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Technical Memorandum

September 6, 2017

Subject: **Kings Creek Flood Risk Mapping from Brunton Side Road to Jock River**

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Executive Summary

This report provides a summary of the analytical methods used and underlying assumptions applied in the preparation of flood plain mapping for Kings Creek from Brunton Side Road to the Jock River. The project has been completed in accordance with the technical guidelines set out under the Canada-Ontario Flood Damage Reduction Program (FDRP) (MNR, 1986), and the technical guide for the flood hazard delineation in Ontario (MNR, 2002) as laid out by the Ontario Ministry of Natural Resources. The 1:100 year flood lines delineated here are suitable for use in the RVCA's regulation limits mapping (as per Ontario Regulation 174/06) and in municipal land use planning and development approval processes under the Planning Act.

Contents

1. Introduction

In 2012, The City of Ottawa and three conservation authorities (Mississippi, Rideau and South Nation) initiated a program for flood risk mapping within the boundary of the City. A multi-year plan for mapping a number of high priority rivers and streams was made. As part of this program, the RVCA has identified 12 stream reaches, where the existing mapping would be updated or mapping will be created for the first time.

Mapping along several large rivers has largely been completed, and smaller streams are now being mapped within the RVCA. Kings Creek is one of them.

There is no previous flood mapping of Kings Creek. However, engineered flood risk mapping is available for the Jock River (PSR/JFSA 2004a, 2004b, 2005). Information from this study, when found useful, is used in the present study. Summary of available information has recently been compiled by RVCA in a watershed report card of the Jock Subwatershed and associated catchment sheets (RVCA, 2010, 2016a).

This report provides a summary of the analytical methods used and underlying assumptions applied in the preparation of flood plain mapping for Kings Creek from Brunton Side Road to the confluence with the Jock River and associated tributaries (Figures 1 and 2). The project has been done in accordance with the technical guidelines set out under the Canada-Ontario Flood Damage Reduction Program (FDRP) (MNR, 1986), and the technical guide for the flood hazard delineation in Ontario (MNR, 2002) as laid out by the Ontario Ministry of Natural Resources. It also conforms to the 'generic regulation' guidelines of Conservation Ontario (2005). The 1:100 year flood lines delineated here are suitable for use in the RVCA's regulation limits mapping (as per Ontario Regulation 174/06) and in municipal land use planning and development approval processes under the Planning Act.

2. Study Area

The following streams have been mapped during this study:

- Kings Creek Main Stem (16 km)
- Kings Creek Tributary A (6 km)
- Goodwood Drain (1 km)

In total, 23 km of streams has been mapped (Figures 2 and 17). The study area is in the rural part of the City of Ottawa and in the Township of Beckwith (Figure 2). The watershed is largely undeveloped, with 38.6% forest, 25.8% wetland and 20.6% agricultural fields. Only about 7.5% is developed or is slated to be developed in near future (e.g., the Prospect Development Project).

3. Data Used

LIDAR: High quality topography is the key to high quality flood risk mapping. Digital Elevation Models (DEM) were derived from LIDAR data procured by the City of Ottawa. The LIDAR was flown in 2012 and in 2015. This data set has a density of about 4 to 10 points per square meter, and an estimated consolidated vertical accuracy (CVA) of 20-25 cm (Airborne Imagery, 2013, 2015). As shown in Figure C.3 in Appendix C, the Kings Creek watershed is covered with 2012 and 2015 LIDAR data. Only the upper part is outside LIDAR coverage and has the 10x10 m DEM collected from MNRF in 2006. These two data sets were merged together in a seamless DEM and used in this study. The City also provided 0.25 m contour lines that were derived from LIDAR data. However, we only used the LIDAR points directly for this study, and the contour lines were never used.

The accuracy of the LIDAR data was checked in the field by RVCA staff in August-September 2014. The true elevations of features on the ground that are identifiable on the mapping were determined using RVCA's survey grade GPS equipment (Trimble R8), and compared with the elevations indicated by the LIDAR spot heights, to determine that any differences between mapped and true elevations were within the accuracy prescribed by the FDRP standards.

In total, 458 spot heights were verified (see Table C.1 and Figure C.1 in Appendix C). As described in the FDRP guidelines (MNR 1986), the spot height checks are considered satisfactory when 90% of the data points are within 0.33 m of the field measurement. As shown in Table C.1, this criterion has been adequately met[1]. On average, the spot heights are within 4.5 cm (Table C.1).

At the few locations where these criteria are not met, changes to the landscape since the date of air photo have been identified as the probable cause of the discrepancy. Data at these locations were disregarded in the DTM verification.

Drape Imagery: The Drape imagery was collected in April-June 2014 with a horizontal accuracy of ±0.5 metre. This high quality colored photo clearly shows the

[1] FDRP (1986) Manual also specifies criteria for checking contour crossings. However, in this study we used only LIDAR spot heights, not contour lines. Therefore, we did not check the accuracy of contour lines supplied by the City of Ottawa.

rivers, creeks, land use, houses, buildings, roads, infrastructure, vegetation and other details.

2011 Aerial photo: The 2011 aerial photo was also available from the City of Ottawa. It is accurate, sharp and in colour, and shows various natural and man-made features clearly.

Building footprint: The 'building footprint' layer was provided by the City of Ottawa for the area inside the urban boundary. It enables us to accurately draw flood lines around buildings. This data layer contained information collected over a number of years.

Land use: A GIS-based land use data set, based on information up to 2014, was recently compiled by RVCA staff. It has 34 categories of land use (see Table 1 and Figure 4). This data set was used in the hydrologic parameter estimation.

RVCA's GIS Department has created this land cover dataset for the Jock River subwatershed (RVCA, 2016a). Vector data originally obtained during approximately the early to late 1990s by the Ministry of Natural Resources and Forests (MNRF) were used to produce a pre-classification of the area. This pre-classification provided a historical overview of the spatial distribution of transportation, settled areas, aggregate sites, evaluated and unevaluated wetlands, wooded areas and water. Updates to this land cover vector data were based on 20cm ortho-imagery acquired through the Digital Raster Acquisition Project for the East (DRAPE), a program lead by the MNRF in 2008 and 2014. DRAPE imagery was also used to incorporate crop and pasture and meadow/thicket as additional land cover classes. Currently RVCA houses two spatially continuous land cover datasets representing the Jock River subwatershed in 2008 and 2014 using 10 land cover classes, which are further divided in to 24 subclasses. This vector data was produced through heads up digitizing to represent the landscape at a 1:4000 scale. Industry standard techniques were used to ensure topological integrity.

Imperviousness: A GIS-based data layer showing the impervious surfaces was obtained from the City of Ottawa. It identified various impervious surfaces such as roads, parking lots, buildings, etc. (Figure 5). This data was based on information collected over a number of years up to 2011. The imperviousness varied in the range from 0.8% to 24.1% for the sub-catchments, with an average of 2.7% for the entire Kings catchment (Table 3a). This data set was used in the hydrologic analysis.

Soil classification: A soils classification layer was obtained from MNRF's LIO (Land Information Ontario) database, details of which are documented in a report by MNR (2012). Soil is classified in to four categories (A, B, C and D) based on infiltration capacity.

Group A soils have a high infiltration rate (low runoff potential) when thoroughly wet; these consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B soils have a moderate infiltration rate and consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture; these soils have a moderate rate of water transmission.

Group C soils have a slow infiltration rate and consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture; these soils have a slow rate of water transmission.

Group D soils have a very slow infiltration rate (high runoff potential) and consist chiefly of clays that have high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material; these soils have a very slow rate of water transmission.

This report (MNR, 2012) describes the infiltration rate in qualitative terms without giving numerical values. However, it appears to be based on the SCS's original classification. USDA-SCS (1986) gives specific range of infiltration or transmission rate (Group A: greater than 0.30 inch/hour; Group B: 0.15-0.30 inch/hour; Group C: 0.05-0.15 inch/hour; Group D: 0-0.05 inch/hour). This soil information was used in hydrological parameter estimation.

As shown in Table 2 and Figure 3, Soil Group B is predominant (64%) in the Kings catchment, followed by Group D (25%) and Group A (5%). Thus, the soil in this area has a moderate infiltration rate. It consists chiefly of moderately deep to deep, well drained soils. The texture is fine to course sand and silt. It also has a moderate rate of water transmission.

4. Hydrological Computations

4.1 Overall Methodology

In the absence of any streamflow measurement – a common situation in many small catchments – we have used a single-event hydrological model to estimate flood flows at key locations along Kings Creek. This approach is sometimes referred to as the 'return period design storm' method, and is one of the acceptable flow estimation procedures discussed in the provincial guidelines (MNR, 1986, 2002). In this method, a synthetic design storm (hyetograph) of specified return period is fed into a rainfall-runoff model to generate the corresponding peak flow, which is generally assumed to have the same return period. This procedure is quite popular and is regularly used in studies related to drainage, stormwater, flooding, and so on.

For small catchments of this size, floods generated by summer storms are expected to be larger compared to spring freshet and should therefore be used in flood risk mapping. Past studies in this area support this notion[2].

Suitable data for calibrating the SWMHYMO model was not available. Therefore, we have estimated the flood quantiles based on theoretical (or synthetic) storms and uncalibrated hydrologic modeling as the best available methodology at the present time. As described later in the report, lack of data also prevented calibration of the hydraulic model.

Synthetic storms of various types and durations were first used to estimate the 1:100 year flood flows. Based largely on engineering judgement, one of the storms was selected as suitable for the flood mapping purposes within the Kings Creek basin. The selected storm was then used to estimate the flood quantiles for various return periods (2, 5, 10, 20, 50, 50, 100, 200, 350 and 500 years).

[2] For example, the 1:100 year summer and spring floods of Flowing Creek (with an area of 49.5 km^2) were estimated at 51 and 46 cms respectively by PRS/JFSA (2004a, 2005) during a larger mapping study on the Jock watershed; it was recommended that the summer flows be used for flood mapping. MVCA (2015) analyzed snowmelt events using the Ottawa Airport data and concluded that 'if a location on a river has a response time somewhat longer than 12 hours, it would be expected that snow melt would govern" (as opposed to summer rainfall). Kings Creek catchment's response time is much lower (2-6 hours) than 12 hours; therefore, summer rainfall is expected to produce larger runoff than spring snowmelt.

4.2 SWMHYMO Model

We have used version 4.02 of SWMHYMO model (JFSA 2000) for estimating the summer floods. This model is used widely in Ontario for both urban and rural catchments.

As shown in Figures 2 and 7, the Kings Creek basin has been divided into eight catchments, and flood quantiles have been estimated at five nodes and three catchment outlets along the creek and its tributaries (Figure 13). A schematic of the SWMHYMO model is shown in Figure 8, where both the catchments and channel segments used for flow routing are included.

In accordance with MNR (2002) guidelines, the hydrological analysis has been done with the foreseeable planning horizon in mind. The only significant future development in this area is known as Prospect. This 377 ha area has been earmarked for future development by the Township of Beckwith. The Township's Official Plan is consulted for information (Township of Beckwith, 2012). We estimated that, when fully developed, roughly 75% this area will comprise of townhomes (1/8 acres or less) and the remaining 25% will comprise of 1 acre lots. The hydrologic parameters have been estimated accordingly.

Among the available runoff-generating modules in SWMHYMO model, two commands (CALIB NASHYD and CALIB STANDHYD) were considered for calculating runoff from rural and urban catchments respectively. In case of Kings Creek, all catchments except one (M3) are essentially rural with imperviousness less than 2.9%.

The CALIB NASHYD command was used for the rural catchments (M1, M2, M4, D1, T1 and T2; Table 3a).

The CALIB NASHYD command, used for rural areas with imperviousness less than 20%, requires the following input:

$AREA$ = area of the catchment (hectares),

DWF = dry weather flow component (m^3/s),

CN or $CN*$ = original or conjugate (modified) curve number,

IA = initial abstraction (mm),

DT = computational time step (minutes),

N = number of lineal reservoirs, and

T_p = time to peak (hour).

Table 3a lists the parameters for all thirteen catchments within Kings basin. The dry weather flow or base flow was assumed to be zero (DWF = 0.0). A one minute time step was used (DT = 1.0 minute). The number of linear reservoirs was set at three (N = 3). These are typical values that hydrologists use in the absence of more site-specific information.

For the catchments with more than 20% imperviousness, CALIB STANHYD command was used. Only one catchment (M3), encompassing a proposed development area known as Prospect, has significant area that is earmarked for future development (Township of Beckwith, 2012). The Prospect development has an area of 377 ha (3.77 km2), which falls within three subcatchments (M3, M4 and D1). This future land use was used in the hydrologic analysis and flood risk delineation, in accordance with MNR (2002) guidelines. CALIB STAMHYD command requires the following input parameters:

$AREA$ = area of the catchment (hectares),

DWF = dry weather flow component (m^3/s),

CN or $CN*$ = original or conjugate (modified) curve number,

$TIMP$ = total imperviousness ratio (between 0.0 and 1.0),

$XIMP$ = directly connected imperviousness ratio (between 0.0 and 1.0),

$LOSS$ = type of loss over impervious surface,

DT = computational time step (minutes),

$IAper$ = initial abstraction on pervious surface (mm),

$SLPP$ = average pervious surface slope (%),

LGP = average lot depth (m),

MNP = roughness coefficient for pervious surface,

SCP = linear reservoir storage coefficient for pervious surface (minutes),

$IAimp$ = initial abstraction on impervious surface (mm),

$SLPI$ = average impervious surface slope (%),

LGI = average overflow travel length (m),

MNI = roughness coefficient for impervious surface, and

SCI = linear reservoir storage coefficient for impervious surface (minutes).

Table 3b lists the parameters for catchment M3. The dry weather flow or base flow was assumed to be zero (DWF = 0.0). A one minute time step was used (DT = 1.0 minute). These are typical values that hydrologists use in the absence of more site-specific information. The rest of the parameters and how they were estimated are explained in Table 3b.

Two parameters (curve number and time to peak) are very important in SWMHYMO modeling and therefore require elaborate discussion.

Curve Number Method: The curve number (CN) method of estimating runoff was first introduced by US Department of Agriculture's Soil Conservation Service (USDA-SCS 1986) and is widely used in North America and elsewhere. This method is used in the SWMHYMO model too. The curve number (CN) was calculated based on land use and soil type (Tables 1 and 2). Equivalent land use and associated CN from TR-55 were first selected for each of the 34 land use and 4 soils types found in this region (Table 4). For each elemental area with a particular land use-soil combination, the appropriate CN value was chosen; these CN values were then area-averaged over the whole catchment to find the aggregate CN for the catchment. CN values varied from 69 to 80 for different sub-catchments, with an average value of 74.5 for the entire Kings catchment (Table 3a).

Both the original SCS curve number method and its 'conjugate' or modified version can be used in SWMHYMO. For this study, we have used the modified method – commonly known as the $CN*$ method. For parameter estimation and calculation procedures, we have closely followed the original SCS manual (USDA-SCS, 1986) and a recent, comprehensive stare-of-the-art review done by a task committee (Hawkins et al., 2009).

The first step is estimating the CN value based on land use and soil type as given in the SCS manual (USDA-SCS, 1986). We have used the following information:

- 2010 land use data set from the City of Ottawa
- Future land use information on Prospect (reference)
- 2009 soil classification by LEO/OMAFRA/MNR

Both data sets were available in digital format. Tables 1, 2 and 4 summarizes parameters related to the estimation of CN and $CN*$. This process was automated in the GIS system.

Once CN was estimated, then the 'conjugate' or modified curve number $CN*$ was calculated using the following equation:

$$CN* = \frac{100}{1.879(\frac{100}{CN} - 1)^{1.15} + 1}$$

Soil storage capacity (S) in mm was related to $CN*$ by the relation:

$$CN* = \frac{25400}{254 + S}$$

And the initial abstraction (IA) in mm was calculated as:

$$IA = 0.05S$$

The above equations were taken from Hawkins et al. (2009; page 35, 9 and 34 respectively).

While the original CN was estimated based on the assumption of an initial abstraction equal to 20% of the soil moisture capacity, later research revealed that the initial abstraction equal to 5% of the soil moisture capacity is more appropriate, the new curve number was called $CN*$, and the relationship between CN and $CN*$ was established. At present, both the original and the modified methods are widely used, with more and more practitioners preferring the latter. However, given that they can be readily converted to each other, one has the option to use any of them.

Time to Peak: The time of concentration (T_c) of a watershed is defined as the time required for water to move from the most remote part of the watershed to its outlet. Many methods are available, mostly empirical and developed for specific conditions, to

estimate T_c. Here, we have used the 'velocity method' originally introduced by Soil Conservation Service (USDA-SCS, 1986) and later elaborated by Natural Resources Conservation Service (USDA-NRCS, 2010). This method has a sound physical basis[3], i.e., the movement of water over the land and along the channel, although estimating parameters – as the case frequently is in hydrology – is at best an approximation.

