.24      .472 2014.0624_22:30      126.92 n/a
                + 03:214          1.61       .037 2014.0624_20:00      138.03 n/a
[DT=30.00] SUM= 04:214ADD      291.85      .484 2014.0624_22:00      126.98 n/a
001:0029-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
SHIFT HYD        -> 04:214ADD      291.85      .484 2014.0624_22:00      126.98 n/a
[LAG= 30.0 min]<- 01:215      291.85      .484 2014.0624_22:30      126.98 n/a
001:0030-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS NASHYD 02:TRB215      1.12       .022 2014.0624_20:00      100.08 .169
[CN= 66.0: N= 1.10]
[TP= .17:DT=30.00]
[IaREC=96.00: SMIN= 52.62: SMAX=350.79: SK=1.000]
[InterEventTime= 96.00]
001:0031-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:215      291.85      .484 2014.0624_22:30      126.98 n/a
                + 02:TRB215      1.12       .022 2014.0624_20:00      100.08 n/a
[DT=30.00] SUM= 03:215ADD      292.97      .491 2014.0624_22:00      126.88 n/a
001:0032-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
SHIFT HYD        -> 03:215ADD      292.97      .491 2014.0624_22:00      126.88 n/a
[LAG= 30.0 min]<- 01:216      292.97      .491 2014.0624_22:30      126.88 n/a
001:0033-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS NASHYD 02:TRB216      1.12       .021 2014.0624_20:00      88.54 .150
[CN= 65.0: N= 1.10]
[TP= .17:DT=30.00]
[IaREC=96.00: SMIN= 54.78: SMAX=365.23: SK=1.000]
[InterEventTime= 96.00]
001:0034-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:216      292.97      .491 2014.0624_22:30      126.88 n/a
                + 02:TRB216      1.12       .021 2014.0624_20:00      88.54 n/a
[DT=30.00] SUM= 10:T2-US      294.09      .497 2014.0624_22:30      126.73 n/a
001:0035-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
EROSION INDEX    10:T2-US          .497       .016 6339.00      .00 .00
[QCE= .730]
001:0036-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CONTINUOUS NASHYD 01:301          86.43      .297 2014.0624_21:00      78.59 .133
[CN= 63.0: N= 1.10]
[TP= 1.24:DT=30.00]
[IaREC=96.00: SMIN= 59.42: SMAX=396.11: SK=1.000]
[InterEventTime= 96.00]
001:0037-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CONTINUOUS NASHYD 02:302          80.69      .208 2014.0624_21:00      92.59 .156
[CN= 64.0: N= 1.10]
[TP= 1.80:DT=30.00]
[IaREC=96.00: SMIN= 57.05: SMAX=380.32: SK=1.000]
[InterEventTime= 96.00]
001:0038-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:301          86.43      .297 2014.0624_21:00      78.59 n/a
                + 02:302          80.69      .208 2014.0624_21:00      92.59 n/a
[DT=30.00] SUM= 03:300a      167.12      .504 2014.0624_21:00      85.35 n/a
001:0039-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
SHIFT HYD        -> 03:300a      167.12      .504 2014.0624_21:00      85.35 n/a
[LAG= 30.0 min]<- 01:310      167.12      .504 2014.0624_21:30      85.35 n/a
001:0040-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CONTINUOUS NASHYD 02:303          65.16      .268 2014.0624_21:00      129.61 .219
[CN= 69.0: N= 1.10]
[TP= 1.31:DT=30.00]
[IaREC=96.00: SMIN= 44.82: SMAX=298.82: SK=1.000]

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SWMHYMO OUTPUT FILE (Post-Development, Continuous) – PSTCON.sum

```

[InterEventTime= 96.00]
001:0041-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:310          167.12          .504 2014.0624_21:30 85.35 n/a
                + 02:303          65.16          .268 2014.0624_21:00 129.61 n/a
[DT=30.00] SUM= 03:300b          232.28          .769 2014.0624_21:00 97.77 n/a
001:0042-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
SHIFT HYD        -> 03:300b          232.28          .769 2014.0624_21:00 97.77 n/a
[LAG= 30.0 min]<- 01:311          232.28          .769 2014.0624_21:30 97.77 n/a
001:0043-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS NASHYD 02:TRB311          1.15          .010 2014.0624_20:00 111.23 .188
[CN= 65.0: N= 1.10]
[Tp= .52:DT=30.00]
[IaREC=96.00: SMIN= 54.78: SMAX=365.23: SK=1.000]
[InterEventTime= 96.00]
001:0044-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:311          232.28          .769 2014.0624_21:30 97.77 n/a
                + 02:TRB311          1.15          .010 2014.0624_20:00 111.23 n/a
[DT=30.00] SUM= 03:311ADD          233.43          .778 2014.0624_21:30 97.84 n/a
001:0045-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS NASHYD 01:TRB312          1.30          .012 2014.0624_20:00 174.35 .294
[CN= 76.0: N= 1.10]
[Tp= .64:DT=30.00]
[IaREC=96.00: SMIN= 32.46: SMAX=216.39: SK=1.000]
[InterEventTime= 96.00]
001:0046-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          03:311ADD          233.43          .778 2014.0624_21:30 97.84 n/a
                + 01:TRB312          1.30          .012 2014.0624_20:00 174.35 n/a
[DT=30.00] SUM= 07:312ADD          234.73          .788 2014.0624_21:30 98.26 n/a
001:0047-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS STANDHYD01:304a          9.61          .386 2014.0624_20:00 251.81 .425
[XIMP=.46:TIMP=.57]
[Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14: F= .00]
[Pervious area: IAPER= 4.67:SLPP=1.60:LGP= 40.:MNP=.250:SCP= .0]
[Impervious area: IAimp= 1.57:SLPI=1.60:LGI= 40.:MNI=.013:SCI= .0]
[IaRECimp= 96.00: IaRECper= 96.00]
001:0048-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS STANDHYD02:402a          5.67          .264 2014.0624_20:00 318.50 .538
[XIMP=.58:TIMP=.73]
[Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14: F= .00]
[Pervious area: IAPER= 4.67:SLPP=2.10:LGP= 40.:MNP=.250:SCP= .0]
[Impervious area: IAimp= 1.57:SLPI=2.10:LGI= 40.:MNI=.013:SCI= .0]
[IaRECimp= 96.00: IaRECper= 96.00]
001:0049-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS STANDHYD03:POND2          1.85          .075 2014.0624_20:00 352.26 .595
[XIMP=.64:TIMP=.80]
[Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14: F= .00]
[Pervious area: IAPER= 4.67:SLPP=.01:LGP= 40.:MNP=.250:SCP= .0]
[Impervious area: IAimp= 1.57:SLPI=.01:LGI= 40.:MNI=.013:SCI= .0]
[IaRECimp= 96.00: IaRECper= 96.00]
001:0050-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:304a          9.61          .386 2014.0624_20:00 251.81 n/a
                + 02:402a          5.67          .264 2014.0624_20:00 318.50 n/a
                + 03:POND2          1.85          .075 2014.0624_20:00 352.26 n/a
[DT=30.00] SUM= 04:P2FLOW          17.13          .725 2014.0624_20:00 284.73 n/a
001:0051-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 04:P2FLOW          17.13          .725 2014.0624_20:00 284.73 n/a
[RDT=30.00] out<- 01:POND2          17.13          .047 2014.0624_21:00 284.73 n/a
                overflow <= 02:P2OVF          .00          .000 2014.0417_ 0:00 .00 n/a
{MxStoUsed=.6915E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
001:0052-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS STANDHYD02:402b          6.07          .282 2014.0624_20:00 318.50 .538
[XIMP=.58:TIMP=.73]
[Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14: F= .00]
[Pervious area: IAPER= 4.67:SLPP=2.10:LGP= 40.:MNP=.250:SCP= .0]
[Impervious area: IAimp= 1.57:SLPI=2.10:LGI= 40.:MNI=.013:SCI= .0]
[IaRECimp= 96.00: IaRECper= 96.00]
001:0053-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS STANDHYD03:402c          1.19          .053 2014.0624_20:00 300.58 .508
[XIMP=.55:TIMP=.68]
[Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14: F= .00]
[Pervious area: IAPER= 4.67:SLPP=2.10:LGP= 40.:MNP=.250:SCP= .0]

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[Impervious area: IAimp= 1.57:SLPI=2.10:LGI= 40.:MNI=.013:SCI= .0]
[IaRECimp= 96.00: IaRECper= 96.00]
001:0054-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          02:402b          6.07          .282 2014.0624_20:00 318.50 n/a
                + 03:402c          1.19          .053 2014.0624_20:00 300.58 n/a
[DT=30.00] SUM= 04:400-OS          7.26          .335 2014.0624_20:00 315.56 n/a
001:0055-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 04:400-OS          7.26          .335 2014.0624_20:00 315.56 n/a
* [RDT=30.00] out<- 02:OSSTOR          7.26          .350 2014.0624_20:00 316.84 n/a
                overflow <= 03:OSOVF          .00          .000 2014.0417_ 0:00 .00 n/a
{MxStoUsed=.3717E-02, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
001:0056-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
CONTINUOUS NASHYD 03:401          16.78          .056 2014.0624_21:00 149.79 .253
[CN= 68.0: N= 1.10]
[Tp= 1.66:DT=30.00]
[IaREC=96.00: SMIN= 48.56: SMAX=323.73: SK=1.000]
[InterEventTime= 96.00]
001:0057-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          01:POND2          17.13          .047 2014.0624_21:00 284.73 n/a
                + 02:OSSTOR          7.26          .350 2014.0624_20:00 316.84 n/a
                + 03:401          16.78          .056 2014.0624_21:00 149.79 n/a
                + 07:312ADD          234.73          .788 2014.0624_21:30 98.26 n/a
[DT=30.00] SUM= 05:P2-T3          275.90          .896 2014.0624_21:30 118.72 n/a
001:0058-----ID:NHYD-----QPEAK-----QAVG--DUR.HRS--ERO.HRS-----EXC.%-
EROSION INDEX 05:P2-T3          .896          .013 7071.50 11.00 .16
[QCE= .570]
001:0059-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS STANDHYD02:403a          2.66          .113 2014.0624_20:00 279.40 .472
[XIMP=.51:TIMP=.64]
[Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14: F= .00]
[Pervious area: IAPER= 4.67:SLPP=1.00:LGP= 40.:MNP=.250:SCP= .0]
[Impervious area: IAimp= 1.57:SLPI=1.00:LGI= 40.:MNI=.013:SCI= .0]
[IaRECimp= 96.00: IaRECper= 96.00]
001:0060-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD          02:403a          2.66          .113 2014.0624_20:00 279.40 n/a
                + 05:P2-T3          275.90          .896 2014.0624_21:30 118.72 n/a
                + 10:T2-US          294.09          .497 2014.0624_22:30 126.73 n/a
[DT=30.00] SUM= 01:234TOT          572.65          1.368 2014.0624_22:30 123.58 n/a
001:0061-----ID:NHYD-----QPEAK-----QAVG--DUR.HRS--ERO.HRS-----EXC.%-
EROSION INDEX 01:234TOT          1.368          .028 7071.50 28.00 .40
[QCE= .570]
001:0062-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS STANDHYD01:203d          1.26          .057 2014.0624_20:00 306.61 .518
[XIMP=.56:TIMP=.70]
[Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14: F= .00]
[Pervious area: IAPER= 4.67:SLPP=2.30:LGP= 40.:MNP=.250:SCP= .0]
[Impervious area: IAimp= 1.57:SLPI=2.30:LGI= 40.:MNI=.013:SCI= .0]
[IaRECimp= 96.00: IaRECper= 96.00]
001:0063-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS STANDHYD02:501a          9.32          .504 2014.0624_20:00 417.36 .705
[XIMP=.74:TIMP=.93]
[Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14: F= .00]
[Pervious area: IAPER= 4.67:SLPP=2.30:LGP= 40.:MNP=.250:SCP= .0]
[Impervious area: IAimp= 1.57:SLPI=2.30:LGI= 40.:MNI=.013:SCI= .0]
[IaRECimp= 96.00: IaRECper= 96.00]
001:0064-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
COMPUTE DUALHYD 02:501a          9.32          .504 2014.0624_20:00 417.36 n/a
Major System / 03:OSSTOR          .00          .000 2014.0417_ 0:00 .00 n/a
Minor System \ 04:TOPOND          9.32          .504 2014.0624_20:00 417.36 n/a
{MjSysSto=.0000E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
001:0065-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS STANDHYD05:502          38.42          1.699 2014.0624_20:00 295.29 .499
[XIMP=.54:TIMP=.67]
[Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14: F= .00]
[Pervious area: IAPER= 4.67:SLPP=2.30:LGP= 40.:MNP=.250:SCP= .0]
[Impervious area: IAimp= 1.57:SLPI=2.30:LGI= 40.:MNI=.013:SCI= .0]
[IaRECimp= 96.00: IaRECper= 96.00]
001:0066-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS STANDHYD06:503          39.10          1.685 2014.0624_20:00 279.40 .472
[XIMP=.51:TIMP=.64]
[Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14: F= .00]

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SWMHYMO OUTPUT FILE (Post-Development, Continuous) – PSTCON.sum

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[Pervious      area: IApr= 4.67:SLPP=2.30:LGP= 40.:MNP=.250:SCP= .0]
[Impervious    area: IAimp= 1.57:SLPI=2.30:LGI= 40.:MNI=.013:SCI= .0]
[IARECImp= 96.00: IARECper= 96.00]
001:0067-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS STANDHYD07:MR1      3.32      .187 2014.0624_20:00 499.90 .844
[XIMP=.80:TIMP=.99]
[Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14: F= .00]
[Pervious      area: IApr= 4.67:SLPP=1.00:LGP= 40.:MNP=.250:SCP= .0]
[Impervious    area: IAimp= 1.57:SLPI=1.00:LGI= 40.:MNI=.013:SCI= .0]
[IARECImp= 96.00: IARECper= 96.00]
001:0068-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS STANDHYD08:MR2      3.04      .171 2014.0624_20:00 499.90 .844
[XIMP=.80:TIMP=.99]
[Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14: F= .00]
[Pervious      area: IApr= 4.67:SLPP=1.00:LGP= 40.:MNP=.250:SCP= .0]
[Impervious    area: IAimp= 1.57:SLPI=1.00:LGI= 40.:MNI=.013:SCI= .0]
[IARECImp= 96.00: IARECper= 96.00]
001:0069-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      01:203d      1.26      .057 2014.0624_20:00 306.61 n/a
+ 05:502      38.42      1.699 2014.0624_20:00 295.29 n/a
+ 07:MR1      3.32      .187 2014.0624_20:00 499.90 n/a
[DT=30.00] SUM= 10:VALE      43.00      1.943 2014.0624_20:00 311.42 n/a
001:0070-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      04:TOPOND      9.32      .504 2014.0624_20:00 417.36 n/a
+ 06:503      39.10      1.685 2014.0624_20:00 279.40 n/a
+ 08:MR2      3.04      .171 2014.0624_20:00 499.90 n/a
[DT=30.00] SUM= 09:MET      51.46      2.360 2014.0624_20:00 317.41 n/a
001:0071-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
* CONTINUOUS STANDHYD01:POND3      11.89      .482 2014.0624_20:00 352.26 .595
[XIMP=.64:TIMP=.80]
[Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14: F= .00]
[Pervious      area: IApr= 4.67:SLPP=.01:LGP= 40.:MNP=.250:SCP= .0]
[Impervious    area: IAimp= 1.57:SLPI=.01:LGI= 40.:MNI=.013:SCI= .0]
[IARECImp= 96.00: IARECper= 96.00]
001:0072-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ADD HYD      10:VALE      43.00      1.943 2014.0624_20:00 311.42 n/a
+ 09:MET      51.46      2.360 2014.0624_20:00 317.41 n/a
+ 01:POND3      11.89      .482 2014.0624_20:00 352.26 n/a
[DT=30.00] SUM= 08:P3ADD      106.35      4.785 2014.0624_20:00 318.89 n/a
001:0073-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.-
ROUTE RESERVOIR -> 09:MET      51.46      2.360 2014.0624_20:00 317.41 n/a
[RD=30.00] out< 01:POND3      51.46      .120 2014.0624_21:00 317.41 n/a
overflow <= 02:E-OVF      .00      .000 2014.0417_ 0:00 .00 n/a
{MxStoUsed=.1962E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
001:0074-----
FINISH
*****
WARNINGS / ERRORS / NOTES
*****
001:0002 READ AES DATA
*** WARNING: Specified end date is beyond the end
date in file.
001:0009 [LAG= .0 min]<-
*** WARNING: Hydrograph was not shifted.
001:0013 CONTINUOUS NASHYD
*** WARNING: Time step is too large for value of TP.
R.V. may be ok. Peak flow could be off.
001:0016 CONTINUOUS NASHYD
*** WARNING: Time step is too large for value of TP.
R.V. may be ok. Peak flow could be off.
001:0018 CONTINUOUS STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
001:0019 CONTINUOUS STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
001:0020 CONTINUOUS STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
001:0021 CONTINUOUS STANDHYD

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*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
001:0026 [LAG= .0 min]<-
*** WARNING: Hydrograph was not shifted.
001:0027 CONTINUOUS NASHYD
*** WARNING: Time step is too large for value of TP.
R.V. may be ok. Peak flow could be off.
001:0030 CONTINUOUS NASHYD
*** WARNING: Time step is too large for value of TP.
R.V. may be ok. Peak flow could be off.
001:0033 CONTINUOUS NASHYD
*** WARNING: Time step is too large for value of TP.
R.V. may be ok. Peak flow could be off.
001:0043 CONTINUOUS NASHYD
*** WARNING: Time step is too large for value of TP.
R.V. may be ok. Peak flow could be off.
001:0045 CONTINUOUS NASHYD
*** WARNING: Time step is too large for value of TP.
R.V. may be ok. Peak flow could be off.
001:0047 CONTINUOUS STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
001:0048 CONTINUOUS STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
001:0049 CONTINUOUS STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
001:0052 CONTINUOUS STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
001:0053 CONTINUOUS STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
001:0055 ROUTE RESERVOIR
*** WARNING: Inflow peak was not reduced!
Check OUTFLOW/STORAGE table or reduce DT.
*** WARNING: Outflow volume is less than inflow volume.
001:0059 CONTINUOUS STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
001:0062 CONTINUOUS STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
001:0063 CONTINUOUS STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
001:0065 CONTINUOUS STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
001:0066 CONTINUOUS STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
001:0067 CONTINUOUS STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
001:0068 CONTINUOUS STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
001:0071 CONTINUOUS STANDHYD
*** WARNING: Storage Coefficient is smaller than DT!
Use a smaller DT or a larger area.
Simulation ended on 2016-05-20 at 10:01:56
=====

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Appendix F

Pond Design Spreadsheets

KNCDP
SWM FACILITY DESIGN - Pond 1

Required storage Volumes (Quality)

Drainage Area	54.1	ha
% Impervious:	62%	
<i>Enhanced protection (80% TSS removal):</i>		
<i>Treatment Volume</i>	199	m3/ha
<i>Extended Detention Storage:</i>		
	40	m3/ha required
	2,165	m3 required
	2,976	m3 provided
	55.0	m3/ha provided
<i>Perm Pool:</i>		
	159	m3/ha required
	8,605	m3 required
	10,080	m3 provided
	186.3	m3/ha provided
<i>Extended Detention:</i>		
	68.89	L/s average
	172.21	L/s max (2.5 x avg)
(% impervious was calculated as the average imperviousness for the drainage areas tributary to the SWM facility)		

Required Forebay Length and width

Parameters:

Length to width ratio of forebay, r =	6.0:1
Peak outflow rate during 25 mm storm, Q	0.160 m ³ /s (24hr ext. det)
Target particle size =	150 mm
Settling velocity, V_s =	0.0003 m/s

Forebay Settling Length, Dist

$$Dist = \sqrt{\frac{rQ_p}{V_s}}$$

$$= 57 \text{ m}$$

Check Dispersion Length, Dist₂

Desired velocity in forebay, V_f =	0.4 m/s
Inlet flow rate, Q_{25mm} =	4.497 m ³ /s
Depth in forebay, d =	1.0 m

$$Dist_2 = \frac{8Q}{dV_f}$$

$$= 90 \text{ m}$$

Therefore, the dispersion length of 90 m governs the design.

Required Length	= 90 m
Provided Length	= 90 m

Minimum Forebay width:

Length of Forebay, L =	90 m
Minimum width, W =	$L/6$
W =	15.0 m

Required Width	= 15.0 m
Provided Width	= 15.0 m

KNCDP
SWM FACILITY DESIGN - Pond 1

Sediment Loading Estimate

Table 6.3 - MOE SWM Planning & Design Manual

Catchment Imperviousness	Annual Loading (kg/ha)	Wet Density (kg/m ³)	Annual Loading (m ³ /ha)
	50	1,230	0.05
35%	770	1,230	0.6
55%	2,300	1,230	1.9
70%	3,495	1,230	2.8
85%	4,680	1,230	3.8

Catchment Area:	54.12 ha
% Impervious:	62%
Annual Sediment Loading:	2,836 kg/ha/yr
	2.31 m ³ /ha/yr
	124.8 m ³ /yr

Sediment Removal Efficiency:	80%
	99.81 m ³ /yr

Sediment Accumulation:	
10yrs	998 m ³

Forebay Volume:	1470 m ³
@ depth:	0.80 m

(Depth to top of Forebay Berm)

City of Ottawa-average precipitation and TSS data

Drainage Area:	54.1 ha
Runoff Coefficient:	0.63
Estimate Influent TSS Level (max):	250 mg/L
(Long-term average):	150 mg/L
Sediment Density:	1,230 kg/m ³
Total Annual Precipitation:	907 mm
Total Annual Rain (Ice Free Period):	686 mm
Total Annual Runoff:	311,211 m ³
Runoff during Ice-free period:	235,381 m ³
Max Annual TSS Loading:	77,803 kg
(total precipitation)	63.3 m ³ /yr
Max Annual TSS Loading:	58,845 kg
(precipitation during ice-free period)	47.8 m ³ /yr
Average Annual TSS Loading:	46,682 kg
(total precipitation)	38.0 m ³ /yr
Average Annual TSS Loading:	35,307 kg
(precipitation during ice-free period)	28.7 m ³ /yr

Target 80% TSS Removal:	
Max:	50.6 m ³ /yr
Min:	23.0 m ³ /yr

Sediment Accumulation:	
10yrs	506 m ³

SWM Facility - Outlet Calculations

Orifice (Extended Detention) Allowable = 16.00 L/s (max) *25mm allowable

C	0.62
Dia	130.00 mm
Area	0.0133 m ²
Invert	79.50 m
C/L	79.57 m

For Elevation = 79.75 m

$$Q_{\text{orifice}} = C \times A \times (2 \times g \times H)^{(1/2)}$$

$$Q_{\text{orifice}} = 1000 \text{ L/m}^3 \times 0.62 \times 0.0133 \text{ m}^2 \times (2 \times 9.81 \times (79.75 \text{ m} - 79.57 \text{ m}))^{(1/2)}$$

$$Q_{\text{orifice}} = 15.68 \text{ L/s}$$

Second Orifice

C	0.62
Dia	230.00 mm
Area	0.0415 m ²
Invert	80.35 m
C/L	80.47 m

For Elevation = 81.50 m

$$Q_{\text{orifice}} = C \times A \times (2 \times g \times H)^{(1/2)}$$

$$Q_{\text{orifice}} = 1000 \text{ L/m}^3 \times 0.62 \times 0.0415 \text{ m}^2 \times (2 \times 9.81 \times (81.50 \text{ m} - 80.47 \text{ m}))^{(1/2)}$$

$$Q_{\text{orifice}} = 116.08 \text{ L/s}$$

Triangular Weir

$$Q (\text{m}^3/\text{s}) = C_{ws} \times \tan(\theta/2) \times H^{(5/2)}$$

Side Weir Coefficeint (C_{ws})	1.45	(ranges from 1.35 to 1.55)
Angle (θ - degrees)	40.0	
Bottom Width (L - m)	0.0	
Bottom of Weir Elevation (m)	81.15	

Water Level Elevation	Flow Rate Over Weir	
(m)	(m ³ /s)	(L/s)
81.15	0.000	0.0
81.25	0.002	1.7
81.35	0.009	9.4
81.45	0.026	26.0
81.55	0.053	53.4
81.65	0.093	93.3
81.75	0.147	147.2
81.85	0.216	216.4
81.95	0.302	302.1

SWM Facility - Stage-Storage

Stage	Elevation (m)	Area m ²	Volume		Outflow		
			Stage m ³	Total m ³	Orifice l/s	Weir l/s	Total l/s
Permanent Pool				10080.0			
Pond Bottom	78.50	9,003	0	0			
Permanent Pool	79.50	11,157	10,080	10,080	0	0	0
Extended Detention	79.75	12,650	2,976	13,056	16	0	16
	80.00	13,422	3,259	16,315	24	0	24
2-year	80.50	14,923	7,086	23,401	57	0	57
5-year	80.80	15,817	4,611	28,012	107	0	107
	81.00	16,433	3,225	31,237	127	0	127
	81.50	17,972	8,601	39,838	167	53	220
100-yr	81.65	18,430	2,730	42,569	177	93	270
	81.95	19,375	5,671	48,239	195	302	497

Required Storage Volume Check		
Storm Event	Active Volume (m ³)	Total Volume (m ³)
25mm	7,280	18,050
2-year	11,820	22,590
5-year	16,780	27,550
100-year	31,150	41,920

Allowable Outlet Flow	
Storm Event	Flow (L/s)
25mm	16.0
2-year	59.0
5-year	107.0
100-year	276.0

KNCDP SWM FACILITY DESIGN - Pond 2

Required storage Volumes (Quality)

Drainage Area	17.6	ha
% Impervious:	41%	
<i>Enhanced protection (80% TSS removal):</i>		
<i>Treatment Volume</i>	149	m ³ /ha
<i>Extended Detention Storage:</i>	40	m ³ /ha required
	704	m ³ required
	901	m ³ provided
	51.2	m ³ /ha provided
<i>Perm Pool:</i>	109	m ³ /ha required
	1,918	m ³ required
	1,991	m ³ provided
	113.1	m ³ /ha provided
<i>Extended Detention:</i>	20.85	L/s average
	52.13	L/s max (2.5 x avg)
(% impervious was calculated as the average imperviousness for the drainage areas tributary to the SWM facility)		

Required Forebay Length and width

Parameters:

Length to width ratio of forebay, r =	3.0:1
Peak outflow rate during 25 mm storm, C	0.030 m ³ /s (24hr ext. det)
Target particle size =	150 mm
Settling velocity, V_s =	0.0003 m/s

Forebay Settling Length, Dist

$$Dist = \sqrt{\frac{rQ_p}{V_s}}$$

$$= 17 \text{ m}$$

Check Dispersion Length, Dist₂

Desired velocity in forebay, V_f =	0.4 m/s
Inlet flow rate, Q_{10yr} =	2.205 m ³ /s
Depth in forebay, d =	1.0 m

$$Dist_2 = \frac{8Q}{dV_f}$$

$$= 44 \text{ m}$$

Therefore, the dispersion length of 44 m governs the design.

Required Length	= 44 m
Provided Length	= 48 m

Minimum Forebay width:

Length of Forebay, L =	44 m
Minimum width, W =	$L/3$
W =	14.7 m

Required Width	= 14.7 m
Provided Width	= 15.0 m

KNCDP
SWM FACILITY DESIGN - Pond 2

Sediment Loading Estimate

Table 6.3 - MOE SWM Planning & Design Manual

Catchment Imperviousness	Annual Loading (kg/ha)	Wet Density (kg/m ³)	Annual Loading (m ³ /ha)
	50	1,230	0.05
35%	770	1,230	0.6
55%	2,300	1,230	1.9
70%	3,495	1,230	2.8
85%	4,680	1,230	3.8

Catchment Area:	17.60 ha
% Impervious:	41%
Annual Sediment Loading:	1,229 kg/ha/yr
	1.00 m ³ /ha/yr
	17.6 m ³ /yr

Sediment Removal Efficiency:	80%
	14.07 m ³ /yr

Sediment Accumulation:	
10yrs	141 m ³

Forebay Volume:	502 m ³
@ depth:	0.80 m

(Depth to top of Forebay Berm)

City of Ottawa-average precipitation and TSS data

Drainage Area:	17.6 ha
Runoff Coefficient:	0.49
Estimate Influent TSS Level (max):	250 mg/L
(Long-term average):	150 mg/L
Sediment Density:	1,230 kg/m ³
Total Annual Precipitation:	907 mm
Total Annual Rain (Ice Free Period):	686 mm
Total Annual Runoff:	77,741 m ³
Runoff during Ice-free period:	58,798 m ³
Max Annual TSS Loading:	19,435 kg
(total precipitation)	15.8 m ³ /yr
Max Annual TSS Loading:	14,700 kg
(precipitation during ice-free period)	12.0 m ³ /yr
Average Annual TSS Loading:	11,661 kg
(total precipitation)	9.5 m ³ /yr
Average Annual TSS Loading:	8,820 kg
(precipitation during ice-free period)	7.2 m ³ /yr

Target 80% TSS Removal:	
Max:	12.6 m ³ /yr
Min:	5.7 m ³ /yr

Sediment Accumulation:	
10yrs	126 m ³

SWM Facility - Outlet Calculations

Orifice (Extended Detention) Allowable = 3.00 L/s (max) *25mm allowable

C	0.62
Dia	55.00 mm
Area	0.0024 m ²
Invert	79.50 m
C/L	79.53 m

For Elevation = 079.75 m

$$Q_{\text{orifice}} = C \times A \times (2 \times g \times H)^{(1/2)}$$

$$Q_{\text{orifice}} = 1000 \text{ L/m}^3 \times 0.62 \times 0.0024 \text{ m}^2 \times (2 \times 9.81 \times (79.75 \text{ m} - 79.53 \text{ m}))^{(1/2)}$$

$$Q_{\text{orifice}} = 3.08 \text{ L/s}$$

Second Orifice

C	0.62
Dia	100.00 mm
Area	0.0079 m ²
Invert	80.40 m
C/L	80.45 m

For Elevation = 81.50 m

$$Q_{\text{orifice}} = C \times A \times (2 \times g \times H)^{(1/2)}$$

$$Q_{\text{orifice}} = 1000 \text{ L/m}^3 \times 0.62 \times 0.0079 \text{ m}^2 \times (2 \times 9.81 \times (81.50 \text{ m} - 80.45 \text{ m}))^{(1/2)}$$

$$Q_{\text{orifice}} = 22.10 \text{ L/s}$$

Triangular Weir

$$Q (\text{m}^3/\text{s}) = C_{ws} \times \tan(\theta/2) \times H^{(5/2)}$$

Side Weir Coefficient (C _{ws})	1.45	(ranges from 1.35 to 1.55)
Angle (θ - degrees)	40.0	
Bottom Width (L - m)	0.0	
Bottom of Weir Elevation (m)	81.20	

Water Level Elevation	Flow Rate Over Weir	
(m)	(m ³ /s)	(L/s)
81.20	0.000	0.0
81.30	0.002	1.7
81.40	0.009	9.4
81.50	0.026	26.0
81.60	0.053	53.4
81.70	0.093	93.3
81.80	0.147	147.2

SWM Facility - Stage-Storage

Stage	Elevation (m)	Area m ²	Volume		Outflow		
			Stage m ³	Total m ³	Orifice l/s	Weir l/s	Total l/s
Permanent Pool				1990.5			
Pond Bottom	78.50	1494	0	0			
Permanent Pool	79.50	2487	1991	1991	0	0	0
Extended Detention	79.75	4719	901	2891	3	0	3
	80.00	5150	1234	4125	4	0	4
2-year	80.50	6042	2798	6923	11	0	11
5-year	80.80	6596	1896	8819	20	0	20
	81.00	6973	1357	10175	24	0	24
100yr	81.50	7944	3729	13905	31	26	57
	81.80	11913	2979	16883	35	147	182

Required Storage Volume Check		
Storm Event	Active Volume (m ³)	Total Volume (m ³)
25mm	2,400	5,022
2-year	3,980	6,602
5-year	5,600	8,222
100-year	10,030	12,652

Allowable Outlet Flow	
Storm Event	Flow (L/s)
25mm	3.0
2-year	16.0
5-year	32.0
100-year	84.0

KNCDP SWM FACILITY DESIGN - Pond 2A

Required storage Volumes (Quality)

Drainage Area	17.6	ha
% Impervious:	41%	
<i>Enhanced protection (80% TSS removal):</i>		
<i>Treatment Volume</i>	149	m3/ha
<i>Extended Detention Storage:</i>	40	m3/ha required
	704	m3 required
	842	m3 provided
	47.9	m3/ha provided
<i>Perm Pool:</i>	109	m3/ha required
	1,918	m3 required
	2,106	m3 provided
	119.7	m3/ha provided
<i>Extended Detention:</i>	19.50	L/s average
	48.75	L/s max (2.5 x avg)
(% impervious was calculated as the average imperviousness for the drainage areas tributary to the SWM facility)		

Required Forebay Length and width

Parameters:

Length to width ratio of forebay, r =	6.0:1
Peak outflow rate during 25 mm storm, C	0.030 m ³ /s (24hr ext. det)
Target particle size =	150 mm
Settling velocity, V_s =	0.0003 m/s

Forebay Settling Length, Dist

$$Dist = \sqrt{\frac{rQ_p}{V_s}}$$

$$= 24 \text{ m}$$

Check Dispersion Length, Dist₂

Desired velocity in forebay, V_f =	0.4 m/s
Inlet flow rate, Q_{10yr} =	2.205 m ³ /s
Depth in forebay, d =	1.0 m

$$Dist_2 = \frac{8Q}{dV_f}$$

$$= 44 \text{ m}$$

Therefore, the dispersion length of 44 m governs the design.

Required Length	= 44 m
Provided Length	= 68 m

Minimum Forebay width:

Length of Forebay, L =	44 m
Minimum width, W =	$L/6$
W =	7.4 m

Required Width	= 7.4 m
Provided Width	= 8.0 m

KNCDP
SWM FACILITY DESIGN - Pond 2A

Sediment Loading Estimate

Table 6.3 - MOE SWM Planning & Design Manual

Catchment Imperviousness	Annual Loading (kg/ha)	Wet Density (kg/m ³)	Annual Loading (m ³ /ha)
	50	1,230	0.05
35%	770	1,230	0.6
55%	2,300	1,230	1.9
70%	3,495	1,230	2.8
85%	4,680	1,230	3.8

Catchment Area:	17.60 ha
% Impervious:	41%
Annual Sediment Loading:	1,229 kg/ha/yr 1.00 m ³ /ha/yr 17.6 m ³ /yr

Sediment Removal Efficiency:	70% 12.31 m ³ /yr
------------------------------	---------------------------------

Sediment Accumulation:	
10yrs	123 m ³

Forebay Volume:	804 m ³
@ depth:	0.80 m

(Depth to top of Forebay Berm)

City of Ottawa-average precipitation and TSS data

Drainage Area:	17.6 ha
Runoff Coefficient:	0.49
Estimate Influent TSS Level (max): (Long-term average):	250 mg/L 150 mg/L
Sediment Density:	1,230 kg/m ³
Total Annual Precipitation:	907 mm
Total Annual Rain (Ice Free Period):	686 mm
Total Annual Runoff:	77,741 m ³
Runoff during Ice-free period:	58,798 m ³
Max Annual TSS Loading: (total precipitation)	19,435 kg 15.8 m ³ /yr
Max Annual TSS Loading: (precipitation during ice-free period)	14,700 kg 12.0 m ³ /yr
Average Annual TSS Loading: (total precipitation)	11,661 kg 9.5 m ³ /yr
Average Annual TSS Loading: (precipitation during ice-free period)	8,820 kg 7.2 m ³ /yr

Target 0% TSS Removal:	
Max:	12.6 m ³ /yr
Min:	5.7 m ³ /yr

Sediment Accumulation:	
10yrs	126 m ³

SWM Facility - Outlet Calculations

Orifice (Extended Detention) Allowable = 3.00 L/s (max) *25mm allowable

C	0.62
Dia	55.00 mm
Area	0.0024 m ²
Invert	79.50 m
C/L	79.53 m

For Elevation = 79.75 m

$$Q_{\text{orifice}} = C \times A \times (2 \times g \times H)^{(1/2)}$$

$$Q_{\text{orifice}} = 1000 \text{ L/m}^3 \times 0.62 \times 0.0024 \text{ m}^2 \times (2 \times 9.81 \times (79.75 \text{ m} - 79.53 \text{ m}))^{(1/2)}$$

$$Q_{\text{orifice}} = 3.08 \text{ L/s}$$

Second Orifice

C	0.62
Dia	100.00 mm
Area	0.0079 m ²
Invert	80.40 m
C/L	80.45 m

For Elevation = 81.50 m

$$Q_{\text{orifice}} = C \times A \times (2 \times g \times H)^{(1/2)}$$

$$Q_{\text{orifice}} = 1000 \text{ L/m}^3 \times 0.62 \times 0.0079 \text{ m}^2 \times (2 \times 9.81 \times (81.50 \text{ m} - 80.45 \text{ m}))^{(1/2)}$$

$$Q_{\text{orifice}} = 22.10 \text{ L/s}$$

Triangular Weir

$$Q (\text{m}^3/\text{s}) = C_{ws} \times \tan(\theta/2) \times H^{(5/2)}$$

Side Weir Coefficient (C_{ws})	1.45	(ranges from 1.35 to 1.55)
Angle (θ - degrees)	40.0	
Bottom Width (L - m)	0.0	
Bottom of Weir Elevation (m)	81.20	

Water Level Elevation	Flow Rate Over Weir	
(m)	(m ³ /s)	(L/s)
81.20	0.000	0.0
81.30	0.002	1.7
81.40	0.009	9.4
81.50	0.026	26.0
81.60	0.053	53.4
81.70	0.093	93.3
81.80	0.147	147.2

SWM Facility - Stage-Storage

Stage	Elevation (m)	Area m ²	Volume		Outflow		
			Stage m ³	Total m ³	Orifice l/s	Weir l/s	Total l/s
Permanent Pool				2106.0			
Pond Bottom	78.50	1568	0	0			
Permanent Pool	79.50	2644	2106	2106	0	0	0
Extended Detention	79.75	4095	842	2948	3	0	3
	80.00	4586	1085	4034	4	0	4
	80.50	6367	2738	6772	11	0	11
2-year	80.55	6447	320	7092	13	0	13
5-year	80.85	6936	2007	9100	21	0	21
	81.00	7185	1059	10159	24	0	24
100yr	81.50	8043	3807	13966	31	26	57
	81.80	11805	2977	16943	35	147	182

Required Storage Volume Check		
Storm Event	Active Volume (m ³)	Total Volume (m ³)
25mm	2,400	5,022
2-year	3,980	6,602
5-year	5,600	8,222
100-year	10,030	12,652

Allowable Outlet Flow	
Storm Event	Flow (L/s)
25mm	3.0
2-year	16.0
5-year	31.0
100-year	84.0

KNCDP
SWM FACILITY DESIGN - Pond 3
(Metcalf)

Required storage Volumes (Quality)

Drainage Area	95.6	ha
% Impervious:	70%	
<i>Enhanced protection (80% TSS removal):</i>		
<i>Treatment Volume</i>	225.0	m3/ha
<i>Extended Detention Storage:</i>	40	m3/ha required
	3,824	m3 required
	7,585	m3 provided
	79.3	m3/ha provided
<i>Perm Pool:</i>	185.0	m3/ha required
	17,688	m3 required
	17,914	m3 provided
	187.4	m3/ha provided
<i>Extended Detention:</i>	175.58	L/s average
	438.95	L/s max (2.5 x avg)
(% impervious was calculated as the average imperviousness for the drainage areas tributary to the SWM facility)		

KNCDP
SWM FACILITY DESIGN - Pond 3
(Metcalf)

Required Forebay Length and width - Valecraft Forebay

Parameters:

Length to width ratio of forebay, $r = 9.0:1$
 Peak outflow rate during 25 mm storm, $Q_p = 0.580 \text{ m}^3/\text{s}$ (24hr ext. det)
 Target particle size = 150 mm
 Settling velocity, $V_s = 0.0003 \text{ m/s}$

Forebay Settling Length, Dist

$$Dist = \sqrt{\frac{rQ_p}{V_s}}$$

= 132 m

Check Dispersion Length, Dist₂

Desired velocity in forebay, $V_f = 0.4 \text{ m/s}$
 Inlet flow rate, $Q_{25\text{mm}} = 3.061 \text{ m}^3/\text{s}$
 Depth in forebay, $d = 1.0 \text{ m}$

$$Dist_2 = \frac{8Q}{dV_f}$$

= 61 m

Therefore, the settling length of 132 m governs the design.

Required Length	= 132 m
Provided Length	= 110 m

Minimum Forebay width:

Length of Forebay, $L = 132 \text{ m}$
 Minimum width, $W = L/9$
 $W = 14.7 \text{ m}$

Required Width	= 14.7 m
Provided Width	= 15.0 m

Required Forebay Length and width - Metcalfe Forebay

Parameters:

Length to width ratio of forebay, $r = 9.0:1$
 Peak outflow rate during 25 mm storm, $Q_p = 0.580 \text{ m}^3/\text{s}$ (24hr ext. det)
 Target particle size = 150 mm
 Settling velocity, $V_s = 0.0003 \text{ m/s}$

Forebay Settling Length, Dist

$$Dist = \sqrt{\frac{rQ_p}{V_s}}$$

= 132 m

Check Dispersion Length, Dist₂

Desired velocity in forebay, $V_f = 0.4 \text{ m/s}$
 Inlet flow rate, $Q_{25\text{mm}} = 3.988 \text{ m}^3/\text{s}$
 Depth in forebay, $d = 1.0 \text{ m}$

$$Dist_2 = \frac{8Q}{dV_f}$$

= 80 m

Therefore, the settling length of 132 m governs the design.

Required Length	= 132 m
Provided Length	= 95 m

Minimum Forebay width:

Length of Forebay, $L = 132 \text{ m}$
 Minimum width, $W = L/9$
 $W = 14.7 \text{ m}$

Required Width	= 14.7 m
Provided Width	= 15.0 m

KNCDP
SWM FACILITY DESIGN - Pond 3
(Metcalf)

Sediment Loading Estimate - Valecraft Forebay

Table 6.3 - MOE SWM Planning & Design Manual

Catchment Imperviousness	Annual Loading (kg/ha)	Wet Density (kg/m ³)	Annual Loading (m ³ /ha)
	50	1,230	0.05
35%	770	1,230	0.6
55%	2,300	1,230	1.9
70%	3,495	1,230	2.8
85%	4,680	1,230	3.8

Catchment Area:	43.00 ha
% Impervious:	70%
Annual Sediment Loading:	3,432 kg/ha/yr
	2.79 m ³ /ha/yr
	120.0 m ³ /yr

Sediment Removal Efficiency:	80%
	95.99 m ³ /yr

Sediment Accumulation:	
10yrs	960 m ³

Forebay Volume:	1126 m ³
@ depth:	0.80 m

(Depth to top of Forebay Berm)

City of Ottawa-average precipitation and TSS data

Drainage Area:	43.0 ha
Runoff Coefficient:	0.69
Estimate Influent TSS Level (max):	250 mg/L
(Long-term average):	150 mg/L
Sediment Density:	1,230 kg/m ³
Total Annual Precipitation:	907 mm
Total Annual Rain (Ice Free Period):	686 mm
Total Annual Runoff:	268,561 m ³
Runoff during Ice-free period:	203,123 m ³
Max Annual TSS Loading:	67,140 kg
(total precipitation)	54.6 m ³ /yr
Max Annual TSS Loading:	50,781 kg
(precipitation during ice-free period)	41.3 m ³ /yr
Average Annual TSS Loading:	40,284 kg
(total precipitation)	32.8 m ³ /yr
Average Annual TSS Loading:	30,468 kg
(precipitation during ice-free period)	24.8 m ³ /yr

Target 80% TSS Removal:	
Max:	43.7 m ³ /yr
Min:	19.8 m ³ /yr

Sediment Accumulation:	
10yrs	437 m ³

**KNCDP
SWM FACILITY DESIGN - Pond 3
(Metcalf)**

Sediment Loading Estimate - Metcalfe Forebay

Table 6.3 - MOE SWM Planning & Design Manual

Catchment Imperviousness	Annual Loading (kg/ha)	Wet Density (kg/m ³)	Annual Loading (m ³ /ha)
	50	1,230	0.05
35%	770	1,230	0.6
55%	2,300	1,230	1.9
70%	3,495	1,230	2.8
85%	4,680	1,230	3.8

Catchment Area:	52.61 ha
% Impervious:	72%
Annual Sediment Loading:	3,601 kg/ha/yr
	2.93 m ³ /ha/yr
	154.0 m ³ /yr

Sediment Removal Efficiency:	80%
	123.20 m ³ /yr

Sediment Accumulation:	
10yrs	1232 m ³

Forebay Volume:	1624 m ³
@ depth:	0.80 m

(Depth to top of Forebay Berm)

City of Ottawa-average precipitation and TSS data

Drainage Area:	52.6 ha
Runoff Coefficient:	0.70
Estimate Influent TSS Level (max):	250 mg/L
(Long-term average):	150 mg/L
Sediment Density:	1,230 kg/m ³
Total Annual Precipitation:	907 mm
Total Annual Rain (Ice Free Period):	686 mm
Total Annual Runoff:	335,930 m ³
Runoff during Ice-free period:	254,077 m ³
Max Annual TSS Loading:	83,982 kg
(total precipitation)	68.3 m ³ /yr
Max Annual TSS Loading:	63,519 kg
(precipitation during ice-free period)	51.6 m ³ /yr
Average Annual TSS Loading:	50,389 kg
(total precipitation)	41.0 m ³ /yr
Average Annual TSS Loading:	38,112 kg
(precipitation during ice-free period)	31.0 m ³ /yr

Target 80% TSS Removal:	
Max:	54.6 m ³ /yr
Min:	24.8 m ³ /yr

Sediment Accumulation:	
10yrs	546 m ³

SWM Facility - Outlet Calculations

Orifice (Extended Detention) Allowable = 58.00 L/s (max) *25mm allowable

C	0.62
Dia	280.00 mm
Area	0.0616 m ²
Invert	65.50 m
C/L	65.64 m

For Elevation = 66.75 m

$$Q_{\text{orifice}} = C \times A \times (2 \times g \times H)^{(1/2)}$$

$$Q_{\text{orifice}} = 1000 \text{ L/m}^3 \times 0.62 \times 0.0616 \text{ m}^2 \times (2 \times 9.81 \times (66.75 \text{ m} - 65.64 \text{ m}))^{(1/2)}$$

$$Q_{\text{orifice}} = 178.16 \text{ L/s}$$

Second Orifice

C	0.62
Dia	330.00 mm
Area	0.0855 m ²
Invert	65.95 m
C/L	66.12 m

For Elevation = 67.00 m

$$Q_{\text{orifice}} = C \times A \times (2 \times g \times H)^{(1/2)}$$

$$Q_{\text{orifice}} = 1000 \text{ L/m}^3 \times 0.62 \times 0.0855 \text{ m}^2 \times (2 \times 9.81 \times (67.00 \text{ m} - 66.12 \text{ m}))^{(1/2)}$$

$$Q_{\text{orifice}} = 220.97 \text{ L/s}$$

Trapezoidal Weir

$$Q (\text{m}^3/\text{s}) = C_w \times L \times H^{(3/2)} + C_{ws} \times \tan(\theta/2) \times H^{(5/2)}$$

Weir Coefficeint (C_w)	2.60	(ranges from 2.40 - 2.80)
Side Weir Coefficeint (C_{ws})	1.45	(ranges from 1.35 to 1.55)
Angle (θ - degrees)	45.0	
Bottom Width (L - m)	0.20	
Bottom of Weir Elevation (m)	66.25	

Water Level Elevation	Flow Rate Over Weir	
(m)	(m³/s)	(L/s)
66.25	0.000	0.0
66.50	0.084	83.8
66.60	0.151	151.2
66.70	0.239	238.6
66.80	0.347	346.8
66.90	0.477	477.1
67.00	0.630	630.3
67.10	0.808	807.6
67.20	1.010	1009.8
67.30	1.238	1238.0

**KNCDP
SWM FACILITY DESIGN - Pond 3
(Metcalf)**

SWM Facility - Stage-Storage

Stage	Elevation (m)	Area m ²	Volume		Outflow		
			Stage m ³	Total m ³	Orifice l/s	Weir l/s	Total l/s
Permanent Pool				17914			
Pond Bottom	64.50	15877	0	0			
Permanent Pool	65.50	19950	17914	17914	0	0	0
Extended Detention	65.75	40731	7585	25499	56	0	56
	66.00	43301	10504	36003	101	0	101
2-year	66.25	44667	10996	46999	218	0	218
5-year	66.50	49024	11711	58710	303	84	386
100-year	67.00	51275	25075	83785	418	630	1049
	67.30	52645	15588	99373	474	1238	1712

Required Storage Volume Check		
Storm Event	Active Volume (m ³)	Total Volume (m ³)
25mm	16,100	37,612
2-year	25,150	46,662
5-year	34,880	56,392
100-year	61,150	82,662

Allowable Outlet Flow	
Storm Event	Flow (L/s)
25mm	58.0
2-year	220.0
5-year	402.0
100-year	1045.0

Kanata North Urban Community Design Plan - EMP

Overland Flow Path to Pond 2 Capacity Calculations

Location : Overland flow to Pond 2

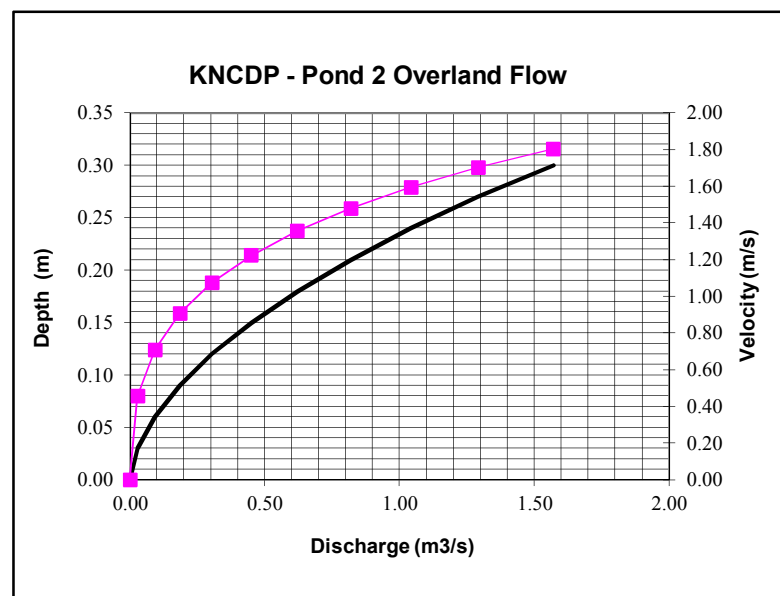
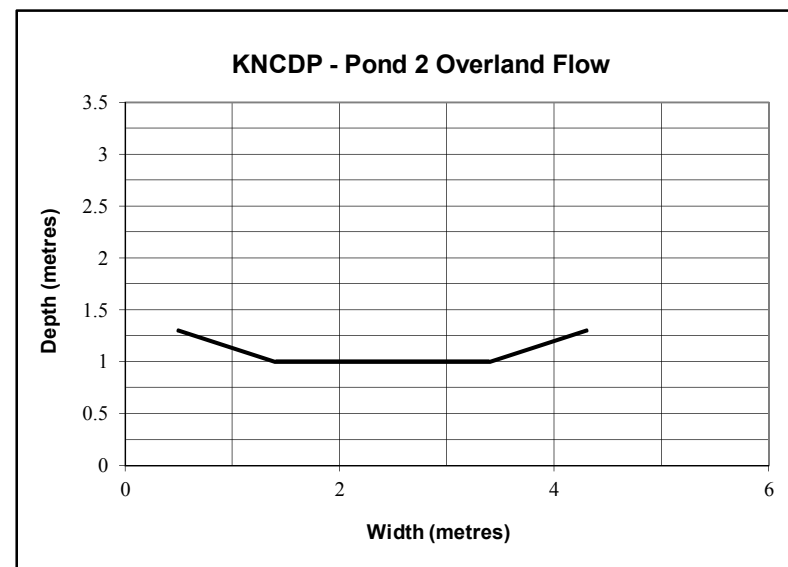
Description: Grassed Swale

Dimensions: Bottom width = 2.00 m
Right Side slopes = 3.0 :1
Left Side slopes = 3.0 :1

Slope = 1.50%
Mannings n = 0.025
Maximum depth = 0.30 m

Overland flow rate to Pond 2 is approximately 1.0 cms

Depth (m)	Area (m ²)	Hydraulic Radius (m)	Velocity (m/s)	Flow (m ³ /s)
0.00	0.00	0.00	0.00	0.00
0.03	0.06	0.03	0.46	0.03
0.06	0.13	0.05	0.71	0.09
0.09	0.20	0.08	0.91	0.19
0.12	0.28	0.10	1.08	0.30
0.15	0.37	0.12	1.22	0.45
0.18	0.46	0.15	1.36	0.62
0.21	0.55	0.17	1.48	0.82
0.24	0.65	0.19	1.60	1.04
0.27	0.76	0.20	1.70	1.29
0.30	0.87	0.22	1.80	1.57

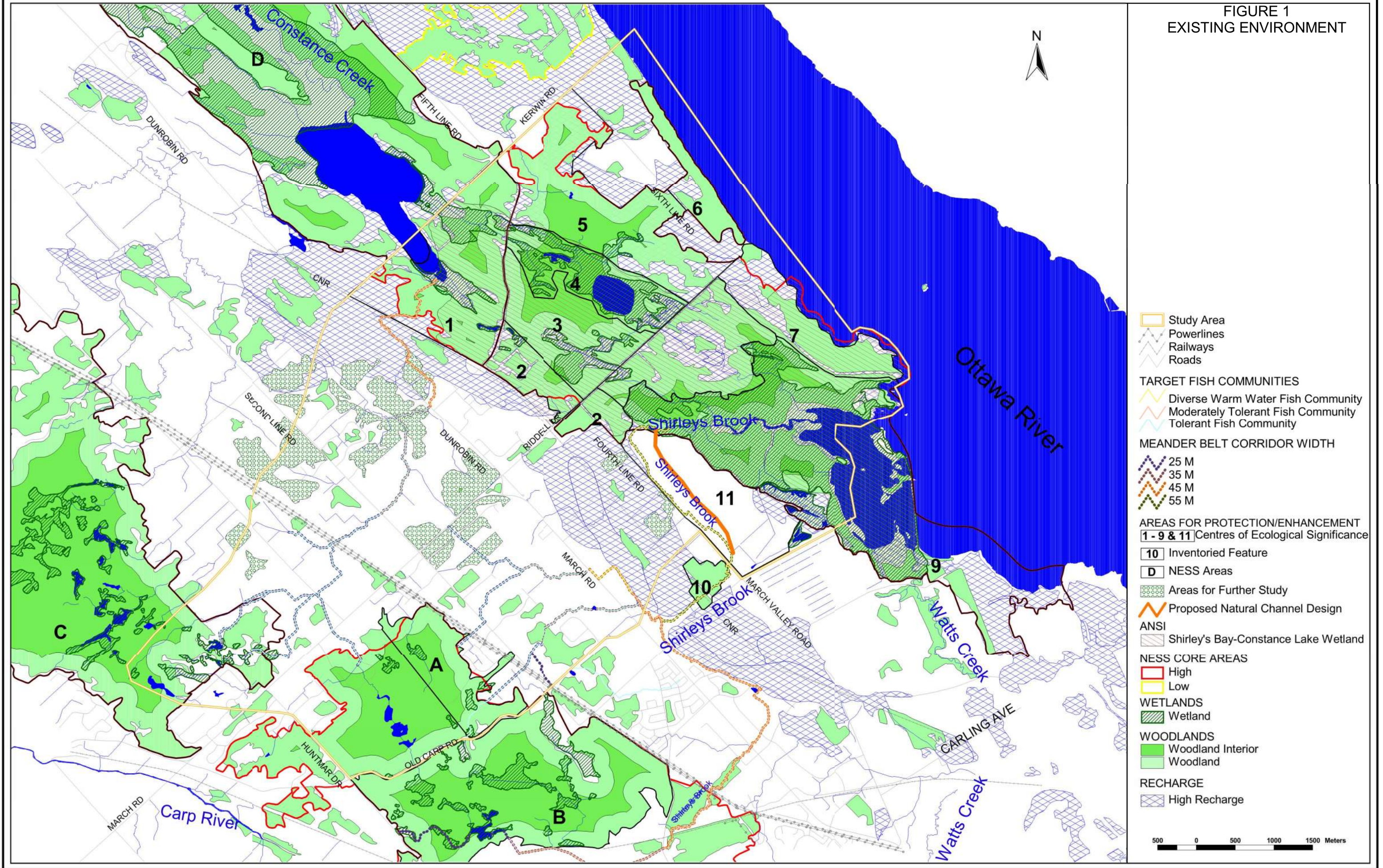


Appendix G

Water Balance Calculations

SHIRLEYS BROOK ENVIRONMENTAL MANAGEMENT PLAN

FIGURE 1
EXISTING ENVIRONMENT



SOIL SURVEY REPORT No. 58

Number of publications	Frequency
0	15
1	10
2	5
3	2
4	1
Total	33

[illegible][illegible][illegible][illegible]

SOIL ASSIGNMENT OR LAND TYPE	SOIL MATERIAL AND TYPE DESCRIPTION	MAIN BARRIER TECHNIQUE	SOIL LANDSCAPE USER DESCRIPTION			
			SOIL LANDSCAPE OR LAND TYPE USE	DORMANT (1-4)	SEMI-ACTIVE (5-6)	ACTIVE OR RECREATION
Barrenland	<p>Activities that require the use of the land are limited to the use of the land for</p> <p>Exposure of the surface of the land for</p>	<p>For the purpose of the land use</p>	<p>Barrenland</p>	<p>Barrenland</p>	<p>Barrenland</p>	<p>Barrenland</p>
DR. 7. LAND TYPE	Medium strength soil and forest of low strength	<p>For the purpose of the land use</p>	<p>For the purpose of the land use</p>	<p>For the purpose of the land use</p>	<p>For the purpose of the land use</p>	<p>For the purpose of the land use</p>
UPLAND	Medium strength soil and forest of low strength	<p>For the purpose of the land use</p>	<p>For the purpose of the land use</p>	<p>For the purpose of the land use</p>	<p>For the purpose of the land use</p>	<p>For the purpose of the land use</p>
Swampland	<p>Swampland is a wetland with water and soil</p>	<p>For the purpose of the land use</p>	<p>For the purpose of the land use</p>	<p>For the purpose of the land use</p>	<p>For the purpose of the land use</p>	<p>For the purpose of the land use</p>

Water Balance Model Description

The Thornthwaite-Mather (1957) water balance models are conceptual models that are used to simulate steady-state climatic averages or continuous values of precipitation (rain + snow), snowpack, snowmelt, soil moisture, evapotranspiration, and water surplus (infiltration + runoff) (refer to **Figure 1**). Input parameters consist of daily precipitation (*PRECIP*), temperature (*MAX / MIN TEMP*), potential evapotranspiration (*PET*), and the available water content (*AWC*) that can also be referred to as the water holding capacity of the soil. All water quantities in the model are based on monthly calculations and are represented as depths (volume per unit area) of liquid water over the area being simulated. *All model units are in millimetres (mm).*

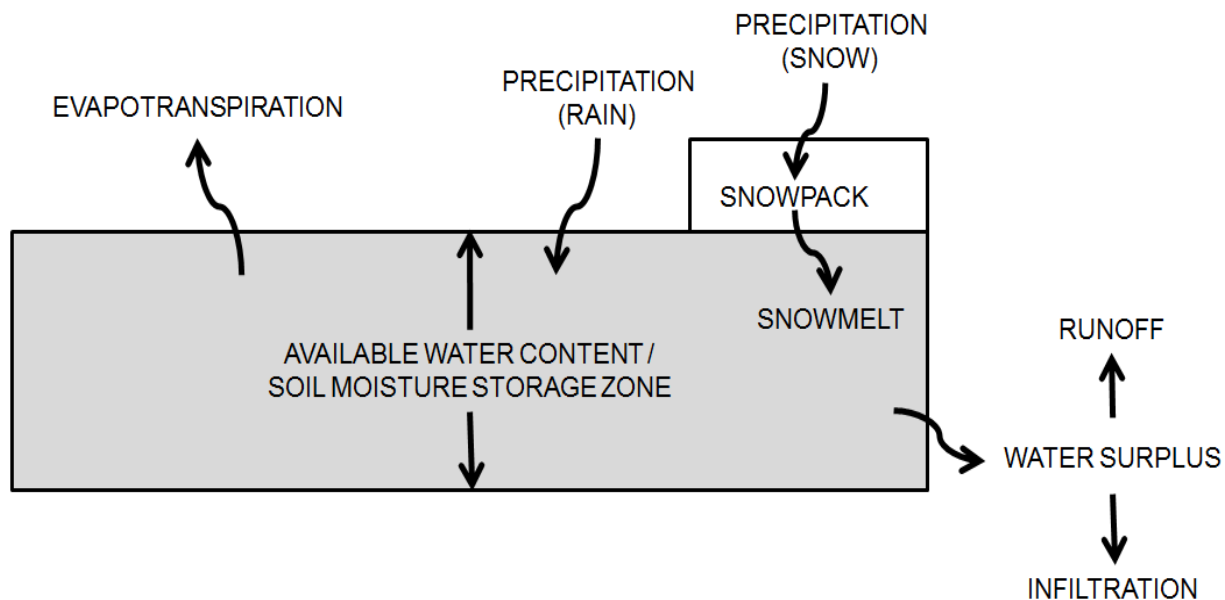


Figure 1: Conceptual Water Balance Model

Available Water Content (Water Holding Capacity)

The available water content (AWC) or water holding capacity of the soil was taken from Table 3.1 from the *Stormwater Management and Planning Manual (MOE, 2003)*, which has been reproduced in **Table 1** below. The available water content is the soil-moisture storage zone or the zone between the field capacity and vertical extent of the root zone.

Table 1: Water Holding Capacity Values (MOE, 2003)

Land Use / Soil Type	Hydrologic Soil Group	Water Holding Capacity (mm)
Urban Lawns / Shallow Rooted Crops (spinach, beans, beets, carrots)		
Fine Sand	A	50
Fine Sandy Loam	B	75
Silt Loam	C	125
Clay Loam	CD	100
Clay	D	75

Water Balance Model Description

Land Use / Soil Type	Hydrologic Soil Group	Water Holding Capacity (mm)
Moderately Rooted Crops (corn and cereal grains)		
Fine Sand	A	75
Fine Sandy Loam	B	150
Silt Loam	C	200
Clay Loam	CD	200
Clay	D	150
Pasture and Shrubs		
Fine Sand	A	100
Fine Sandy Loam	B	150
Silt Loam	C	250
Clay Loam	CD	250
Clay	D	200
Mature Forests		
Fine Sand	A	250
Fine Sandy Loam	B	300
Silt Loam	C	400
Clay Loam	CD	400
Clay	D	350

Precipitation

Daily precipitation (*PRECIP*) values consist of the total daily rainfall and water equivalent of snowmelt that fell on that day. Based on the mean daily temperature (*MEAN TEMP*) precipitation falls either as rainfall (*RAIN*) or the water equivalent of snowfall (*SNOW*):

- *RAIN*: If (*MEAN TEMP* \geq 0, *RAIN*, *SNOW*)
- *SNOW*: If (*MEAN TEMP* < 0, *SNOW*, *RAIN*)

Snowmelt / Snowpack / Water Input

Snowmelt (*MELT*) occurs if there is available snow (water equivalent) in the snowpack (*SNOWPACK*) and the maximum daily temperature (*MAX TEMP*) is greater than 0. The available snowmelt is limited to the available water in the snowpack.

Snowmelt is computed by a degree-day equation (Haith, 1985):

$$SNOWMELT \text{ (cm/d)} = MELT \text{ COEFFICIENT} \times [AIR \text{ TEMP (}^{\circ}C) - MELT \text{ TEMP (}^{\circ}C)]$$

The melt coefficient is typically 0.45 for northern climates (Haith, 1985). The melt temperature is assumed to be 0°C. The air temperature is assumed to be the max temperature multiplied by a ratio of the max to min temperatures:

$$AIR \text{ TEMP} = MAX \text{ TEMP} / (MAX \text{ TEMP} - MIN \text{ TEMP})$$

Water Balance Model Description

Therefore the snowmelt equation is:

- *MELT: If (MAX TEMP > 0, IF(SNOWPACK > 0, MIN((MAX TEMP*0.45*MAX TEMP/(MAX TEMP – MIN TEMP)*10mm/cm), SNOWPACK), 0), 0)*

Snow accumulates in the snowpack from the previous day if precipitation falls as snow and there is no snowmelt or the amount of snow that falls in a day exceeds the daily snowmelt:

$$\text{SNOWPACK}_N = \text{SNOWPACK}_{N-1} + \text{SNOW} - \text{MELT}$$

The initial snowmelt on day 1 (i.e. January 1) is assumed to be 0. The initial snowpack on day 1 is assumed to be the snowpack on the last day of simulation (i.e. December 31).

The total water input (W) is rain + snowmelt. This is the available water that fills the soil moisture storage zone each day.

Evaporation

Measured potential evaporation (PE) data (i.e. lake evaporation) is provided with the Environment Canada Climate Normals (see example below). The data represents daily averages for each month over a 20+ year period.

▼ Evaporation

<u>Evaporation</u>													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Lake Evaporation (mm)	0	0	0	0	3,6	4,3	4,5	3,7	2,4	1,4	0	0	0
													C

The daily evaporation data was assumed to represent the middle or 15th of each month and 'smoothed' to represent the transition from month to month (see **Figure 2** below). As shown in **Figure 2** this produces a more realistic curve of potential evapotranspiration.