The time to peak (T_p) is defined as the time between rainfall event and the corresponding peak flow. It is related to the time of concentration as (USDA-CSC 1986, page 15-3):

$$T_p = 0.6T_c$$

Both T_c and T_p were calculated using the method detailed in the USDA-NRCS (2010) manual. The time to peak (T_p) was an input to SWMHYMO model (Table 3a). It varied from 0.9 to 6.9 hours for different sub-catchments.

All estimated parameters necessary for the SWMHYMO modeling of the Kings Creek catchment are listed in Tables 3a-b.

Channel Routing: The ROUTE CHANNEL command of the SWMHYMO model was used for routing the flow along rivers and streams. The model requires channel length, slope, roughness and a typical channel cross-section. Channel length and slope are given in Table 3a. Figure 8 shows how the channels fit within the overall model structure. Typical cross-section for each channel was based on the characteristic main channel and adjacent floodplains where applicable. Manning's roughness coefficients for the main channel and floodplain were also assigned based on land use and expected flow

[3] The SCS velocity method is generally considered to have a sound physical basis and is often used as a yardstick to evaluate other methods (see, for instance, McCuen et al. 1984; Grimaldi et al. 2012 and Sharifi and Hosseini 2011). Grimaldi et al. found that as much as 500% variation is quite common when using different methods to estimate time of concentration. They also made an interesting remark: "Indeed, it a paradox that advanced hydraulic models, such as 2-D flood propagation models for hydraulic risk mapping based on very expensive topographic and remote sensing data, are actually limited by design hydrographs based on anachronistic parameters, such as Tc." This is consistent with the commonly observed fact that hydraulic calculations are much more accurate than hydrologic calculations. Also, from the practitioner's point of view, "as a general rule, methods that compute individual travel times for various types of flow segments (for example, overland flows and channelized flows), and then sum the individual travel times to estimate the total travel time, are thought to be the most reliable" (Bentley Systems 2007b).

conditions. Care was taken to ensure that parameter values used in SWMHYMO were consistent with those used in HEC-RAS model.

Since many wetlands are present in this watershed, their influence on the mapping was taken into consideration. The influence of the wetlands on the hydrological response of the watershed was taken in to account by treating it as a land use category when computing hydrological parameters. Moreover, we have incorporated the storage of the system (both floodplain and wetlands) into the channel routing routine of the SWMHYMO as broad floodplains. This is how wetlands were incorporated in the hydrologic computation or flow estimation. In the hydraulic computation (HEC-RAS modeling), both floodplains and wetlands were incorporated as part of wide cross-sections, providing floodplain storage and flow attenuation. Where applicable, the roughness (Manning's n) coefficient for the floodplain also reflect the wetland conditions.

4.3 Selection of Design Storm

A wide variety of design (or synthetic) storms are available. However, a particular storm is generally selected for flood mapping purposes after appropriate scrutiny. For this study, synthetic storms of two types (Chicago and SCS Type II) and four durations (3, 6, 12 and 24 hours) were considered for hydrologic modeling (Table 5). These storms are routinely used in Canada for both stormwater management and flood risk studies. Recent studies in neighboring conservation authorities (SNCA 2014; MVCA 2015) as well as within the RVCA (RVCA 2016b, 2017a, 2017b) confirm the suitability of these storms for the purposes of floodplain mapping in small basins.

The following synthetic storms were considered:

- 3 hour SCS Type II storm
- 6 hour SCS Type II storm
- 12 hour SCS Type II storm
- 24 hour SCS Type II storm
- 3 hour Chicago storm
- 6 hour Chicago storm

- 12 hour Chicago storm
- 24 hour Chicago storm

Hyetographs corresponding to these storms were generated from the most recent IDF curve at Ottawa Airport (Station ID 6106000), obtained from Environment Canada[4]. This IDF curve was based on the most recent analysis using 39 years of data from 1967 to 2007 (with 2001 and 2005 data missing)[5]. Generally, the curve for a certain return period follows an equation like:

$$I = \frac{a}{(b+t)^c}$$

where,

I = rainfall intensity (mm/hour), and

a, b, c = constants.

From the EC IDF curve (Figure 9), equations were fitted via the STORM software and constants determined for all return periods (Figure 10). These equations were then used to generate rainfall hyetographs, for which we used the STORMS 2010 utility software (version 3.0.1) from JFSA (2011). Figure 11 shows the storm hyetographs. Hyetographs were input to SWMHYMO model, where they drive the rainfall-runoff computation. This procedure was followed for all Chicago storms and the SCS 24 hour storm. For all other SCS storms (3, 6, 12 hour durations), the distribution was taken from the City Sewer Guidelines (2012; page 5.18).

Using the eight synthetic storms, the 1:100 year flows were computed for all sub-catchments and at key locations along the stream (Table 6), which were then scrutinized to select an appropriate storm for the purposes of flood mapping. This step is somewhat subjective and requires engineering judgement. As expected, the longer duration storms produced higher flows; usually the flow corresponding to a 3 hour storm was about 59-

[4] Information on IDF curve was obtained from Environment Canada's website [http://climate.weather.gc.ca/prods_servs/engineering_e.html].

[5] City of Ottawa's Sewer Design Guidelines (2012) contain an old IDF curve based on 1961-1990 data, which yields somewhat smaller storm depths than the more recent IDF curve (based on 1967-2007 data). We have opted to use the most recent IDF curve because it reflects recent climatic conditions, is based on more data (39 years as opposed to 31 years), and is slightly conservative (produces bigger storms). The FDRP Manual (MNR 1986) also recommends the use of most recent IDF information.

68% of that produced by a 24 hour storm. The SCS storms produced slightly higher flows (by about 9-14%) compared to Chicago storms. The estimated flows from various storms were thus within the typical variation associated with hydrologic computation; no storm produced extremely high or low flows. This appears to endorse the notion that all storms considered here and associated flows were within the realm of hydrological plausibility. No storm stood out as an outlier or as unrealistic. In the selection of a storm for flood mapping purposes, we wanted to be as close as possible to reality with a slight degree of conservatism. Considering all, we selected the 24 hour SCS Type II storm as the most suitable for Kings Creek flood mapping[6]. As can be seen in Table 6 and Figure 12, it produced the higher flows, but only marginally so (12-18% higher than those produced by the Chicago storm). This selection was consistent with our philosophy of being as close as possible to reality, with only a slight degree of conservatism to account for the uncertainty.

4.4 Estimated Flood Quantiles

After the 24 hour SCS Type II storm was selected for the flood mapping purposes, the SYMHYMO model was run for all events with return periods from 2 to 500 years (Table 7). Input and output files of the SWMHYMO model are included in Appendix D. Estimated flood quantiles at key location were tabulated (Table 8 and Figures 13 and 14). Flood flows from this table were then used in the hydraulic modeling; thus, this table is the link between hydrologic and hydraulic computations.

4.5 Comparison with Other Methods

In order to assess the reasonableness of the flood quantiles computed here (with SCS Type II 24 hour storm), a comparison was made to those computed at other small catchments elsewhere (Figures 15 and 16). Besides comparing the data points to each other, three lines were drawn to provide the context. They are:

[6] The hydrological analyses done here and the results obtained therefrom are considered suitable for the purposes of floodplain mapping of Kings Creek only, and for no other purpose. It should be emphasized that the methodology, storms considered and selected, modeling, and the estimated flood quantiles may not be suitable for any other purpose, including land drainage, stormwater management and infrastructure design. Any subsequent use of the data, model and other information contained in this report should be made only after independent verification and scrutiny by qualified engineers/hydrologists.

- Area pro-rating: based on Jock River at Moodie Drive; 1:100 year spring flood of 196 cms based on measured data (PSR/JFSA 2004a)
- 1:100 year floods computed by the Index Flood Method (MNR, 1986)
- Creager envelope curve with a coefficient of 30 (Watt et al. 1989)

Figures 15 and 16 show that, in general, the Kings Creek flows are within the usual variation of computed floods from other catchments, both within and outside of the Jock watershed. In particular, the good matching of Kings data with other small catchments within the Jock watershed (taken from PSR/JFSA 2005b; JFSA 2010; RVCA 2016b, 2017a, 2017b) gave credence to the hydrologic modeling presented here. Some of the data from highly urban catchments (mainly from Bilberry Creek area; unpublished RVCA data) exhibit high flows, which is expected. In rural areas dominated by lakes and long streams such as the Otter-Hutton system, the flows were lower than even the index floods (RVCA, 2016b). We note that all of the estimated floods within the Kings basin are higher than those given by the Index Flood Method, which was based on measured streamflow data and was prescribed for estimating floods in the absence of better information. The estimated floods are also in line with the prorated values based on Jock River. All data points are below the Creager envelope curve, although flows from the highly urban areas can get very close. On the balance, we found that the Kings Creek data compare well with other data and are within the confines of pertinent estimation methods.

5. Hydraulic Computations

5.1 HEC-RAS Model

Following standard procedures (MNR, 1986; USACE, 1990, 2010), a steady-state hydraulic model of Kings Creek was built. The HEC-RAS software (version 4.1.0) developed by the US Army Corps of Engineers (USACE, 2010) was used. It uses the same back water calculation procedure as HEC-2 (USACE, 1990), which has been the industry standard since the 1970s, but with improved data processing and graphical capabilities. About 23 km of Kings Creek and its tributaries was included in the HEC-RAS model.

Cross-Sections: The cross-sections used in the modeling were generated from the latest topography (2012 and 2015 LIDAR) using GIS tools. While, the above-water part of the cross-sections generated from LIDAR is accurate, the under-water portion of the channel is sometimes not adequate. In such cases, the under-water portion of the cross-section was adjusted from field observation. Since the LIDAR were flown during low flow conditions, the adjustment required for under-water channel was usually minor (less than 30-50 cm). The probable impact of such minor adjustments on 1:100 year flood level is expected to be insignificant as well. Therefore, the cross-sectional data was considered adequate for the purposes of flood mapping.

In total, 89 cross-sections were used in our HEC-RAS model. Figure 17 shows a schematic of the HEC-RAS model. Drawing KG-1 in Appendix F shows the cross-sections in greater detail, along with the computed Regulatory Flood Levels (RFLs) and flood risk limits. The location and alignment of river cross-sections within the model were based on engineering judgment as related to the expected flow during high flood events.

Channel Roughness: The Manning's roughness coefficient was estimated to be 0.035 in the main channel, and in the range of 0.05 to 0.08 for most of the overbank areas depending on the land use and vegetation (Table B.1 in Appendix B). These values were consistent with standard values, such as those recommended by Chow (1959). Where applicable, the roughness coefficient for the floodplain also reflect the wetland conditions.

Bridges/Culverts: Within the study area there are 9 road crossings (Table 10). As-built drawings obtained from the City. Moreover, field survey by RVCA technicians during Fall 2010 were used for determining bridge/culvert dimensions. Road crossings and associated cross-sections were updated to match the as-built information.

Flood Quantiles: The estimated design flows from the hydrologic analysis (discussed above), with return periods ranging from 2 to 500 years (Table 8), were used in the HEC-RAS model. Table 9 shows the flows that were input to the HEC-RAS model.

For each channel reach, flows at both upstream and downstream ends were estimated form the SWMHYMO model, as listed in Table 8. As is the usual practice, the higher of these two flows – almost always the downstream one – was used for the hydraulic calculation in the HEC-RAS model.

Downstream Boundary Condition: Known or estimated water levels are usually used as downstream boundary conditions in HEC-RAS models. In this case, Kings Creek drains into the Jock River. So, the water level of the Jock River during summer months, if known, could be used as the downstream boundary condition of the Kings Creek model. During the Jock River flood mapping study (PSR/JFSA, 2004b, 2005), the Jock River was mapped for the spring flood condition (the dominant flood), not for the summer floods. However, the summer flood values were estimated for the Jock River. We ran the Jock River HEC-RAS model with these summer flood flows and estimated the water level in Jock River at this location. The estimated water level was 99.64 m for a 2 year summer flood in the Jock River; this was used as the boundary condition for the 100 year summer flood of the Kings Creek, which can be taken as having a joint probability of 1% summer flooding. Due to the difference in size of the Kings and Jock basins, it is very likely that the peak runoffs from them during summer storms would not coincide, thus justifying the use of 2 year Jock River water level as the boundary condition[7]. We also

[7] This approach is consistent with the provincial recommendation regarding estimating flood level at stream confluences (MNR 2002; Section 4.4 Confluence of Rivers). It states that "Where the high water conditions at the junction of two rivers are generated by two independent flood events, the flood standard should be based on the higher of:

i) mean annual flood level in the smaller river and the flood standard (Hazel, Timmins, observed or 100 year event) in the connecting channel; or

ii) flood standard (Hazel, Timmins, observed or 100 year event) in the smaller river and mean annual flood levels in the connecting channels.

run the model with 2 year flow in the Kings Creek and 100 year flow in the Jock River, but it yielded a water surface profile about 0.7 m lower than the other combination (100 year Kings and 2 year Jock) and therefore was not further used. Test runs using various combinations of flow and boundary condition led us to use the 2 year water level for all flow events in the Kings Creek, because this approach produces a conservative flood level for a given joint probability and ensures internal consistency of computed water surface profiles. The area influenced by the boundary condition was flooded by the 100 year spring flood of the Jock River and is already included within RVCA's regulation limits; this made the fine tuning of the boundary condition for various storm events a rather academic exercise.

Once the model was set up, the computed profiles and other parameters were scrutinized to assess the reasonableness of model outputs. Special attention was given to the computed water level and energy profiles near road crossings. Adjustments of model parameters – mainly the channel resistance and contraction and expansion coefficients – were made as necessary.

Suitable data to calibrate or validate the HEC-RAS model was not available. Therefore, no calibration was done[8]. However, we exercised professional judgement and tried to be slightly on the conservative side. Our approach of slight conservatism (a combination of hydrologic and hydraulic computations) is also congruent with the current notion of the Precautionary Principle, which applies when there exist considerable scientific uncertainties about causality, magnitude, probability, and consequences of different course of action (UNESCO 2005). The Precautionary Principle is also a key policy of Environment Canada[9].

Where the high water conditions at the junction of two rivers are caused by the same event, the flood standard is applied to both."

[8] Given the constraints, this HEC-RAS model is the best we could build for the limited purpose of floodplain mapping at this time. We recognize that this model may not be suitable for other purposes. Further model improvement/adjustment/modification may be necessary for other purposes; it all depends on the purpose of the modeling and the features and phenomena a model is meant to capture. We therefore caution against using this model for other purposes without first confirming its suitability.

[9] Canada's environmental policy is also guided by the precautionary principle and is reflected in the Federal Sustainable Development Act which states that the Minister of Environment must "develop a Federal

5.2 Computed Water Surface Profiles

The HEC-RAS model was run with the design floods. The 1:100 year computed water surface elevations and other parameters are shown in Table 12. Typical water surface profiles and all cross-sections are included in Appendix B.

Computed water surface elevations for various flood events with return periods ranging from 2 to 500 years are presented in Tables 13 and 14. It should be pointed out that the model has been built for the expected conditions prevailing during intense rainfall-generated flood events in the summer. Caution should be used when applying this model to simulate water surface profiles for events of other magnitude and during other seasons of the year.

Computed head losses across road crossings are listed in Table 11.

In cold climate areas like Ontario, spring floods may also be accompanied by ice jams. Here we have only analyzed the summer floods, not the spring floods. We are unaware of any ice-related flooding that caused significant concern in this area.

5.3 Sensitivity Analysis

Flood quantiles have the highest degree of uncertainty in our computation and is most likely to affect the water surface profile. Therefore, we decided to test the sensitivity of water surface profile to a wide variation in flow.

The sensitivity analysis was conducted to determine how much the computed water surface elevations will vary with changes in the value used for the 1:100 year discharge. Six flow conditions were tested:

- 1:100 year flow increased by 10%
- 1:100 year flow increased by 25%
- 1:100 year flow increased by 50%
- 1:100 year flows decreased by 10%

Sustainable Development Strategy based on the precautionary principle". The precautionary principle states that: "Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation". In other words, the absence of complete scientific evidence to take precautions does not mean that precautions should not be taken – especially when there is a possibility of irreversible damage (Environment Canada, 2010).

- 1:100 year flow decreased by 25%
- 1:100 year flow decreased by 50%

Figures 18(a-c) and 19(a-c) show the computed water surface profiles and the differences in computed water levels for each condition. Figures 18(a-c) indicates that the computed water surface elevations are less sensitive to the discharge value in the steeper portions of the reach and more sensitive upstream of road crossings. The sensitivity analysis indicates that the computed water level can vary by about 0.10 m for a 10% variation in flow along most of the river reach, which is typical in the hydrologic estimation of design flow. For a 25% increase in flow, the water level can go up by about 0.20 m.

The sensitivity analysis provides an indication of the potential implications of inaccuracies in flow estimation, and changes in the expected flood flows that might result from urbanization and climate change.

6. Selection of Regulatory Flood Levels

As per Section 3 of the Provincial Policy Statement under the Planning Act (MMAH, 2005, 2014), the regulatory flood in Zone 2, which includes the RVCA, is the 1:100 year flood. Depending on the local hydraulic conditions, the computed water surface elevation, the energy grade or a value in between is generally taken as the Regulatory Flood Level (RFL). Engineering judgment is applied to recommend an appropriate value for the regulatory flood level at each cross-section, using the model outputs and considering hydraulic characteristics of the river reach, and the inherent limitations of numerical modeling.