Water Balance Model Description

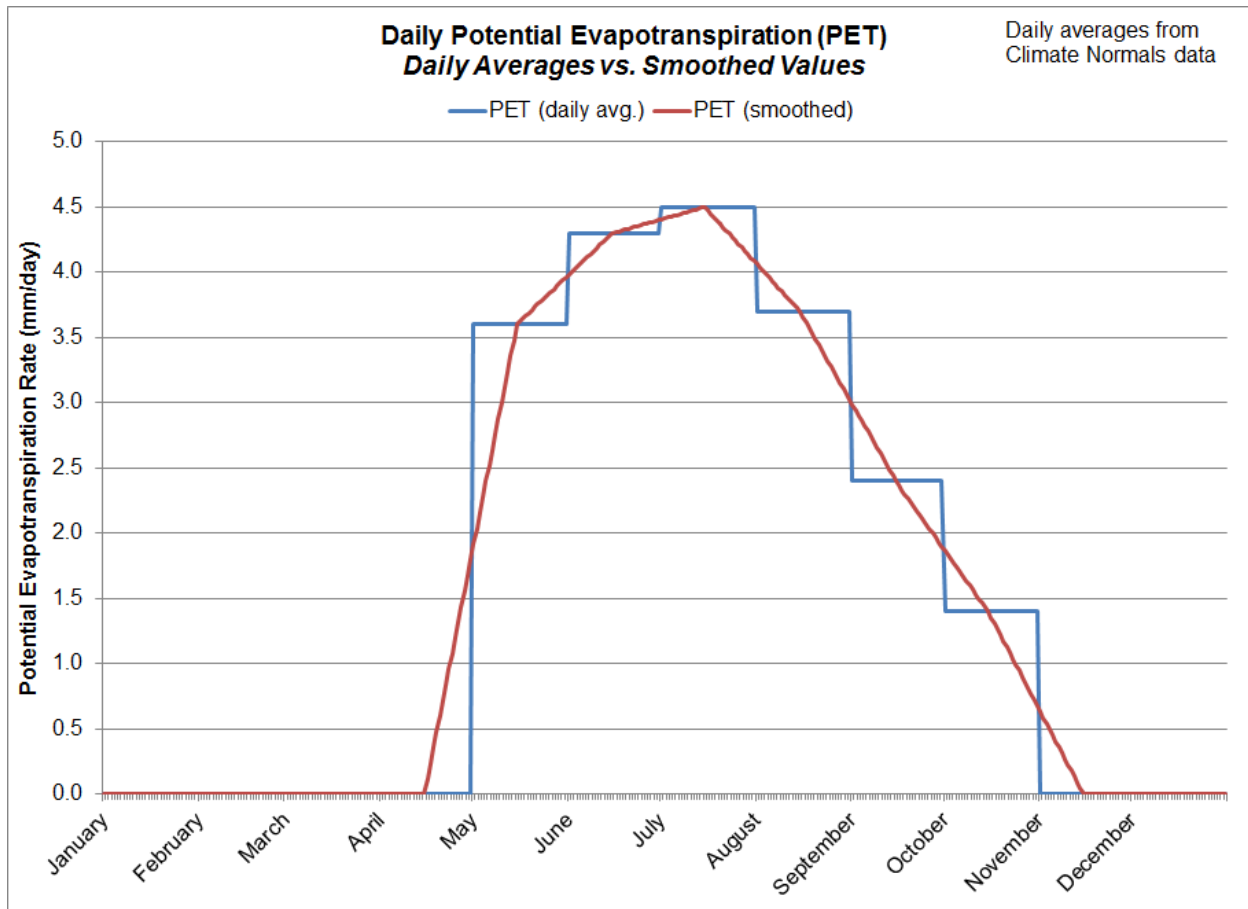


Figure 2: Daily Potential Evapotranspiration Rates (Daily Averages vs. Smoothed Values)

Potential Evapotranspiration

To convert potential evaporation data to potential crop evapotranspiration (PET) data a cover coefficient is applied based on land use and growing / dormant seasons:

$$PET = PE \times \text{Crop Cover Coefficient}$$

Crop cover coefficients are based on the crop growth stages for different crop types (see **Figure 3**). A typical crop coefficient curve is shown in **Figure 4**, which depicts a crop that provides transpiration above the potential evaporation rates during the growing season.

Water Balance Model Description

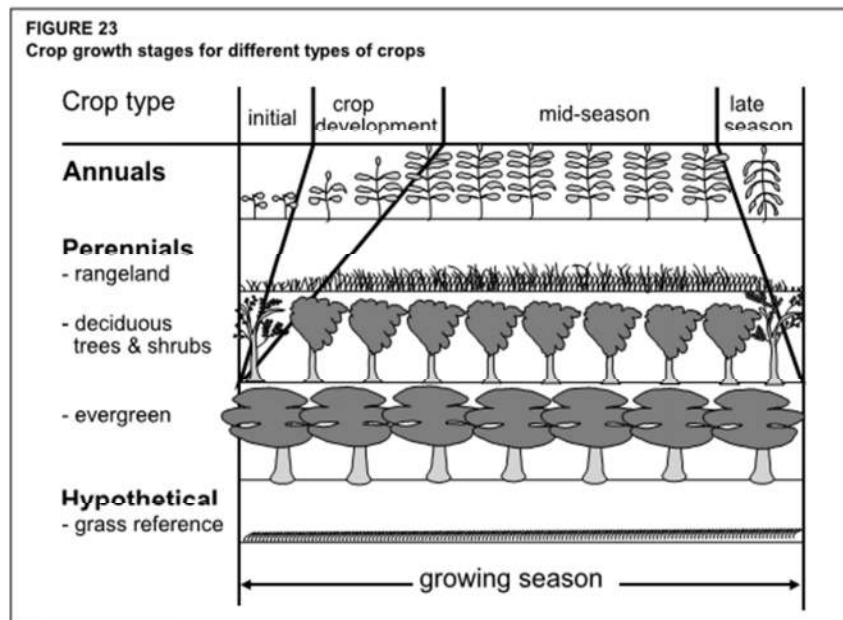


Figure 3: Crop Growth Stages for Different Types of Crops

Source: Food and Agriculture Organization of the United Nations (FAO), 1998, *Crop Evapotranspiration - Guidelines for Computing Crop Water Requirements*. FAO Irrigation and Drainage paper 56.

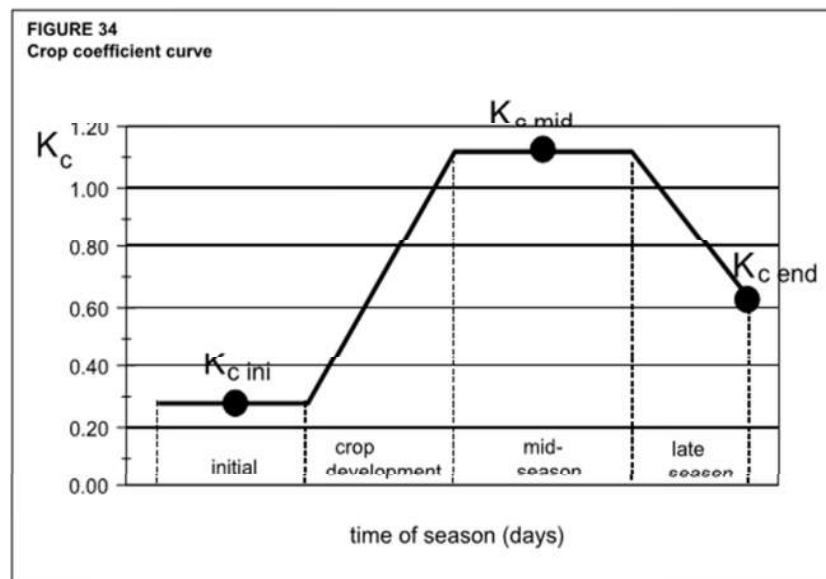


Figure 4: Crop Coefficient Curve

Source: Food and Agriculture Organization of the United Nations (FAO), 1998, *Crop Evapotranspiration - Guidelines for Computing Crop Water Requirements*. FAO Irrigation and Drainage paper 56.

Water Balance Model Description

The crop cover coefficients used in the water budget model for the various land use types is shown in **Table 2**. The growing / dormant seasons are shown in **Table 3**. The crop cover coefficients for the initial growing season are based on the average value of the dormant and middle of the growing season.

Table 2: Crop Cover Coefficients

Land Use	Dormant Season	Initial Growing Season	Middle of Growing Season	End of Growing Season
Urban Lawns / Shallow Rooted Crops	0.40	0.78	1.15	0.55
Moderately Rooted Crops	0.30	0.73	1.15	0.40
Pasture and Shrubs	0.40	0.68	0.95	0.90
Mature Forest	0.3	0.75	1.20	0.30
Impervious Areas	1.00	1.00	1.00	1.00

Reference: Data is based on Table 12 from the Food and Agriculture Organization of the United Nations (FAO), 1998, Crop Evapotranspiration - Guidelines for Computing Crop Water Requirements. FAO Irrigation and Drainage paper 56.

Table 3: Crop Growing Season

Month(s)	Crop Growing Season
January – April	Dormant Season
May	Initial Growing Season
June - August	Middle of Growing Season
September	End of Growing Season
October - December	Dormant Season (harvest in October)

Reference: Food and Agriculture Organization of the United Nations (FAO), 1977, Crop Water Requirements. FAO Irrigation and Drainage paper 24.

Actual Evapotranspiration

Following Alley (1984), if the monthly water input (i.e. rain + snowmelt) is greater than the potential evapotranspiration (PET) rate, the actual evapotranspiration (AET) rate takes place at the potential evapotranspiration rate:

$$\text{IF } W > PET, \text{ then } AET = PET$$

If the monthly water input is less than the potential evapotranspiration rate (i.e. $W < PET$) then the actual evapotranspiration rate is the sum of the water input and an increment removed from the available water in the soil moisture storage zone (SOIL WATER):

$$\text{IF } W < PET, \text{ then } AET = W + \Delta \text{SOIL WATER}$$

Water Balance Model Description

$$WHERE: \Delta SOIL\ WATER = SOIL\ WATER_{N-1} - SOIL\ WATER_N$$

Figure 5 shows a comparison of the average monthly potential evapotranspiration and actual evapotranspiration rates.

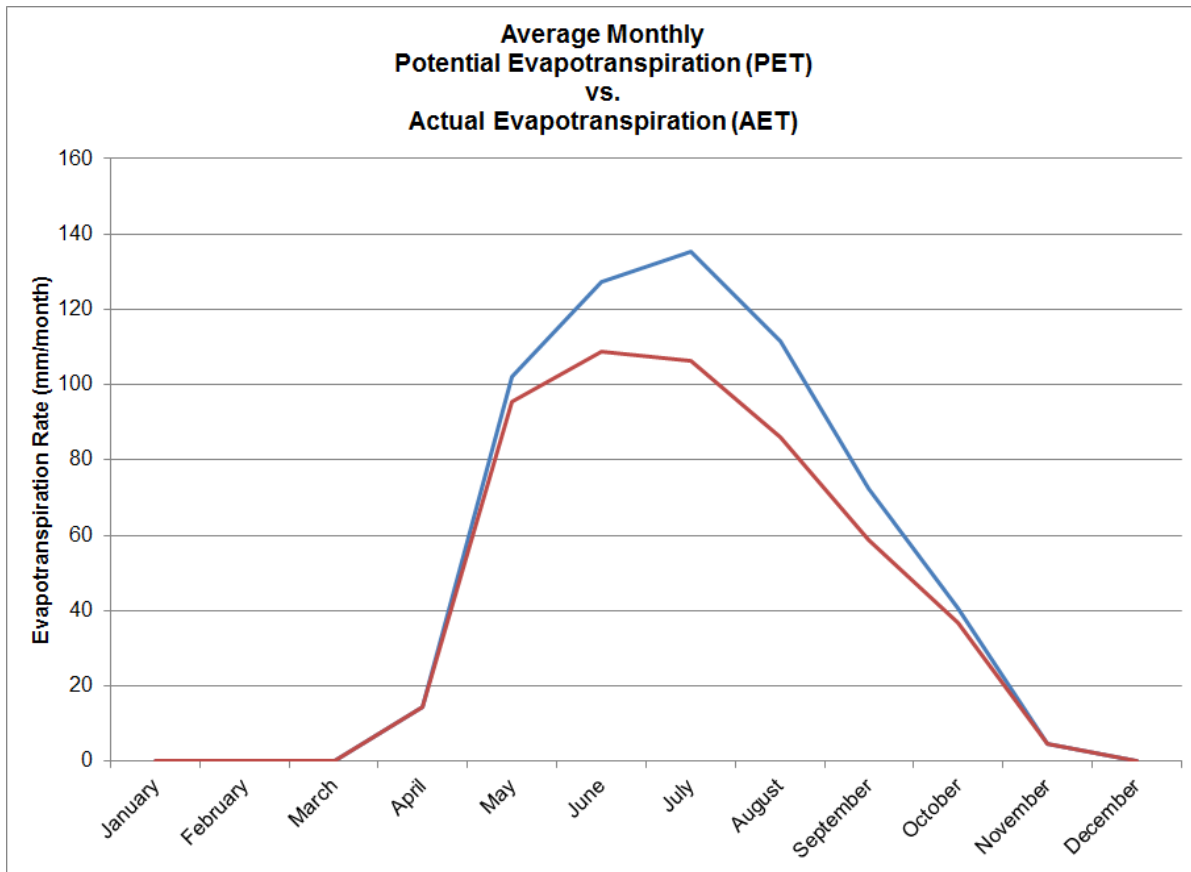


Figure 5: Average Monthly Potential Evapotranspiration vs. Actual Evapotranspiration

Soil Moisture

The soil moisture storage zone (SOIL WATER) is the amount of water available for actual evapotranspiration, but actual evapotranspiration is limited by the potential evapotranspiration rate.

The decrease / change in the soil moisture storage zone ($\Delta SOIL\ WATER$) is based on the following relationship (Thornthwaite, 1948), where AWC represents the available water content:

$$\Delta SOIL\ WATER = SOIL\ WATER_{N-1} \times [1 - \exp(-(PET - W) / AWC)]$$

The soil moisture storage zone is replenished with rainwater and snowmelt (i.e. the water input) to the maximum value of the available water content (AWC):

$$SOIL\ WATER_N = \min[(W - PET) + SOIL\ WATER_{N-1}, AWC]$$

Water Balance Model Description

Water Surplus

The water surplus (SURPLUS) is defined as the excess water that is greater than the available water content (AWC).

$$SURPLUS = W - AET - \Delta SOIL\ WATER$$

The water surplus represents the difference between precipitation and evapotranspiration. It is an estimate of the water that is available to contribute to infiltration and runoff (i.e. streamflow).

Infiltration / Runoff

The amount of water surplus that is infiltration was determined by summing the infiltration factors (IF) based on topography, soils and land cover. Since the water surplus represents infiltration and runoff; direct runoff is the amount of water surplus remaining after taking into account infiltration: $(1.0 - \text{infiltration factor} = \text{runoff factor})$. The infiltration and runoff factors were applied to the average monthly water surplus values:

$$INFILTRATION = IF \times SURPLUS$$

$$RUNOFF = (1.0 - IF) \times SURPLUS$$

The infiltration factors are shown in **Table 4**, which was reproduced from Table 3.1 in the *Stormwater Management and Planning Manual (MOE, 2003)*. These infiltration factors were initially presented in the document “*Hydrogeological Technical Information Requirements for Land Development Applications*” (MOE, 1995).

Table 4: Infiltration Factors (MOE, 2003)

Description	Value of Infiltration Factor
<i>Topography</i>	
Flat Land, average slope < 0.6 m/km	0.3
Rolling Land, average slope 2.8 m/km to 3.8 m/km	0.2
Hilly Land, average slope 28 m/km to 47 m/km	0.1
<i>Surficial Soils</i>	
Tight impervious clay	0.1
Medium combination of clay and loam	0.2
Open sandy loam	0.4
<i>Land Cover</i>	
Cultivated Land	0.1
Woodland	0.2

Each soil type been assigned a corresponding infiltration factor as per Table 3.1 in the *Stormwater Management and Planning Manual (MOE, 2003)*, as shown in **Table 5** below.

Water Balance Model Description

Table 5: Soils Infiltration Factors

Soil Type	Hydrologic Soil Group	Infiltration Factor
Coarse Sand	A	0.40
Fine Sand	AB	0.40
Fine Sandy Loam	B	0.30
Loam	BC	0.30
Silt Loam	C	0.20
Clay Loam	CD	0.15
Clay	D	0.10

The land use was combined into five (5) main categories (mature forest, row crops, pasture / meadow, urban lawns, and impervious areas) to be consistent with Table 3.1 in the *Stormwater Management and Planning Manual (MOE, 2003)*. The land use infiltration factors are shown in **Table 6** below.

Table 6: Land Use Infiltration Factor

Land Use	Infiltration Factor
Urban Lawns	0.10
Row Crops	0.10
Pasture / Meadow	0.10
Mature Forest	0.20
Impervious Areas	0.00

Land Use / Soils / Topography

Developed areas represent a combination of impervious areas and urban lawns as shown in **Table 7** below.

Table 7: Land Use Designations for Developed Areas

Land Use (developed areas)	% Impervious (impervious areas)	% Pervious (urban lawns)
Existing Residential (rural estate lots)	25%	75%
Low Density Development	50%	50%
Medium Density Development	65%	35%
High Density Development / Roads	80%	20%
Stormwater Management Facility (SWMF)	50%	50%

The available water content (AWC) and infiltration factors (IF), and crop cover coefficients (CROP COEF) are determined based on the combination of land use, soils and topography, as shown in **Table 8** (existing areas) and **Table 9** (developed areas) below.

Water Balance Model Description

Table 8: Model Parameters based on Land Use / Soils (existing areas)

Land Use	Soils (HSG)	AWC (mm)	IF (Land Use)	IF (Soils)	Crop Cover Coefficient			
					Dormant Season	Initial Growing Season	Middle of Growing Season	End of Growing Season
Urban Lawns	A	50	0.10	0.40	0.40	0.78	1.15	0.55
	AB	62.5		0.40				
	B	75		0.30				
	BC	100		0.30				
	C	125		0.20				
	CD	100		0.15				
	D	75		0.10				
Row Crops	A	75	0.10	0.40	0.30	0.73	1.15	0.40
	AB	112.5		0.40				
	B	150		0.30				
	BC	175		0.30				
	C	200		0.20				
	CD	200		0.15				
	D	150		0.10				
Pasture / Meadow	A	100	0.10	0.40	0.40	0.68	0.95	0.90
	AB	125		0.40				
	B	150		0.30				
	BC	200		0.30				
	C	250		0.20				
	CD	250		0.15				
	D	200		0.10				
Mature Forest	A	250	0.20	0.40	0.30	0.75	1.20	0.30
	AB	275		0.40				
	B	300		0.30				
	BC	350		0.30				
	C	400		0.20				
	CD	400		0.15				
	D	350		0.10				
Impervious Areas (see Table 9)	A	0	0.00	0.00	1.00	1.00	1.00	1.00
	AB	0						
	B	0						
	BC	0						
	C	0						
	CD	0						
	D	0						

*For impervious areas, potential evapotranspiration is equal to potential evaporation (i.e. crop cover coefficient = 1.00).

Water Balance Model Description

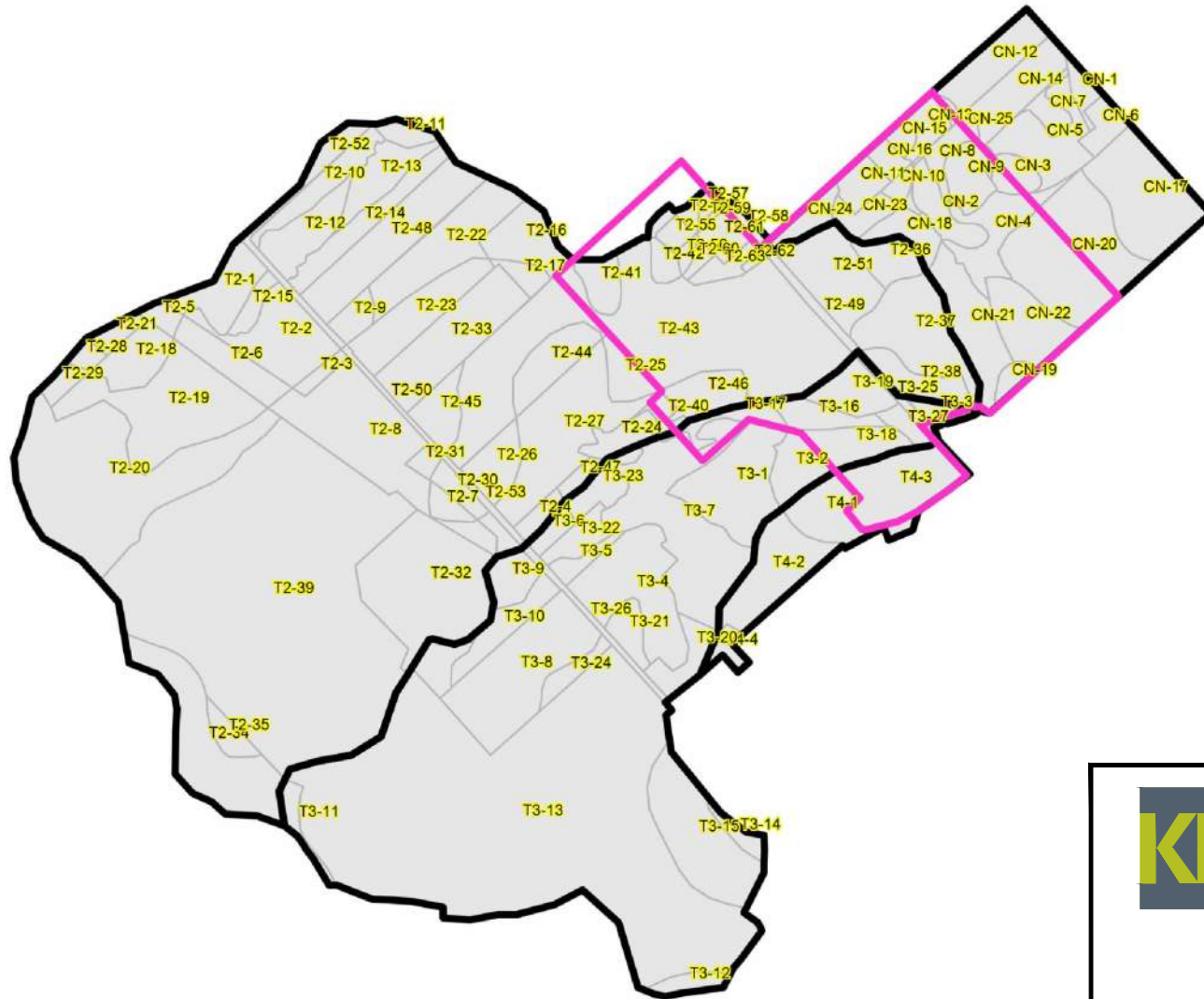
Table 9: Model Parameters based on Land Use / Soils (developed areas)

Land Use	Soils (HSG)	AWC (mm)	IF (Land Use)	IF (Soils)	Crop Cover Coefficient			
					Dormant Season	Initial Growing Season	Middle of Growing Season	End of Growing Season
Existing Residential (25% Imp.)	A	38	0.08	0.30	0.55	0.84	1.11	0.66
	AB	47		0.30				
	B	56		0.23				
	BC	75		0.23				
	C	94		0.15				
	CD	75		0.11				
	D	56		0.08				
Low Density Development (50% Imp.)	A	25	0.05	0.20	0.70	0.89	1.08	0.78
	AB	31		0.20				
	B	38		0.15				
	BC	50		0.15				
	C	63		0.10				
	CD	50		0.08				
	D	38		0.05				
Medium Density Development (65% Imp.)	A	18	0.04	0.14	0.79	0.92	1.05	0.84
	AB	22		0.14				
	B	26		0.11				
	BC	35		0.11				
	C	44		0.07				
	CD	35		0.05				
	D	26		0.04				
High Density Development / Roads (80% Imp.)	A	10	0.02	0.08	0.88	0.96	1.03	0.91
	AB	13		0.08				
	B	15		0.06				
	BC	20		0.06				
	C	25		0.04				
	CD	20		0.03				
	D	15		0.02				
SWMF's (50% imp.)	A	25	0.05	0.20	0.70	0.89	1.08	0.78
	AB	31		0.20				
	B	38		0.15				
	BC	50		0.15				
	C	63		0.10				
	CD	50		0.08				
	D	38		0.05				




*Example calculation of AWC (HSG 'A') for existing residential areas:

- Existing residential areas are 25% impervious areas, 75% pervious (i.e. urban lawns):
- AWC (HSG 'A') for impervious areas = 0 mm; AWC (HSG 'A') for urban lawns = 50 mm
- Therefore, AWC (HSG 'A') for existing residential areas = 25% x 0 mm + 75% x 50 mm = 38 mm

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Legend

-  KNUEA
-  PRE-CATCHMENTS
-  PRE-WB-AREAS

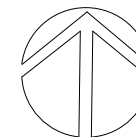
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KANATA NORTH COMMUNITY DESIGN PLAN

FIGURE NO. B1

WATER BUDGET AREA IDs
(PRE-DEVELOPMENT - WATERSHEDS)



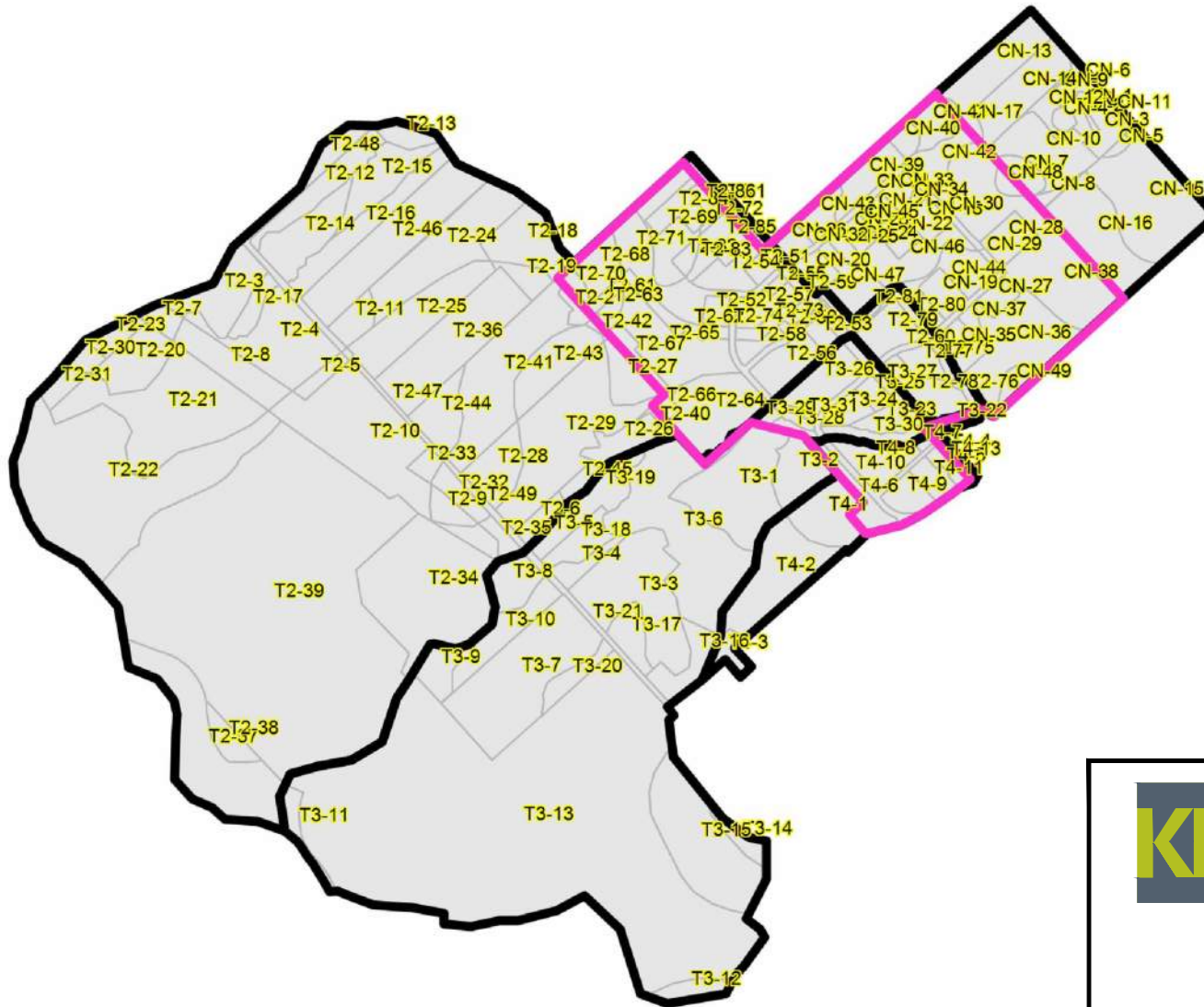
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112117

SCALE
AS SHOWN

NOVATECH
Engineers, Planners & Landscape Architects

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Legend

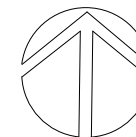
- KNUEA
- POST-CATCHMENTS
- POST-WB-AREAS



KANATA NORTH COMMUNITY DESIGN PLAN

FIGURE NO. B2

WATER BUDGET AREA IDs
(POST-DEVELOPMENT - WATERSHEDS)



DATE
MAY 2016

JOB
112117

SCALE
AS SHOWN

NOVATECH
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Baseflow Separation Methodology

Recursive Digital Filter Method (Eckhardt, 2004)

$$b_k = [(1 - BFI_{max}) * a * b_{k-1} + (1 - a) * BFI_{max} * y_k] / (1 - a * BFI_{max})$$

Where,

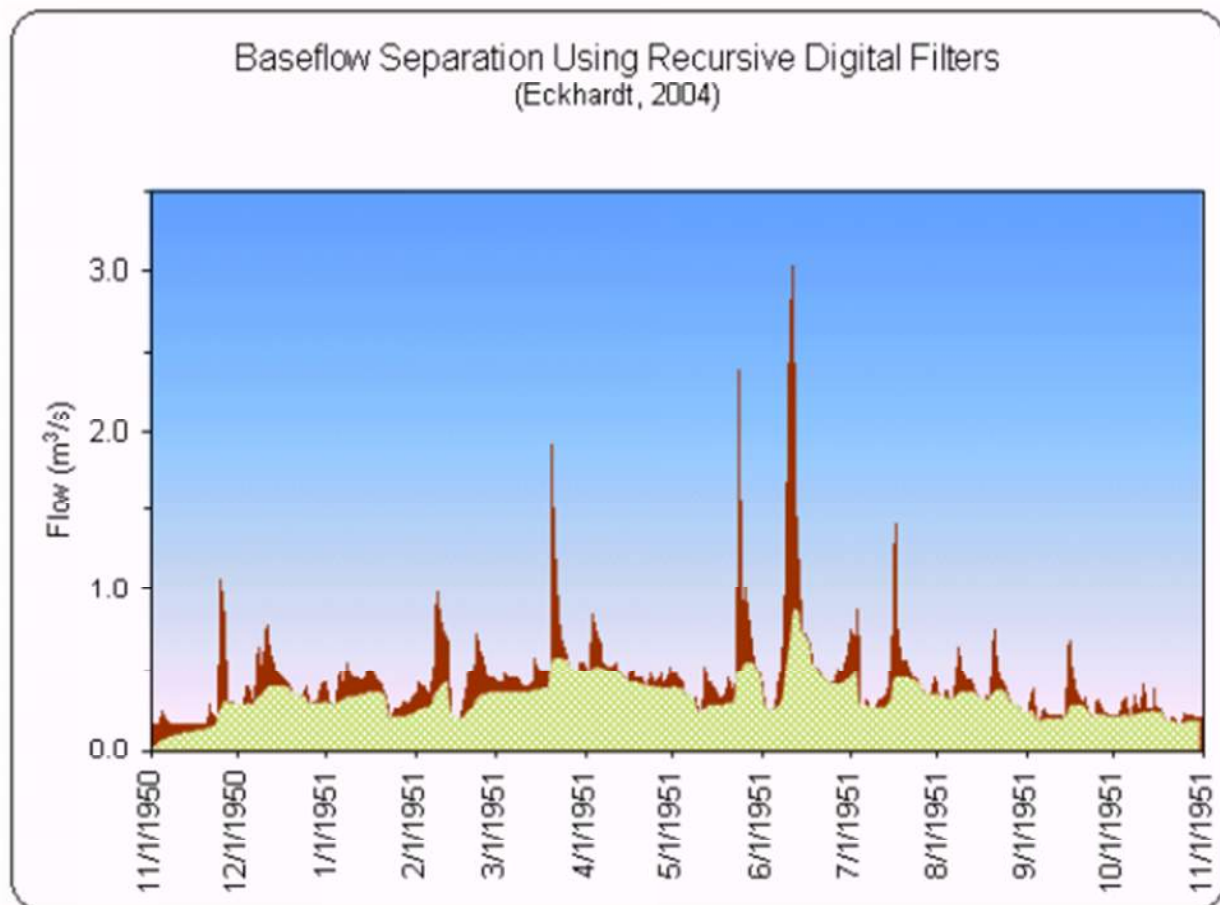
b_k : Baseflow at time step k ,

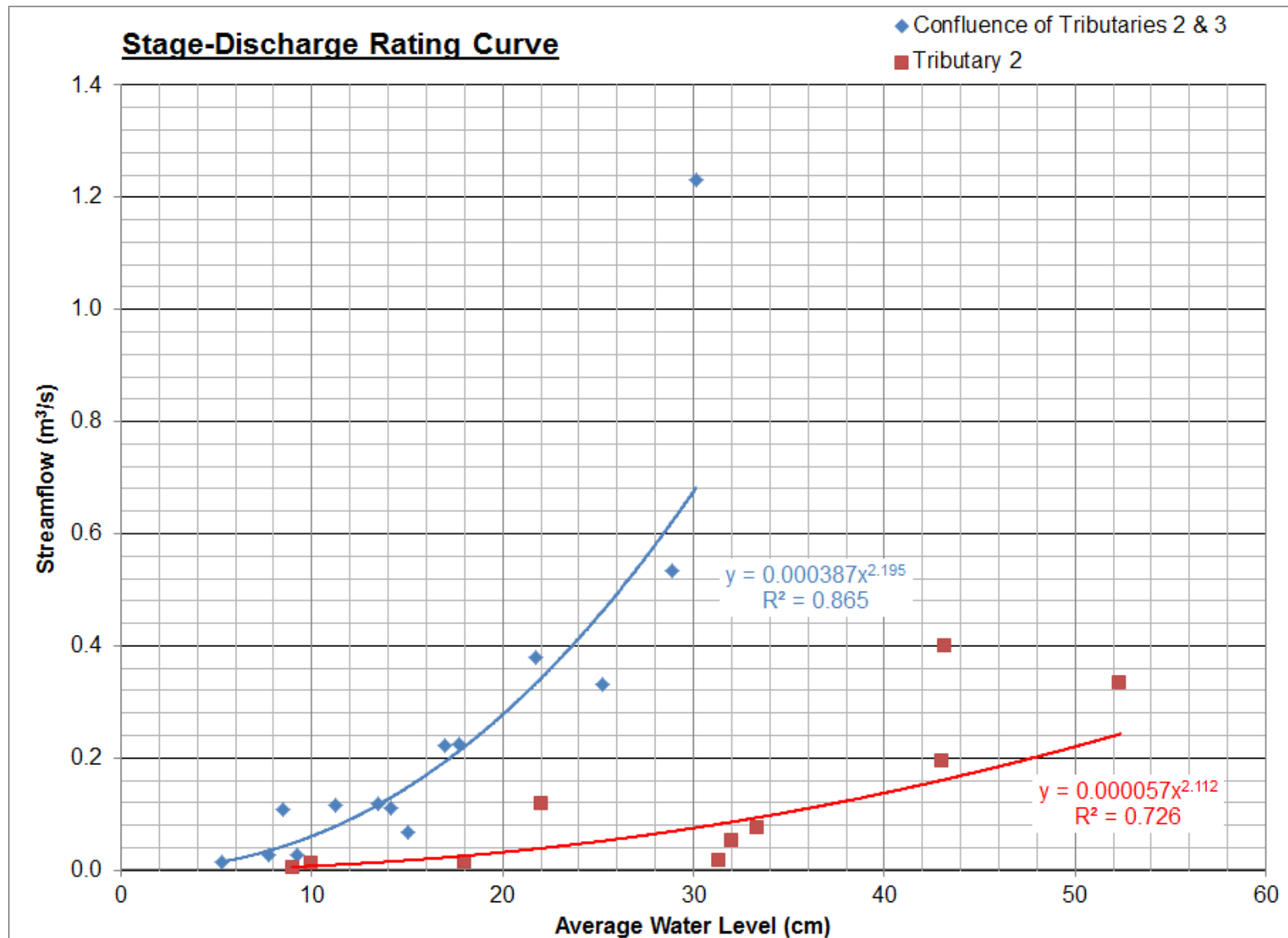
b_{k-1} : Baseflow at time step $k-1$,

y_k : Total streamflow at time step k ,

BFI_{max} : Baseflow Index (ratio of baseflow to the total flow),

a : Filter parameter.





Monthly Summaries of Continuous Streamflow Monitoring Data

Month	Total Monthly Rainfall (mm)	Average Monthly Streamflow (L/s)			Average Monthly Baseflow (L/s)		
		Tributary 2	Tributary 3	Tributaries 2&3	Tributary 2	Tributary 3	Tributaries 2&3
May	91.9	13.4	9.8	67.2	6.5	4.9	32.3
June	143.2	45.2	44.9	137.8	22.5	22.4	69.1
July	61.8	8.0	3.9	19.2	4.1	2.0	9.7
August	96.8	3.8	0.0	1.9	1.9	0.0	1.0
September	93.0	8.0	1.0	8.6	4.0	0.5	4.3
October	72.3	15.1	5.2	35.8	7.5	2.6	17.7
November	37.2	36.5	4.3	52.7	18.1	2.1	26.3
December	42.1	61.8	12.3	83.4	30.8	6.1	41.8
TOTAL (May - Dec.)	638.3	25.0	10.1	48.9	12.4	5.1	24.4

Month	Total Monthly Rainfall (mm)	Total Monthly Streamflow (mm)			Total Monthly Baseflow (mm)		
		Tributary 2	Tributary 3	Tributaries 2&3	Tributary 2	Tributary 3	Tributaries 2&3
May	91.9	2.4	3.0	6.9	1.2	1.5	3.3
June	143.2	29.8	49.9	51.5	14.8	24.8	25.8
July	61.8	5.4	4.4	7.4	2.8	2.3	3.8
August	96.8	2.6	0.0	0.7	1.3	0.0	0.4
September	93.0	5.3	1.1	3.2	2.6	0.6	1.6
October	72.3	10.3	6.0	13.8	5.1	3.0	6.8
November	37.2	24.0	4.8	19.7	11.9	2.4	9.8
December	42.1	42.0	14.2	32.2	21.0	7.1	16.1
TOTAL (May - Dec.)	638.3	121.8	83.4	135.5	60.7	41.7	67.7

Daily Summaries of Continuous Streamflow Monitoring Data

Date	Total Daily Rainfall (mm)	Average Daily Streamflow (L/s)			Average Daily Baseflow (L/s)		
		Tributary 2	Tributary 3	Tributaries 2&3	Tributary 2	Tributary 3	Tributaries 2&3
23/05/2014	6.9	0.0	0.0	0.0	0.0	0.0	0.0
24/05/2014	0.3	0.0	0.0	0.0	0.0	0.0	0.0
25/05/2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26/05/2014	0.3	13.5	10.8	61.4	3.9	3.0	17.3
27/05/2014	0.0	25.2	24.8	124.0	12.4	12.0	60.1
28/05/2014	0.0	21.7	21.6	106.5	11.2	11.2	55.5
29/05/2014	0.0	19.4	17.9	89.9	9.9	9.5	46.6
30/05/2014	0.0	16.6	5.9	87.8	8.7	4.7	44.0
31/05/2014	0.0	14.0	0.0	84.8	7.2	0.3	42.9
01/06/2014	0.0	12.0	0.0	52.8	6.4	0.0	30.8
02/06/2014	0.0	9.9	0.0	41.9	5.1	0.0	22.4
03/06/2014	14.6	11.8	0.0	49.8	5.5	0.0	22.9
04/06/2014	0.0	13.0	0.0	59.1	6.6	0.0	29.6
05/06/2014	0.9	11.1	0.0	52.7	5.7	0.0	26.7
06/06/2014	0.0	9.5	0.0	46.8	5.0	0.0	24.6
07/06/2014	0.0	7.8	0.0	40.9	4.4	0.0	21.5
08/06/2014	0.0	3.4	0.0	36.9	1.9	0.0	18.5
09/06/2014	0.0	5.0	0.0	34.8	2.2	0.0	17.8
10/06/2014	0.0	8.1	0.0	30.9	3.7	0.0	15.9
11/06/2014	18.4	11.0	0.0	54.6	4.8	0.0	21.7
12/06/2014	20.1	61.7	46.8	215.9	24.1	16.9	87.1
13/06/2014	10.0	64.5	46.1	218.4	31.4	23.1	108.6
14/06/2014	0.0	53.8	28.9	186.1	30.3	17.9	102.7
15/06/2014	0.0	32.8	15.7	126.5	18.7	9.1	69.3
16/06/2014	0.0	21.1	8.5	92.8	11.7	5.1	50.0
17/06/2014	15.3	19.6	8.1	87.6	9.3	3.5	42.4
18/06/2014	0.1	44.0	25.8	140.3	19.6	11.6	66.7
19/06/2014	0.0	30.4	12.5	101.8	17.2	7.5	54.8
20/06/2014	0.0	21.9	5.2	75.6	11.8	3.7	40.7
21/06/2014	0.0	18.6	0.0	65.7	9.6	0.3	33.8
22/06/2014	0.0	16.2	0.0	59.4	8.5	0.0	31.0
23/06/2014	0.0	14.2	0.0	55.5	7.3	0.0	28.4
24/06/2014	62.7	78.7	124.8	395.2	17.1	15.0	76.2
25/06/2014	1.0	370.7	575.2	1137.2	172.1	281.5	596.7
26/06/2014	0.1	180.7	224.4	322.3	107.4	142.0	227.9
27/06/2014	0.0	109.3	108.1	149.3	62.2	66.3	90.9
28/06/2014	0.0	50.2	54.5	88.4	32.5	33.0	50.8
29/06/2014	0.0	31.4	36.3	65.4	16.9	19.9	34.9
30/06/2014	0.0	33.9	26.7	48.5	16.9	14.4	26.2
01/07/2014	3.1	27.0	20.2	36.1	14.0	10.8	19.1
02/07/2014	3.7	24.3	16.9	37.6	12.5	8.8	18.7
03/07/2014	0.4	21.5	18.8	36.4	11.1	9.2	18.4
04/07/2014	0.2	17.2	12.7	32.4	9.2	7.2	16.8
05/07/2014	0.0	12.7	6.5	26.7	6.8	3.9	14.1
06/07/2014	2.4	10.6	0.5	21.1	5.5	0.8	11.3
07/07/2014	8.1	14.7	6.2	32.2	6.5	1.6	13.9
08/07/2014	8.6	14.4	12.4	34.1	7.4	6.2	17.3
09/07/2014	0.0	14.4	14.9	34.0	7.5	7.5	17.5
10/07/2014	0.0	10.1	7.3	27.7	5.5	4.5	14.6
11/07/2014	0.0	8.1	0.1	23.0	4.2	0.6	12.0
12/07/2014	0.0	7.8	0.0	19.8	4.0	0.0	10.3
13/07/2014	10.6	3.5	0.0	25.3	2.3	0.0	11.2
14/07/2014	0.0	2.3	0.7	25.5	1.3	0.3	13.3
15/07/2014	2.8	1.9	0.0	23.5	0.9	0.1	11.7
16/07/2014	0.4	3.9	2.6	19.9	1.7	1.0	10.7
17/07/2014	0.0	4.6	0.0	17.9	2.3	0.3	9.1
18/07/2014	0.0	4.0	0.0	15.2	2.1	0.0	8.0
19/07/2014	0.0	3.2	0.0	12.5	1.7	0.0	6.5
20/07/2014	0.4	5.0	0.0	12.4	2.2	0.0	6.2
21/07/2014	0.0	5.1	0.0	10.8	2.6	0.0	5.7
22/07/2014	0.0	4.0	0.0	9.1	2.1	0.0	4.7
23/07/2014	0.0	3.5	0.0	6.9	1.9	0.0	3.8
24/07/2014	0.0	2.7	0.0	5.0	1.4	0.0	2.7
25/07/2014	0.0	2.4	0.0	3.9	1.2	0.0	2.1
26/07/2014	1.7	2.2	0.0	2.7	1.1	0.0	1.4
27/07/2014	10.7	3.5	0.0	8.5	1.5	0.0	3.2
28/07/2014	0.1	3.0	0.0	9.6	1.6	0.0	4.9
29/07/2014	0.0	2.8	0.0	7.2	1.5	0.0	4.3
30/07/2014	8.4	3.5	0.0	8.0	1.6	0.0	3.3
31/07/2014	0.2	3.1	0.0	10.1	1.6	0.0	5.2

Daily Summaries of Continuous Streamflow Monitoring Data

Date	Total Daily Rainfall (mm)	Average Daily Streamflow (L/s)			Average Daily Baseflow (L/s)		
		Tributary 2	Tributary 3	Tributaries 2&3	Tributary 2	Tributary 3	Tributaries 2&3
01/08/2014	0.0	2.8	0.0	5.7	1.4	0.0	3.4
02/08/2014	0.0	2.6	0.0	2.7	1.3	0.0	1.7
03/08/2014	0.0	2.3	0.0	1.4	1.1	0.0	0.8
04/08/2014	3.8	2.4	0.0	0.1	1.1	0.0	0.1
05/08/2014	1.0	2.3	0.0	1.1	1.2	0.0	0.4
06/08/2014	0.0	2.5	0.0	0.2	1.3	0.0	0.2
07/08/2014	0.1	1.8	0.0	0.6	0.9	0.0	0.2
08/08/2014	0.0	1.8	0.0	0.4	0.9	0.0	0.2
09/08/2014	0.0	1.6	0.0	0.4	0.8	0.0	0.2
10/08/2014	0.0	1.5	0.0	0.2	0.8	0.0	0.1
11/08/2014	0.0	1.1	0.0	0.1	0.6	0.0	0.1
12/08/2014	36.0	5.4	0.0	1.7	1.6	0.0	0.3
13/08/2014	8.5	6.5	0.0	5.7	3.8	0.0	3.0
14/08/2014	0.6	4.6	0.0	2.7	2.3	0.0	1.4
15/08/2014	0.3	4.4	0.0	1.5	2.3	0.0	1.0
16/08/2014	8.2	4.9	0.0	0.8	2.3	0.0	0.3
17/08/2014	0.6	4.9	0.0	3.0	2.6	0.0	1.4
18/08/2014	0.1	4.5	0.0	2.0	2.3	0.0	1.1
19/08/2014	0.0	4.0	0.0	1.1	2.1	0.0	0.6
20/08/2014	8.7	3.7	0.0	0.7	1.8	0.0	0.3
21/08/2014	18.5	6.3	0.0	5.8	2.7	0.0	2.1
22/08/2014	0.0	6.2	0.0	7.1	3.3	0.0	3.7
23/08/2014	0.0	5.4	0.0	5.2	2.8	0.0	2.8
24/08/2014	0.0	5.0	0.0	3.2	2.5	0.0	1.9
25/08/2014	0.0	4.7	0.0	1.9	2.4	0.0	1.0
26/08/2014	0.0	4.2	0.0	1.0	2.2	0.0	0.6
27/08/2014	0.0	3.7	0.0	0.2	1.9	0.0	0.2
28/08/2014	0.0	3.6	0.0	0.7	1.8	0.0	0.3
29/08/2014	0.0	3.9	0.0	0.5	1.9	0.0	0.3
30/08/2014	0.2	3.8	0.0	0.9	2.0	0.0	0.4
31/08/2014	10.2	4.1	0.0	0.9	1.9	0.0	0.4
01/09/2014	0.2	3.9	0.0	2.3	2.1	0.0	1.1
02/09/2014	7.5	5.0	0.0	1.8	2.3	0.0	0.9
03/09/2014	0.3	4.3	0.0	2.1	2.3	0.0	1.1
04/09/2014	0.7	4.3	0.0	1.0	2.1	0.0	0.6
05/09/2014	21.5	6.7	0.0	4.1	2.8	0.0	1.1
06/09/2014	11.1	6.8	0.0	8.4	3.6	0.0	4.3
07/09/2014	0.0	6.3	0.0	5.1	3.2	0.0	2.9
08/09/2014	0.0	6.2	0.0	3.7	3.1	0.0	2.0
09/09/2014	0.0	5.5	0.0	2.6	2.8	0.0	1.5
10/09/2014	1.6	5.4	0.0	2.4	2.8	0.0	1.3
11/09/2014	4.0	6.0	0.0	4.9	2.8	0.0	2.0
12/09/2014	0.0	6.1	0.0	4.4	3.0	0.0	2.4
13/09/2014	15.7	7.5	0.0	8.5	3.4	0.0	3.1
14/09/2014	0.0	7.7	0.0	9.9	4.0	0.0	5.5
15/09/2014	3.3	9.1	0.0	8.3	4.3	0.0	4.3
16/09/2014	0.2	9.1	0.0	8.0	4.6	0.0	4.0
17/09/2014	6.5	8.7	0.0	6.9	4.3	0.0	3.4
18/09/2014	0.1	8.8	0.0	9.7	4.5	0.0	4.7
19/09/2014	0.0	7.7	0.0	7.2	3.9	0.0	3.7
20/09/2014	6.0	7.8	0.0	9.9	3.9	0.0	4.7
21/09/2014	14.3	11.4	3.5	21.4	5.1	0.3	8.4
22/09/2014	0.0	11.0	27.2	24.0	5.8	13.7	13.0
23/09/2014	0.0	9.9	0.0	18.0	5.0	1.4	9.5
24/09/2014	0.0	11.1	0.0	16.4	5.4	0.0	8.4
25/09/2014	0.0	11.2	0.0	15.3	5.6	0.0	7.7
26/09/2014	0.0	11.6	0.0	13.0	5.7	0.0	6.8
27/09/2014	0.0	11.1	0.0	11.7	5.6	0.0	6.0
28/09/2014	0.0	10.2	0.0	9.3	5.3	0.0	5.0
29/09/2014	0.0	10.0	0.0	8.5	5.0	0.0	4.3
30/09/2014	0.0	9.8	0.0	7.9	5.0	0.0	4.0

Daily Summaries of Continuous Streamflow Monitoring Data

Date	Total Daily Rainfall (mm)	Average Daily Streamflow (L/s)			Average Daily Baseflow (L/s)		
		Tributary 2	Tributary 3	Tributaries 2&3	Tributary 2	Tributary 3	Tributaries 2&3
01/10/2014	0.0	9.2	0.0	8.6	4.6	0.0	4.2
02/10/2014	0.0	8.7	0.0	8.1	4.5	0.0	4.1
03/10/2014	0.0	5.8	0.0	7.8	3.1	0.0	4.0
04/10/2014	4.2	7.5	0.0	7.8	3.5	0.0	3.7
05/10/2014	0.0	7.8	0.0	9.9	3.9	0.0	4.9
06/10/2014	1.1	8.4	0.0	12.5	4.2	0.0	5.8
07/10/2014	6.9	8.7	0.0	12.5	4.2	0.0	6.3
08/10/2014	10.8	11.4	0.0	23.5	5.4	0.0	10.5
09/10/2014	1.9	10.8	0.0	19.0	5.4	0.0	9.9
10/10/2014	0.0	11.0	0.0	17.8	5.5	0.0	9.1
11/10/2014	0.0	11.2	0.0	21.6	5.6	0.0	9.9
12/10/2014	0.1	11.9	0.0	22.1	5.8	0.0	11.7
13/10/2014	0.1	10.2	0.0	18.8	5.3	0.0	9.5
14/10/2014	0.0	9.3	0.0	15.5	4.7	0.0	8.5
15/10/2014	4.2	10.2	0.0	13.9	4.9	0.0	6.6
16/10/2014	11.8	14.2	14.5	28.7	6.5	2.5	11.4
17/10/2014	2.0	16.7	48.5	43.9	8.2	22.9	20.9
18/10/2014	0.7	16.4	29.9	49.6	8.4	19.6	24.9
19/10/2014	0.0	15.1	0.0	43.1	7.6	1.4	22.3
20/10/2014	3.9	14.9	0.0	42.7	7.5	0.0	21.3
21/10/2014	8.3	22.9	16.3	62.3	9.7	4.9	26.9
22/10/2014	0.0	32.7	18.6	77.8	16.4	10.8	39.3
23/10/2014	0.0	23.1	4.6	59.7	12.4	3.9	31.6
24/10/2014	0.0	20.2	0.0	56.9	10.4	0.2	28.8
25/10/2014	9.5	17.7	0.0	51.5	8.9	0.0	25.9
26/10/2014	0.2	25.0	15.7	72.1	11.5	5.8	33.7
27/10/2014	3.0	23.6	4.3	66.1	12.3	4.0	34.0
28/10/2014	3.4	22.9	2.4	65.6	11.3	0.8	32.7
29/10/2014	0.2	23.9	5.0	65.0	12.0	2.5	32.7
30/10/2014	0.0	20.7	1.3	56.2	10.7	1.1	29.2
31/10/2014	0.0	17.5	0.0	48.0	9.1	0.0	24.9
01/11/2014	0.0	17.2	0.0	44.0	8.6	0.0	22.4
02/11/2014	0.0	15.1	0.0	41.7	7.9	0.0	21.2
03/11/2014	0.0	14.8	0.0	39.3	7.4	0.0	19.9
04/11/2014	4.9	15.8	0.0	37.4	7.6	0.0	18.6
05/11/2014	0.2	18.8	0.0	45.4	9.2	0.0	22.1
06/11/2014	1.9	25.4	0.0	43.0	11.2	0.0	21.6
07/11/2014	1.7	30.3	0.0	42.2	15.2	0.0	21.3
08/11/2014	0.7	27.9	0.0	37.9	14.1	0.0	19.5
09/11/2014	0.3	28.3	0.0	37.8	14.1	0.0	19.0
10/11/2014	0.3	28.2	0.0	35.3	14.2	0.0	18.0
11/11/2014	0.0	27.4	0.0	34.9	13.7	0.0	17.4
12/11/2014	3.1	29.1	0.0	39.4	14.4	0.0	19.3
13/11/2014	0.0	27.1	0.0	37.9	13.7	0.0	19.1
14/11/2014	0.0	26.1	0.0	35.7	13.2	0.0	17.7
15/11/2014	0.0	24.8	0.0	35.9	12.6	0.0	18.3
16/11/2014	0.0	25.1	0.0	37.5	12.5	0.0	18.4
17/11/2014	7.4	26.4	0.0	37.6	13.0	0.0	18.7
18/11/2014	0.2	26.0	0.0	37.0	13.3	0.0	18.9
19/11/2014	0.2	24.7	0.0	36.8	12.4	0.0	18.6
20/11/2014	0.0	24.5	0.0	33.2	12.4	0.0	16.8
21/11/2014	0.0	22.6	0.0	34.1	11.5	0.0	16.6
22/11/2014	2.0	24.4	0.0	44.7	12.0	0.0	21.7
23/11/2014	13.4	31.7	6.0	53.0	14.1	1.5	22.9
24/11/2014	1.0	100.9	42.5	172.3	39.0	16.3	69.7
25/11/2014	0.0	109.0	32.7	138.1	58.1	19.1	78.7
26/11/2014	0.0	83.2	21.3	95.5	44.1	11.8	51.7
27/11/2014	0.0	71.7	14.7	79.6	37.1	8.3	41.5
28/11/2014	0.0	61.3	6.3	67.5	32.2	4.2	35.6
29/11/2014	0.0	51.9	2.6	67.2	26.7	1.5	33.9
30/11/2014	0.2	53.7	4.1	59.1	26.5	1.8	29.6

Daily Summaries of Continuous Streamflow Monitoring Data

Date	Total Daily Rainfall (mm)	Average Daily Streamflow (L/s)			Average Daily Baseflow (L/s)		
		Tributary 2	Tributary 3	Tributaries 2&3	Tributary 2	Tributary 3	Tributaries 2&3
01/12/2014	0.0	54.2	5.3	58.8	27.5	2.8	29.9
02/12/2014	3.0	41.8	0.0	72.2	22.2	0.5	36.0
03/12/2014	2.6	45.2	0.0	53.9	22.1	0.0	28.2
04/12/2014	0.0	42.2	0.0	47.8	21.8	0.0	23.6
05/12/2014	0.0	38.2	0.0	61.6	19.2	0.0	29.3
06/12/2014	0.0	40.8	0.0	53.5	20.3	0.0	28.5
07/12/2014	0.0	33.9	0.0	56.1	17.9	0.0	26.8
08/12/2014	0.0	28.9	0.0	85.9	14.7	0.0	41.6
09/12/2014	0.2	39.8	0.0	91.2	18.5	0.0	41.9
10/12/2014	11.1	40.7	0.0	84.6	20.5	0.0	44.7
11/12/2014	0.8	39.8	0.0	65.6	20.1	0.0	34.1
12/12/2014	0.4	35.6	0.0	55.0	18.4	0.0	30.0
13/12/2014	0.2	33.2	17.0	44.7	16.7	8.2	23.0
14/12/2014	0.0	34.5	0.0	43.4	17.1	0.3	22.5
15/12/2014	0.0	34.4	0.0	37.9	17.1	0.0	19.0
16/12/2014	6.0	35.2	0.0	39.8	17.4	0.0	19.7
17/12/2014	8.5	39.6	4.7	46.3	19.1	1.0	21.9
18/12/2014	0.0	47.8	5.2	55.2	22.9	3.4	26.7
19/12/2014	0.0	49.3	4.8	69.3	24.9	2.3	31.5
20/12/2014	0.0	52.3	6.5	60.6	25.8	3.3	33.5
21/12/2014	0.0	46.3	7.5	68.7	23.6	2.4	32.7
22/12/2014	0.7	46.9	5.7	83.6	23.5	3.5	39.9
23/12/2014	1.0	49.4	1.5	87.0	24.3	1.8	44.0
24/12/2014	4.9	59.2	24.1	87.6	27.8	8.5	41.3
25/12/2014	0.2	159.8	64.2	196.8	64.4	26.1	83.4
26/12/2014	0.0	164.0	62.4	177.2	85.6	32.7	94.6
27/12/2014	2.5	148.2	53.7	150.1	75.5	27.9	78.2
28/12/2014	0.0	155.6	62.6	158.0	77.4	31.3	79.1
29/12/2014	0.0	121.3	29.7	130.9	65.5	18.6	66.2
30/12/2014	0.0	85.5	16.1	178.3	46.7	9.6	93.8
31/12/2014	0.0	72.3	11.4	84.6	37.2	6.4	49.2

Daily Summaries of Continuous Streamflow Monitoring Data

Date	Total Daily Rainfall (mm)	Total Daily Streamflow (mm)			Total Daily Baseflow (mm)		
		Tributary 2	Tributary 3	Tributaries 2&3	Tributary 2	Tributary 3	Tributaries 2&3
23/05/2014	6.9	0.0	0.0	0.0	0.0	0.0	0.0
24/05/2014	0.3	0.0	0.0	0.0	0.0	0.0	0.0
25/05/2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26/05/2014	0.3	0.3	0.4	0.8	0.1	0.1	0.2
27/05/2014	0.0	0.6	0.9	1.5	0.3	0.4	0.7
28/05/2014	0.0	0.5	0.8	1.3	0.2	0.4	0.7
29/05/2014	0.0	0.4	0.7	1.1	0.2	0.4	0.6
30/05/2014	0.0	0.4	0.2	1.1	0.2	0.2	0.5
31/05/2014	0.0	0.3	0.0	1.1	0.2	0.0	0.5
01/06/2014	0.0	0.3	0.0	0.7	0.1	0.0	0.4
02/06/2014	0.0	0.2	0.0	0.5	0.1	0.0	0.3
03/06/2014	14.6	0.3	0.0	0.6	0.1	0.0	0.3
04/06/2014	0.0	0.3	0.0	0.7	0.1	0.0	0.4
05/06/2014	0.9	0.2	0.0	0.7	0.1	0.0	0.3
06/06/2014	0.0	0.2	0.0	0.6	0.1	0.0	0.3
07/06/2014	0.0	0.2	0.0	0.5	0.1	0.0	0.3
08/06/2014	0.0	0.1	0.0	0.5	0.0	0.0	0.2
09/06/2014	0.0	0.1	0.0	0.4	0.0	0.0	0.2
10/06/2014	0.0	0.2	0.0	0.4	0.1	0.0	0.2
11/06/2014	18.4	0.2	0.0	0.7	0.1	0.0	0.3
12/06/2014	20.1	1.4	1.7	2.7	0.5	0.6	1.1
13/06/2014	10.0	1.4	1.7	2.7	0.7	0.9	1.4
14/06/2014	0.0	1.2	1.1	2.3	0.7	0.7	1.3
15/06/2014	0.0	0.7	0.6	1.6	0.4	0.3	0.9
16/06/2014	0.0	0.5	0.3	1.2	0.3	0.2	0.6
17/06/2014	15.3	0.4	0.3	1.1	0.2	0.1	0.5
18/06/2014	0.1	1.0	1.0	1.7	0.4	0.4	0.8
19/06/2014	0.0	0.7	0.5	1.3	0.4	0.3	0.7
20/06/2014	0.0	0.5	0.2	0.9	0.3	0.1	0.5
21/06/2014	0.0	0.4	0.0	0.8	0.2	0.0	0.4
22/06/2014	0.0	0.4	0.0	0.7	0.2	0.0	0.4
23/06/2014	0.0	0.3	0.0	0.7	0.2	0.0	0.4
24/06/2014	62.7	1.7	4.6	4.9	0.4	0.6	0.9
25/06/2014	1.0	8.1	21.3	14.2	3.8	10.4	7.4
26/06/2014	0.1	4.0	8.3	4.0	2.4	5.3	2.8
27/06/2014	0.0	2.4	4.0	1.9	1.4	2.5	1.1
28/06/2014	0.0	1.1	2.0	1.1	0.7	1.2	0.6
29/06/2014	0.0	0.7	1.3	0.8	0.4	0.7	0.4
30/06/2014	0.0	0.7	1.0	0.6	0.4	0.5	0.3
01/07/2014	3.1	0.6	0.7	0.5	0.3	0.4	0.2
02/07/2014	3.7	0.5	0.6	0.5	0.3	0.3	0.2
03/07/2014	0.4	0.5	0.7	0.5	0.2	0.3	0.2
04/07/2014	0.2	0.4	0.5	0.4	0.2	0.3	0.2
05/07/2014	0.0	0.3	0.2	0.3	0.1	0.1	0.2
06/07/2014	2.4	0.2	0.0	0.3	0.1	0.0	0.1
07/07/2014	8.1	0.3	0.2	0.4	0.1	0.1	0.2
08/07/2014	8.6	0.3	0.5	0.4	0.2	0.2	0.2
09/07/2014	0.0	0.3	0.6	0.4	0.2	0.3	0.2
10/07/2014	0.0	0.2	0.3	0.3	0.1	0.2	0.2
11/07/2014	0.0	0.2	0.0	0.3	0.1	0.0	0.1
12/07/2014	0.0	0.2	0.0	0.2	0.1	0.0	0.1
13/07/2014	10.6	0.1	0.0	0.3	0.1	0.0	0.1
14/07/2014	0.0	0.0	0.0	0.3	0.0	0.0	0.2
15/07/2014	2.8	0.0	0.0	0.3	0.0	0.0	0.1
16/07/2014	0.4	0.1	0.1	0.2	0.0	0.0	0.1
17/07/2014	0.0	0.1	0.0	0.2	0.0	0.0	0.1
18/07/2014	0.0	0.1	0.0	0.2	0.0	0.0	0.1
19/07/2014	0.0	0.1	0.0	0.2	0.0	0.0	0.1
20/07/2014	0.4	0.1	0.0	0.2	0.0	0.0	0.1
21/07/2014	0.0	0.1	0.0	0.1	0.1	0.0	0.1
22/07/2014	0.0	0.1	0.0	0.1	0.0	0.0	0.1
23/07/2014	0.0	0.1	0.0	0.1	0.0	0.0	0.0
24/07/2014	0.0	0.1	0.0	0.1	0.0	0.0	0.0
25/07/2014	0.0	0.1	0.0	0.0	0.0	0.0	0.0
26/07/2014	1.7	0.0	0.0	0.0	0.0	0.0	0.0
27/07/2014	10.7	0.1	0.0	0.1	0.0	0.0	0.0
28/07/2014	0.1	0.1	0.0	0.1	0.0	0.0	0.1
29/07/2014	0.0	0.1	0.0	0.1	0.0	0.0	0.1
30/07/2014	8.4	0.1	0.0	0.1	0.0	0.0	0.0
31/07/2014	0.2	0.1	0.0	0.1	0.0	0.0	0.1

Daily Summaries of Continuous Streamflow Monitoring Data

Date	Total Daily Rainfall (mm)	Total Daily Streamflow (mm)			Total Daily Baseflow (mm)		
		Tributary 2	Tributary 3	Tributaries 2&3	Tributary 2	Tributary 3	Tributaries 2&3
01/08/2014	0.0	0.1	0.0	0.1	0.0	0.0	0.0
02/08/2014	0.0	0.1	0.0	0.0	0.0	0.0	0.0
03/08/2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0
04/08/2014	3.8	0.1	0.0	0.0	0.0	0.0	0.0
05/08/2014	1.0	0.1	0.0	0.0	0.0	0.0	0.0
06/08/2014	0.0	0.1	0.0	0.0	0.0	0.0	0.0
07/08/2014	0.1	0.0	0.0	0.0	0.0	0.0	0.0
08/08/2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0
09/08/2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10/08/2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11/08/2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12/08/2014	36.0	0.1	0.0	0.0	0.0	0.0	0.0
13/08/2014	8.5	0.1	0.0	0.1	0.1	0.0	0.0
14/08/2014	0.6	0.1	0.0	0.0	0.1	0.0	0.0
15/08/2014	0.3	0.1	0.0	0.0	0.0	0.0	0.0
16/08/2014	8.2	0.1	0.0	0.0	0.0	0.0	0.0
17/08/2014	0.6	0.1	0.0	0.0	0.1	0.0	0.0
18/08/2014	0.1	0.1	0.0	0.0	0.1	0.0	0.0
19/08/2014	0.0	0.1	0.0	0.0	0.0	0.0	0.0
20/08/2014	8.7	0.1	0.0	0.0	0.0	0.0	0.0
21/08/2014	18.5	0.1	0.0	0.1	0.1	0.0	0.0
22/08/2014	0.0	0.1	0.0	0.1	0.1	0.0	0.0
23/08/2014	0.0	0.1	0.0	0.1	0.1	0.0	0.0
24/08/2014	0.0	0.1	0.0	0.0	0.1	0.0	0.0
25/08/2014	0.0	0.1	0.0	0.0	0.1	0.0	0.0
26/08/2014	0.0	0.1	0.0	0.0	0.0	0.0	0.0
27/08/2014	0.0	0.1	0.0	0.0	0.0	0.0	0.0
28/08/2014	0.0	0.1	0.0	0.0	0.0	0.0	0.0
29/08/2014	0.0	0.1	0.0	0.0	0.0	0.0	0.0
30/08/2014	0.2	0.1	0.0	0.0	0.0	0.0	0.0
31/08/2014	10.2	0.1	0.0	0.0	0.0	0.0	0.0
01/09/2014	0.2	0.1	0.0	0.0	0.0	0.0	0.0
02/09/2014	7.5	0.1	0.0	0.0	0.1	0.0	0.0
03/09/2014	0.3	0.1	0.0	0.0	0.1	0.0	0.0
04/09/2014	0.7	0.1	0.0	0.0	0.0	0.0	0.0
05/09/2014	21.5	0.1	0.0	0.1	0.1	0.0	0.0
06/09/2014	11.1	0.1	0.0	0.1	0.1	0.0	0.1
07/09/2014	0.0	0.1	0.0	0.1	0.1	0.0	0.0
08/09/2014	0.0	0.1	0.0	0.0	0.1	0.0	0.0
09/09/2014	0.0	0.1	0.0	0.0	0.1	0.0	0.0
10/09/2014	1.6	0.1	0.0	0.0	0.1	0.0	0.0
11/09/2014	4.0	0.1	0.0	0.1	0.1	0.0	0.0
12/09/2014	0.0	0.1	0.0	0.1	0.1	0.0	0.0
13/09/2014	15.7	0.2	0.0	0.1	0.1	0.0	0.0
14/09/2014	0.0	0.2	0.0	0.1	0.1	0.0	0.1
15/09/2014	3.3	0.2	0.0	0.1	0.1	0.0	0.1
16/09/2014	0.2	0.2	0.0	0.1	0.1	0.0	0.1
17/09/2014	6.5	0.2	0.0	0.1	0.1	0.0	0.0
18/09/2014	0.1	0.2	0.0	0.1	0.1	0.0	0.1
19/09/2014	0.0	0.2	0.0	0.1	0.1	0.0	0.0
20/09/2014	6.0	0.2	0.0	0.1	0.1	0.0	0.1
21/09/2014	14.3	0.3	0.1	0.3	0.1	0.0	0.1
22/09/2014	0.0	0.2	1.0	0.3	0.1	0.5	0.2
23/09/2014	0.0	0.2	0.0	0.2	0.1	0.1	0.1
24/09/2014	0.0	0.2	0.0	0.2	0.1	0.0	0.1
25/09/2014	0.0	0.2	0.0	0.2	0.1	0.0	0.1
26/09/2014	0.0	0.3	0.0	0.2	0.1	0.0	0.1
27/09/2014	0.0	0.2	0.0	0.1	0.1	0.0	0.1
28/09/2014	0.0	0.2	0.0	0.1	0.1	0.0	0.1
29/09/2014	0.0	0.2	0.0	0.1	0.1	0.0	0.1
30/09/2014	0.0	0.2	0.0	0.1	0.1	0.0	0.1

Daily Summaries of Continuous Streamflow Monitoring Data