When the stream velocity is relatively low and varies only gradually over relatively long river reaches, the water surface can generally be taken as the RFL.

However, near bridges, culverts and other water control structures and on steeper reaches where streamflow velocities are higher, and may change more abruptly, the computed water surface elevation may be substantially lower than the energy grade level, with the possibility that the water level may rise to the energy grade near obstacles and irregularities in the channel profile or cross-section which may not be represented in the hydraulic model. In such cases, the regulatory flood level is generally based on the computed energy grade as a conservative approach, given that the model-generated water surface elevation is less likely to be a true representation of flood risk in such situations.

Another possible situation arises when the computed water surface profile is undulating, with downstream water levels occasionally higher than upstream levels. When this occurs, it is more often an artifact from the simplifying assumptions of the modeling scheme than a reliable prediction of the actual differences in streamflow velocity and depth (and hence energy grade) from one cross-section to the next. Accordingly, the regulatory flood level at the upstream cross-section is taken to be equivalent to the downstream water surface elevation in these situations.

In all cases, the RFL is always between the computed water level and energy grade line. Hence, for the sake of simplicity and consistency, the energy grade elevation is often used as the RFL as a standard practice in delineating flood hazard areas.

For the present study, the regulatory flood levels were set equal to the computed energy grade and are tabulated in Table 12, along with the computed water surface elevations and energy grades at each cross-section in the model.

7. Flood Line Delineation

7.1 General

Once the RFLs are established, the plotting of 1:100 year flood lines or flood risk limits is a relatively straightforward matter. Given the topographical information in the form of LIDAR spot heights, the inundated area below the RFLs can be easily delineated manually or by using automated computer programs. In the present case, it was done manually with a focus on areas with complex topography, infrastructure, and overbank flow paths. The raw LIDAR spot heights were extensively used in the plotting the flood risk limit.

Field surveys were conducted by RVCA staff in May 2017 to verify hydraulic connectivity through culvert openings and flood prone areas.

The record of site-specific information associated with RVCA's regulatory approval process since 2006 was checked. It was found that no site-specific work affects the flood risk lines.

Drawings KG-1 and KG-2 in Appendix F depict the delineated floodplain and areas of shallow flooding.

7.2 Buildings in the Floodplain

Presence of existing buildings within the floodplain and associated variation in the way a building could be exposed to flood risk required special attention. Recently, RVCA has consolidated a few rules for drawing flood lines in the vicinity of buildings (Appendix A), which have been followed in this study. Due to the limitations of the data and methodology used in the current mapping done at a large scale, and the small degree of (inevitable) subjectivity in drawing flood lines around buildings at a smaller scale, RVCA recommends that, should the need arise for accurate flood line delineation near buildings, site-specific information be taken into account when dealing with flood risk at these locations. It is the practice of RVCA to refine flood lines when more accurate information becomes available.

7.3 Flood Mapping Data in GIS

The regulatory flood lines and cross-sections have been incorporated as separate layers in RVCA's Geographical Information System (GIS). In this system, one can view the flood lines, cross-sections, design flow, water level, energy grade, RFL, and other computed parameters. The flood lines can be overlain on the aerial photography or any other base mapping layers that are in the system and at any scale that suits the user's need.

The regulatory flood line layer is maintained, and updated as required according to the established procedures of the RVCA (RVCA 2005).

Drawings KG-1 and KG-2 show the flood risk limits as delineated in this study. At all cross-section locations, the RFL is indicated. The general surrounding and land marks are also included for easy referencing.

8. Project Deliverables

The key information or knowledge products generated from this project are:

1) The Flood Mapping Report (this Technical Memorandum) – which summarizes the analytical methods that were used and the underlying assumptions
2) SWMHYMO model files
3) HEC-RAS model files
4) The flood risk limit lines in GIS format (shape files) – identifying the extent of lands which are considered to be vulnerable to flooding during a regulatory flood event (1:100 year flood)
5) The position and orientation of cross-sections used in the HEC-RAS model, in GIS format (shape files) – which, when used in conjunction with the HEC-RAS model output files, informs the user as to the estimated 1:100 year water surface elevation and the regulatory flood level for any location in the study area

A "documentation folder" containing working notes and relevant background information accumulated during the study process is maintained by the water resources engineering unit within RVCA's Watershed Science and Engineering Services department.

9. Closure

The hydrotechnical and cartographic procedures used in this study generally conform to present day standards for flood hazard delineation, as set out in the MNR's Natural Hazards Technical Guide (MNR, 2002). The resulting 1:100 year flood lines are suitable for use in the RVCA's regulation limits mapping (as per Ontario Regulation 174/06) and in municipal land use planning and development approval processes under the Planning Act.

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Senior Water Resources Engineer

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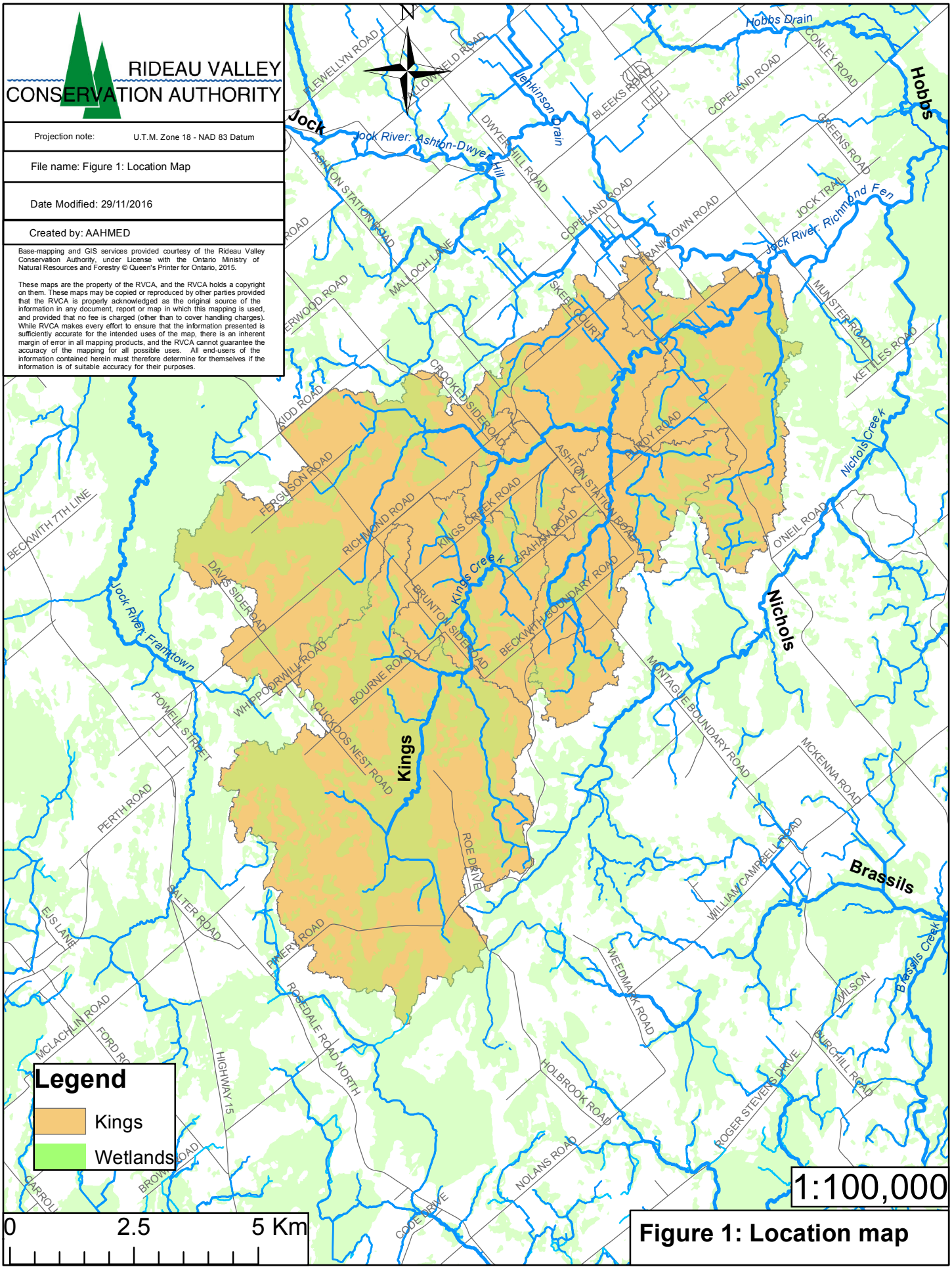
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Figure 1: Location map
Jock River: Ashton-Dwyer Hill
Jock River: Richmond Fen
Jock River: Franktown
Hobbs Drain
Jenkinson Drain
Kings Creek
Nichols Creek
Brassils Creek
Jock
Hobbs
Nichols
Kings
Brassils
FLEWELLYN ROAD
HOLLOWFIELD ROAD
DWYER HILL ROAD
ASHTON STATION ROAD
MALLOCH LANE
SKEFF COURT
BLEEKS ROAD
COPELAND ROAD
CONLEY ROAD
GREENS ROAD
JOCK TRAIL
FRANKTOWN ROAD
MUNSTER ROAD
KETTLES ROAD
O'NEIL ROAD
KIDD ROAD
CROOKED SIDEROAD
FERGUSON ROAD
RICHMOND ROAD
KINGS CREEK ROAD
GRAHAM ROAD
BECKWITH 7TH LINE
DAVIS SIDEROAD
BRUNTON SIDEROAD
BECKWITH BOUNDARY ROAD
WHIPPOORWILL ROAD
BOURNE ROAD
CUCKOOS NEST ROAD
POWELL STREET
PERTH ROAD
ROE DRIVE
MONTAGUE BOUNDARY ROAD
MCKENNA ROAD
WILLIAM CAMPBELL ROAD
BALTER ROAD
EJS LANE
PINERY ROAD
ROSEDALE ROAD NORTH
WEEDMARK ROAD
WILSON
MCLACHLIN ROAD
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BURCHILL ROAD
NOLANS ROAD
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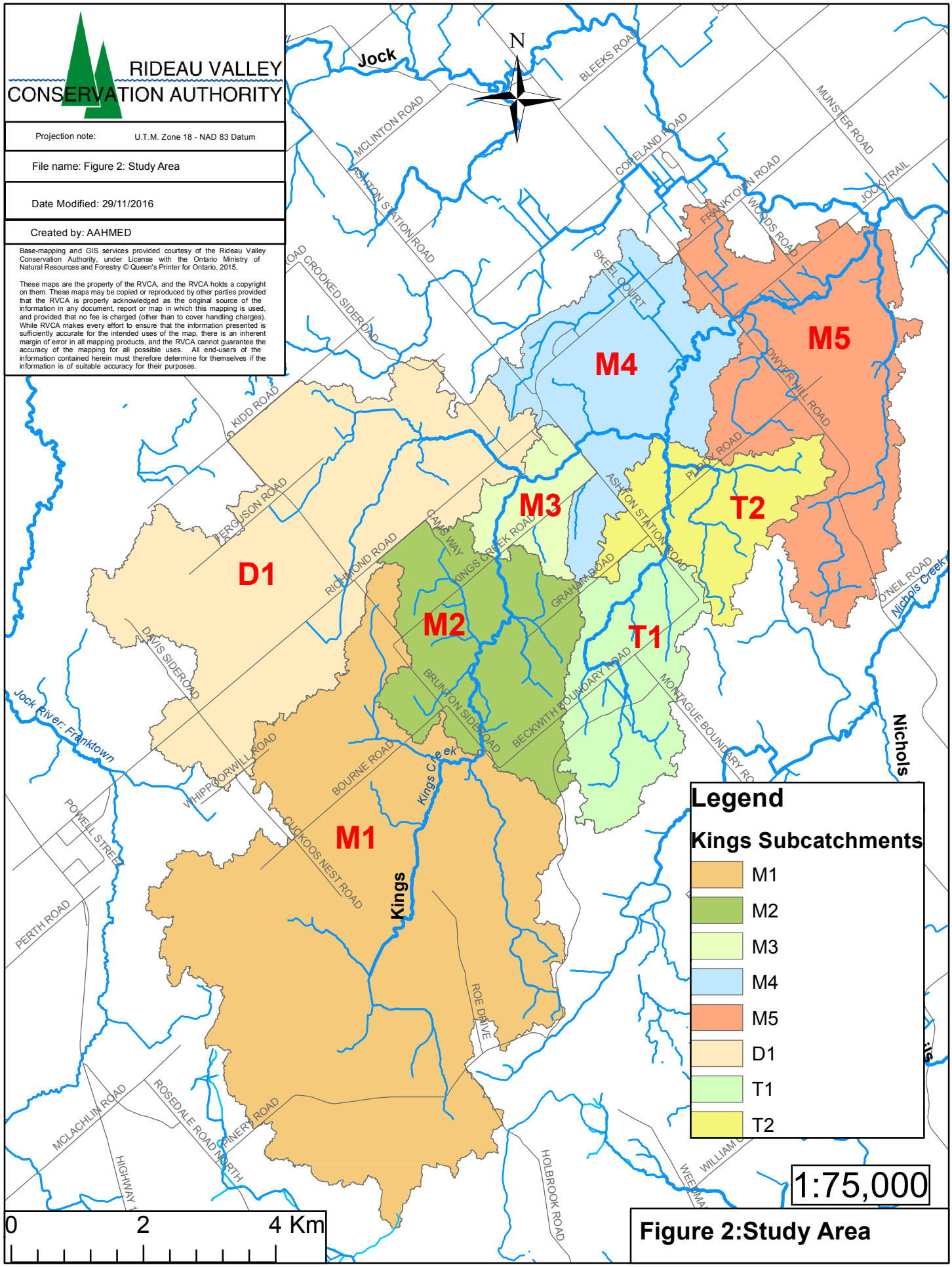
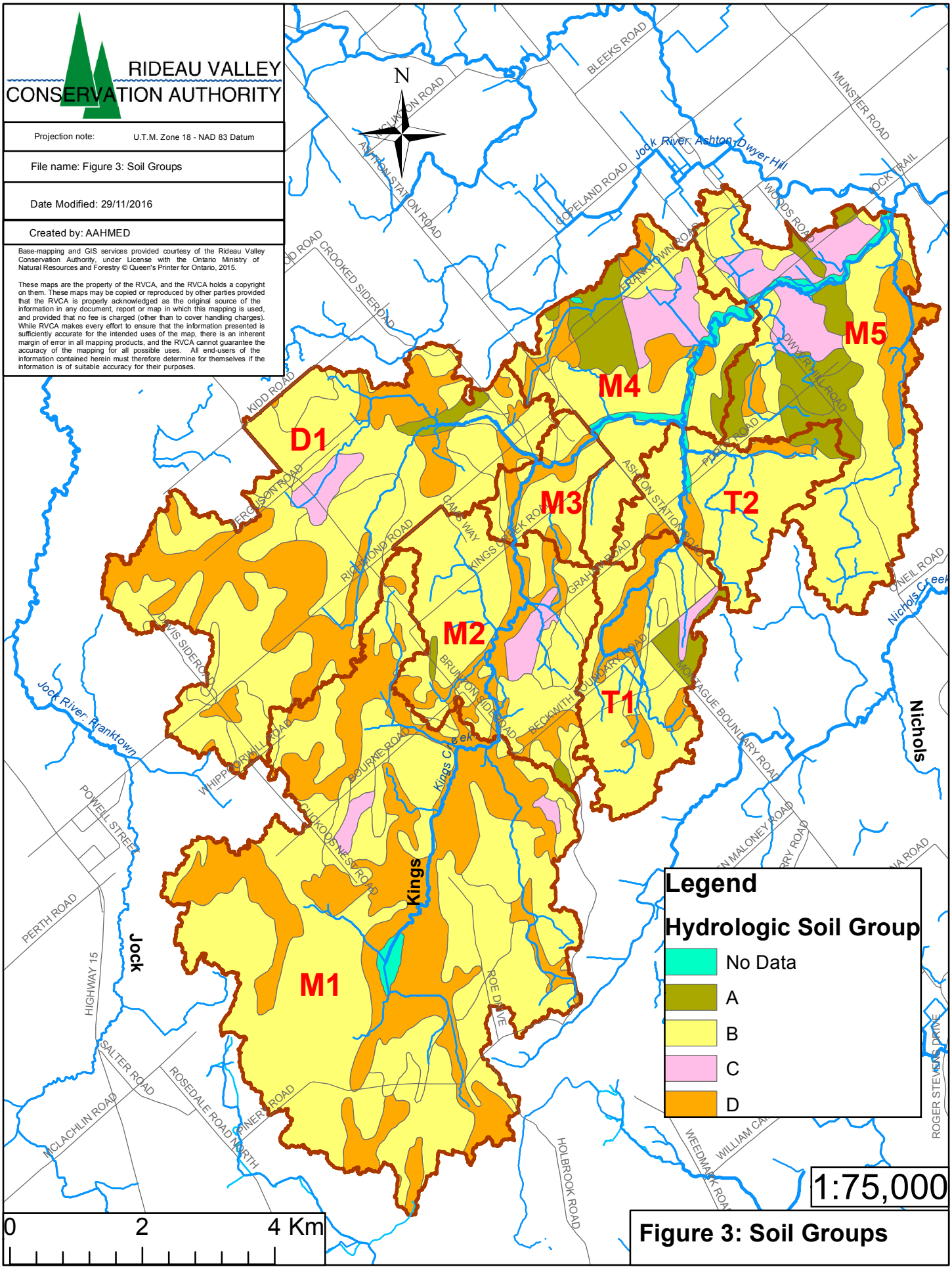