Date	Total Daily Rainfall (mm)	Total Daily Streamflow (mm)			Total Daily Baseflow (mm)		
		Tributary 2	Tributary 3	Tributaries 2&3	Tributary 2	Tributary 3	Tributaries 2&3
01/10/2014	0.0	0.2	0.0	0.1	0.1	0.0	0.1
02/10/2014	0.0	0.2	0.0	0.1	0.1	0.0	0.1
03/10/2014	0.0	0.1	0.0	0.1	0.1	0.0	0.1
04/10/2014	4.2	0.2	0.0	0.1	0.1	0.0	0.0
05/10/2014	0.0	0.2	0.0	0.1	0.1	0.0	0.1
06/10/2014	1.1	0.2	0.0	0.2	0.1	0.0	0.1
07/10/2014	6.9	0.2	0.0	0.2	0.1	0.0	0.1
08/10/2014	10.8	0.2	0.0	0.3	0.1	0.0	0.1
09/10/2014	1.9	0.2	0.0	0.2	0.1	0.0	0.1
10/10/2014	0.0	0.2	0.0	0.2	0.1	0.0	0.1
11/10/2014	0.0	0.2	0.0	0.3	0.1	0.0	0.1
12/10/2014	0.1	0.3	0.0	0.3	0.1	0.0	0.1
13/10/2014	0.1	0.2	0.0	0.2	0.1	0.0	0.1
14/10/2014	0.0	0.2	0.0	0.2	0.1	0.0	0.1
15/10/2014	4.2	0.2	0.0	0.2	0.1	0.0	0.1
16/10/2014	11.8	0.3	0.5	0.4	0.1	0.1	0.1
17/10/2014	2.0	0.4	1.8	0.5	0.2	0.8	0.3
18/10/2014	0.7	0.4	1.1	0.6	0.2	0.7	0.3
19/10/2014	0.0	0.3	0.0	0.5	0.2	0.1	0.3
20/10/2014	3.9	0.3	0.0	0.5	0.2	0.0	0.3
21/10/2014	8.3	0.5	0.6	0.8	0.2	0.2	0.3
22/10/2014	0.0	0.7	0.7	1.0	0.4	0.4	0.5
23/10/2014	0.0	0.5	0.2	0.7	0.3	0.1	0.4
24/10/2014	0.0	0.4	0.0	0.7	0.2	0.0	0.4
25/10/2014	9.5	0.4	0.0	0.6	0.2	0.0	0.3
26/10/2014	0.2	0.5	0.6	0.9	0.3	0.2	0.4
27/10/2014	3.0	0.5	0.2	0.8	0.3	0.1	0.4
28/10/2014	3.4	0.5	0.1	0.8	0.2	0.0	0.4
29/10/2014	0.2	0.5	0.2	0.8	0.3	0.1	0.4
30/10/2014	0.0	0.5	0.0	0.7	0.2	0.0	0.4
31/10/2014	0.0	0.4	0.0	0.6	0.2	0.0	0.3
01/11/2014	0.0	0.4	0.0	0.5	0.2	0.0	0.3
02/11/2014	0.0	0.3	0.0	0.5	0.2	0.0	0.3
03/11/2014	0.0	0.3	0.0	0.5	0.2	0.0	0.2
04/11/2014	4.9	0.3	0.0	0.5	0.2	0.0	0.2
05/11/2014	0.2	0.4	0.0	0.6	0.2	0.0	0.3
06/11/2014	1.9	0.6	0.0	0.5	0.2	0.0	0.3
07/11/2014	1.7	0.7	0.0	0.5	0.3	0.0	0.3
08/11/2014	0.7	0.6	0.0	0.5	0.3	0.0	0.2
09/11/2014	0.3	0.6	0.0	0.5	0.3	0.0	0.2
10/11/2014	0.3	0.6	0.0	0.4	0.3	0.0	0.2
11/11/2014	0.0	0.6	0.0	0.4	0.3	0.0	0.2
12/11/2014	3.1	0.6	0.0	0.5	0.3	0.0	0.2
13/11/2014	0.0	0.6	0.0	0.5	0.3	0.0	0.2
14/11/2014	0.0	0.6	0.0	0.4	0.3	0.0	0.2
15/11/2014	0.0	0.5	0.0	0.4	0.3	0.0	0.2
16/11/2014	0.0	0.6	0.0	0.5	0.3	0.0	0.2
17/11/2014	7.4	0.6	0.0	0.5	0.3	0.0	0.2
18/11/2014	0.2	0.6	0.0	0.5	0.3	0.0	0.2
19/11/2014	0.2	0.5	0.0	0.5	0.3	0.0	0.2
20/11/2014	0.0	0.5	0.0	0.4	0.3	0.0	0.2
21/11/2014	0.0	0.5	0.0	0.4	0.3	0.0	0.2
22/11/2014	2.0	0.5	0.0	0.6	0.3	0.0	0.3
23/11/2014	13.4	0.7	0.2	0.7	0.3	0.1	0.3
24/11/2014	1.0	2.2	1.6	2.1	0.9	0.6	0.9
25/11/2014	0.0	2.4	1.2	1.7	1.3	0.7	1.0
26/11/2014	0.0	1.8	0.8	1.2	1.0	0.4	0.6
27/11/2014	0.0	1.6	0.5	1.0	0.8	0.3	0.5
28/11/2014	0.0	1.3	0.2	0.8	0.7	0.2	0.4
29/11/2014	0.0	1.1	0.1	0.8	0.6	0.1	0.4
30/11/2014	0.2	1.2	0.2	0.7	0.6	0.1	0.4

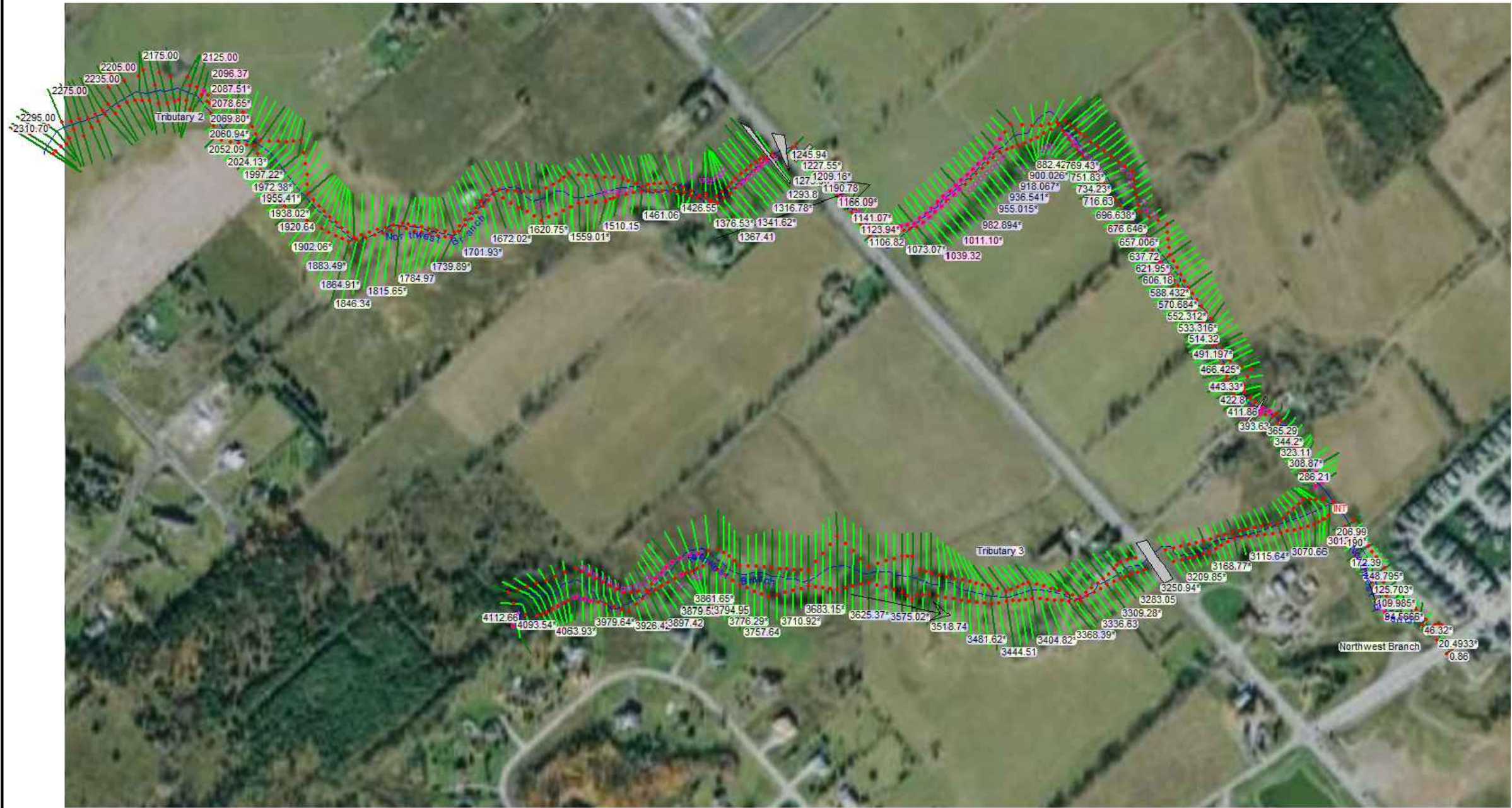
Daily Summaries of Continuous Streamflow Monitoring Data

Date	Total Daily Rainfall (mm)	Total Daily Streamflow (mm)			Total Daily Baseflow (mm)		
		Tributary 2	Tributary 3	Tributaries 2&3	Tributary 2	Tributary 3	Tributaries 2&3
01/12/2014	0.0	1.2	0.2	0.7	0.6	0.1	0.4
02/12/2014	3.0	0.9	0.0	0.9	0.5	0.0	0.4
03/12/2014	2.6	1.0	0.0	0.7	0.5	0.0	0.4
04/12/2014	0.0	0.9	0.0	0.6	0.5	0.0	0.3
05/12/2014	0.0	0.8	0.0	0.8	0.4	0.0	0.4
06/12/2014	0.0	0.9	0.0	0.7	0.4	0.0	0.4
07/12/2014	0.0	0.7	0.0	0.7	0.4	0.0	0.3
08/12/2014	0.0	0.6	0.0	1.1	0.3	0.0	0.5
09/12/2014	0.2	0.9	0.0	1.1	0.4	0.0	0.5
10/12/2014	11.1	0.9	0.0	1.1	0.5	0.0	0.6
11/12/2014	0.8	0.9	0.0	0.8	0.4	0.0	0.4
12/12/2014	0.4	0.8	0.0	0.7	0.4	0.0	0.4
13/12/2014	0.2	0.7	0.6	0.6	0.4	0.3	0.3
14/12/2014	0.0	0.8	0.0	0.5	0.4	0.0	0.3
15/12/2014	0.0	0.8	0.0	0.5	0.4	0.0	0.2
16/12/2014	6.0	0.8	0.0	0.5	0.4	0.0	0.2
17/12/2014	8.5	0.9	0.2	0.6	0.4	0.0	0.3
18/12/2014	0.0	1.0	0.2	0.7	0.5	0.1	0.3
19/12/2014	0.0	1.1	0.2	0.9	0.5	0.1	0.4
20/12/2014	0.0	1.1	0.2	0.8	0.6	0.1	0.4
21/12/2014	0.0	1.0	0.3	0.9	0.5	0.1	0.4
22/12/2014	0.7	1.0	0.2	1.0	0.5	0.1	0.5
23/12/2014	1.0	1.1	0.1	1.1	0.5	0.1	0.5
24/12/2014	4.9	1.3	0.9	1.1	0.6	0.3	0.5
25/12/2014	0.2	3.5	2.4	2.5	1.4	1.0	1.0
26/12/2014	0.0	3.6	2.3	2.2	1.9	1.2	1.2
27/12/2014	2.5	3.3	2.0	1.9	1.7	1.0	1.0
28/12/2014	0.0	3.4	2.3	2.0	1.7	1.2	1.0
29/12/2014	0.0	2.7	1.1	1.6	1.4	0.7	0.8
30/12/2014	0.0	1.9	0.6	2.2	1.0	0.4	1.2
31/12/2014	0.0	1.6	0.4	1.1	0.8	0.2	0.6

Appendix H

Hydraulic Analysis of Shirley's Brook Tributaries

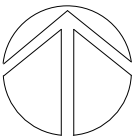
M:\2012\112117\CAD\Design\EMP\MEMO (CS)\HECRAS Figs.dwg, H-1 ExCond, Apr 04, 2016 - 11:46am, bthurber



KANATA NORTH

COMMUNITY DESIGN PLAN

FIGURE NO. H-1
EXISTING CONDITIONS
HEC-RAS MODEL
SCHEMATIC



DATE
MAY 2016

JOB
112117

SCALE
NTS



HEC-RAS Output: Existing Conditions

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary 3	4112.66	100yr-24hrSCS	1.01	89.22	89.46	89.46	89.53	0.023886	1.13	0.9	7.05	1
Tributary 3	4112.66	5yr-24hrSCS	0.36	89.22	89.38	89.38	89.42	0.027588	0.89	0.4	4.89	1
Tributary 3	4112.66	2yr-24hrSCS	0.2	89.22	89.35	89.35	89.38	0.034006	0.84	0.24	3.81	1.06
Tributary 3	4103.10*	100yr-24hrSCS	1.01	88.98	89.22	89.23	89.3	0.030133	1.23	0.82	6.32	1.09
Tributary 3	4103.10*	5yr-24hrSCS	0.36	88.98	89.14	89.14	89.18	0.028795	0.93	0.38	4.33	1
Tributary 3	4103.10*	2yr-24hrSCS	0.2	88.98	89.07	89.11	89.17	0.111662	1.35	0.15	2.7	1.83
Tributary 3	4093.54*	100yr-24hrSCS	1.01	88.74	88.98	88.98	89.05	0.027461	1.16	0.87	6.35	1
Tributary 3	4093.54*	5yr-24hrSCS	0.36	88.74	88.88	88.89	88.93	0.03163	0.94	0.38	4.19	1
Tributary 3	4093.54*	2yr-24hrSCS	0.2	88.74	88.86	88.84	88.88	0.023697	0.75	0.27	3.38	0.85
Tributary 3	4083.98*	100yr-24hrSCS	1.01	88.49	88.72	88.72	88.79	0.032027	1.21	0.84	6.11	1.05
Tributary 3	4083.98*	5yr-24hrSCS	0.36	88.49	88.63	88.63	88.67	0.028393	0.9	0.4	4.13	0.93
Tributary 3	4083.98*	2yr-24hrSCS	0.2	88.49	88.59	88.58	88.62	0.037467	0.85	0.24	3.39	1.02
Tributary 3	4074.43	100yr-24hrSCS	1.01	88.25	88.48	88.46	88.53	0.019656	1.02	0.99	6.28	0.82
Tributary 3	4074.43	5yr-24hrSCS	0.36	88.25	88.29	88.36	88.89	1.641731	3.43	0.1	2.97	5.84
Tributary 3	4074.43	2yr-24hrSCS	0.2	88.25	88.35		88.37	0.022489	0.67	0.3	3.96	0.78
Tributary 3	4063.93*	100yr-24hrSCS	1.01	88.07	88.3		88.35	0.019318	1.01	1.01	6.42	0.81
Tributary 3	4063.93*	5yr-24hrSCS	0.36	88.07	88.2	88.17	88.23	0.018192	0.73	0.49	4.82	0.73
Tributary 3	4063.93*	2yr-24hrSCS	0.2	88.07	88.17		88.19	0.017504	0.61	0.34	4.23	0.69
Tributary 3	4053.43*	100yr-24hrSCS	1.01	87.89	88.11		88.16	0.021824	1.04	0.97	6.47	0.86
Tributary 3	4053.43*	5yr-24hrSCS	0.36	87.89	88.02		88.05	0.02111	0.76	0.47	4.89	0.78
Tributary 3	4053.43*	2yr-24hrSCS	0.2	87.89	87.98	87.97	88	0.024054	0.67	0.31	4.25	0.8
Tributary 3	4042.93*	100yr-24hrSCS	1.01	87.71	87.93		87.98	0.020171	1	1.01	6.75	0.82
Tributary 3	4042.93*	5yr-24hrSCS	0.36	87.71	87.84		87.86	0.018794	0.72	0.5	5.12	0.74
Tributary 3	4042.93*	2yr-24hrSCS	0.2	87.71	87.81		87.82	0.017458	0.59	0.35	4.56	0.68
Tributary 3	4032.43*	100yr-24hrSCS	1.01	87.54	87.74		87.79	0.021048	1	1.01	6.91	0.84
Tributary 3	4032.43*	5yr-24hrSCS	0.36	87.54	87.65		87.68	0.021838	0.75	0.48	5.21	0.79
Tributary 3	4032.43*	2yr-24hrSCS	0.2	87.54	87.62		87.64	0.021686	0.63	0.33	4.65	0.75
Tributary 3	4021.93*	100yr-24hrSCS	1.01	87.36	87.56	87.53	87.61	0.018757	0.95	1.07	7.29	0.79
Tributary 3	4021.93*	5yr-24hrSCS	0.36	87.36	87.47		87.5	0.018134	0.69	0.52	5.49	0.72
Tributary 3	4021.93*	2yr-24hrSCS	0.2	87.36	87.44		87.46	0.018519	0.58	0.35	4.9	0.7
Tributary 3	4011.43*	100yr-24hrSCS	1.01	87.18	87.36	87.35	87.42	0.02438	1.04	0.98	7.1	0.89
Tributary 3	4011.43*	5yr-24hrSCS	0.36	87.18	87.29		87.31	0.023042	0.74	0.48	5.54	0.8
Tributary 3	4011.43*	2yr-24hrSCS	0.2	87.18	87.26		87.28	0.022573	0.61	0.33	5	0.76
Tributary 3	4000.94	100yr-24hrSCS	1.01	87	87.21	87.17	87.24	0.014452	0.85	1.19	7.86	0.7
Tributary 3	4000.94	5yr-24hrSCS	0.36	87	87.11	87.09	87.14	0.016514	0.65	0.55	5.94	0.69
Tributary 3	4000.94	2yr-24hrSCS	0.2	87	87.08	87.07	87.1	0.01715	0.55	0.37	5.32	0.67
Tributary 3	3990.29*	100yr-24hrSCS	1.01	86.84	87.06	87.03	87.1	0.014021	0.88	1.15	7.29	0.71
Tributary 3	3990.29*	5yr-24hrSCS	0.36	86.84	86.97	86.94	86.99	0.014496	0.66	0.54	5.38	0.67
Tributary 3	3990.29*	2yr-24hrSCS	0.2	86.84	86.93	86.91	86.95	0.014683	0.56	0.36	4.74	0.65
Tributary 3	3979.64*	100yr-24hrSCS	1.01	86.68	86.93	86.88	86.97	0.014041	0.91	1.12	6.84	0.71
Tributary 3	3979.64*	5yr-24hrSCS	0.36	86.68	86.82	86.79	86.85	0.01396	0.69	0.52	4.81	0.67
Tributary 3	3979.64*	2yr-24hrSCS	0.2	86.68	86.78	86.76	86.8	0.017435	0.63	0.32	4.05	0.71
Tributary 3	3969.00*	100yr-24hrSCS	1.01	86.52	86.79	86.75	86.83	0.013563	0.93	1.09	6.48	0.72
Tributary 3	3969.00*	5yr-24hrSCS	0.36	86.52	86.68	86.64	86.7	0.013837	0.73	0.49	4.23	0.69
Tributary 3	3969.00*	2yr-24hrSCS	0.2	86.52	86.63	86.61	86.65	0.014418	0.64	0.32	3.54	0.67
Tributary 3	3958.35*	100yr-24hrSCS	1.01	86.36	86.66	86.62	86.71	0.013372	0.96	1.06	6.19	0.74
Tributary 3	3958.35*	5yr-24hrSCS	0.36	86.36	86.53	86.51	86.56	0.015525	0.82	0.44	3.63	0.75
Tributary 3	3958.35*	2yr-24hrSCS	0.2	86.36	86.48	86.46	86.51	0.016148	0.72	0.28	2.94	0.74
Tributary 3	3947.71*	100yr-24hrSCS	1.01	86.2	86.54	86.5	86.59	0.012244	0.94	1.07	6.26	0.73
Tributary 3	3947.71*	5yr-24hrSCS	0.36	86.2	86.41	86.37	86.44	0.012205	0.8	0.45	3.36	0.69
Tributary 3	3947.71*	2yr-24hrSCS	0.2	86.2	86.35	86.32	86.38	0.013172	0.72	0.28	2.59	0.7
Tributary 3	3937.06*	100yr-24hrSCS	1.01	86.04	86.42	86.38	86.47	0.012872	0.94	1.08	6.62	0.74
Tributary 3	3937.06*	5yr-24hrSCS	0.36	86.04	86.3	86.25	86.33	0.010523	0.76	0.47	3.32	0.65
Tributary 3	3937.06*	2yr-24hrSCS	0.2	86.04	86.23	86.19	86.26	0.011065	0.7	0.29	2.39	0.65
Tributary 3	3926.42	100yr-24hrSCS	1.01	85.88	86.32	86.27	86.35	0.010838	0.85	1.2	7.79	0.69
Tributary 3	3926.42	5yr-24hrSCS	0.36	85.88	86.2	86.14	86.23	0.010528	0.71	0.51	4.18	0.65
Tributary 3	3926.42	2yr-24hrSCS	0.2	85.88	86.14	86.09	86.16	0.009054	0.68	0.3	2.36	0.6
Tributary 3	3916.75*	100yr-24hrSCS	1.01	85.84	86.22	86.17	86.26	0.009331	0.8	1.26	7.94	0.64
Tributary 3	3916.75*	5yr-24hrSCS	0.36	85.84	86.11	86.06	86.13	0.010076	0.68	0.53	4.51	0.63
Tributary 3	3916.75*	2yr-24hrSCS	0.2	85.84	86.05	86.01	86.07	0.009508	0.62	0.33	3.09	0.6

HEC-RAS Output: Existing Conditions

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary 3	3907.08*	100yr-24hrSCS	1.01	85.79	86.16	86.08	86.19	0.0057	0.69	1.46	7.95	0.52
Tributary 3	3907.08*	5yr-24hrSCS	0.36	85.79	86.04	85.97	86.05	0.006307	0.56	0.64	5.12	0.51
Tributary 3	3907.08*	2yr-24hrSCS	0.2	85.79	85.99	85.93	86	0.006141	0.49	0.41	3.97	0.49
Tributary 3	3897.42	100yr-24hrSCS	1.01	85.75	86.03	86.01	86.1	0.014121	1.15	0.9	5.83	0.82
Tributary 3	3897.42	5yr-24hrSCS	0.36	85.75	85.92	85.9	85.96	0.01599	0.87	0.41	3.44	0.8
Tributary 3	3897.42	2yr-24hrSCS	0.2	85.75	85.88	85.86	85.91	0.016005	0.74	0.27	2.93	0.77
Tributary 3	3888.47*	100yr-24hrSCS	1.01	85.63	85.9	85.88	85.97	0.016257	1.13	0.9	4.9	0.85
Tributary 3	3888.47*	5yr-24hrSCS	0.36	85.63	85.79	85.77	85.83	0.015655	0.83	0.43	3.7	0.77
Tributary 3	3888.47*	2yr-24hrSCS	0.2	85.63	85.76	85.74	85.78	0.0142	0.67	0.31	3.35	0.71
Tributary 3	3879.53*	100yr-24hrSCS	1.01	85.5	85.76	85.74	85.82	0.015531	1.09	0.93	5.03	0.81
Tributary 3	3879.53*	5yr-24hrSCS	0.36	85.5	85.67	85.64	85.7	0.012723	0.72	0.5	4.31	0.68
Tributary 3	3879.53*	2yr-24hrSCS	0.2	85.5	85.63	85.61	85.65	0.01449	0.63	0.33	3.86	0.69
Tributary 3	3870.59*	100yr-24hrSCS	1.01	85.38	85.63	85.6	85.69	0.01577	1.04	0.98	5.54	0.79
Tributary 3	3870.59*	5yr-24hrSCS	0.36	85.38	85.54	85.52	85.57	0.015358	0.71	0.5	4.87	0.71
Tributary 3	3870.59*	2yr-24hrSCS	0.2	85.38	85.51	85.48	85.52	0.015038	0.59	0.34	4.35	0.67
Tributary 3	3861.65*	100yr-24hrSCS	1.01	85.26	85.52	85.48	85.56	0.012088	0.9	1.13	6.21	0.67
Tributary 3	3861.65*	5yr-24hrSCS	0.36	85.26	85.42	85.39	85.44	0.012199	0.62	0.57	5.54	0.62
Tributary 3	3861.65*	2yr-24hrSCS	0.2	85.26	85.39	85.36	85.4	0.012505	0.52	0.39	4.99	0.6
Tributary 3	3852.71	100yr-24hrSCS	1.01	85.13	85.36	85.34	85.41	0.022102	1.04	0.98	6.58	0.86
Tributary 3	3852.71	5yr-24hrSCS	0.36	85.13	85.29	85.27	85.31	0.016538	0.65	0.55	6.11	0.69
Tributary 3	3852.71	2yr-24hrSCS	0.2	85.13	85.26	85.24	85.27	0.017898	0.56	0.36	5.29	0.68
Tributary 3	3841.15*	100yr-24hrSCS	1.01	84.96	85.14	85.13	85.19	0.024754	1.02	1	7.86	0.91
Tributary 3	3841.15*	5yr-24hrSCS	0.36	84.96	85.06	85.06	85.1	0.031302	0.79	0.46	6.31	0.93
Tributary 3	3841.15*	2yr-24hrSCS	0.2	84.96	85.04	85.04	85.06	0.025561	0.61	0.33	5.78	0.81
Tributary 3	3829.60*	100yr-24hrSCS	1.01	84.78	84.95	84.93	84.99	0.017985	0.88	1.16	9.34	0.79
Tributary 3	3829.60*	5yr-24hrSCS	0.36	84.78	84.89	84.86	84.9	0.014306	0.58	0.61	7.72	0.66
Tributary 3	3829.60*	2yr-24hrSCS	0.2	84.78	84.86	84.84	84.87	0.017096	0.51	0.4	6.91	0.68
Tributary 3	3818.05*	100yr-24hrSCS	1.01	84.6	84.74	84.73	84.79	0.024386	0.95	1.07	10.05	0.93
Tributary 3	3818.05*	5yr-24hrSCS	0.36	84.6	84.68	84.67	84.7	0.032054	0.73	0.49	8.25	0.96
Tributary 3	3818.05*	2yr-24hrSCS	0.2	84.6	84.66	84.65	84.68	0.023636	0.55	0.37	7.72	0.8
Tributary 3	3806.50*	100yr-24hrSCS	1.01	84.43	84.56	84.54	84.59	0.015515	0.79	1.28	11.67	0.76
Tributary 3	3806.50*	5yr-24hrSCS	0.36	84.43	84.51		84.52	0.012054	0.52	0.7	10.01	0.62
Tributary 3	3806.50*	2yr-24hrSCS	0.2	84.43	84.48	84.46	84.49	0.01489	0.45	0.45	9.24	0.65
Tributary 3	3794.95	100yr-24hrSCS	1.01	84.25	84.35	84.35	84.4	0.031001	0.96	1.06	12.67	1.06
Tributary 3	3794.95	5yr-24hrSCS	0.36	84.25	84.3	84.3	84.33	0.035403	0.71	0.51	10.69	1.03
Tributary 3	3794.95	2yr-24hrSCS	0.2	84.25	84.29	84.29	84.31	0.027992	0.54	0.38	10.17	0.88
Tributary 3	3785.62*	100yr-24hrSCS	1.01	83.91	84.01	84.02	84.07	0.039299	1.09	0.93	11.13	1.2
Tributary 3	3785.62*	5yr-24hrSCS	0.36	83.91	83.97	83.97	84	0.037705	0.77	0.47	9.05	1.08
Tributary 3	3785.62*	2yr-24hrSCS	0.2	83.91	83.95	83.95	83.97	0.047784	0.69	0.3	8.16	1.15
Tributary 3	3776.29*	100yr-24hrSCS	1.01	83.56	83.69	83.7	83.75	0.032244	1.04	0.97	10.65	1.1
Tributary 3	3776.29*	5yr-24hrSCS	0.36	83.56	83.64	83.64	83.67	0.034238	0.79	0.45	7.92	1.05
Tributary 3	3776.29*	2yr-24hrSCS	0.2	83.56	83.62	83.62	83.64	0.028554	0.62	0.33	7.05	0.92
Tributary 3	3766.96*	100yr-24hrSCS	1.01	83.22	83.37	83.38	83.43	0.038663	1.12	0.9	10.05	1.2
Tributary 3	3766.96*	5yr-24hrSCS	0.36	83.22	83.31	83.31	83.35	0.037833	0.85	0.42	7.07	1.11
Tributary 3	3766.96*	2yr-24hrSCS	0.2	83.22	83.29	83.29	83.32	0.044412	0.77	0.26	5.74	1.15
Tributary 3	3757.64	100yr-24hrSCS	1.01	82.88	83.06	83.06	83.11	0.031846	1.06	0.96	10.18	1.1
Tributary 3	3757.64	5yr-24hrSCS	0.36	82.88	83	83	83.03	0.031532	0.79	0.45	7.28	1.02
Tributary 3	3757.64	2yr-24hrSCS	0.2	82.88	82.88	82.97	1869.84	90489.85	187.29	0	0.33	1045.75
Tributary 3	3748.27*	100yr-24hrSCS	1.01	82.62	82.8	82.81	82.86	0.036014	1.07	0.95	10.82	1.15
Tributary 3	3748.27*	5yr-24hrSCS	0.36	82.62	82.75	82.75	82.78	0.025735	0.73	0.49	7.79	0.92
Tributary 3	3748.27*	2yr-24hrSCS	0.2	82.62	82.72	82.72	82.75	0.040296	0.75	0.27	5.78	1.1
Tributary 3	3738.91*	100yr-24hrSCS	1.01	82.37	82.53	82.55	82.61	0.049039	1.19	0.85	10.48	1.33
Tributary 3	3738.91*	5yr-24hrSCS	0.36	82.37	82.5	82.5	82.52	0.020389	0.65	0.55	8.51	0.82
Tributary 3	3738.91*	2yr-24hrSCS	0.2	82.37	82.38	82.47	188.9	2245.341	45.73	0	0.72	185.18
Tributary 3	3729.54*	100yr-24hrSCS	1.01	82.11	82.22	82.29	82.61	0.490175	2.79	0.36	7	3.9
Tributary 3	3729.54*	5yr-24hrSCS	0.36	82.11	82.22	82.22	82.26	0.043918	0.87	0.41	7.39	1.18
Tributary 3	3729.54*	2yr-24hrSCS	0.2	82.11	82.16	82.21	82.7	2.199217	3.27	0.06	2.92	7.12
Tributary 3	3720.18	100yr-24hrSCS	1.01	81.86	82.08	82.03	82.09	0.006113	0.56	1.81	14.38	0.5
Tributary 3	3720.18	5yr-24hrSCS	0.36	81.86	81.9	81.96	82.33	1.288602	2.92	0.12	4.53	5.67
Tributary 3	3720.18	2yr-24hrSCS	0.2	81.86	81.9	81.94	82.09	0.643645	1.93	0.11	4.33	3.94

HEC-RAS Output: Existing Conditions

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary 3	3710.92*	100yr-24hrSCS	1.01	81.74	81.99		82.02	0.01092	0.75	1.36	10.35	0.66
Tributary 3	3710.92*	5yr-24hrSCS	0.36	81.74	81.9	81.88	81.92	0.012123	0.62	0.58	6.42	0.65
Tributary 3	3710.92*	2yr-24hrSCS	0.2	81.74	81.86	81.84	81.88	0.01273	0.55	0.37	5.04	0.65
Tributary 3	3701.66*	100yr-24hrSCS	1.01	81.62	81.85		81.89	0.015751	0.96	1.05	6.92	0.79
Tributary 3	3701.66*	5yr-24hrSCS	0.36	81.62	81.74		81.77	0.019199	0.78	0.46	4.74	0.81
Tributary 3	3701.66*	2yr-24hrSCS	0.2	81.62	81.71		81.73	0.019828	0.67	0.3	4.08	0.79
Tributary 3	3692.41*	100yr-24hrSCS	1.01	81.49	81.71	81.67	81.75	0.014614	0.97	1.05	6.21	0.75
Tributary 3	3692.41*	5yr-24hrSCS	0.36	81.49	81.62	81.59	81.64	0.010583	0.62	0.58	5.19	0.6
Tributary 3	3692.41*	2yr-24hrSCS	0.2	81.49	81.59	81.55	81.61	0.008524	0.48	0.43	4.84	0.52
Tributary 3	3683.15*	100yr-24hrSCS	1.01	81.37	81.55		81.6	0.01847	1.02	0.99	6.22	0.81
Tributary 3	3683.15*	5yr-24hrSCS	0.36	81.37	81.46		81.49	0.02625	0.78	0.46	5.57	0.87
Tributary 3	3683.15*	2yr-24hrSCS	0.2	81.37	81.43	81.43	81.45	0.042245	0.73	0.28	5.34	1.03
Tributary 3	3673.9	100yr-24hrSCS	1.01	81.25	81.44		81.48	0.009842	0.8	1.28	6.93	0.59
Tributary 3	3673.9	5yr-24hrSCS	0.36	81.25	81.37		81.38	0.006261	0.47	0.77	6.65	0.44
Tributary 3	3673.9	2yr-24hrSCS	0.2	81.25	81.34	81.3	81.35	0.004406	0.34	0.6	6.56	0.35
Tributary 3	3664.25*	100yr-24hrSCS	1.01	81.25	81.43		81.43	0.00194	0.34	2.97	17.18	0.26
Tributary 3	3664.25*	5yr-24hrSCS	0.36	81.25	81.34		81.35	0.002085	0.23	1.54	16.73	0.24
Tributary 3	3664.25*	2yr-24hrSCS	0.2	81.25	81.32		81.32	0.00163	0.17	1.18	16.62	0.21
Tributary 3	3654.60*	100yr-24hrSCS	1.01	81.25	81.42		81.42	0.000896	0.22	4.52	27.44	0.18
Tributary 3	3654.60*	5yr-24hrSCS	0.36	81.25	81.33		81.33	0.001533	0.18	2.04	26.81	0.2
Tributary 3	3654.60*	2yr-24hrSCS	0.2	81.25	81.31		81.31	0.001214	0.13	1.56	26.68	0.17