Figure 2:Study Area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N
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T2
Jock River: Ashton-Dwyer Hill
Jock River: Franktown
Kings Creek
Nichols Creek
Jock
Kings
Nichols
BLEEKS ROAD
MUNSTER ROAD
ASHTON STATION ROAD
COPELAND ROAD
WOODS ROAD
ROCK TRAIL
FRANKTOWN ROAD
DWYER HILL ROAD
KIDD ROAD
CROOKED SIDEROAD
FERGUSON ROAD
CAMS WAY
KINGS CREEK ROAD
RICHMOND ROAD
DAVIS SIDEROAD
GRAHAM ROAD
PINEVIEW ROAD
O'NEIL ROAD
BRUNTON SIDEROAD
BECKWITH BOUNDARY ROAD
MONTAGUE BOUNDARY ROAD
WHIPPOORWILL ROAD
BOURKE ROAD
CUCKOOS NEST ROAD
POWELL STREET
PERTH ROAD
HIGHWAY 15
SALTER ROAD
ROSEDALE ROAD NORTH
PINER ROAD
MCLACHLIN ROAD
ROE DRIVE
HOLBROOK ROAD
WEEDMARK ROAD
ROGER STEVENS DRIVE
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Hydrologic Soil Group
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Figure 3: Soil Groups

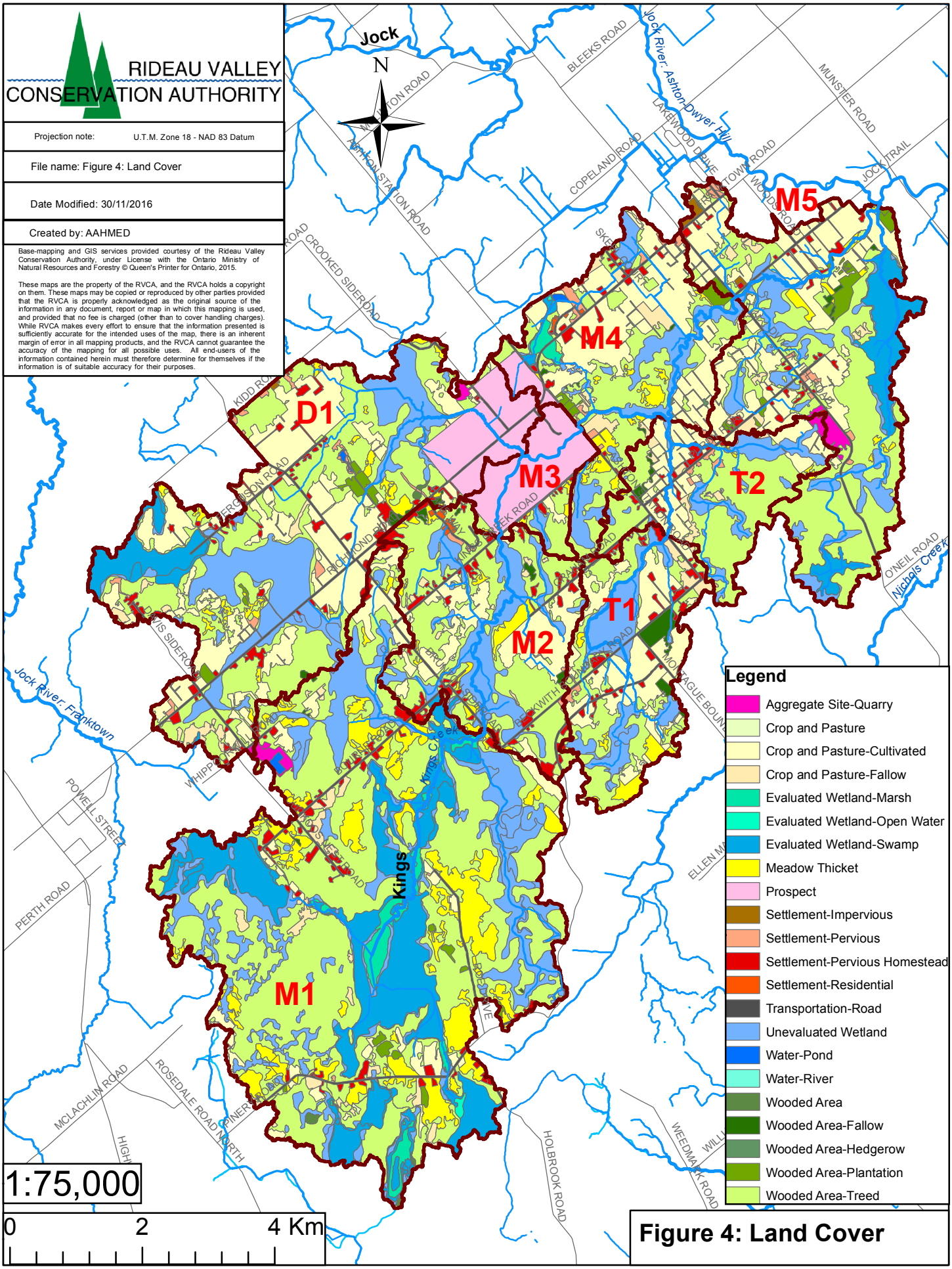
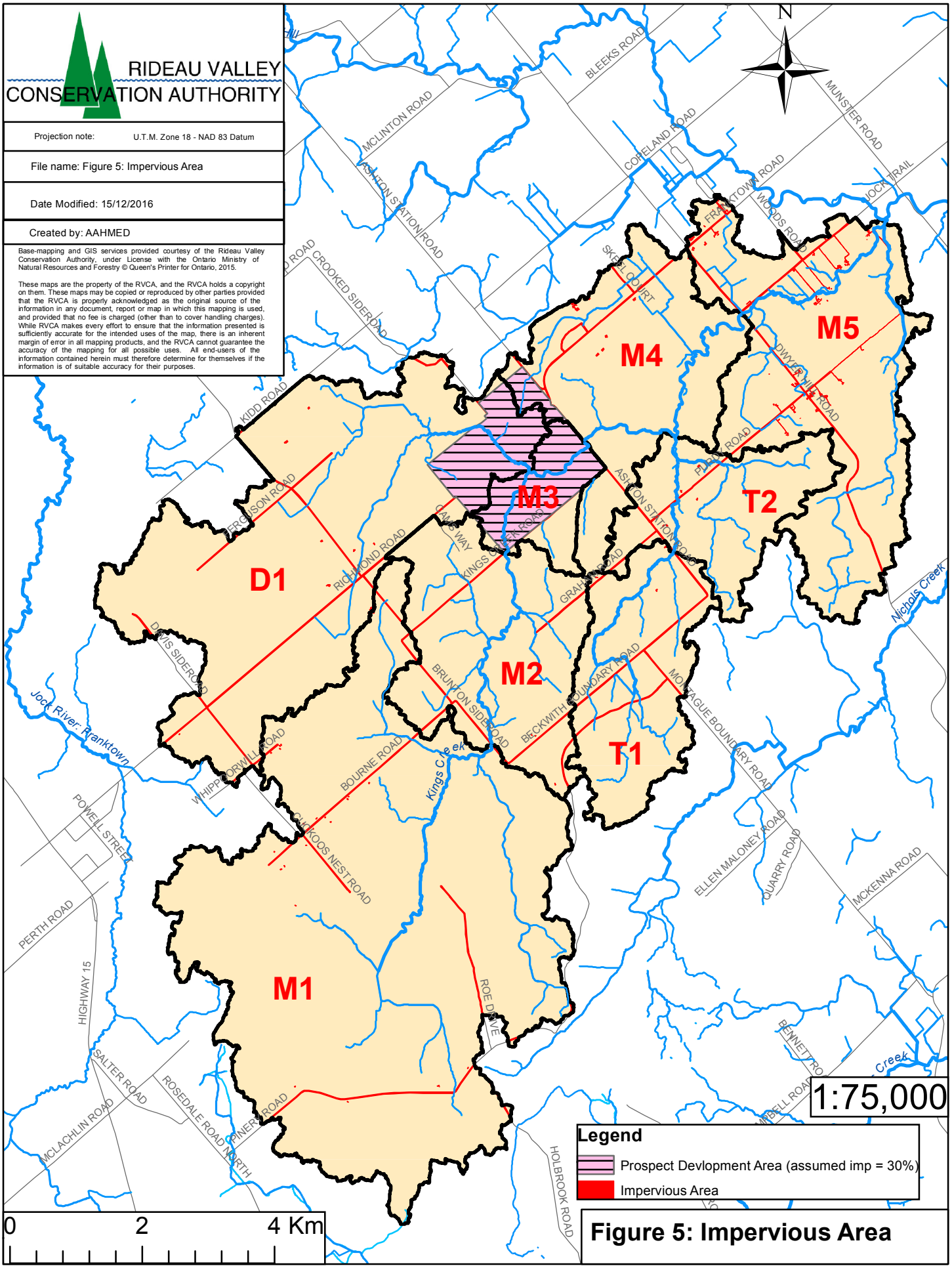


Figure 4: Land Cover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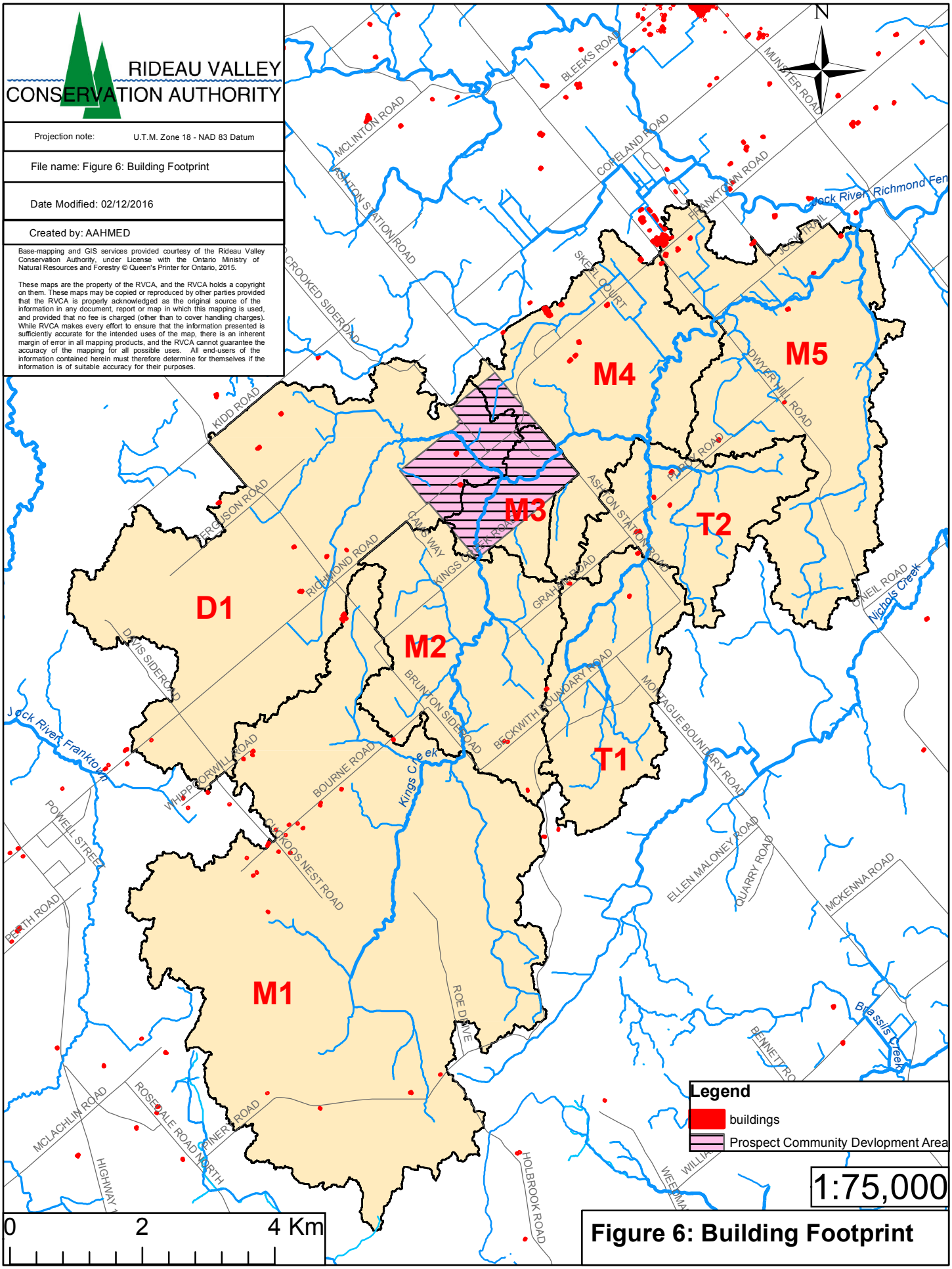
T2
BLEEKS ROAD
MCLINTON ROAD
ASHTON STATION ROAD
CORELAND ROAD
MUNSTER ROAD
FRANKTOWN ROAD
WOODS ROAD
JOCK TRAIL
SKEELS COURT
CROOKED SIDEROAD
KIDD ROAD
FERGUSON ROAD
RICHMOND ROAD
DAVIS SIDEROAD
CAMS WAY
KINGS WAY
BRUNTON SIDEROAD
GRAHAM ROAD
ASHTON STATION ROAD
DIVIDE HILL ROAD
FLOOD ROAD
Nichols Creek
Jock River: Franktown
WHIPPOORWILL ROAD
BOURNE ROAD
Kings Creek
CHUKOOS NEST ROAD
BECKWITH BOUNDARY ROAD
MONTAGUE BOUNDARY ROAD
ELLEN MALONEY ROAD
QUARRY ROAD
MCKENNA ROAD
POWELL STREET
PERTH ROAD
HIGHWAY 15
SALTER ROAD
ROSEDALE ROAD NORTH
PINER ROAD
MCLACHLIN ROAD
ROE DRIVE
HOLBROOK ROAD
BENNETT ROAD
Creek
1:75,000
Legend
Prospect Devlopment Area (assumed imp = 30%)
Impervious Area
0
2
4 Km
Figure 5: Impervious Area