Tributary 3	3644.95*	100yr-24hrSCS	1.01	81.25	81.41		81.41	0.000525	0.17	6.02	37.75	0.13
Tributary 3	3644.95*	5yr-24hrSCS	0.36	81.25	81.32		81.32	0.001366	0.15	2.4	36.9	0.19
Tributary 3	3644.95*	2yr-24hrSCS	0.2	81.25	81.3		81.3	0.001292	0.12	1.74	36.74	0.17
Tributary 3	3635.31	100yr-24hrSCS	1.01	81.25	81.41		81.41	0.000348	0.14	7.51	48.09	0.11
Tributary 3	3635.31	5yr-24hrSCS	0.36	81.25	81.28		81.28	0.01229	0.26	1.36	46.67	0.49
Tributary 3	3635.31	2yr-24hrSCS	0.2	81.25	81.28		81.28	0.003716	0.15	1.39	46.68	0.27
Tributary 3	3625.37*	100yr-24hrSCS	1.01	81.19	81.41		81.41	0.000201	0.13	7.85	36.98	0.09
Tributary 3	3625.37*	5yr-24hrSCS	0.36	81.19	81.26		81.26	0.000879	0.13	2.66	35.64	0.16
Tributary 3	3625.37*	2yr-24hrSCS	0.2	81.19	81.21		81.22	0.009639	0.22	0.92	35.16	0.44
Tributary 3	3615.43*	100yr-24hrSCS	1.01	81.12	81.4		81.41	0.000183	0.15	6.91	26.07	0.09
Tributary 3	3615.43*	5yr-24hrSCS	0.36	81.12	81.26		81.26	0.000266	0.11	3.23	24.67	0.1
Tributary 3	3615.43*	2yr-24hrSCS	0.2	81.12	81.2		81.21	0.000494	0.11	1.9	24.2	0.12
Tributary 3	3605.49*	100yr-24hrSCS	1.01	81.06	81.4		81.4	0.00031	0.22	4.67	15.69	0.13
Tributary 3	3605.49*	5yr-24hrSCS	0.36	81.06	81.26		81.26	0.000254	0.14	2.53	13.97	0.11
Tributary 3	3605.49*	2yr-24hrSCS	0.2	81.06	81.2		81.2	0.000255	0.11	1.78	13.44	0.1
Tributary 3	3595.55	100yr-24hrSCS	1.01	81	81.33		81.39	0.011365	1.03	0.98	4.93	0.74
Tributary 3	3595.55	5yr-24hrSCS	0.36	81	81.22		81.25	0.011437	0.76	0.47	3.7	0.69
Tributary 3	3595.55	2yr-24hrSCS	0.2	81	81.17		81.19	0.011507	0.66	0.31	3.04	0.66
Tributary 3	3585.28*	100yr-24hrSCS	1.01	80.9	81.24		81.28	0.010179	0.9	1.13	6.17	0.67
Tributary 3	3585.28*	5yr-24hrSCS	0.36	80.9	81.12		81.15	0.009414	0.67	0.53	4.24	0.61
Tributary 3	3585.28*	2yr-24hrSCS	0.2	80.9	81.08		81.09	0.009149	0.58	0.35	3.47	0.58
Tributary 3	3575.02*	100yr-24hrSCS	1.01	80.8	81.13		81.17	0.011156	0.86	1.18	6.78	0.66
Tributary 3	3575.02*	5yr-24hrSCS	0.36	80.8	81.02		81.04	0.010764	0.66	0.54	4.5	0.61
Tributary 3	3575.02*	2yr-24hrSCS	0.2	80.8	80.97		80.99	0.01058	0.58	0.35	3.59	0.58
Tributary 3	3564.75*	100yr-24hrSCS	1.01	80.71	81.05	80.97	81.08	0.00777	0.71	1.43	8.08	0.54
Tributary 3	3564.75*	5yr-24hrSCS	0.36	80.71	80.94		80.95	0.006695	0.52	0.68	5.44	0.47
Tributary 3	3564.75*	2yr-24hrSCS	0.2	80.71	80.88		80.89	0.008281	0.51	0.4	3.93	0.51
Tributary 3	3554.49	100yr-24hrSCS	1.01	80.61	80.86	80.86	80.93	0.031294	1.16	0.88	6.55	1.01
Tributary 3	3554.49	5yr-24hrSCS	0.36	80.61	80.76	80.76	80.81	0.038789	1.04	0.34	3.55	1.06
Tributary 3	3554.49	2yr-24hrSCS	0.2	80.61	80.74	80.71	80.76	0.023414	0.75	0.27	3.12	0.81
Tributary 3	3548.69*	100yr-24hrSCS	1.01	80.55	80.83	80.68	80.84	0.002046	0.4	2.55	12.22	0.28
Tributary 3	3548.69*	5yr-24hrSCS	0.36	80.55	80.66	80.63	80.67	0.008043	0.46	0.78	8.48	0.48
Tributary 3	3548.69*	2yr-24hrSCS	0.2	80.55	80.61	80.6	80.62	0.023008	0.53	0.39	7.43	0.74
Tributary 3	3542.89	100yr-24hrSCS	1.01	80.5	80.84		80.84	0.000331	0.19	5.39	20.15	0.12
Tributary 3	3542.89	5yr-24hrSCS	0.36	80.5	80.66		80.66	0.000562	0.16	2.21	15.47	0.14
Tributary 3	3542.89	2yr-24hrSCS	0.2	80.5	80.6		80.6	0.001009	0.16	1.28	14.24	0.17
Tributary 3	3534.04	100yr-24hrSCS	1.01	80.25	80.74	80.71	80.82	0.015679	1.29	0.79	3.51	0.87
Tributary 3	3534.04	5yr-24hrSCS	0.36	80.25	80.6	80.55	80.64	0.010912	0.89	0.4	2.33	0.69
Tributary 3	3534.04	2yr-24hrSCS	0.2	80.25	80.54		80.57	0.009031	0.74	0.28	1.85	0.61

HEC-RAS Output: Existing Conditions

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary 3	3526.39*	100yr-24hrSCS	1.01	80.2	80.58	80.58	80.68	0.022225	1.39	0.73	3.84	1.02
Tributary 3	3526.39*	5yr-24hrSCS	0.36	80.2	80.46	80.46	80.52	0.024622	1.09	0.33	2.7	1
Tributary 3	3526.39*	2yr-24hrSCS	0.2	80.2	80.41	80.41	80.46	0.026611	0.99	0.21	2.07	1
Tributary 3	3518.74	100yr-24hrSCS	1.01	80.16	80.52	80.43	80.56	0.006833	0.93	1.09	4.26	0.59
Tributary 3	3518.74	5yr-24hrSCS	0.36	80.16	80.28	80.32	80.44	0.148054	1.78	0.2	3.08	2.22
Tributary 3	3518.74	2yr-24hrSCS	0.2	80.16	80.33	80.28	80.34	0.007432	0.56	0.36	3.33	0.54
Tributary 3	3509.46*	100yr-24hrSCS	1.01	80.09	80.46		80.5	0.006593	0.92	1.11	4.36	0.58
Tributary 3	3509.46*	5yr-24hrSCS	0.36	80.09	80.32	80.26	80.34	0.006822	0.66	0.54	3.59	0.54
Tributary 3	3509.46*	2yr-24hrSCS	0.2	80.09	80.27		80.28	0.006893	0.55	0.37	3.33	0.52
Tributary 3	3500.18*	100yr-24hrSCS	1.01	80.02	80.4		80.44	0.00597	0.88	1.16	4.52	0.55
Tributary 3	3500.18*	5yr-24hrSCS	0.36	80.02	80.26		80.28	0.005995	0.63	0.57	3.65	0.51
Tributary 3	3500.18*	2yr-24hrSCS	0.2	80.02	80.21		80.22	0.006474	0.54	0.38	3.34	0.51
Tributary 3	3490.90*	100yr-24hrSCS	1.01	79.96	80.36		80.39	0.004889	0.81	1.26	4.8	0.5
Tributary 3	3490.90*	5yr-24hrSCS	0.36	79.96	80.22		80.24	0.003963	0.55	0.65	3.85	0.42
Tributary 3	3490.90*	2yr-24hrSCS	0.2	79.96	80.17		80.18	0.003622	0.44	0.46	3.5	0.39
Tributary 3	3481.62*	100yr-24hrSCS	1.01	79.89	80.33		80.35	0.00349	0.7	1.44	5.27	0.43
Tributary 3	3481.62*	5yr-24hrSCS	0.36	79.89	80.2		80.21	0.002077	0.43	0.83	4.26	0.31
Tributary 3	3481.62*	2yr-24hrSCS	0.2	79.89	80.15		80.16	0.001448	0.32	0.63	3.87	0.25
Tributary 3	3472.34*	100yr-24hrSCS	1.01	79.82	80.31		80.32	0.002387	0.58	1.75	6.5	0.36
Tributary 3	3472.34*	5yr-24hrSCS	0.36	79.82	80.19		80.19	0.001016	0.33	1.09	4.92	0.22
Tributary 3	3472.34*	2yr-24hrSCS	0.2	79.82	80.15		80.15	0.000597	0.23	0.88	4.52	0.17
Tributary 3	3463.06*	100yr-24hrSCS	1.01	79.76	80.3		80.31	0.001342	0.45	2.28	8.12	0.27
Tributary 3	3463.06*	5yr-24hrSCS	0.36	79.76	80.18		80.19	0.000522	0.24	1.46	6.32	0.16
Tributary 3	3463.06*	2yr-24hrSCS	0.2	79.76	80.14		80.14	0.000274	0.17	1.21	5.65	0.12
Tributary 3	3453.78*	100yr-24hrSCS	1.01	79.69	80.29		80.3	0.000785	0.33	3.08	11.65	0.2
Tributary 3	3453.78*	5yr-24hrSCS	0.36	79.69	80.18		80.18	0.000242	0.18	2.04	8.17	0.11
Tributary 3	3453.78*	2yr-24hrSCS	0.2	79.69	80.14		80.14	0.000123	0.12	1.72	7.47	0.08
Tributary 3	3444.51	100yr-24hrSCS	1.01	79.62	80.29		80.29	0.00035	0.22	4.6	17.35	0.14
Tributary 3	3444.51	5yr-24hrSCS	0.36	79.62	80.18		80.18	0.000121	0.12	3	12.76	0.08
Tributary 3	3444.51	2yr-24hrSCS	0.2	79.62	80.14		80.14	0.000059	0.08	2.51	11.1	0.05
Tributary 3	3435.9*	100yr-24hrSCS	1.01	79.81	80.28		80.29	0.000755	0.3	3.41	14.55	0.2
Tributary 3	3435.9*	5yr-24hrSCS	0.36	79.81	80.18		80.18	0.000325	0.17	2.08	10.79	0.12
Tributary 3	3435.9*	2yr-24hrSCS	0.2	79.81	80.14		80.14	0.000178	0.12	1.69	9.39	0.09
Tributary 3	3427.29	100yr-24hrSCS	1.01	80	80.26		80.27	0.003607	0.52	1.94	12.05	0.41
Tributary 3	3427.29	5yr-24hrSCS	0.36	80	80.17		80.17	0.002727	0.36	1	8.51	0.33
Tributary 3	3427.29	2yr-24hrSCS	0.2	80	80.13		80.14	0.002222	0.28	0.72	7.46	0.29
Tributary 3	3419.8*	100yr-24hrSCS	1.01	80	80.24		80.25	0.003288	0.48	2.09	12.97	0.39
Tributary 3	3419.8*	5yr-24hrSCS	0.36	80	80.15		80.15	0.00239	0.32	1.1	9.88	0.31
Tributary 3	3419.8*	2yr-24hrSCS	0.2	80	80.12		80.12	0.001897	0.25	0.81	8.84	0.27
Tributary 3	3412.31*	100yr-24hrSCS	1.01	80	80.21		80.22	0.003223	0.46	2.19	14.27	0.38
Tributary 3	3412.31*	5yr-24hrSCS	0.36	80	80.13		80.14	0.002367	0.31	1.17	11.23	0.3
Tributary 3	3412.31*	2yr-24hrSCS	0.2	80	80.1		80.11	0.001834	0.24	0.87	10.23	0.26
Tributary 3	3404.82*	100yr-24hrSCS	1.01	80	80.19		80.2	0.003599	0.46	2.18	15.42	0.39
Tributary 3	3404.82*	5yr-24hrSCS	0.36	80	80.11		80.12	0.00283	0.31	1.15	12.44	0.33
Tributary 3	3404.82*	2yr-24hrSCS	0.2	80	80.09		80.09	0.002155	0.24	0.86	11.49	0.27
Tributary 3	3397.33	100yr-24hrSCS	1.01	80	80.11		80.14	0.019731	0.8	1.26	14.12	0.86
Tributary 3	3397.33	5yr-24hrSCS	0.36	80	80.08		80.08	0.008334	0.43	0.84	12.74	0.53
Tributary 3	3397.33	2yr-24hrSCS	0.2	80	80.04	80.03	80.05	0.032382	0.54	0.38	11.07	0.93
Tributary 3	3387.68*	100yr-24hrSCS	1.01	79.85	80.07		80.08	0.00247	0.44	2.29	13.07	0.34
Tributary 3	3387.68*	5yr-24hrSCS	0.36	79.85	79.91	79.91	79.94	0.033168	0.74	0.48	9.02	1.02
Tributary 3	3387.68*	2yr-24hrSCS	0.2	79.85	79.91		79.92	0.007962	0.38	0.53	9.15	0.51
Tributary 3	3378.03*	100yr-24hrSCS	1.01	79.7	80.06		80.07	0.000736	0.32	3.17	11.89	0.2
Tributary 3	3378.03*	5yr-24hrSCS	0.36	79.7	79.83	79.76	79.84	0.003322	0.39	0.92	7.9	0.37
Tributary 3	3378.03*	2yr-24hrSCS	0.2	79.7	79.75	79.75	79.77	0.03828	0.7	0.29	6.54	1.06
Tributary 3	3368.39*	100yr-24hrSCS	1.01	79.55	80.06		80.06	0.000431	0.29	3.53	10.38	0.16
Tributary 3	3368.39*	5yr-24hrSCS	0.36	79.55	79.83		79.83	0.000523	0.23	1.53	7.11	0.16
Tributary 3	3368.39*	2yr-24hrSCS	0.2	79.55	79.74	79.61	79.74	0.000688	0.22	0.95	6.1	0.17
Tributary 3	3358.74*	100yr-24hrSCS	1.01	79.4	80.05		80.06	0.000432	0.31	3.3	8.69	0.16
Tributary 3	3358.74*	5yr-24hrSCS	0.36	79.4	79.82		79.83	0.000301	0.21	1.67	5.78	0.13
Tributary 3	3358.74*	2yr-24hrSCS	0.2	79.4	79.74		79.74	0.000247	0.17	1.19	5	0.11

HEC-RAS Output: Existing Conditions

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary 3	3349.1	100yr-24hrSCS	1.01	79.25	80.04		80.05	0.000881	0.42	2.42	6.77	0.22
Tributary 3	3349.1	5yr-24hrSCS	0.36	79.25	79.82		79.82	0.000541	0.29	1.24	4.2	0.17
Tributary 3	3349.1	2yr-24hrSCS	0.2	79.25	79.73		79.73	0.000389	0.22	0.91	3.49	0.14
Tributary 3	3342.86*	100yr-24hrSCS	1.01	79.33	80.03		80.05	0.001736	0.55	1.86	5.8	0.31
Tributary 3	3342.86*	5yr-24hrSCS	0.36	79.33	79.81		79.82	0.001478	0.43	0.84	3.36	0.27
Tributary 3	3342.86*	2yr-24hrSCS	0.2	79.33	79.72		79.73	0.001264	0.35	0.58	2.79	0.24
Tributary 3	3336.63	100yr-24hrSCS	1.01	79.4	79.88	79.88	80.01	0.020606	1.61	0.63	2.38	1
Tributary 3	3336.63	5yr-24hrSCS	0.36	79.4	79.7	79.7	79.79	0.023563	1.28	0.28	1.67	1
Tributary 3	3336.63	2yr-24hrSCS	0.2	79.4	79.64	79.64	79.7	0.025407	1.12	0.18	1.4	1
Tributary 3	3327.51*	100yr-24hrSCS	1.01	79.24	79.59	79.63	79.77	0.03477	1.9	0.53	2.36	1.27
Tributary 3	3327.51*	5yr-24hrSCS	0.36	79.24	79.46	79.47	79.55	0.031061	1.37	0.26	1.75	1.13
Tributary 3	3327.51*	2yr-24hrSCS	0.2	79.24	79.42	79.41	79.47	0.022101	1.05	0.2	1.52	0.93
Tributary 3	3318.4*	100yr-24hrSCS	1.01	79.07	79.4	79.4	79.52	0.022259	1.57	0.65	2.72	1.03
Tributary 3	3318.4*	5yr-24hrSCS	0.36	79.07	79.23	79.25	79.33	0.037147	1.38	0.26	1.98	1.22
Tributary 3	3318.4*	2yr-24hrSCS	0.2	79.07	79.2	79.2	79.25	0.027311	1.03	0.2	1.85	1.01
Tributary 3	3309.28*	100yr-24hrSCS	1.01	78.91	79.16	79.18	79.3	0.030782	1.68	0.6	2.95	1.18
Tributary 3	3309.28*	5yr-24hrSCS	0.36	78.91	78.98	79.05	79.32	0.354837	2.59	0.14	2.27	3.36
Tributary 3	3309.28*	2yr-24hrSCS	0.2	78.91	79.03	79.02	79.06	0.016734	0.8	0.25	2.44	0.79
Tributary 3	3300.17	100yr-24hrSCS	1.01	78.75	78.96	78.98	79.09	0.031354	1.59	0.64	3.44	1.18
Tributary 3	3300.17	5yr-24hrSCS	0.36	78.75	78.87	78.87	78.92	0.026901	1.05	0.34	3.11	1.01
Tributary 3	3300.17	2yr-24hrSCS	0.2	78.75	78.83	78.83	78.87	0.030786	0.89	0.23	3	1.03
Tributary 3	3291.61*	100yr-24hrSCS	1.01	78.38	78.57	78.62	78.75	0.046774	1.88	0.54	3.11	1.44
Tributary 3	3291.61*	5yr-24hrSCS	0.36	78.38	78.47	78.5	78.58	0.064457	1.44	0.25	2.77	1.53
Tributary 3	3291.61*	2yr-24hrSCS	0.2	78.38	78.45	78.46	78.51	0.057842	1.13	0.18	2.68	1.39
Tributary 3	3283.05	100yr-24hrSCS	1.01	78	78.22	78.26	78.38	0.039077	1.78	0.57	3.12	1.33
Tributary 3	3283.05	5yr-24hrSCS	0.36	78	78.13	78.14	78.2	0.031365	1.17	0.31	2.71	1.11
Tributary 3	3283.05	2yr-24hrSCS	0.2	78	78.1	78.09	78.14	0.019863	0.83	0.25	2.61	0.86
Tributary 3	3277.27*	100yr-24hrSCS	1.01	77.87	78.11	78.11	78.2	0.021672	1.38	0.73	3.8	1
Tributary 3	3277.27*	5yr-24hrSCS	0.36	77.87	77.97	78	78.06	0.05423	1.32	0.27	3.06	1.41
Tributary 3	3277.27*	2yr-24hrSCS	0.2	77.87	77.96	77.96	78	0.028648	0.88	0.23	2.98	1
Tributary 3	3271.49	100yr-24hrSCS	1.16	77.75	78.03	77.98	78.09	0.011157	1.1	1.06	4.72	0.74
Tributary 3	3271.49	5yr-24hrSCS	0.42	77.75	77.78	77.87	79.06	3.780951	5.01	0.08	3.07	9.7
Tributary 3	3271.49	2yr-24hrSCS	0.24	77.75	77.79	77.84	77.98	0.330719	1.91	0.13	3.16	3.06
Tributary 3	3261.21*	100yr-24hrSCS	1.16	77.64	77.95		78	0.008627	1.01	1.15	4.76	0.66
Tributary 3	3261.21*	5yr-24hrSCS	0.42	77.64	77.82	77.77	77.84	0.0075	0.7	0.6	3.9	0.57
Tributary 3	3261.21*	2yr-24hrSCS	0.24	77.64	77.77	77.72	77.79	0.007609	0.59	0.41	3.53	0.55
Tributary 3	3250.94*	100yr-24hrSCS	1.16	77.52	77.78	77.78	77.88	0.021222	1.39	0.84	4.26	1
Tributary 3	3250.94*	5yr-24hrSCS	0.42	77.52	77.66	77.66	77.72	0.025367	1.08	0.39	3.3	1.01
Tributary 3	3250.94*	2yr-24hrSCS	0.24	77.52	77.62	77.62	77.66	0.02756	0.92	0.26	3	1
Tributary 3	3246.09		Culvert									
Tributary 3	3209.85*	100yr-24hrSCS	1.16	77.07	77.43		77.49	0.010681	1.11	1.05	4.44	0.73
Tributary 3	3209.85*	5yr-24hrSCS	0.42	77.07	77.28		77.32	0.010936	0.86	0.48	3.01	0.69
Tributary 3	3209.85*	2yr-24hrSCS	0.24	77.07	77.22		77.25	0.011144	0.77	0.31	2.33	0.67
Tributary 3	3199.58*	100yr-24hrSCS	1.16	76.95	77.34		77.4	0.010696	1.1	1.05	4.45	0.73
Tributary 3	3199.58*	5yr-24hrSCS	0.42	76.95	77.18		77.22	0.010966	0.87	0.48	2.93	0.69
Tributary 3	3199.58*	2yr-24hrSCS	0.24	76.95	77.11		77.15	0.011186	0.79	0.31	2.2	0.68
Tributary 3	3189.31*	100yr-24hrSCS	1.16	76.84	77.24		77.3	0.01073	1.1	1.05	4.51	0.73
Tributary 3	3189.31*	5yr-24hrSCS	0.42	76.84	77.08		77.12	0.010852	0.88	0.48	2.86	0.69
Tributary 3	3189.31*	2yr-24hrSCS	0.24	76.84	77.01		77.05	0.010909	0.79	0.3	2.11	0.67
Tributary 3	3179.04*	100yr-24hrSCS	1.16	76.73	77.15		77.2	0.010323	1.07	1.08	4.62	0.71
Tributary 3	3179.04*	5yr-24hrSCS	0.42	76.73	76.99		77.03	0.010602	0.87	0.48	2.83	0.68
Tributary 3	3179.04*	2yr-24hrSCS	0.24	76.73	76.91		76.94	0.011552	0.82	0.29	2	0.69
Tributary 3	3168.77*	100yr-24hrSCS	1.16	76.61	77.07		77.12	0.008744	0.99	1.17	5.03	0.65
Tributary 3	3168.77*	5yr-24hrSCS	0.42	76.61	76.91		76.94	0.008803	0.8	0.52	3.04	0.62
Tributary 3	3168.77*	2yr-24hrSCS	0.24	76.61	76.83		76.86	0.0079	0.73	0.33	2.01	0.57
Tributary 3	3158.5	100yr-24hrSCS	1.16	76.5	76.9	76.9	76.99	0.022439	1.36	0.85	4.54	1.01
Tributary 3	3158.5	5yr-24hrSCS	0.42	76.5	76.73	76.73	76.81	0.022671	1.26	0.33	1.94	0.97
Tributary 3	3158.5	2yr-24hrSCS	0.24	76.5	76.67	76.67	76.73	0.022254	1.07	0.23	1.68	0.93
Tributary 3	3150.03*	100yr-24hrSCS	1.16	76.31	76.69	76.7	76.8	0.025944	1.45	0.8	4.38	1.08
Tributary 3	3150.03*	5yr-24hrSCS	0.42	76.31	76.54	76.54	76.62	0.024526	1.27	0.33	2.04	1.01
Tributary 3	3150.03*	2yr-24hrSCS	0.24	76.31	76.48	76.47	76.54	0.024626	1.11	0.22	1.67	0.98

HEC-RAS Output: Existing Conditions

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary 3	3141.57*	100yr-24hrSCS	1.16	76.13	76.51	76.51	76.6	0.02279	1.36	0.85	4.69	1.02
Tributary 3	3141.57*	5yr-24hrSCS	0.42	76.13	76.36	76.35	76.43	0.021277	1.2	0.35	2.15	0.95
Tributary 3	3141.57*	2yr-24hrSCS	0.24	76.13	76.29	76.29	76.35	0.021332	1.05	0.23	1.72	0.92
Tributary 3	3133.10*	100yr-24hrSCS	1.16	75.94	76.31	76.32	76.41	0.025489	1.4	0.83	4.71	1.07
Tributary 3	3133.10*	5yr-24hrSCS	0.42	75.94	76.15	76.15	76.24	0.02601	1.31	0.32	2	1.05
Tributary 3	3133.10*	2yr-24hrSCS	0.24	75.94	76.1	76.1	76.16	0.025441	1.11	0.22	1.72	1
Tributary 3	3124.64	100yr-24hrSCS	1.16	75.75	76.17	76.14	76.23	0.015149	1.1	1.05	5.84	0.83
Tributary 3	3124.64	5yr-24hrSCS	0.42	75.75	76.02	75.97	76.07	0.013233	0.98	0.42	2.45	0.75
Tributary 3	3124.64	2yr-24hrSCS	0.24	75.75	75.95	75.91	75.98	0.01131	0.86	0.28	1.76	0.69
Tributary 3	3115.64*	100yr-24hrSCS	1.16	75.67	76.05		76.11	0.012772	1.02	1.13	6.26	0.77
Tributary 3	3115.64*	5yr-24hrSCS	0.42	75.67	75.92		75.96	0.011348	0.84	0.5	3.37	0.69
Tributary 3	3115.64*	2yr-24hrSCS	0.24	75.67	75.85		75.88	0.01101	0.78	0.31	2.25	0.67
Tributary 3	3106.64*	100yr-24hrSCS	1.16	75.58	75.95		75.99	0.011486	0.95	1.21	6.9	0.73
Tributary 3	3106.64*	5yr-24hrSCS	0.42	75.58	75.82		75.85	0.010549	0.76	0.55	4.14	0.66
Tributary 3	3106.64*	2yr-24hrSCS	0.24	75.58	75.76		75.79	0.010038	0.71	0.34	2.69	0.64
Tributary 3	3097.65*	100yr-24hrSCS	1.16	75.5	75.85		75.89	0.010331	0.88	1.31	7.76	0.68
Tributary 3	3097.65*	5yr-24hrSCS	0.42	75.5	75.74		75.76	0.009661	0.7	0.6	4.78	0.63
Tributary 3	3097.65*	2yr-24hrSCS	0.24	75.5	75.67		75.7	0.010823	0.7	0.35	2.97	0.65
Tributary 3	3088.65*	100yr-24hrSCS	1.16	75.42	75.76		75.8	0.009745	0.82	1.41	8.83	0.66
Tributary 3	3088.65*	5yr-24hrSCS	0.42	75.42	75.64		75.67	0.01185	0.76	0.55	4.55	0.69
Tributary 3	3088.65*	2yr-24hrSCS	0.24	75.42	75.57		75.6	0.010541	0.71	0.34	2.78	0.65
Tributary 3	3079.65*	100yr-24hrSCS	1.16	75.33	75.69		75.71	0.0082	0.71	1.62	11.2	0.6
Tributary 3	3079.65*	5yr-24hrSCS	0.42	75.33	75.54		75.57	0.009027	0.79	0.53	3.34	0.63
Tributary 3	3079.65*	2yr-24hrSCS	0.24	75.33	75.49		75.51	0.009013	0.67	0.36	2.89	0.61
Tributary 3	3070.66	100yr-24hrSCS	1.16	75.25	75.57	75.55	75.61	0.017017	0.87	1.33	11.7	0.82
Tributary 3	3070.66	5yr-24hrSCS	0.42	75.25	75.43		75.47	0.014791	0.95	0.44	2.99	0.79
Tributary 3	3070.66	2yr-24hrSCS	0.24	75.25	75.39		75.41	0.011809	0.74	0.33	2.76	0.69
Tributary 3	3062.05*	100yr-24hrSCS	1.16	75.15	75.42		75.46	0.017178	0.9	1.29	11.04	0.83
Tributary 3	3062.05*	5yr-24hrSCS	0.42	75.15	75.31		75.35	0.013393	0.8	0.52	4.35	0.74
Tributary 3	3062.05*	2yr-24hrSCS	0.24	75.15	75.27		75.3	0.013703	0.69	0.35	3.75	0.72
Tributary 3	3053.45*	100yr-24hrSCS	1.16	75.05	75.3		75.33	0.013808	0.81	1.43	12.13	0.75
Tributary 3	3053.45*	5yr-24hrSCS	0.42	75.05	75.21		75.23	0.012477	0.71	0.59	5.58	0.7
Tributary 3	3053.45*	2yr-24hrSCS	0.24	75.05	75.17		75.19	0.011494	0.59	0.41	4.78	0.65
Tributary 3	3044.84*	100yr-24hrSCS	1.16	74.95	75.18		75.21	0.013405	0.77	1.5	13.23	0.73
Tributary 3	3044.84*	5yr-24hrSCS	0.42	74.95	75.09		75.12	0.014173	0.67	0.63	7.18	0.72
Tributary 3	3044.84*	2yr-24hrSCS	0.24	74.95	75.06		75.08	0.014551	0.6	0.4	5.46	0.71
Tributary 3	3036.24*	100yr-24hrSCS	1.16	74.85	75.06		75.09	0.013114	0.75	1.54	14.02	0.72