RIDEAU VALLEY
CONSERVATION AUTHORITY
Projection note: U.T.M. Zone 18 - NAD 83 Datum
File name: Figure 6: Building Footprint
Date Modified: 02/12/2016
Created by: AAHMED
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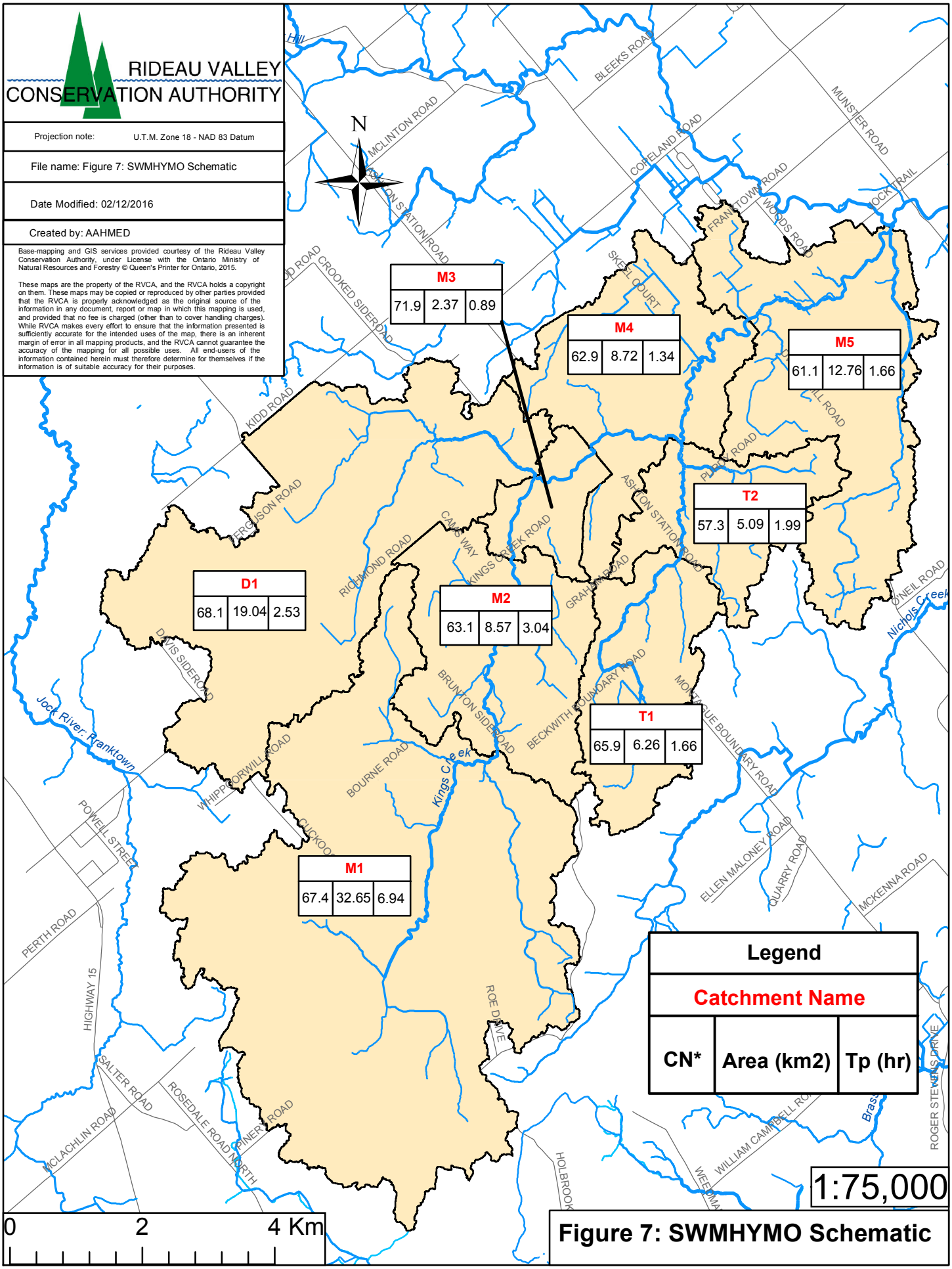
N
M1
M2
M3
M4
M5
D1
T1
T2
BLEEKS ROAD
MUNSTER ROAD
MCLINTON ROAD
COPELAND ROAD
ASHTON STATION ROAD
FRANKTOWN ROAD
Jock River Richmond Fen
SKEEL COURT
CROOKED SIDEROAD
KIDD ROAD
DWYER HILL ROAD
FERGUSON ROAD
RICHMOND ROAD
CAMP WAY
KINGS CORNER ROAD
ASHTON STATION ROAD
GRAHAM ROAD
O'NEIL ROAD
Nichols Creek
DAVIS SIDEROAD
BRUNTON SIDEROAD
BECKWITH BOUNDARY ROAD
MONTAGUE BOUNDARY ROAD
Jock River Franktown
WHIPPOORWILL ROAD
BOURNE ROAD
Kings Creek
POWELL STREET
CLYDES NEST ROAD
ELLEN MALONEY ROAD
QUARRY ROAD
MCKENNA ROAD
PERTH ROAD
ROE DRIVE
Bellamy Creek
MCLACHLIN ROAD
ROSEDALE ROAD NORTH
HIGHWAY
HOLBROOK ROAD
Legend
buildings
Prospect Community Devlopment Area
1:75,000
0
2
4 Km
Figure 6: Building Footprint


RIDEAU VALLEY CONSERVATION AUTHORITY
Projection note: U.T.M. Zone 18 - NAD 83 Datum
File name: Figure 7: SWMHYMO Schematic
Date Modified: 02/12/2016
Created by: AAHMED
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N
M3 71.9 2.37 0.89
M4 62.9 8.72 1.34
M5 61.1 12.76 1.66
T2 57.3 5.09 1.99
D1 68.1 19.04 2.53
M2 63.1 8.57 3.04
T1 65.9 6.26 1.66
M1 67.4 32.65 6.94
Legend
Catchment Name
CN* Area (km2) Tp (hr)
1:75,000
0 2 4 Km
Figure 7: SWMHYMO Schematic

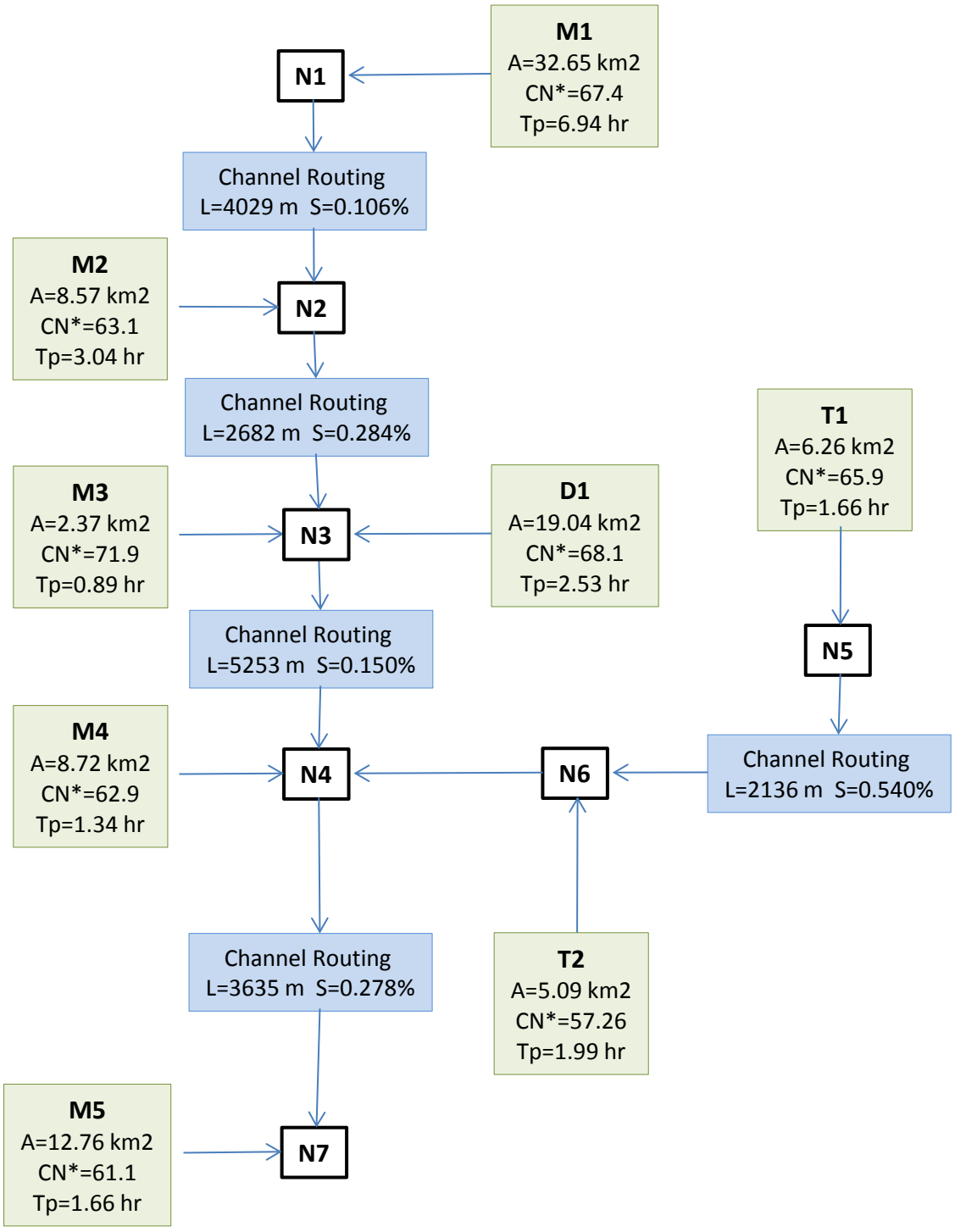


Figure 8 SWMHYMO Flow Chart

Figure 9 IDF curve for Ottawa Airport based on 1967-2007 data

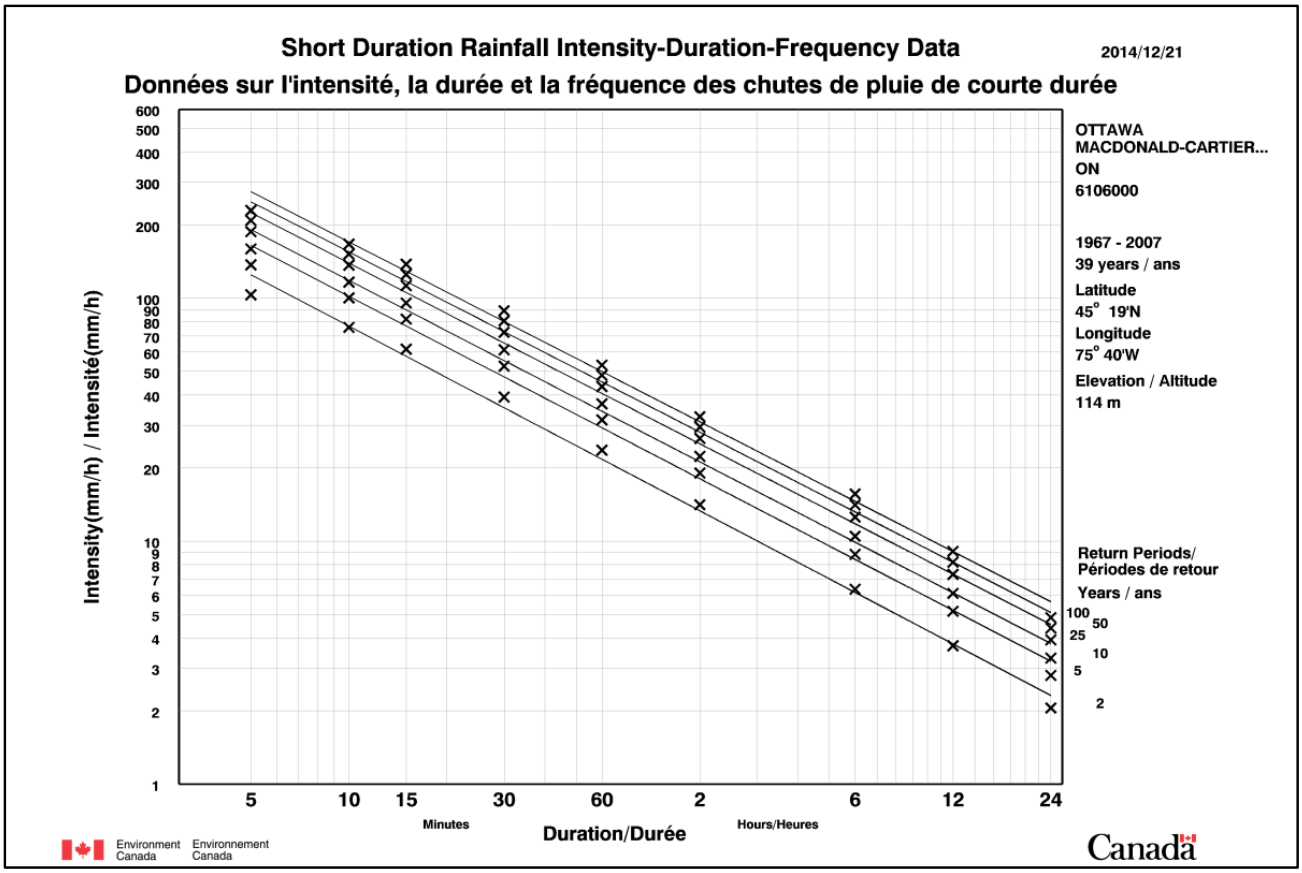


Figure 10 Fitted IDF curves for Ottawa Airport generated by STORMS software

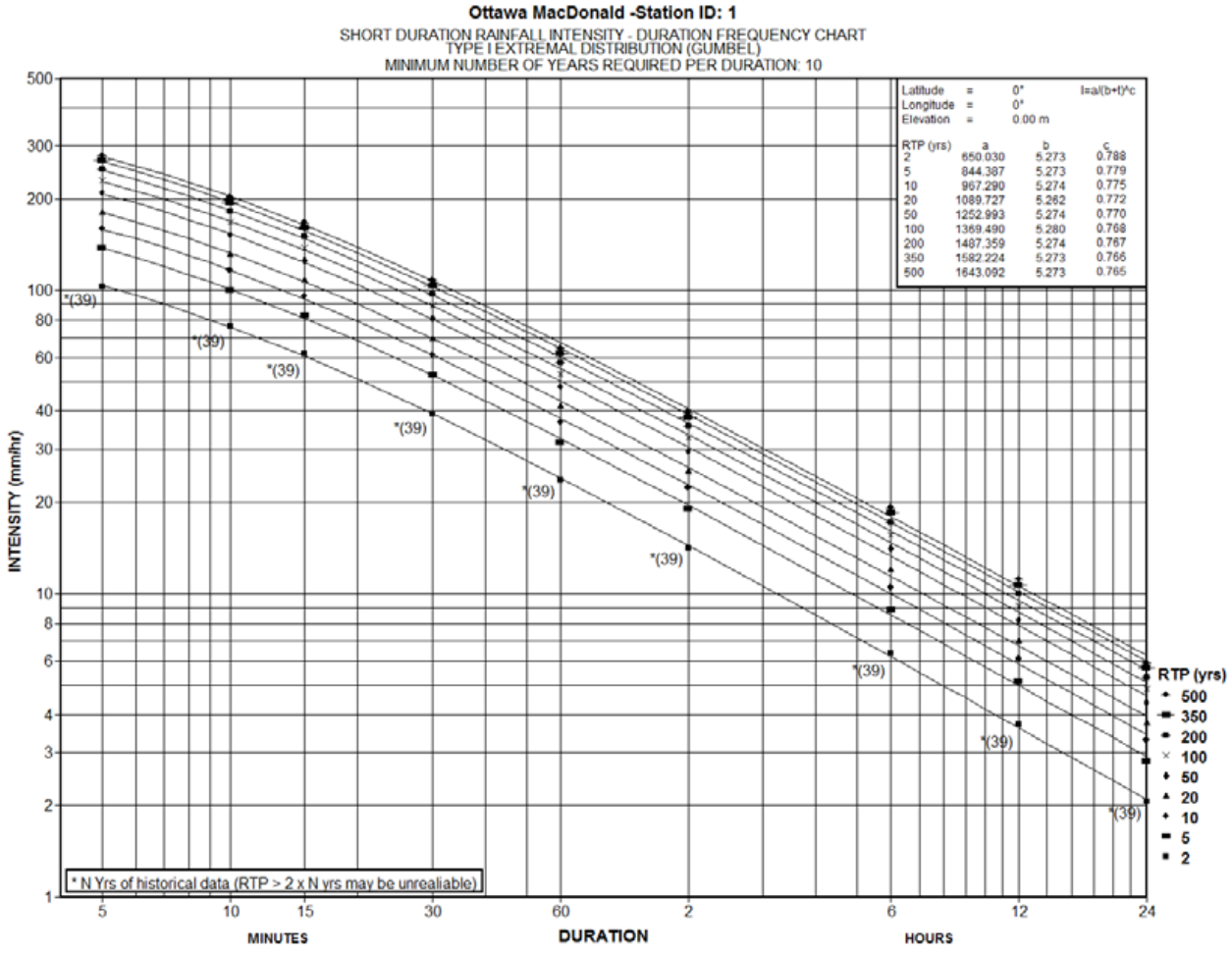
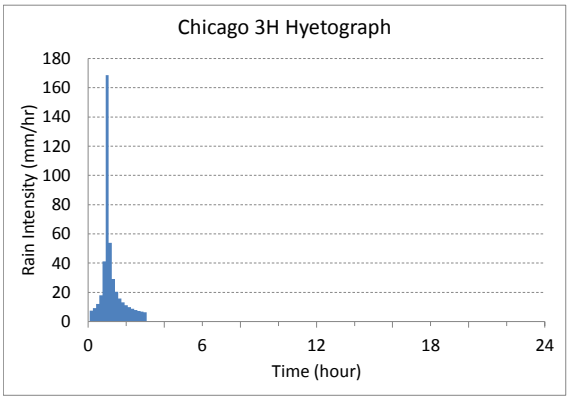
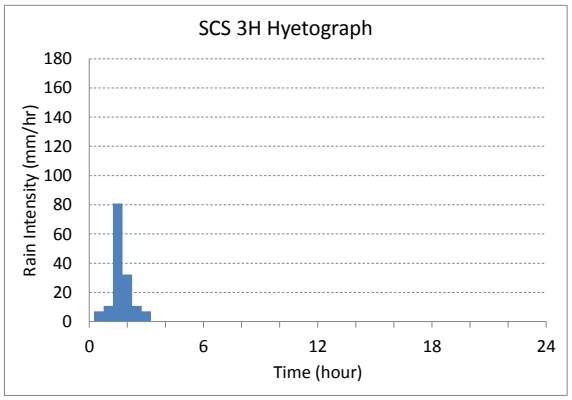
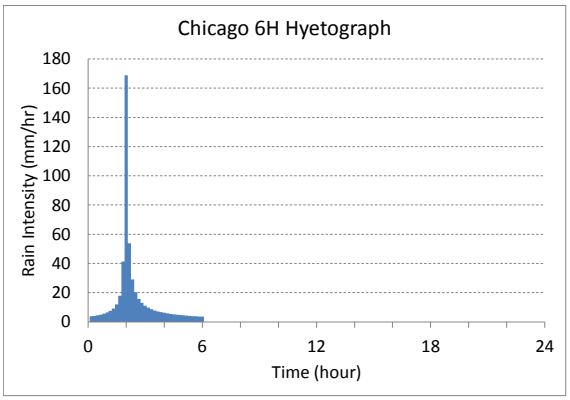
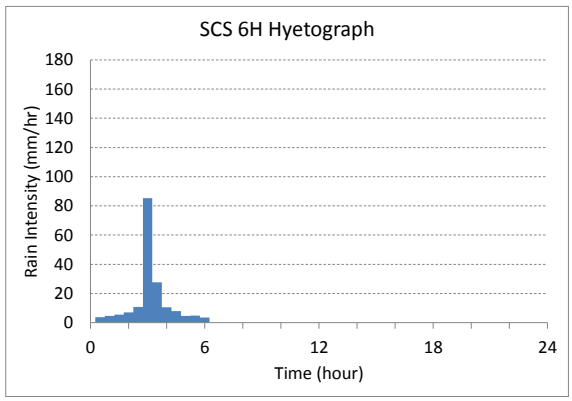


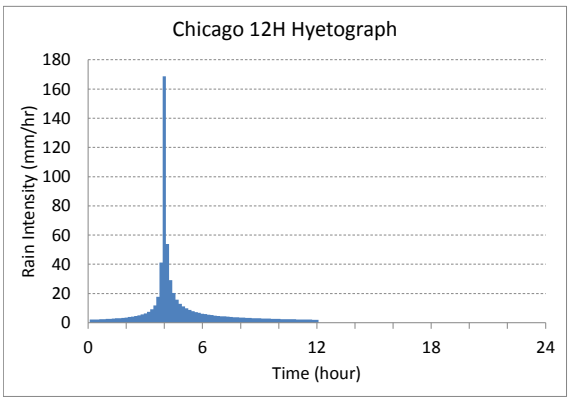
Figure 11 Hyetographs of various design storms

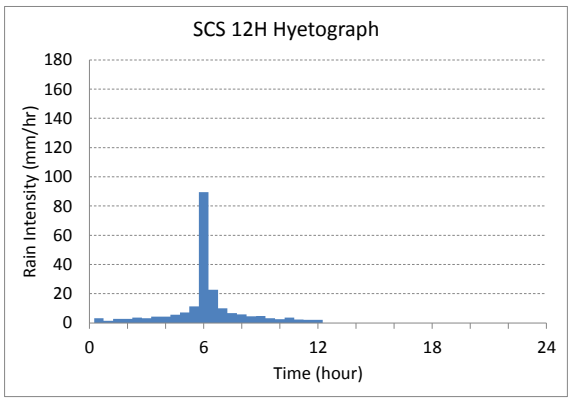


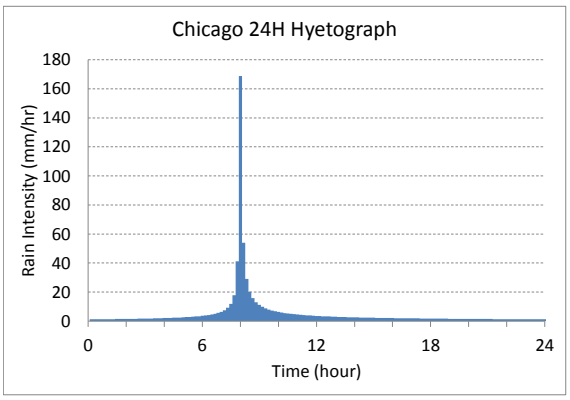












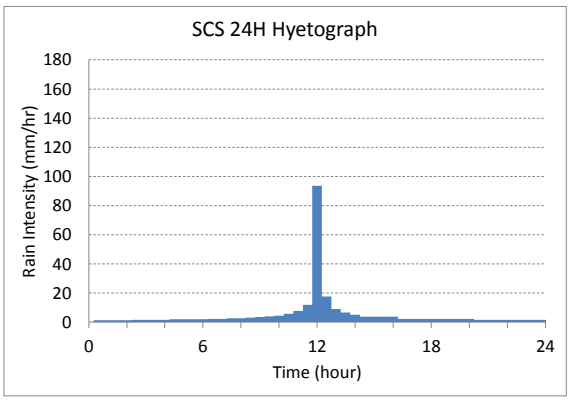
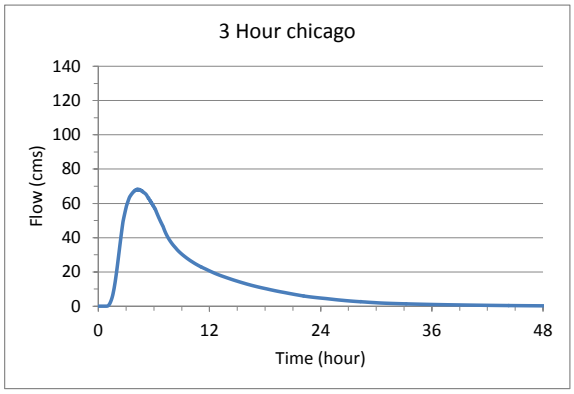
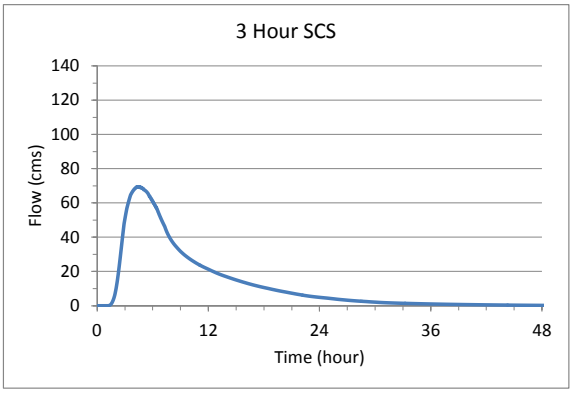
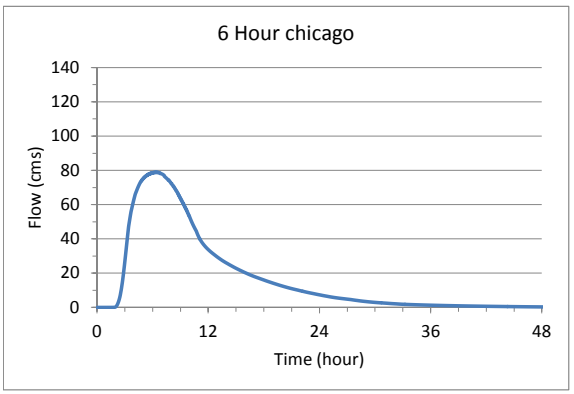
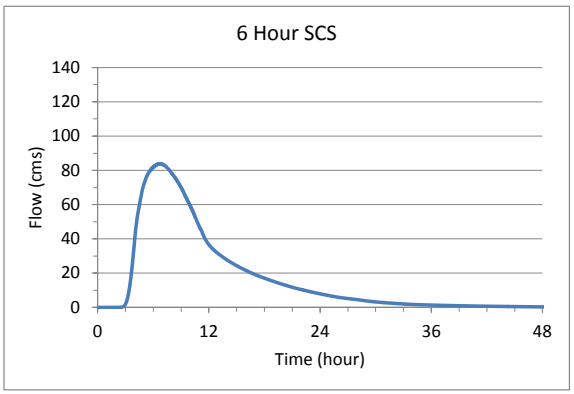


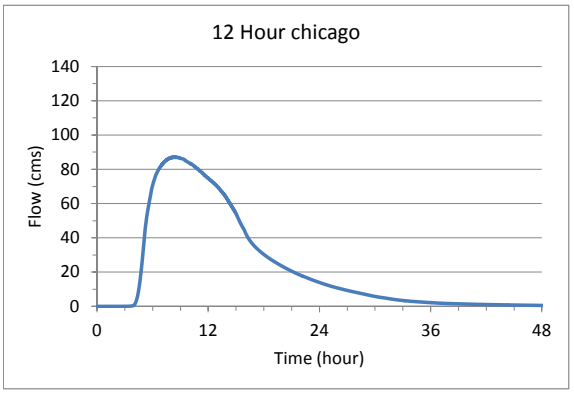
Figure 12 SWMHYMO generated flow at node N7 for different design storms

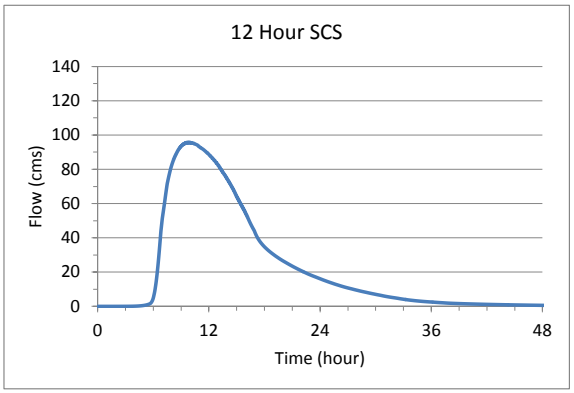


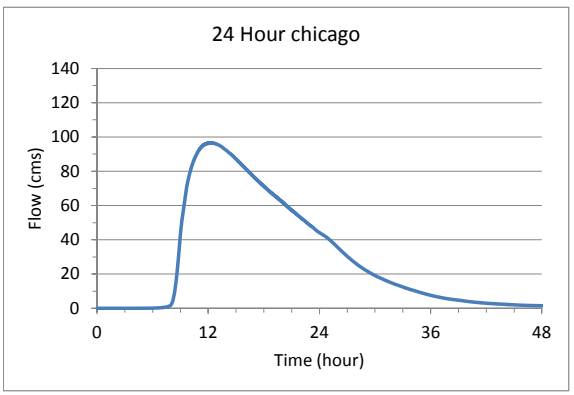


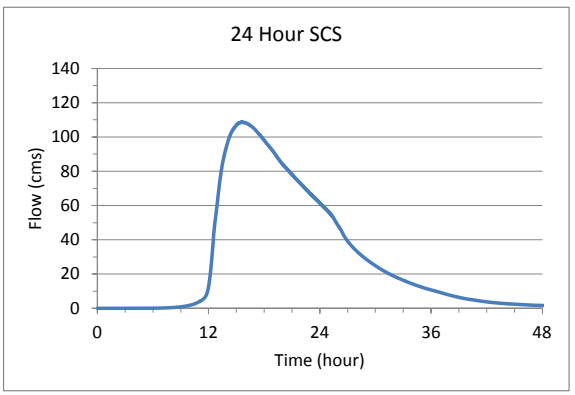


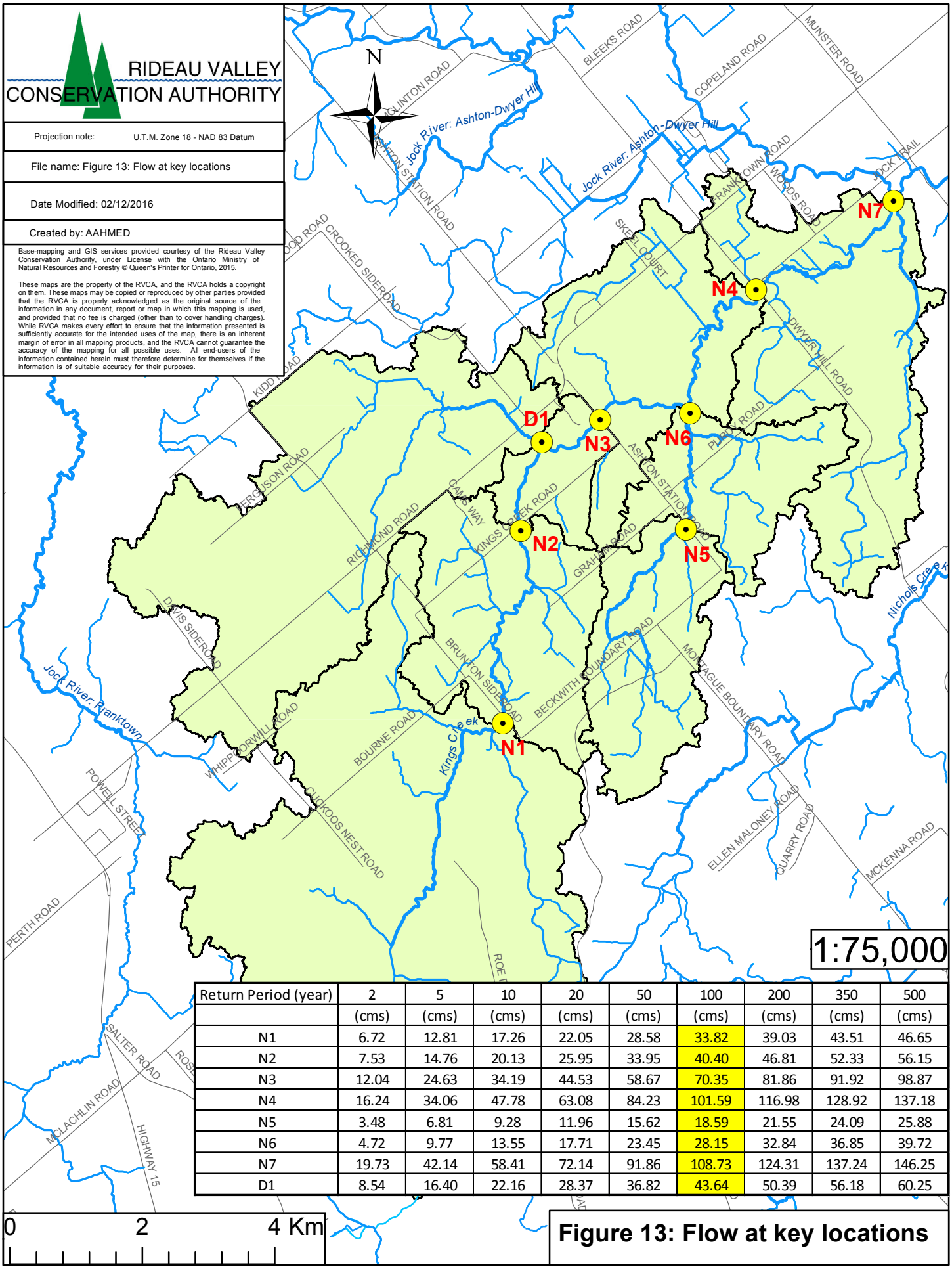












Return Period (year)	2	5	10	20	50	100	200	350	500
	(cms)	(cms)	(cms)	(cms)	(cms)	(cms)	(cms)	(cms)	(cms)
N1	6.72	12.81	17.26	22.05	28.58	33.82	39.03	43.51	46.65
N2	7.53	14.76	20.13	25.95	33.95	40.40	46.81	52.33	56.15
N3	12.04	24.63	34.19	44.53	58.67	70.35	81.86	91.92	98.87
N4	16.24	34.06	47.78	63.08	84.23	101.59	116.98	128.92	137.18
N5	3.48	6.81	9.28	11.96	15.62	18.59	21.55	24.09	25.88
N6	4.72	9.77	13.55	17.71	23.45	28.15	32.84	36.85	39.72
N7	19.73	42.14	58.41	72.14	91.86	108.73	124.31	137.24	146.25
D1	8.54	16.40	22.16	28.37	36.82	43.64	50.39	56.18	60.25