Tributary 3	3036.24*	5yr-24hrSCS	0.42	74.85	75		75.01	0.010282	0.54	0.78	9.81	0.61
Tributary 3	3036.24*	2yr-24hrSCS	0.24	74.85	74.97		74.98	0.009437	0.46	0.52	7.61	0.57
Tributary 3	3027.64	100yr-24hrSCS	1.16	74.75	74.93	74.91	74.96	0.018648	0.84	1.39	14.01	0.85
Tributary 3	3027.64	5yr-24hrSCS	0.42	74.75	74.86		74.89	0.018846	0.64	0.65	9.72	0.8
Tributary 3	3027.64	2yr-24hrSCS	0.24	74.75	74.83	74.83	74.85	0.027963	0.65	0.37	7.26	0.93
Tributary 3	3020.29*	100yr-24hrSCS	1.16	74.55	74.8		74.85	0.012518	0.94	1.23	7.72	0.75
Tributary 3	3020.29*	5yr-24hrSCS	0.42	74.55	74.68	74.68	74.72	0.026932	0.93	0.45	5.13	1
Tributary 3	3020.29*	2yr-24hrSCS	0.24	74.55	74.66	74.66	74.68	0.02046	0.71	0.34	4.6	0.84
Tributary 3	3012.94*	100yr-24hrSCS	1.16	74.35	74.77		74.8	0.003222	0.64	1.8	7.16	0.41
Tributary 3	3012.94*	5yr-24hrSCS	0.42	74.35	74.58	74.51	74.6	0.00514	0.59	0.71	4.61	0.48
Tributary 3	3012.94*	2yr-24hrSCS	0.24	74.35	74.5	74.47	74.52	0.010041	0.63	0.38	3.65	0.62
Tributary 3	3005.6	100yr-24hrSCS	1.18	74.15	74.76		74.78	0.002043	0.56	2.09	7.1	0.33
Tributary 3	3005.6	5yr-24hrSCS	0.43	74.15	74.58		74.58	0.00105	0.37	1.15	4.4	0.23
Tributary 3	3005.6	2yr-24hrSCS	0.25	74.15	74.5		74.5	0.000843	0.3	0.83	3.83	0.2

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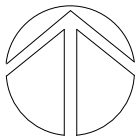
COMMUNITY DESIGN PLAN

FIGURE NO. H-2
PROPOSED CONDITIONS
HEC-RAS MODEL
SCHEMATIC

DATE
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Engineers, Planners & Landscape Architects

HEC-RAS Output: Proposed Conditions

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary 3	4112.66	100yr-24hrSCS	1.02	89.22	89.46	89.46	89.53	0.024009	1.14	0.9	7.04	1
Tributary 3	4112.66	5yr-24hrSCS	0.36	89.22	89.38	89.38	89.42	0.027988	0.9	0.4	4.88	1
Tributary 3	4112.66	2yr-24hrSCS	0.2	89.22	89.35	89.35	89.38	0.034006	0.84	0.24	3.81	1.06
Tributary 3	4103.10*	100yr-24hrSCS	1.02	88.98	89.22	89.23	89.3	0.029996	1.23	0.82	6.33	1.09
Tributary 3	4103.10*	5yr-24hrSCS	0.36	88.98	89.13	89.14	89.19	0.042138	1.08	0.33	4.03	1.2
Tributary 3	4103.10*	2yr-24hrSCS	0.2	88.98	89.07	89.11	89.17	0.111662	1.35	0.15	2.7	1.83
Tributary 3	4093.54*	100yr-24hrSCS	1.02	88.74	88.98	88.98	89.05	0.029316	1.19	0.85	6.26	1.03
Tributary 3	4093.54*	5yr-24hrSCS	0.36	88.74	88.83	88.89	88.99	0.16652	1.78	0.2	2.98	2.18
Tributary 3	4093.54*	2yr-24hrSCS	0.2	88.74	88.86	88.84	88.88	0.023697	0.75	0.27	3.38	0.85
Tributary 3	4083.98*	100yr-24hrSCS	1.02	88.49	88.72	88.72	88.79	0.030322	1.19	0.85	6.17	1.02
Tributary 3	4083.98*	5yr-24hrSCS	0.36	88.49	88.63	88.63	88.67	0.024898	0.86	0.42	4.21	0.88
Tributary 3	4083.98*	2yr-24hrSCS	0.2	88.49	88.59	88.58	88.62	0.037467	0.85	0.24	3.39	1.02
Tributary 3	4074.43	100yr-24hrSCS	1.02	88.25	88.48	88.46	88.53	0.019666	1.02	0.99	6.28	0.82
Tributary 3	4074.43	5yr-24hrSCS	0.36	88.25	88.31	88.36	88.51	0.312704	1.98	0.18	3.39	2.73
Tributary 3	4074.43	2yr-24hrSCS	0.2	88.25	88.35		88.37	0.022489	0.67	0.3	3.96	0.78
Tributary 3	4063.93*	100yr-24hrSCS	1.02	88.07	88.3		88.35	0.019318	1.01	1.01	6.43	0.81
Tributary 3	4063.93*	5yr-24hrSCS	0.36	88.07	88.2	88.17	88.23	0.019243	0.75	0.48	4.79	0.75
Tributary 3	4063.93*	2yr-24hrSCS	0.2	88.07	88.17		88.19	0.017504	0.61	0.34	4.23	0.69
Tributary 3	4053.43*	100yr-24hrSCS	1.02	87.89	88.11		88.16	0.021806	1.04	0.97	6.47	0.86
Tributary 3	4053.43*	5yr-24hrSCS	0.36	87.89	88.02		88.05	0.021099	0.76	0.47	4.89	0.78
Tributary 3	4053.43*	2yr-24hrSCS	0.2	87.89	87.98	87.97	88	0.024054	0.67	0.31	4.25	0.8
Tributary 3	4042.93*	100yr-24hrSCS	1.02	87.71	87.93		87.98	0.020161	1	1.01	6.75	0.82
Tributary 3	4042.93*	5yr-24hrSCS	0.36	87.71	87.84		87.86	0.018774	0.72	0.5	5.12	0.74
Tributary 3	4042.93*	2yr-24hrSCS	0.2	87.71	87.81		87.82	0.017458	0.59	0.35	4.56	0.68
Tributary 3	4032.43*	100yr-24hrSCS	1.02	87.54	87.74		87.79	0.021034	1	1.01	6.92	0.84
Tributary 3	4032.43*	5yr-24hrSCS	0.36	87.54	87.65		87.68	0.021793	0.75	0.48	5.21	0.79
Tributary 3	4032.43*	2yr-24hrSCS	0.2	87.54	87.62		87.64	0.021686	0.63	0.33	4.65	0.75
Tributary 3	4021.93*	100yr-24hrSCS	1.02	87.36	87.56	87.53	87.61	0.018768	0.95	1.07	7.29	0.79
Tributary 3	4021.93*	5yr-24hrSCS	0.36	87.36	87.47		87.5	0.018209	0.7	0.52	5.5	0.72
Tributary 3	4021.93*	2yr-24hrSCS	0.2	87.36	87.44		87.46	0.018519	0.58	0.35	4.9	0.7
Tributary 3	4011.43*	100yr-24hrSCS	1.02	87.18	87.36	87.35	87.42	0.024375	1.04	0.98	7.1	0.89
Tributary 3	4011.43*	5yr-24hrSCS	0.36	87.18	87.29		87.31	0.022961	0.74	0.48	5.55	0.8
Tributary 3	4011.43*	2yr-24hrSCS	0.2	87.18	87.26		87.28	0.022573	0.61	0.33	5	0.76
Tributary 3	4000.94	100yr-24hrSCS	1.02	87	87.21	87.17	87.24	0.014455	0.85	1.19	7.87	0.7
Tributary 3	4000.94	5yr-24hrSCS	0.36	87	87.11	87.09	87.14	0.016568	0.66	0.55	5.94	0.69
Tributary 3	4000.94	2yr-24hrSCS	0.2	87	87.08	87.07	87.1	0.01715	0.55	0.37	5.32	0.67
Tributary 3	3990.29*	100yr-24hrSCS	1.02	86.84	87.06	87.03	87.1	0.014019	0.88	1.15	7.29	0.71
Tributary 3	3990.29*	5yr-24hrSCS	0.36	86.84	86.97	86.94	86.99	0.014411	0.66	0.54	5.38	0.67
Tributary 3	3990.29*	2yr-24hrSCS	0.2	86.84	86.93	86.91	86.95	0.014683	0.56	0.36	4.74	0.65
Tributary 3	3979.64*	100yr-24hrSCS	1.02	86.68	86.93	86.88	86.97	0.014041	0.91	1.12	6.84	0.72
Tributary 3	3979.64*	5yr-24hrSCS	0.36	86.68	86.82	86.79	86.85	0.013983	0.69	0.52	4.81	0.67
Tributary 3	3979.64*	2yr-24hrSCS	0.2	86.68	86.78	86.76	86.8	0.017435	0.63	0.32	4.05	0.71
Tributary 3	3969.00*	100yr-24hrSCS	1.02	86.52	86.79	86.75	86.84	0.013564	0.93	1.09	6.48	0.72
Tributary 3	3969.00*	5yr-24hrSCS	0.36	86.52	86.68	86.64	86.7	0.013826	0.73	0.49	4.24	0.69
Tributary 3	3969.00*	2yr-24hrSCS	0.2	86.52	86.63	86.61	86.65	0.014418	0.64	0.32	3.54	0.67
Tributary 3	3958.35*	100yr-24hrSCS	1.02	86.36	86.66	86.62	86.71	0.013369	0.96	1.06	6.19	0.74
Tributary 3	3958.35*	5yr-24hrSCS	0.36	86.36	86.53	86.51	86.56	0.015541	0.82	0.44	3.64	0.75
Tributary 3	3958.35*	2yr-24hrSCS	0.2	86.36	86.48	86.46	86.51	0.016148	0.72	0.28	2.94	0.74
Tributary 3	3947.71*	100yr-24hrSCS	1.02	86.2	86.54	86.5	86.59	0.012245	0.94	1.08	6.26	0.73
Tributary 3	3947.71*	5yr-24hrSCS	0.36	86.2	86.41	86.37	86.44	0.012188	0.8	0.45	3.36	0.69
Tributary 3	3947.71*	2yr-24hrSCS	0.2	86.2	86.35	86.32	86.38	0.013172	0.72	0.28	2.59	0.7
Tributary 3	3937.06*	100yr-24hrSCS	1.02	86.04	86.42	86.38	86.47	0.012871	0.94	1.08	6.62	0.74
Tributary 3	3937.06*	5yr-24hrSCS	0.36	86.04	86.3	86.25	86.33	0.010533	0.76	0.47	3.33	0.65
Tributary 3	3937.06*	2yr-24hrSCS	0.2	86.04	86.23	86.19	86.26	0.011065	0.7	0.29	2.39	0.65
Tributary 3	3926.42	100yr-24hrSCS	1.02	85.88	86.32	86.27	86.35	0.010838	0.85	1.2	7.79	0.69
Tributary 3	3926.42	5yr-24hrSCS	0.36	85.88	86.2	86.14	86.23	0.010532	0.71	0.51	4.18	0.65
Tributary 3	3926.42	2yr-24hrSCS	0.2	85.88	86.14	86.09	86.16	0.009054	0.68	0.3	2.36	0.6
Tributary 3	3916.75*	100yr-24hrSCS	1.02	85.84	86.22	86.17	86.26	0.009327	0.8	1.26	7.95	0.64
Tributary 3	3916.75*	5yr-24hrSCS	0.36	85.84	86.11	86.06	86.13	0.010078	0.68	0.53	4.52	0.63
Tributary 3	3916.75*	2yr-24hrSCS	0.2	85.84	86.05	86.01	86.07	0.009508	0.62	0.33	3.09	0.6

HEC-RAS Output: Proposed Conditions

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary 3	3907.08*	100yr-24hrSCS	1.02	85.79	86.16	86.08	86.19	0.005698	0.69	1.46	7.95	0.52
Tributary 3	3907.08*	5yr-24hrSCS	0.36	85.79	86.04	85.98	86.05	0.006317	0.56	0.64	5.13	0.51
Tributary 3	3907.08*	2yr-24hrSCS	0.2	85.79	85.99	85.93	86	0.006141	0.49	0.41	3.97	0.49
Tributary 3	3897.42	100yr-24hrSCS	1.02	85.75	86.03	86.01	86.1	0.014119	1.15	0.9	5.83	0.82
Tributary 3	3897.42	5yr-24hrSCS	0.36	85.75	85.92	85.9	85.96	0.015938	0.87	0.41	3.44	0.8
Tributary 3	3897.42	2yr-24hrSCS	0.2	85.75	85.88	85.86	85.91	0.016005	0.74	0.27	2.93	0.77
Tributary 3	3888.47*	100yr-24hrSCS	1.02	85.63	85.9	85.88	85.97	0.016256	1.13	0.9	4.9	0.85
Tributary 3	3888.47*	5yr-24hrSCS	0.36	85.63	85.79	85.77	85.83	0.015594	0.83	0.43	3.71	0.77
Tributary 3	3888.47*	2yr-24hrSCS	0.2	85.63	85.76	85.74	85.78	0.0142	0.67	0.31	3.35	0.71
Tributary 3	3879.53*	100yr-24hrSCS	1.02	85.5	85.76	85.74	85.82	0.015532	1.09	0.93	5.03	0.81
Tributary 3	3879.53*	5yr-24hrSCS	0.36	85.5	85.67	85.64	85.7	0.012816	0.72	0.5	4.31	0.68
Tributary 3	3879.53*	2yr-24hrSCS	0.2	85.5	85.63	85.61	85.65	0.01449	0.63	0.33	3.86	0.69
Tributary 3	3870.59*	100yr-24hrSCS	1.02	85.38	85.63	85.6	85.69	0.015769	1.04	0.98	5.54	0.79
Tributary 3	3870.59*	5yr-24hrSCS	0.36	85.38	85.54	85.52	85.57	0.015293	0.71	0.5	4.87	0.71
Tributary 3	3870.59*	2yr-24hrSCS	0.2	85.38	85.51	85.48	85.52	0.015038	0.59	0.34	4.35	0.67
Tributary 3	3861.65*	100yr-24hrSCS	1.02	85.26	85.52	85.48	85.56	0.012095	0.9	1.13	6.22	0.67
Tributary 3	3861.65*	5yr-24hrSCS	0.36	85.26	85.42	85.39	85.44	0.012336	0.63	0.57	5.54	0.62
Tributary 3	3861.65*	2yr-24hrSCS	0.2	85.26	85.39	85.36	85.4	0.012505	0.52	0.39	4.99	0.6
Tributary 3	3852.71	100yr-24hrSCS	1.02	85.13	85.36	85.34	85.41	0.022055	1.04	0.98	6.58	0.86
Tributary 3	3852.71	5yr-24hrSCS	0.36	85.13	85.29	85.27	85.31	0.016658	0.65	0.55	6.11	0.69
Tributary 3	3852.71	2yr-24hrSCS	0.2	85.13	85.26	85.24	85.27	0.017898	0.56	0.36	5.29	0.68
Tributary 3	3841.15*	100yr-24hrSCS	1.02	84.96	85.14	85.13	85.19	0.024849	1.02	1	7.86	0.91
Tributary 3	3841.15*	5yr-24hrSCS	0.36	84.96	85.07	85.06	85.1	0.029187	0.77	0.47	6.36	0.9
Tributary 3	3841.15*	2yr-24hrSCS	0.2	84.96	85.04	85.04	85.06	0.025561	0.61	0.33	5.78	0.81
Tributary 3	3829.60*	100yr-24hrSCS	1.02	84.78	84.95	84.93	84.99	0.017927	0.88	1.16	9.34	0.79
Tributary 3	3829.60*	5yr-24hrSCS	0.36	84.78	84.89	84.86	84.9	0.014229	0.58	0.62	7.73	0.66
Tributary 3	3829.60*	2yr-24hrSCS	0.2	84.78	84.86	84.84	84.87	0.017096	0.51	0.4	6.91	0.68
Tributary 3	3818.05*	100yr-24hrSCS	1.02	84.6	84.74	84.73	84.79	0.024642	0.95	1.07	10.04	0.93
Tributary 3	3818.05*	5yr-24hrSCS	0.36	84.6	84.68	84.67	84.7	0.032311	0.74	0.49	8.25	0.97
Tributary 3	3818.05*	2yr-24hrSCS	0.2	84.6	84.66	84.65	84.68	0.023636	0.55	0.37	7.72	0.8
Tributary 3	3806.50*	100yr-24hrSCS	1.02	84.43	84.56	84.54	84.59	0.015534	0.79	1.28	11.67	0.76
Tributary 3	3806.50*	5yr-24hrSCS	0.36	84.43	84.51		84.52	0.011969	0.51	0.7	10.02	0.62
Tributary 3	3806.50*	2yr-24hrSCS	0.2	84.43	84.48	84.46	84.49	0.01489	0.45	0.45	9.24	0.65
Tributary 3	3794.95	100yr-24hrSCS	1.02	84.25	84.35	84.35	84.4	0.030386	0.95	1.06	12.69	1.05
Tributary 3	3794.95	5yr-24hrSCS	0.36	84.25	84.3	84.3	84.33	0.035795	0.71	0.51	10.68	1.04
Tributary 3	3794.95	2yr-24hrSCS	0.2	84.25	84.29	84.29	84.31	0.027992	0.54	0.38	10.17	0.88
Tributary 3	3785.62*	100yr-24hrSCS	1.02	83.91	84.01	84.02	84.07	0.042848	1.12	0.91	11.02	1.24
Tributary 3	3785.62*	5yr-24hrSCS	0.36	83.91	83.97	83.97	84	0.037369	0.77	0.47	9.07	1.08
Tributary 3	3785.62*	2yr-24hrSCS	0.2	83.91	83.95	83.95	83.97	0.047784	0.69	0.3	8.16	1.15
Tributary 3	3776.29*	100yr-24hrSCS	1.02	83.56	83.7	83.7	83.75	0.030524	1.02	0.99	10.74	1.07
Tributary 3	3776.29*	5yr-24hrSCS	0.36	83.56	83.64	83.64	83.67	0.034525	0.79	0.45	7.92	1.05
Tributary 3	3776.29*	2yr-24hrSCS	0.2	83.56	83.62	83.62	83.64	0.028554	0.62	0.33	7.05	0.92
Tributary 3	3766.96*	100yr-24hrSCS	1.02	83.22	83.37	83.38	83.43	0.040884	1.15	0.88	9.96	1.23
Tributary 3	3766.96*	5yr-24hrSCS	0.36	83.22	83.3	83.31	83.36	0.067696	1.05	0.34	6.44	1.45
Tributary 3	3766.96*	2yr-24hrSCS	0.2	83.22	83.29	83.29	83.32	0.044412	0.77	0.26	5.74	1.15
Tributary 3	3757.64	100yr-24hrSCS	1.02	82.88	83.06	83.06	83.11	0.030704	1.04	0.97	10.2	1.08
Tributary 3	3757.64	5yr-24hrSCS	0.36	82.88	82.92	83	85.74	12.46491	7.44	0.05	2.4	16.75
Tributary 3	3757.64	2yr-24hrSCS	0.2	82.88	82.88	82.97	1869.84	90489.85	187.29	0	0.33	1045.75
Tributary 3	3748.27*	100yr-24hrSCS	1.02	82.62	82.81	82.81	82.86	0.026995	0.95	1.06	11.6	1.01
Tributary 3	3748.27*	5yr-24hrSCS	0.36	82.62	82.73	82.75	82.79	0.067894	1.05	0.34	6.49	1.45
Tributary 3	3748.27*	2yr-24hrSCS	0.2	82.62	82.72	82.72	82.75	0.040296	0.75	0.27	5.78	1.1
Tributary 3	3738.91*	100yr-24hrSCS	1.02	82.37	82.55	82.55	82.6	0.031819	1.02	1	11.14	1.09
Tributary 3	3738.91*	5yr-24hrSCS	0.36	82.37	82.42	82.5	83.62	3.878616	4.85	0.07	2.92	9.73
Tributary 3	3738.91*	2yr-24hrSCS	0.2	82.37	82.38	82.47	188.9	2245.341	45.73	0	0.72	185.18
Tributary 3	3729.54*	100yr-24hrSCS	1.02	82.11	82.28	82.29	82.34	0.041135	1.12	0.91	10.68	1.23
Tributary 3	3729.54*	5yr-24hrSCS	0.36	82.11	82.22	82.22	82.26	0.044103	0.87	0.41	7.39	1.18
Tributary 3	3729.54*	2yr-24hrSCS	0.2	82.11	82.16	82.21	82.7	2.199217	3.27	0.06	2.92	7.12
Tributary 3	3720.18	100yr-24hrSCS	1.02	81.86	82.13	82.03	82.14	0.002084	0.38	2.65	16.67	0.31
Tributary 3	3720.18	5yr-24hrSCS	0.36	81.86	81.9	81.96	82.36	1.397973	3.01	0.12	4.5	5.89
Tributary 3	3720.18	2yr-24hrSCS	0.2	81.86	81.9	81.94	82.09	0.643645	1.93	0.11	4.33	3.94

HEC-RAS Output: Proposed Conditions

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary 3	3710.92*	100yr-24hrSCS	1.02	81.74	82.12		82.12	0.001311	0.34	2.98	15.11	0.24
Tributary 3	3710.92*	5yr-24hrSCS	0.36	81.74	81.88	81.88	81.91	0.02159	0.77	0.47	5.68	0.86
Tributary 3	3710.92*	2yr-24hrSCS	0.2	81.74	81.85	81.84	81.87	0.017747	0.62	0.33	4.71	0.76
Tributary 3	3701.66*	100yr-24hrSCS	1.02	81.62	82.11		82.12	0.000549	0.27	3.74	13.29	0.16
Tributary 3	3701.66*	5yr-24hrSCS	0.36	81.62	81.8	81.72	81.81	0.005234	0.49	0.73	5.82	0.44
Tributary 3	3701.66*	2yr-24hrSCS	0.2	81.62	81.72		81.74	0.013654	0.59	0.35	4.27	0.66
Tributary 3	3692.41*	100yr-24hrSCS	1.45	81.49	82.11		82.11	0.000497	0.31	4.66	11.94	0.16
Tributary 3	3692.41*	5yr-24hrSCS	0.57	81.49	81.78		81.78	0.001585	0.37	1.53	7.19	0.26
Tributary 3	3692.41*	2yr-24hrSCS	0.37	81.49	81.69		81.69	0.002834	0.4	0.92	5.93	0.33
Tributary 3	3683.15*	100yr-24hrSCS	1.45	81.37	82.1	81.57	82.11	0.000238	0.25	5.7	10.88	0.11
Tributary 3	3683.15*	5yr-24hrSCS	0.57	81.37	81.78	81.48	81.78	0.000334	0.22	2.59	8.04	0.12
Tributary 3	3683.15*	2yr-24hrSCS	0.37	81.37	81.68	81.45	81.68	0.00036	0.2	1.88	7.25	0.12
Tributary 3	3676	Culvert										
Tributary 3	3664.25*	100yr-24hrSCS	1.45	81.25	81.49		81.49	0.001528	0.36	3.99	17.48	0.24
Tributary 3	3664.25*	5yr-24hrSCS	0.57	81.25	81.37		81.37	0.002392	0.29	1.95	16.86	0.27
Tributary 3	3664.25*	2yr-24hrSCS	0.37	81.25	81.34		81.35	0.002117	0.24	1.56	16.74	0.25
Tributary 3	3654.60*	100yr-24hrSCS	1.45	81.25	81.48		81.48	0.000638	0.23	6.24	27.86	0.16
Tributary 3	3654.60*	5yr-24hrSCS	0.57	81.25	81.35		81.35	0.00155	0.21	2.68	26.98	0.21
Tributary 3	3654.60*	2yr-24hrSCS	0.37	81.25	81.33		81.33	0.001548	0.18	2.07	26.82	0.2
Tributary 3	3644.95*	100yr-24hrSCS	1.45	81.25	81.48		81.48	0.000352	0.17	8.46	38.28	0.12
Tributary 3	3644.95*	5yr-24hrSCS	0.57	81.25	81.34		81.34	0.001272	0.18	3.23	37.11	0.19
Tributary 3	3644.95*	2yr-24hrSCS	0.37	81.25	81.32		81.32	0.001405	0.15	2.43	36.91	0.19
Tributary 3	3635.31	100yr-24hrSCS	1.45	81.25	81.47		81.48	0.000223	0.14	10.69	48.74	0.09
Tributary 3	3635.31	5yr-24hrSCS	0.57	81.25	81.32		81.32	0.001439	0.17	3.43	47.18	0.2
Tributary 3	3635.31	2yr-24hrSCS	0.37	81.25	81.28		81.28	0.010286	0.25	1.47	46.7	0.45
Tributary 3	3625.37*	100yr-24hrSCS	1.45	81.19	81.47		81.47	0.000169	0.14	10.32	37.6	0.09
Tributary 3	3625.37*	5yr-24hrSCS	0.57	81.19	81.32		81.32	0.000361	0.12	4.6	36.11	0.11
Tributary 3	3625.37*	2yr-24hrSCS	0.37	81.19	81.27		81.27	0.000804	0.13	2.79	35.67	0.15
Tributary 3	3615.43*	100yr-24hrSCS	1.45	81.12	81.47		81.47	0.000183	0.17	8.66	26.72	0.09
Tributary 3	3615.43*	5yr-24hrSCS	0.57	81.12	81.31		81.32	0.000209	0.12	4.62	25.15	0.09
Tributary 3	3615.43*	2yr-24hrSCS	0.37	81.12	81.26		81.26	0.000259	0.11	3.33	24.7	0.1
Tributary 3	3605.49*	100yr-24hrSCS	1.45	81.06	81.47		81.47	0.00034	0.25	5.72	16.37	0.14
Tributary 3	3605.49*	5yr-24hrSCS	0.57	81.06	81.31		81.31	0.000273	0.17	3.32	14.63	0.11
Tributary 3	3605.49*	2yr-24hrSCS	0.37	81.06	81.26		81.26	0.000254	0.14	2.58	14	0.11
Tributary 3	3595.55	100yr-24hrSCS	1.45	81	81.38		81.45	0.01233	1.18	1.23	5.3	0.79
Tributary 3	3595.55	5yr-24hrSCS	0.57	81	81.26		81.3	0.011479	0.87	0.65	4.28	0.71
Tributary 3	3595.55	2yr-24hrSCS	0.37	81	81.22		81.25	0.011362	0.77	0.48	3.74	0.69
Tributary 3	3585.28*	100yr-24hrSCS	1.45	80.9	81.28		81.34	0.010685	1.02	1.42	6.69	0.7
Tributary 3	3585.28*	5yr-24hrSCS	0.57	80.9	81.17		81.2	0.009785	0.76	0.74	5.04	0.63
Tributary 3	3585.28*	2yr-24hrSCS	0.37	80.9	81.13		81.15	0.009512	0.68	0.54	4.28	0.61
Tributary 3	3575.02*	100yr-24hrSCS	1.45	80.8	81.18		81.23	0.010873	0.94	1.54	7.67	0.67
Tributary 3	3575.02*	5yr-24hrSCS	0.57	80.8	81.06		81.09	0.010826	0.73	0.77	5.55	0.63
Tributary 3	3575.02*	2yr-24hrSCS	0.37	80.8	81.02		81.04	0.010707	0.66	0.56	4.58	0.61
Tributary 3	3564.75*	100yr-24hrSCS	1.45	80.71	81.1	81.01	81.13	0.008199	0.79	1.82	9.07	0.57
Tributary 3	3564.75*	5yr-24hrSCS	0.57	80.71	80.98	80.91	81	0.007259	0.6	0.94	6.52	0.5
Tributary 3	3564.75*	2yr-24hrSCS	0.37	80.71	80.94		80.96	0.007002	0.54	0.69	5.47	0.48
Tributary 3	3554.49	100yr-24hrSCS	1.45	80.61	80.91	80.91	80.98	0.029812	1.23	1.18	7.77	1
Tributary 3	3554.49	5yr-24hrSCS	0.57	80.61	80.81	80.81	80.86	0.032698	1.04	0.54	4.88	1
Tributary 3	3554.49	2yr-24hrSCS	0.37	80.61	80.76	80.76	80.82	0.037403	1.03	0.36	3.67	1.04
Tributary 3	3548.69*	100yr-24hrSCS	1.45	80.55	80.91	80.71	80.92	0.001624	0.4	3.64	14.58	0.25
Tributary 3	3548.69*	5yr-24hrSCS	0.57	80.55	80.73	80.64	80.74	0.003559	0.41	1.39	9.7	0.34
Tributary 3	3548.69*	2yr-24hrSCS	0.37	80.55	80.67	80.63	80.68	0.006965	0.44	0.84	8.58	0.45
Tributary 3	3542.89	100yr-24hrSCS	1.45	80.5	80.92		80.92	0.000293	0.21	7.03	20.95	0.11
Tributary 3	3542.89	5yr-24hrSCS	0.57	80.5	80.73		80.73	0.000408	0.17	3.31	16.76	0.12
Tributary 3	3542.89	2yr-24hrSCS	0.37	80.5	80.67		80.67	0.000521	0.16	2.31	15.6	0.13