Figure 13: Flow at key locations

Figure 14 Estimated 1:100 year flows along Kings Creek

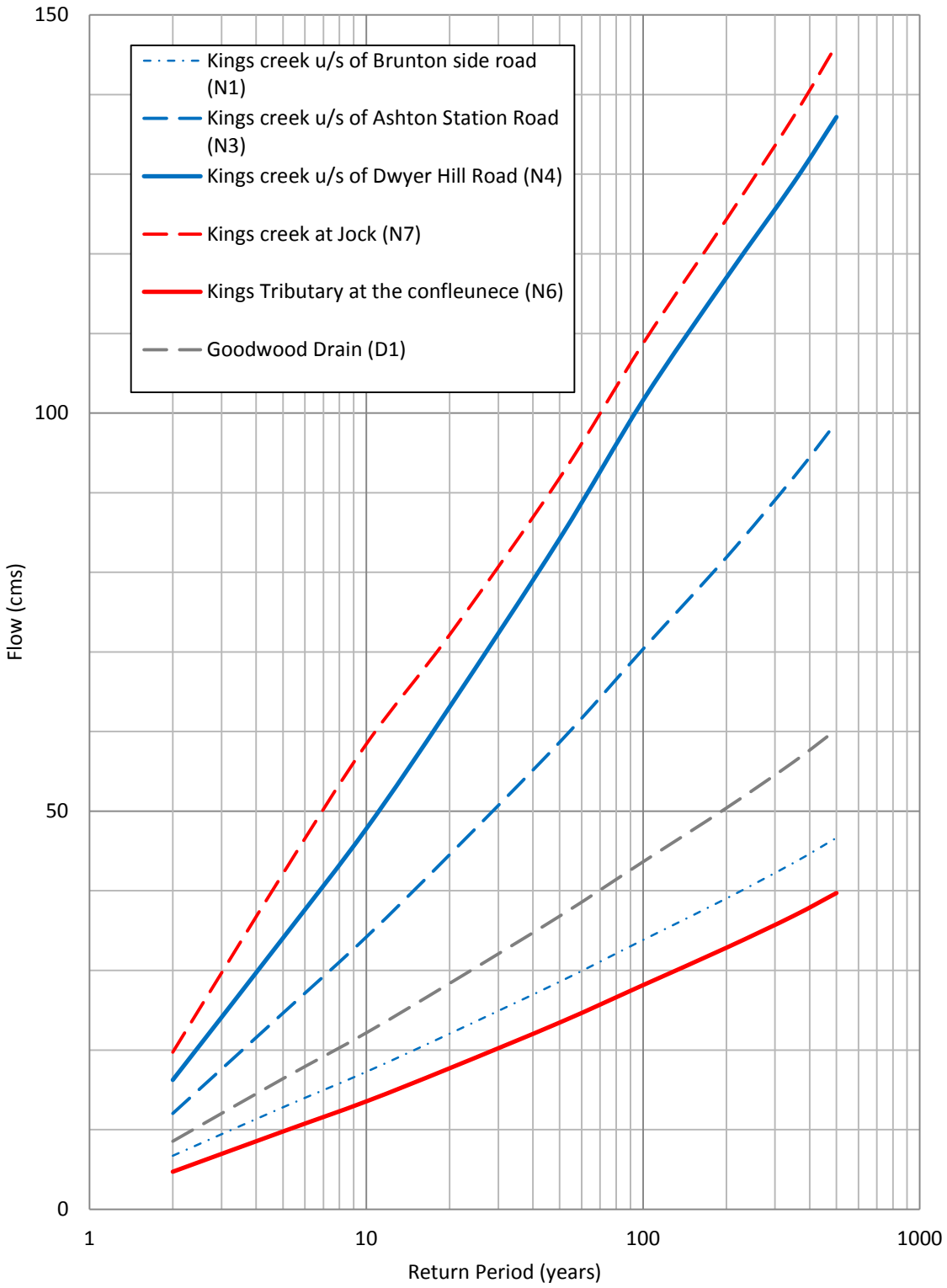


Figure 15 Comparison of estimated 1:100 year flows

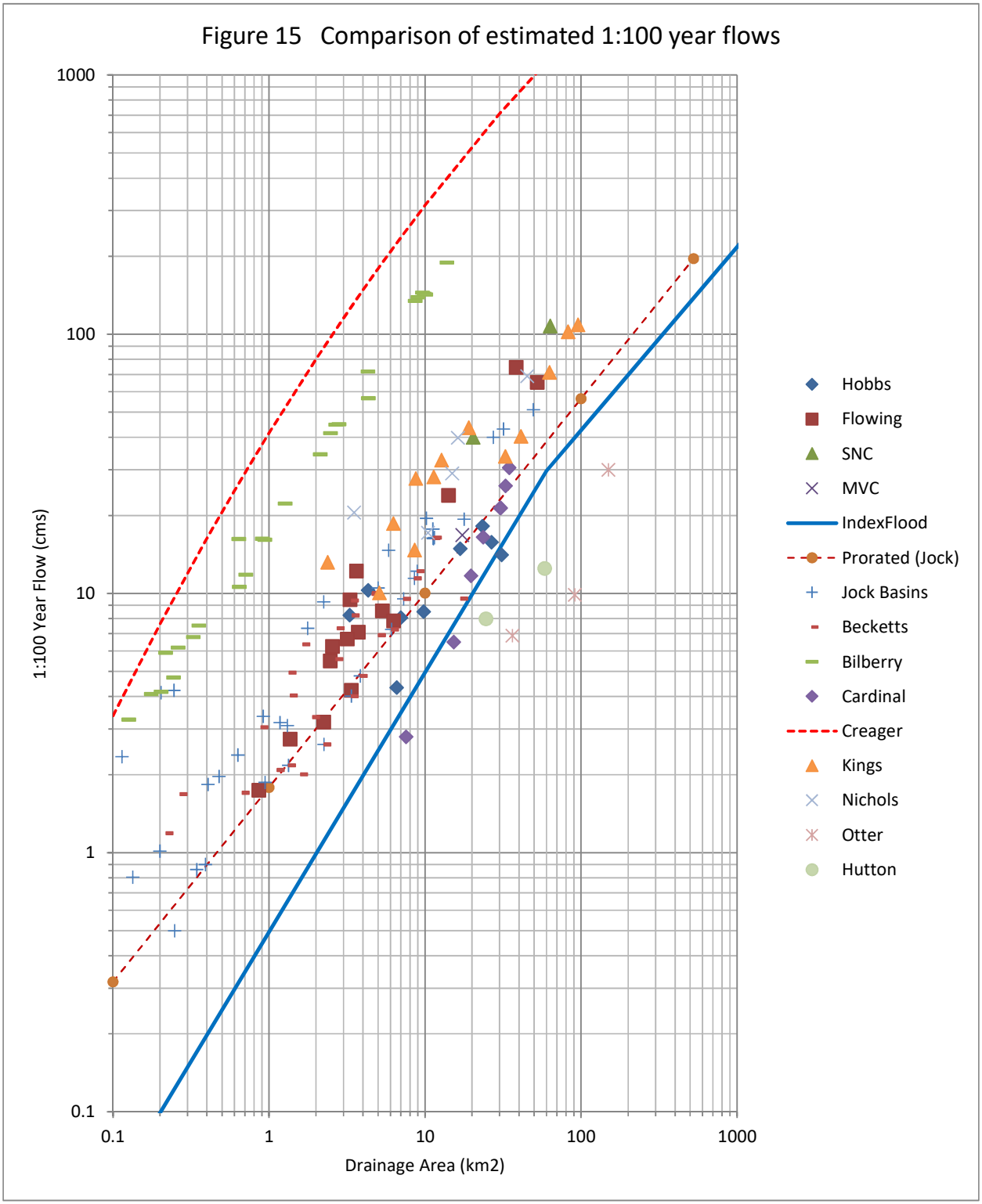
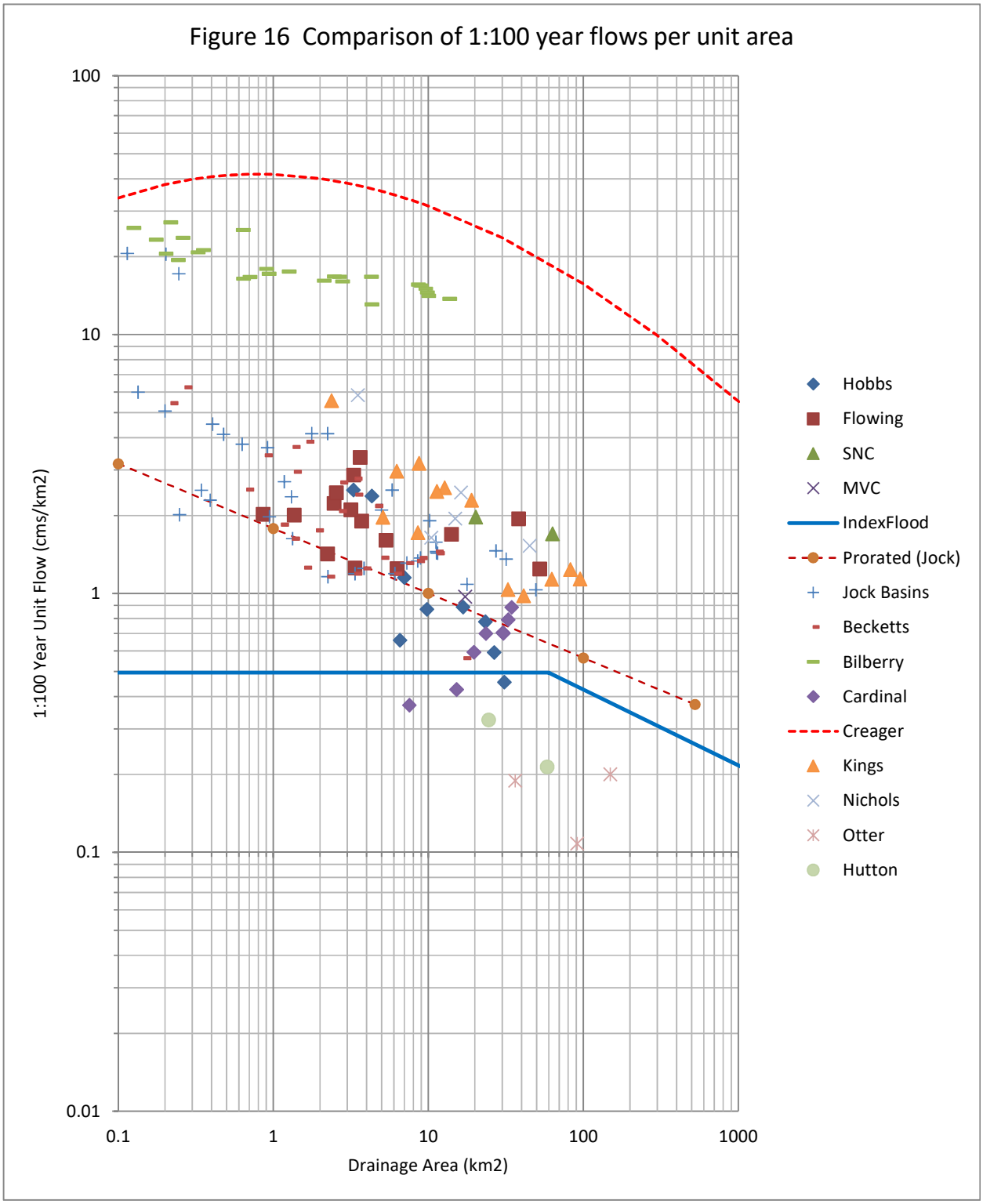
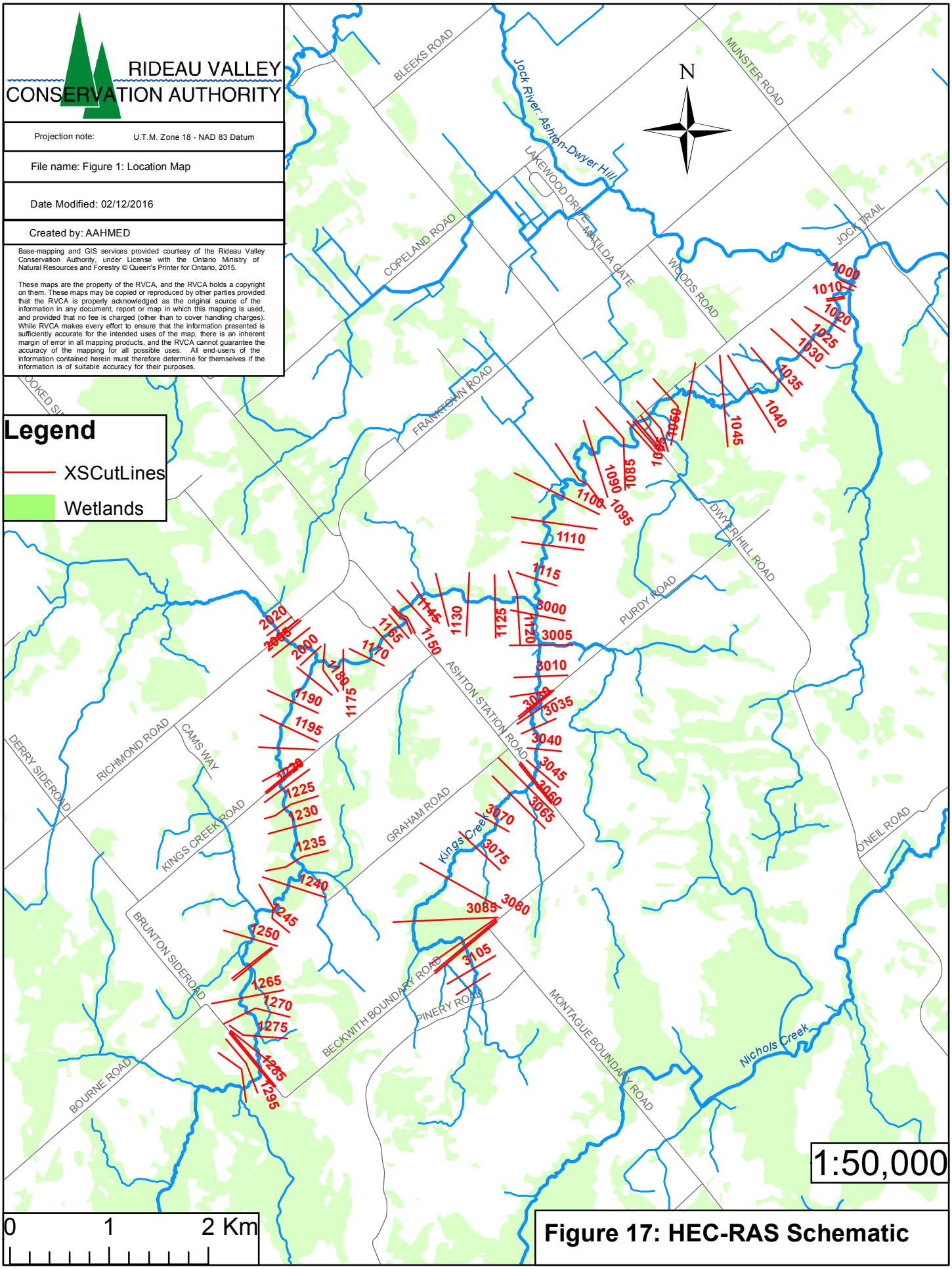


Figure 16 Comparison of 1:100 year flows per unit area




RIDEAU VALLEY CONSERVATION AUTHORITY
Projection note: U.T.M. Zone 18 - NAD 83 Datum
File name: Figure 1: Location Map
Date Modified: 02/12/2016
Created by: AAHMED
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Legend
XSCutLines
Wetlands
N
BLEEKS ROAD
Jock River: Ashton-Dwyer Hill
MUNSTER ROAD
LAKEWOOD DRIVE
MATILDA GATE
COPELAND ROAD
WOODS ROAD
JOCK TRAIL
FRANKTOWN ROAD
DWYER HILL ROAD
PURDY ROAD
ASHTON STATION ROAD
RICHMOND ROAD
CAMIS WAY
DERRY SIDEROAD
KINGS CREEK ROAD
GRAHAM ROAD
Kings Creek
O'NEIL ROAD
BRUNTON SIDEROAD
BECKWITH BOUNDARY ROAD
PINERY ROAD
MONTAGUE BOUNDARY ROAD
Nichols Creek
BOURNE ROAD
1:50,000
0 1 2 Km
Figure 17: HEC-RAS Schematic

Figure 18 Selection of Boundary Condition

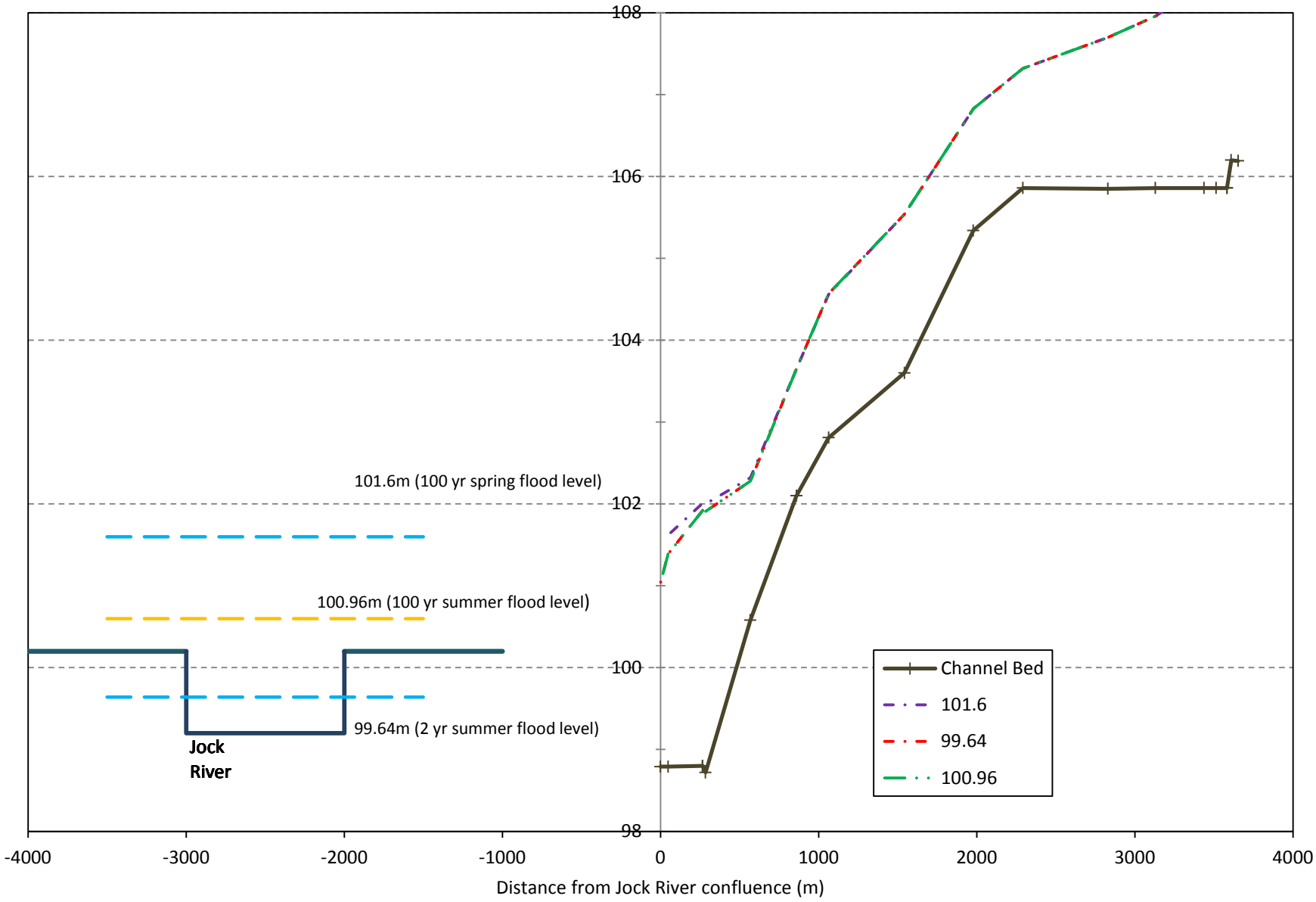


Figure 19a Sensitivity analysis of the computed water level for the design flow (Kings Creek)