Tributary 3	3534.04	100yr-24hrSCS	1.45	80.25	80.79	80.77	80.9	0.018139	1.48	0.98	3.93	0.95
Tributary 3	3534.04	5yr-24hrSCS	0.57	80.25	80.66	80.61	80.71	0.012886	1.05	0.54	2.76	0.76
Tributary 3	3534.04	2yr-24hrSCS	0.37	80.25	80.61	80.55	80.65	0.010096	0.87	0.42	2.41	0.66

HEC-RAS Output: Proposed Conditions

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary 3	3526.39*	100yr-24hrSCS	1.45	80.2	80.64	80.64	80.75	0.020125	1.5	0.97	4.19	1
Tributary 3	3526.39*	5yr-24hrSCS	0.57	80.2	80.51	80.51	80.58	0.02328	1.19	0.48	3.28	1
Tributary 3	3526.39*	2yr-24hrSCS	0.37	80.2	80.46	80.46	80.53	0.028861	1.17	0.32	2.64	1.07
Tributary 3	3518.74	100yr-24hrSCS	1.45	80.16	80.58	80.49	80.64	0.006869	1.05	1.39	4.59	0.61
Tributary 3	3518.74	5yr-24hrSCS	0.57	80.16	80.43	80.36	80.46	0.006952	0.78	0.73	3.82	0.57
Tributary 3	3518.74	2yr-24hrSCS	0.37	80.16	80.26	80.33	80.52	0.29102	2.26	0.16	2.91	3.04
Tributary 3	3509.46*	100yr-24hrSCS	1.45	80.09	80.52		80.58	0.006688	1.03	1.41	4.72	0.6
Tributary 3	3509.46*	5yr-24hrSCS	0.57	80.09	80.37		80.4	0.006664	0.76	0.74	3.88	0.56
Tributary 3	3509.46*	2yr-24hrSCS	0.37	80.09	80.32	80.26	80.34	0.006812	0.67	0.55	3.61	0.55
Tributary 3	3500.18*	100yr-24hrSCS	1.45	80.02	80.47		80.52	0.006195	0.99	1.47	4.92	0.58
Tributary 3	3500.18*	5yr-24hrSCS	0.57	80.02	80.31		80.34	0.005854	0.73	0.78	3.98	0.53
Tributary 3	3500.18*	2yr-24hrSCS	0.37	80.02	80.26		80.28	0.005978	0.64	0.58	3.67	0.51
Tributary 3	3490.90*	100yr-24hrSCS	1.45	79.96	80.42		80.47	0.005331	0.92	1.57	5.23	0.54
Tributary 3	3490.90*	5yr-24hrSCS	0.57	79.96	80.27		80.3	0.00432	0.65	0.87	4.22	0.46
Tributary 3	3490.90*	2yr-24hrSCS	0.37	79.96	80.22		80.24	0.00399	0.55	0.67	3.87	0.43
Tributary 3	3481.62*	100yr-24hrSCS	1.45	79.89	80.38		80.42	0.004321	0.82	1.76	5.93	0.48
Tributary 3	3481.62*	5yr-24hrSCS	0.57	79.89	80.25		80.26	0.002657	0.54	1.05	4.65	0.36
Tributary 3	3481.62*	2yr-24hrSCS	0.37	79.89	80.2		80.21	0.002119	0.44	0.84	4.28	0.32
Tributary 3	3472.34*	100yr-24hrSCS	1.45	79.82	80.36		80.38	0.003069	0.69	2.11	7.3	0.41
Tributary 3	3472.34*	5yr-24hrSCS	0.57	79.82	80.23		80.24	0.001484	0.43	1.32	5.37	0.28
Tributary 3	3472.34*	2yr-24hrSCS	0.37	79.82	80.19		80.2	0.001046	0.34	1.1	4.95	0.23
Tributary 3	3463.06*	100yr-24hrSCS	1.45	79.76	80.35		80.36	0.001777	0.54	2.69	8.89	0.31
Tributary 3	3463.06*	5yr-24hrSCS	0.57	79.76	80.23		80.23	0.00082	0.32	1.75	7.02	0.21
Tributary 3	3463.06*	2yr-24hrSCS	0.37	79.76	80.19		80.19	0.000541	0.25	1.48	6.37	0.17
Tributary 3	3453.78*	100yr-24hrSCS	1.45	79.69	80.34		80.35	0.001099	0.39	3.67	13.6	0.24
Tributary 3	3453.78*	5yr-24hrSCS	0.57	79.69	80.22		80.23	0.000394	0.24	2.4	8.92	0.14
Tributary 3	3453.78*	2yr-24hrSCS	0.37	79.69	80.19		80.19	0.000251	0.18	2.06	8.22	0.11
Tributary 3	3444.51	100yr-24hrSCS	1.45	79.62	80.33		80.34	0.000449	0.27	5.44	18.57	0.16
Tributary 3	3444.51	5yr-24hrSCS	0.57	79.62	80.22		80.22	0.000201	0.16	3.57	14.48	0.1
Tributary 3	3444.51	2yr-24hrSCS	0.37	79.62	80.18		80.18	0.000126	0.12	3.03	12.87	0.08
Tributary 3	3435.9*	100yr-24hrSCS	1.45	79.81	80.33		80.33	0.00092	0.36	4.07	15.37	0.22
Tributary 3	3435.9*	5yr-24hrSCS	0.57	79.81	80.22		80.22	0.000498	0.22	2.55	12.4	0.16
Tributary 3	3435.9*	2yr-24hrSCS	0.37	79.81	80.18		80.18	0.000336	0.18	2.11	10.89	0.13
Tributary 3	3427.29	100yr-24hrSCS	1.45	80	80.3		80.32	0.003656	0.6	2.47	14.78	0.42
Tributary 3	3427.29	5yr-24hrSCS	0.57	80	80.2		80.21	0.003168	0.43	1.33	9.74	0.37
Tributary 3	3427.29	2yr-24hrSCS	0.37	80	80.17		80.18	0.002768	0.36	1.02	8.59	0.34
Tributary 3	3419.8*	100yr-24hrSCS	1.45	80	80.28		80.29	0.003394	0.55	2.64	15.39	0.4
Tributary 3	3419.8*	5yr-24hrSCS	0.57	80	80.18		80.19	0.002798	0.39	1.45	11.04	0.34
Tributary 3	3419.8*	2yr-24hrSCS	0.37	80	80.15		80.16	0.002433	0.33	1.12	9.94	0.31
Tributary 3	3412.31*	100yr-24hrSCS	1.45	80	80.25		80.26	0.003403	0.52	2.77	15.75	0.4
Tributary 3	3412.31*	5yr-24hrSCS	0.57	80	80.16		80.17	0.002771	0.37	1.52	12.34	0.34
Tributary 3	3412.31*	2yr-24hrSCS	0.37	80	80.13		80.14	0.002421	0.31	1.18	11.29	0.31
Tributary 3	3404.82*	100yr-24hrSCS	1.45	80	80.22		80.24	0.003644	0.52	2.8	16.99	0.41
Tributary 3	3404.82*	5yr-24hrSCS	0.57	80	80.14		80.15	0.003258	0.38	1.5	13.51	0.36
Tributary 3	3404.82*	2yr-24hrSCS	0.37	80	80.11		80.12	0.002911	0.32	1.17	12.49	0.33
Tributary 3	3397.33	100yr-24hrSCS	1.45	80	80.19		80.21	0.005105	0.56	2.57	17.71	0.47
Tributary 3	3397.33	5yr-24hrSCS	0.57	80	80.09		80.1	0.01316	0.58	0.98	13.21	0.68
Tributary 3	3397.33	2yr-24hrSCS	0.37	80	80.07		80.08	0.011061	0.47	0.78	12.55	0.6
Tributary 3	3387.68*	100yr-24hrSCS	1.45	79.85	80.17		80.18	0.001262	0.38	3.78	16.24	0.25
Tributary 3	3387.68*	5yr-24hrSCS	0.57	79.85	79.94		79.97	0.017637	0.71	0.8	9.81	0.8
Tributary 3	3387.68*	2yr-24hrSCS	0.37	79.85	79.92	79.92	79.94	0.02047	0.64	0.58	9.27	0.82
Tributary 3	3378.03*	100yr-24hrSCS	1.45	79.7	80.17		80.17	0.000599	0.32	4.55	14.73	0.18
Tributary 3	3378.03*	5yr-24hrSCS	0.57	79.7	79.92		79.93	0.001367	0.34	1.68	9.32	0.25
Tributary 3	3378.03*	2yr-24hrSCS	0.37	79.7	79.71	79.79	83.18	55.98469	8.25	0.04	5.91	30.24
Tributary 3	3368.39*	100yr-24hrSCS	1.45	79.55	80.16		80.17	0.000446	0.31	4.75	13.09	0.16
Tributary 3	3368.39*	5yr-24hrSCS	0.57	79.55	79.92		79.92	0.000459	0.25	2.23	8.23	0.16
Tributary 3	3368.39*	2yr-24hrSCS	0.37	79.55	79.83	79.63	79.84	0.000516	0.23	1.58	7.18	0.16
Tributary 3	3358.74*	100yr-24hrSCS	1.45	79.4	80.16		80.16	0.000504	0.33	4.33	11.34	0.17
Tributary 3	3358.74*	5yr-24hrSCS	0.57	79.4	79.91		79.92	0.00035	0.25	2.24	6.74	0.14
Tributary 3	3358.74*	2yr-24hrSCS	0.37	79.4	79.83		79.83	0.000305	0.22	1.71	5.85	0.13

HEC-RAS Output: Proposed Conditions

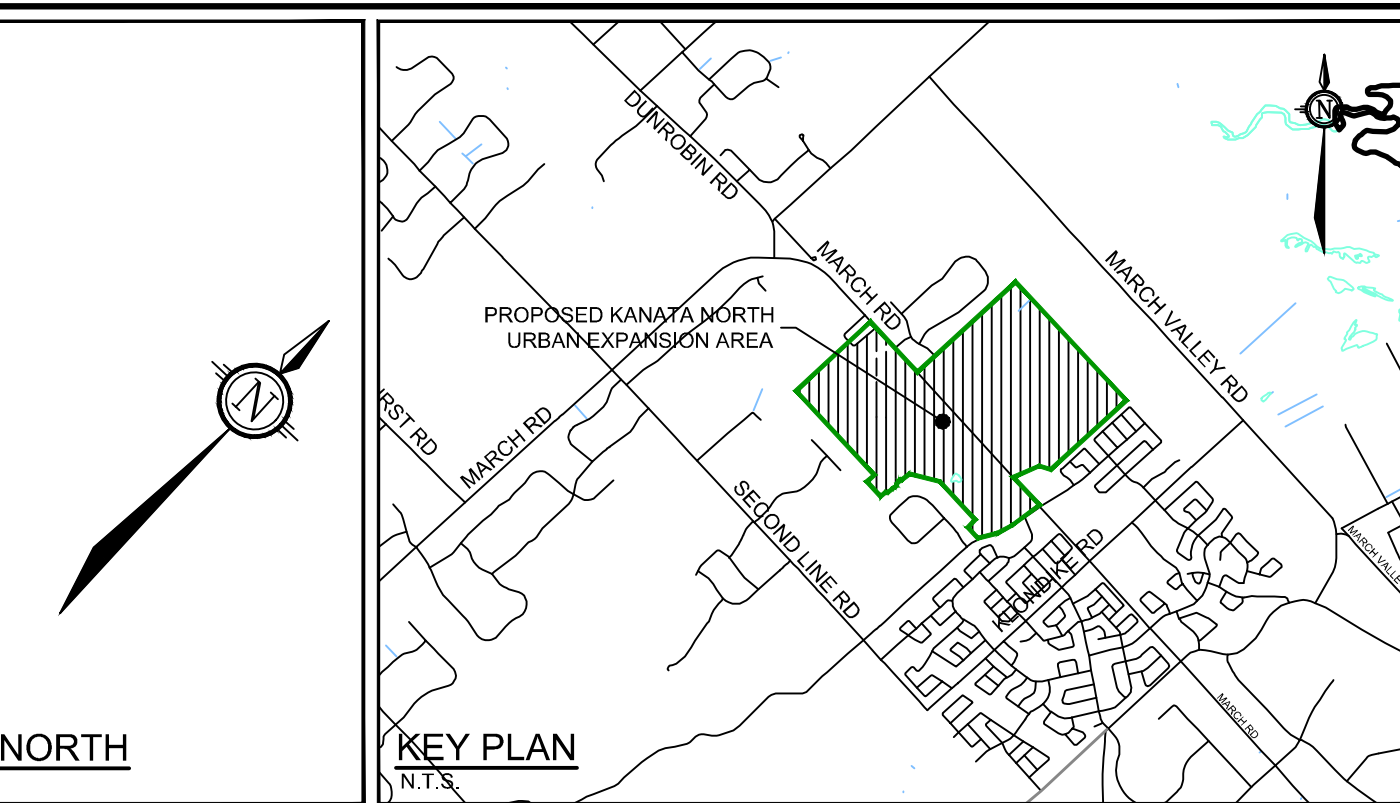
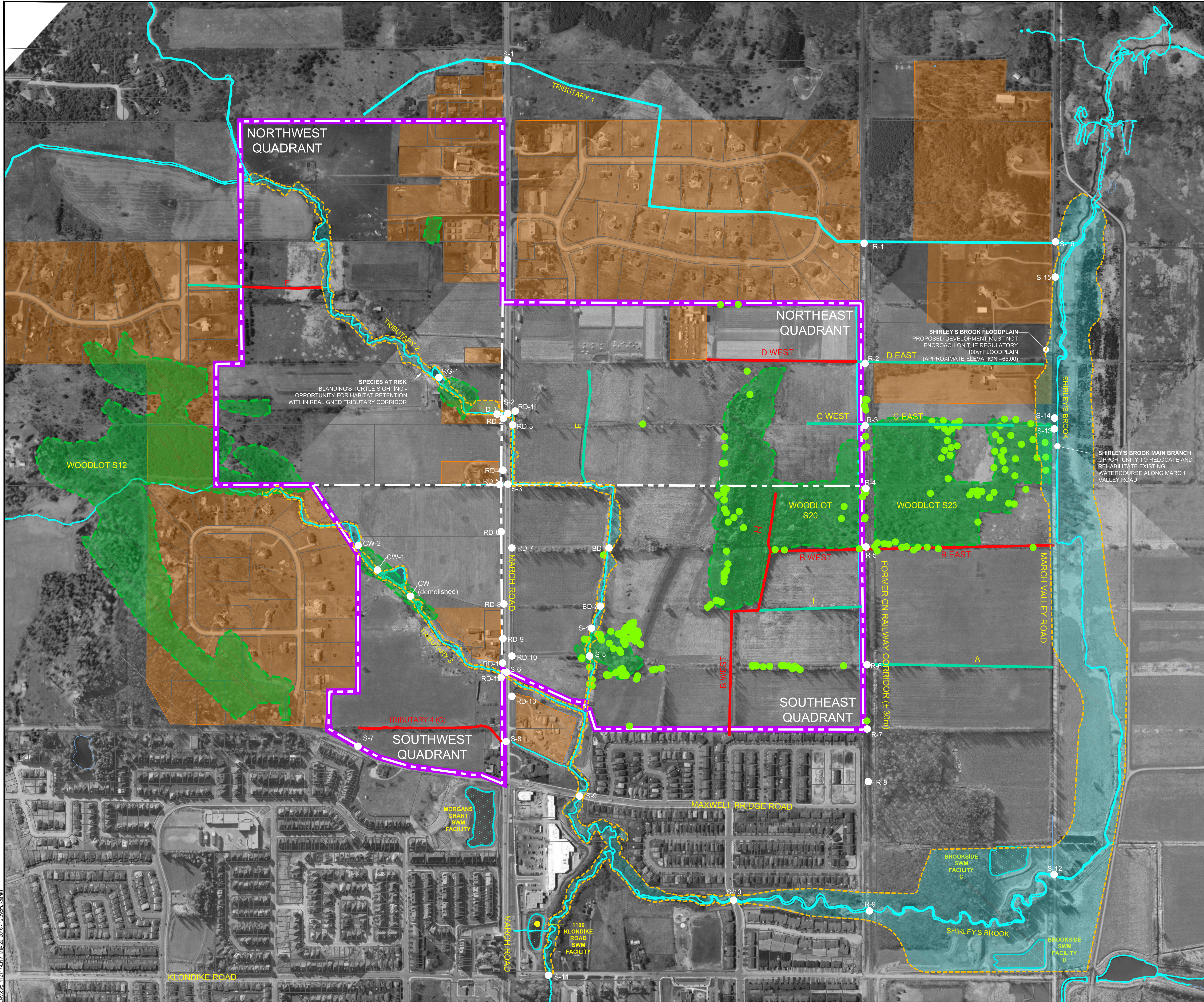
Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary 3	3349.1	100yr-24hrSCS	1.45	79.25	80.15		80.16	0.001041	0.45	3.25	9.43	0.24
Tributary 3	3349.1	5yr-24hrSCS	0.57	79.25	79.91		79.91	0.000655	0.34	1.65	4.94	0.19
Tributary 3	3349.1	2yr-24hrSCS	0.37	79.25	79.82		79.83	0.00055	0.29	1.27	4.25	0.17
Tributary 3	3342.86*	100yr-24hrSCS	1.45	79.33	80.13		80.15	0.001665	0.58	2.49	6.88	0.31
Tributary 3	3342.86*	5yr-24hrSCS	0.57	79.33	79.89		79.91	0.001684	0.48	1.17	4.28	0.29
Tributary 3	3342.86*	2yr-24hrSCS	0.37	79.33	79.81		79.82	0.001498	0.43	0.86	3.42	0.27
Tributary 3	3336.63	100yr-24hrSCS	1.45	79.4	79.96	79.96	80.11	0.019774	1.74	0.83	2.71	1
Tributary 3	3336.63	5yr-24hrSCS	0.57	79.4	79.77	79.77	79.87	0.022949	1.43	0.39	1.93	1.01
Tributary 3	3336.63	2yr-24hrSCS	0.37	79.4	79.71	79.71	79.79	0.02348	1.29	0.29	1.68	1
Tributary 3	3327.51*	100yr-24hrSCS	1.45	79.24	79.65	79.71	79.87	0.035047	2.1	0.69	2.64	1.31
Tributary 3	3327.51*	5yr-24hrSCS	0.57	79.24	79.51	79.53	79.63	0.031877	1.56	0.36	2.03	1.18
Tributary 3	3327.51*	2yr-24hrSCS	0.37	79.24	79.46	79.48	79.56	0.031123	1.38	0.27	1.77	1.13
Tributary 3	3318.4*	100yr-24hrSCS	1.45	79.07	79.46	79.47	79.61	0.022379	1.73	0.84	3.03	1.05
Tributary 3	3318.4*	5yr-24hrSCS	0.57	79.07	79.3	79.31	79.4	0.027193	1.42	0.4	2.26	1.08
Tributary 3	3318.4*	2yr-24hrSCS	0.37	79.07	79.23	79.25	79.33	0.037791	1.4	0.26	1.99	1.23
Tributary 3	3309.28*	100yr-24hrSCS	1.45	78.91	79.21	79.25	79.39	0.029461	1.85	0.79	3.19	1.19
Tributary 3	3309.28*	5yr-24hrSCS	0.57	78.91	79.11	79.1	79.18	0.018948	1.18	0.48	2.77	0.91
Tributary 3	3309.28*	2yr-24hrSCS	0.37	78.91	78.97	79.05	79.37	0.437216	2.8	0.13	2.26	3.71
Tributary 3	3300.17	100yr-24hrSCS	1.45	78.75	79.04	79.04	79.16	0.021442	1.58	0.92	3.74	1.02
Tributary 3	3300.17	5yr-24hrSCS	0.57	78.75	78.91	78.91	78.98	0.025303	1.21	0.47	3.25	1.02
Tributary 3	3300.17	2yr-24hrSCS	0.37	78.75	78.87	78.87	78.93	0.026094	1.05	0.35	3.13	1
Tributary 3	3291.61*	100yr-24hrSCS	1.45	78.38	78.6	78.68	78.87	0.058997	2.29	0.63	3.22	1.65
Tributary 3	3291.61*	5yr-24hrSCS	0.57	78.38	78.5	78.54	78.65	0.062588	1.68	0.34	2.87	1.57
Tributary 3	3291.61*	2yr-24hrSCS	0.37	78.38	78.47	78.52	78.58	0.070128	1.5	0.25	2.76	1.6
Tributary 3	3283.05	100yr-24hrSCS	1.45	78	78.28	78.32	78.46	0.034769	1.91	0.76	3.41	1.29
Tributary 3	3283.05	5yr-24hrSCS	0.57	78	78.16	78.18	78.26	0.031699	1.37	0.41	2.88	1.15
Tributary 3	3283.05	2yr-24hrSCS	0.37	78	78.13	78.14	78.2	0.028891	1.15	0.32	2.73	1.07
Tributary 3	3277.27*	100yr-24hrSCS	1.45	77.87	78.3	78.16	78.35	0.004884	0.91	1.59	5.03	0.52
Tributary 3	3277.27*	5yr-24hrSCS	0.57	77.87	78.02	78.04	78.11	0.03242	1.3	0.43	3.34	1.15
Tributary 3	3277.27*	2yr-24hrSCS	0.37	77.87	77.98	78	78.06	0.039662	1.2	0.31	3.12	1.22
Tributary 3	3271.49	100yr-24hrSCS	1.45	77.75	78.31		78.32	0.001286	0.55	2.63	6.47	0.28
Tributary 3	3271.49	5yr-24hrSCS	0.57	77.75	77.97	77.9	78	0.006179	0.71	0.8	4.37	0.53
Tributary 3	3271.49	2yr-24hrSCS	0.37	77.75	77.81	77.86	77.99	0.179642	1.85	0.2	3.32	2.41
Tributary 3	3261.21*	100yr-24hrSCS	1.45	77.64	78.3		78.31	0.000706	0.44	3.26	7.03	0.21
Tributary 3	3261.21*	5yr-24hrSCS	0.57	77.64	77.95		77.96	0.001969	0.49	1.16	4.78	0.31
Tributary 3	3261.21*	2yr-24hrSCS	0.37	77.64	77.85	77.75	77.87	0.003248	0.51	0.73	4.12	0.38
Tributary 3	3250.94*	100yr-24hrSCS	1.45	77.52	78.3	77.81	78.31	0.000415	0.37	3.96	7.63	0.16
Tributary 3	3250.94*	5yr-24hrSCS	0.51	77.52	77.95	77.67	77.95	0.000585	0.31	1.64	5.36	0.18
Tributary 3	3250.94*	2yr-24hrSCS	0.31	77.52	77.85	77.63	77.85	0.000595	0.27	1.15	4.71	0.17
Tributary 3	3246.09		Culvert									
Tributary 3	3209.85*	100yr-24hrSCS	1.45	77.07	77.47		77.54	0.010651	1.18	1.24	4.76	0.74
Tributary 3	3209.85*	5yr-24hrSCS	0.51	77.07	77.31		77.35	0.010865	0.9	0.56	3.29	0.69
Tributary 3	3209.85*	2yr-24hrSCS	0.31	77.07	77.25		77.28	0.011134	0.82	0.38	2.58	0.68
Tributary 3	3199.58*	100yr-24hrSCS	1.45	76.95	77.38		77.45	0.010707	1.17	1.24	4.79	0.74
Tributary 3	3199.58*	5yr-24hrSCS	0.51	76.95	77.21		77.25	0.010877	0.9	0.56	3.25	0.69
Tributary 3	3199.58*	2yr-24hrSCS	0.31	76.95	77.14		77.18	0.01118	0.83	0.37	2.43	0.68
Tributary 3	3189.31*	100yr-24hrSCS	1.45	76.84	77.28		77.35	0.010708	1.17	1.24	4.84	0.74
Tributary 3	3189.31*	5yr-24hrSCS	0.51	76.84	77.11		77.15	0.010765	0.9	0.56	3.22	0.69
Tributary 3	3189.31*	2yr-24hrSCS	0.31	76.84	77.04		77.08	0.011256	0.86	0.36	2.27	0.69
Tributary 3	3179.04*	100yr-24hrSCS	1.45	76.73	77.19		77.25	0.010434	1.14	1.27	4.99	0.72
Tributary 3	3179.04*	5yr-24hrSCS	0.51	76.73	77.02		77.06	0.010531	0.89	0.57	3.24	0.68
Tributary 3	3179.04*	2yr-24hrSCS	0.31	76.73	76.94		76.98	0.010664	0.86	0.36	2.14	0.67
Tributary 3	3168.77*	100yr-24hrSCS	1.45	76.61	77.1		77.16	0.009089	1.06	1.37	5.47	0.67
Tributary 3	3168.77*	5yr-24hrSCS	0.51	76.61	76.94		76.97	0.008322	0.8	0.63	3.51	0.61
Tributary 3	3168.77*	2yr-24hrSCS	0.31	76.61	76.86		76.89	0.008334	0.77	0.4	2.33	0.6
Tributary 3	3158.5	100yr-24hrSCS	1.45	76.5	76.93	76.93	77.03	0.021911	1.41	1.03	5.15	1.01
Tributary 3	3158.5	5yr-24hrSCS	0.51	76.5	76.76	76.76	76.85	0.023249	1.31	0.39	2.17	0.99
Tributary 3	3158.5	2yr-24hrSCS	0.31	76.5	76.69	76.69	76.76	0.025089	1.2	0.26	1.76	1

HEC-RAS Output: Proposed Conditions

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary 3	3150.03*	100yr-24hrSCS	1.45	76.31	76.72	76.74	76.84	0.026998	1.53	0.95	4.93	1.11
Tributary 3	3150.03*	5yr-24hrSCS	0.51	76.31	76.57	76.57	76.65	0.023773	1.29	0.39	2.31	1.01
Tributary 3	3150.03*	2yr-24hrSCS	0.31	76.31	76.49	76.5	76.57	0.032898	1.32	0.23	1.71	1.14
Tributary 3	3141.57*	100yr-24hrSCS	1.45	76.13	76.53	76.55	76.65	0.027329	1.52	0.95	5.08	1.12
Tributary 3	3141.57*	5yr-24hrSCS	0.51	76.13	76.37	76.37	76.46	0.024517	1.32	0.38	2.25	1.03
Tributary 3	3141.57*	2yr-24hrSCS	0.31	76.13	76.26	76.31	76.41	0.06763	1.69	0.18	1.58	1.6
Tributary 3	3133.10*	100yr-24hrSCS	1.45	75.94	76.34	76.35	76.46	0.027718	1.53	0.95	5.04	1.13
Tributary 3	3133.10*	5yr-24hrSCS	0.51	75.94	76.18	76.18	76.27	0.023248	1.33	0.38	2.15	1.01
Tributary 3	3133.10*	2yr-24hrSCS	0.31	75.94	76.12	76.12	76.19	0.024857	1.18	0.26	1.84	1.01
Tributary 3	3124.64	100yr-24hrSCS	1.45	75.75	76.21	76.18	76.27	0.015168	1.15	1.27	6.59	0.84
Tributary 3	3124.64	5yr-24hrSCS	0.51	75.75	76.05	75.98	76.1	0.014203	0.97	0.52	3.24	0.78
Tributary 3	3124.64	2yr-24hrSCS	0.31	75.75	75.97	75.93	76.02	0.012242	0.95	0.32	1.84	0.72
Tributary 3	3115.64*	100yr-24hrSCS	1.45	75.67	76.08		76.14	0.013057	1.08	1.35	6.97	0.78
Tributary 3	3115.64*	5yr-24hrSCS	0.51	75.67	75.94		75.98	0.012068	0.87	0.58	3.87	0.72
Tributary 3	3115.64*	2yr-24hrSCS	0.31	75.67	75.88		75.91	0.010568	0.82	0.37	2.43	0.67
Tributary 3	3106.64*	100yr-24hrSCS	1.45	75.58	75.98		76.03	0.011812	1.01	1.43	7.6	0.74
Tributary 3	3106.64*	5yr-24hrSCS	0.51	75.58	75.85		75.88	0.010137	0.77	0.66	4.66	0.65
Tributary 3	3106.64*	2yr-24hrSCS	0.31	75.58	75.79		75.82	0.010481	0.73	0.42	3.33	0.65
Tributary 3	3097.65*	100yr-24hrSCS	1.45	75.5	75.88		75.92	0.010757	0.94	1.54	8.48	0.71
Tributary 3	3097.65*	5yr-24hrSCS	0.51	75.5	75.75		75.78	0.010325	0.74	0.68	5.2	0.65
Tributary 3	3097.65*	2yr-24hrSCS	0.31	75.5	75.7		75.72	0.010853	0.71	0.44	3.71	0.66
Tributary 3	3088.65*	100yr-24hrSCS	1.45	75.42	75.79		75.83	0.010383	0.89	1.63	9.61	0.69
Tributary 3	3088.65*	5yr-24hrSCS	0.51	75.42	75.67		75.7	0.008901	0.67	0.75	6.03	0.6
Tributary 3	3088.65*	2yr-24hrSCS	0.31	75.42	75.59		75.62	0.010973	0.77	0.4	2.99	0.67
Tributary 3	3079.65*	100yr-24hrSCS	1.45	75.33	75.71		75.74	0.008246	0.77	1.89	12.02	0.61
Tributary 3	3079.65*	5yr-24hrSCS	0.51	75.33	75.59		75.61	0.010389	0.69	0.73	6.34	0.64
Tributary 3	3079.65*	2yr-24hrSCS	0.31	75.33	75.51		75.54	0.009001	0.72	0.43	3.05	0.62
Tributary 3	3070.66	100yr-24hrSCS	1.45	75.25	75.59		75.63	0.019075	0.96	1.51	12.58	0.88
Tributary 3	3070.66	5yr-24hrSCS	0.51	75.25	75.44		75.5	0.015499	1.03	0.49	3.1	0.82
Tributary 3	3070.66	2yr-24hrSCS	0.31	75.25	75.4		75.44	0.013143	0.83	0.37	2.85	0.73
Tributary 3	3062.05*	100yr-24hrSCS	1.45	75.15	75.45		75.49	0.016228	0.91	1.59	12.57	0.82
Tributary 3	3062.05*	5yr-24hrSCS	0.51	75.15	75.33		75.37	0.015006	0.88	0.58	4.56	0.79
Tributary 3	3062.05*	2yr-24hrSCS	0.31	75.15	75.29		75.32	0.013015	0.72	0.42	4.02	0.71
Tributary 3	3053.45*	100yr-24hrSCS	1.45	75.05	75.32		75.36	0.015759	0.89	1.63	13.14	0.81
Tributary 3	3053.45*	5yr-24hrSCS	0.51	75.05	75.22		75.25	0.013527	0.77	0.66	5.85	0.73
Tributary 3	3053.45*	2yr-24hrSCS	0.31	75.05	75.18		75.2	0.014576	0.69	0.44	4.96	0.74
Tributary 3	3044.84*	100yr-24hrSCS	1.45	74.95	75.2		75.23	0.014216	0.84	1.73	14.13	0.77
Tributary 3	3044.84*	5yr-24hrSCS	0.51	74.95	75.11		75.13	0.013814	0.67	0.75	8.35	0.72
Tributary 3	3044.84*	2yr-24hrSCS	0.31	74.95	75.08		75.09	0.012503	0.61	0.5	6.07	0.67
Tributary 3	3036.24*	100yr-24hrSCS	1.45	74.85	75.08		75.11	0.013134	0.8	1.82	15.18	0.73
Tributary 3	3036.24*	5yr-24hrSCS	0.51	74.85	75		75.02	0.012938	0.61	0.83	10.18	0.68
Tributary 3	3036.24*	2yr-24hrSCS	0.31	74.85	74.97		74.99	0.010987	0.52	0.6	8.33	0.62
Tributary 3	3027.64	100yr-24hrSCS	1.45	74.75	74.95		74.99	0.016253	0.84	1.72	15.4	0.81
Tributary 3	3027.64	5yr-24hrSCS	0.51	74.75	74.88		74.9	0.017241	0.65	0.77	10.61	0.77
Tributary 3	3027.64	2yr-24hrSCS	0.31	74.75	74.85		74.87	0.020217	0.62	0.5	8.44	0.81
Tributary 3	3020.29*	100yr-24hrSCS	1.45	74.55	74.84		74.88	0.011347	0.92	1.58	9.5	0.72
Tributary 3	3020.29*	5yr-24hrSCS	0.51	74.55	74.69	74.69	74.74	0.027932	0.99	0.51	5.37	1.03
Tributary 3	3020.29*	2yr-24hrSCS	0.31	74.55	74.66	74.66	74.7	0.029062	0.87	0.35	4.68	1.01
Tributary 3	3012.94*	100yr-24hrSCS	1.45	74.35	74.81		74.83	0.00417	0.71	2.04	8.47	0.46
Tributary 3	3012.94*	5yr-24hrSCS	0.51	74.35	74.6	74.53	74.62	0.005977	0.65	0.77	4.76	0.52
Tributary 3	3012.94*	2yr-24hrSCS	0.31	74.35	74.43	74.48	74.64	0.228356	1.99	0.15	2.76	2.69
Tributary 3	3005.6	100yr-24hrSCS	1.45	74.15	74.78		74.8	0.002776	0.64	2.28	8.13	0.38
Tributary 3	3005.6	5yr-24hrSCS	0.51	74.15	74.59		74.6	0.001318	0.42	1.19	4.48	0.26
Tributary 3	3005.6	2yr-24hrSCS	0.31	74.15	74.51	74.32	74.51	0.001194	0.36	0.86	3.89	0.24

Appendix I

Engineering Drawings



- LEGEND - GENERAL**
- KNUEA AREA
 - DRAINAGE CHANNEL
 - KNUEA AREA QUADRANT BOUNDARY
- LEGEND - CONSTRAINTS**
- FLOODPLAIN LIMITS (APPROXIMATE)
 - AREAS SERVED BY PRIVATE WATER SUPPLY WELLS
 - HYDRAULIC STRUCTURE ID
 - BD BEAVER DAM
 - CW CONCRETE WEIR
 - D DRIVEWAY CULVERT
 - R RAILWAY CULVERT
 - RD ROADWAY CULVERT
 - RG ROCK GABION BASKET
 - S SHIRLEY'S BROOK CULVERT
 - HEADWATER DRAINAGE CHANNEL TO BE COMPENSATED
 - HEADWATER DRAINAGE CHANNEL NOT REQUIRING COMPENSATION OR MITIGATION
 - DRAINAGE CHANNEL ID
- LEGEND - FEATURES**
- EXISTING SWM FACILITY
 - WOODED AREA
 - BUTTERNUT LOCATIONS (EXAMPLES)

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS,
WATERMANS, SEWERS AND OTHER
UNDERGROUND AND OVERGROUND UTILITIES AND
STRUCTURES IS NOT NECESSARILY SHOWN ON
THE CONTRACT DRAWINGS, AND WHERE SHOWN,
THE ACCURACY OF THE POSITION OF SUCH
UTILITIES AND STRUCTURES IS NOT GUARANTEED.
BEFORE STARTING WORK, DETERMINE THE EXACT
LOCATION OF ALL SUCH UTILITIES AND
STRUCTURES AND ASSUME ALL LIABILITY FOR
DAMAGE TO THEM.

No.	REVISION	DATE	BY
3.	ISSUED FOR CITY REVIEW WITH FINAL EMP	05/24/2016	KJA
2.	ISSUED FOR CITY REVIEW WITH FINAL DRAFT EMP	04/04/2016	KJA
1.	ISSUED FOR CITY REVIEW WITH DRAFT EMP	02/29/2016	KJA

SCALE

1:4000

0 40 80 120 160

PERSON	FOR REVIEW ONLY
KJA	
MJP	
BET	
CMS	
MJP	

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LOCATION
CITY OF OTTAWA
KANATA NORTH URBAN EXPANSION AREA

DRAWING NAME
EXISTING ENVIRONMENTAL INVENTORY

PROJECT NO.
112117

REV
REV # 3

DRAWING NO.
112117-ENV

\\0302\112117\240\Design\EMP\112117-ENV.dwg, 112117-ENV, May 20, 2016 - 12:38pm, akens

PL-ENV-12117-1033mm-0107mm