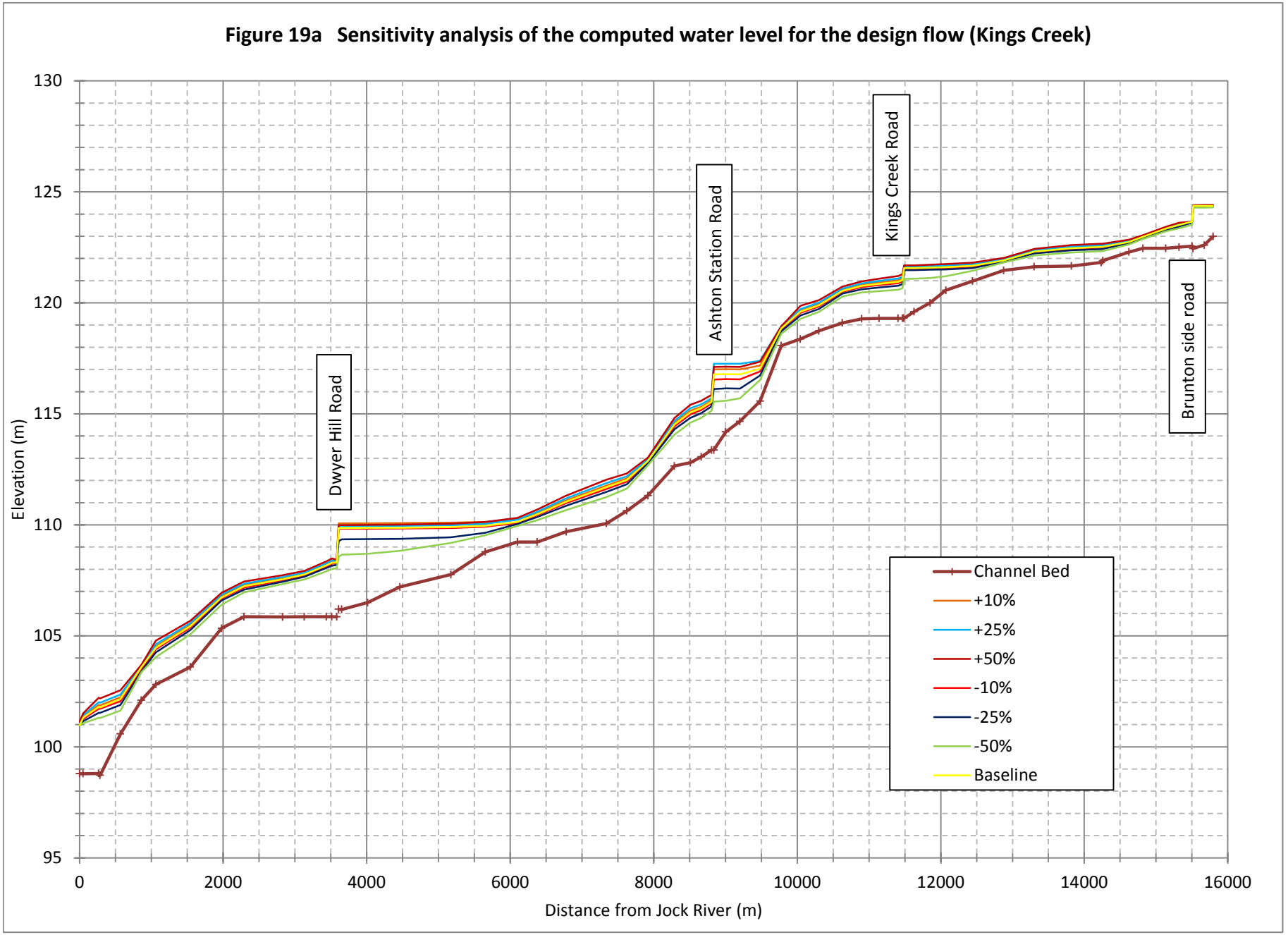


Figure 19b Sensitivity analysis of the computed water level for the design flow (Goodwood Drain)

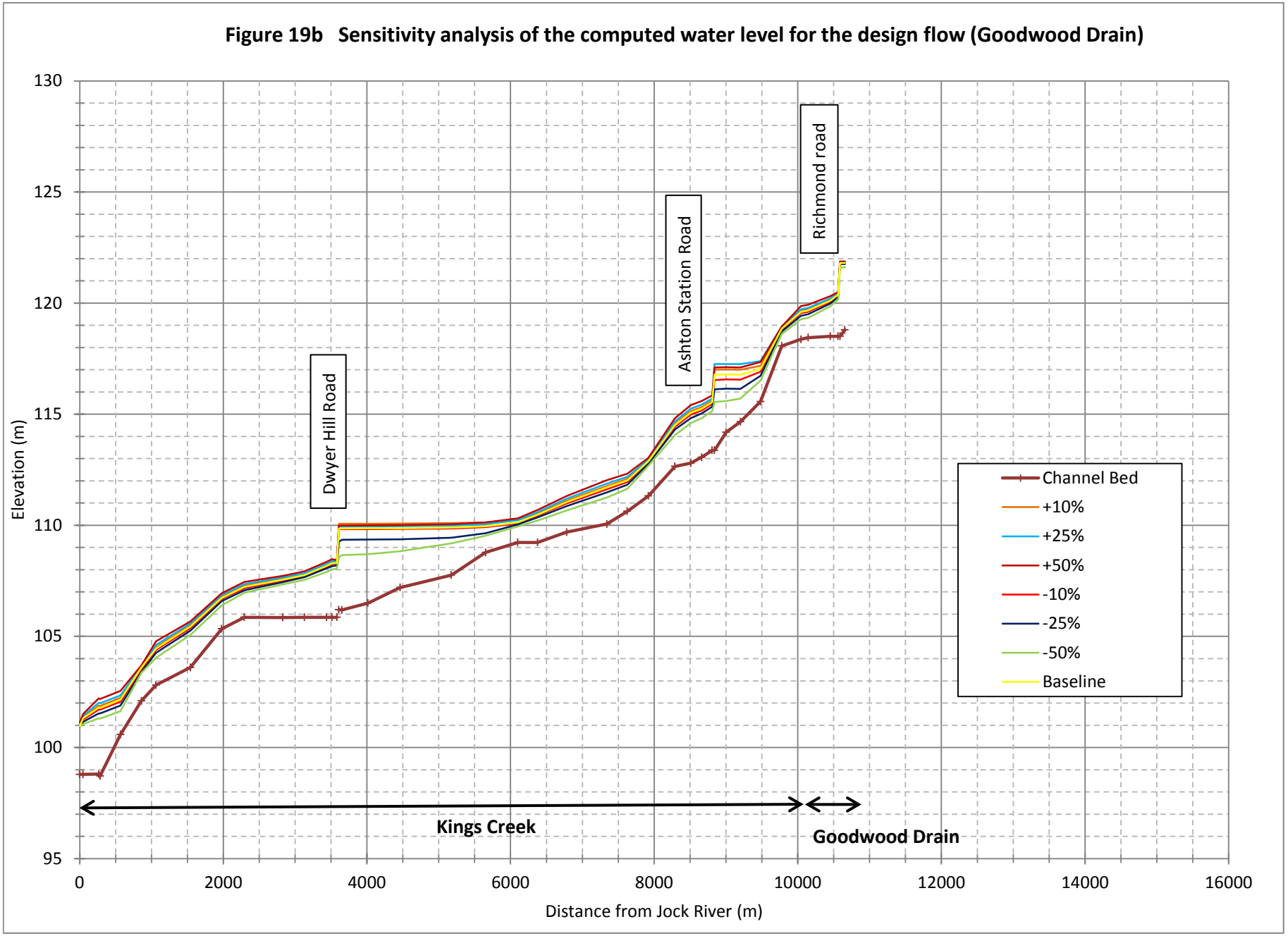


Figure 19c Sensitivity analysis of the computed water level for the design flow (Kings Tributary)

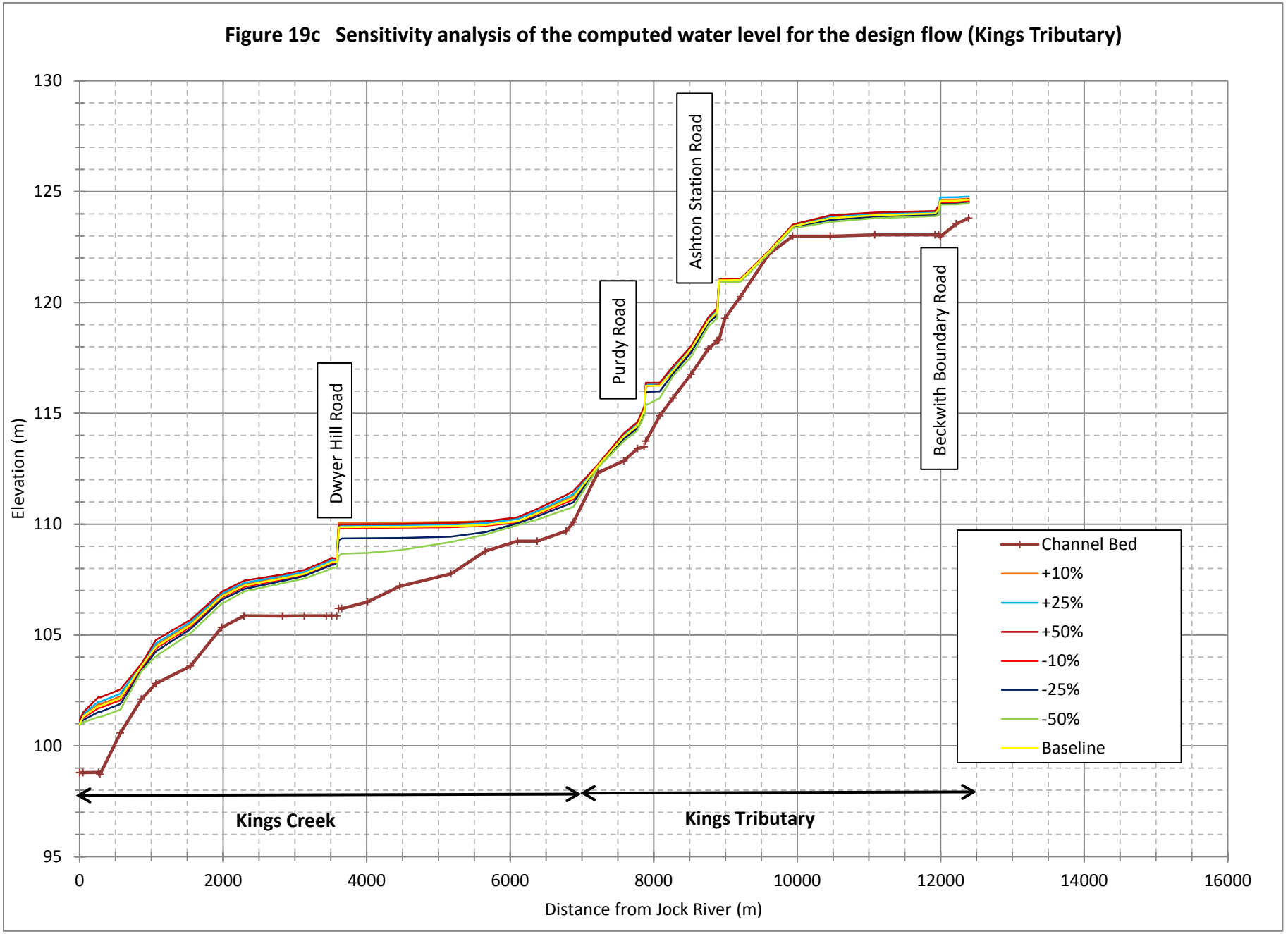


Figure 20a Sensitivity analysis - water level difference (Kings Creek)

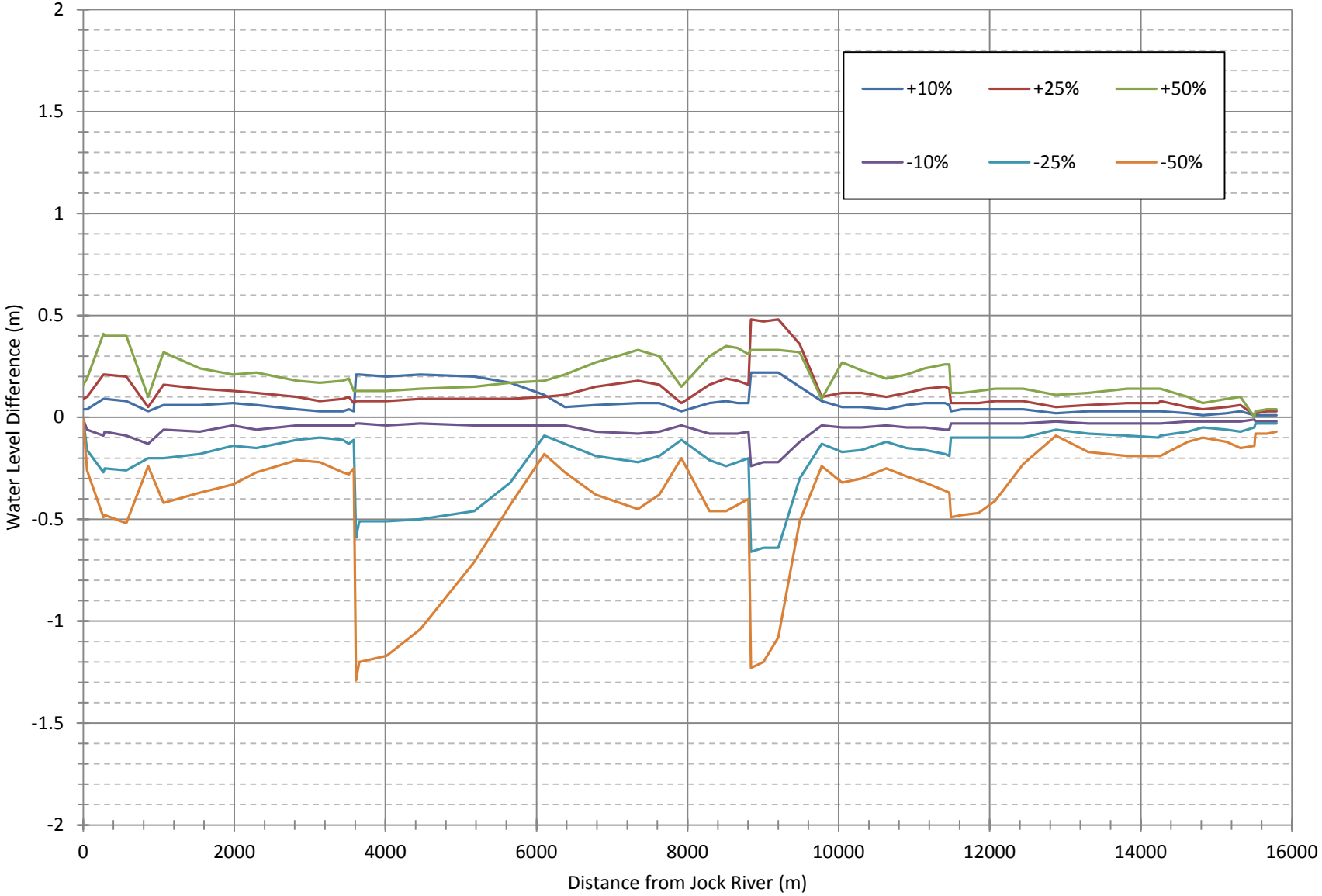


Figure 20b Sensitivity analysis - water level difference (Goodwood Drain)

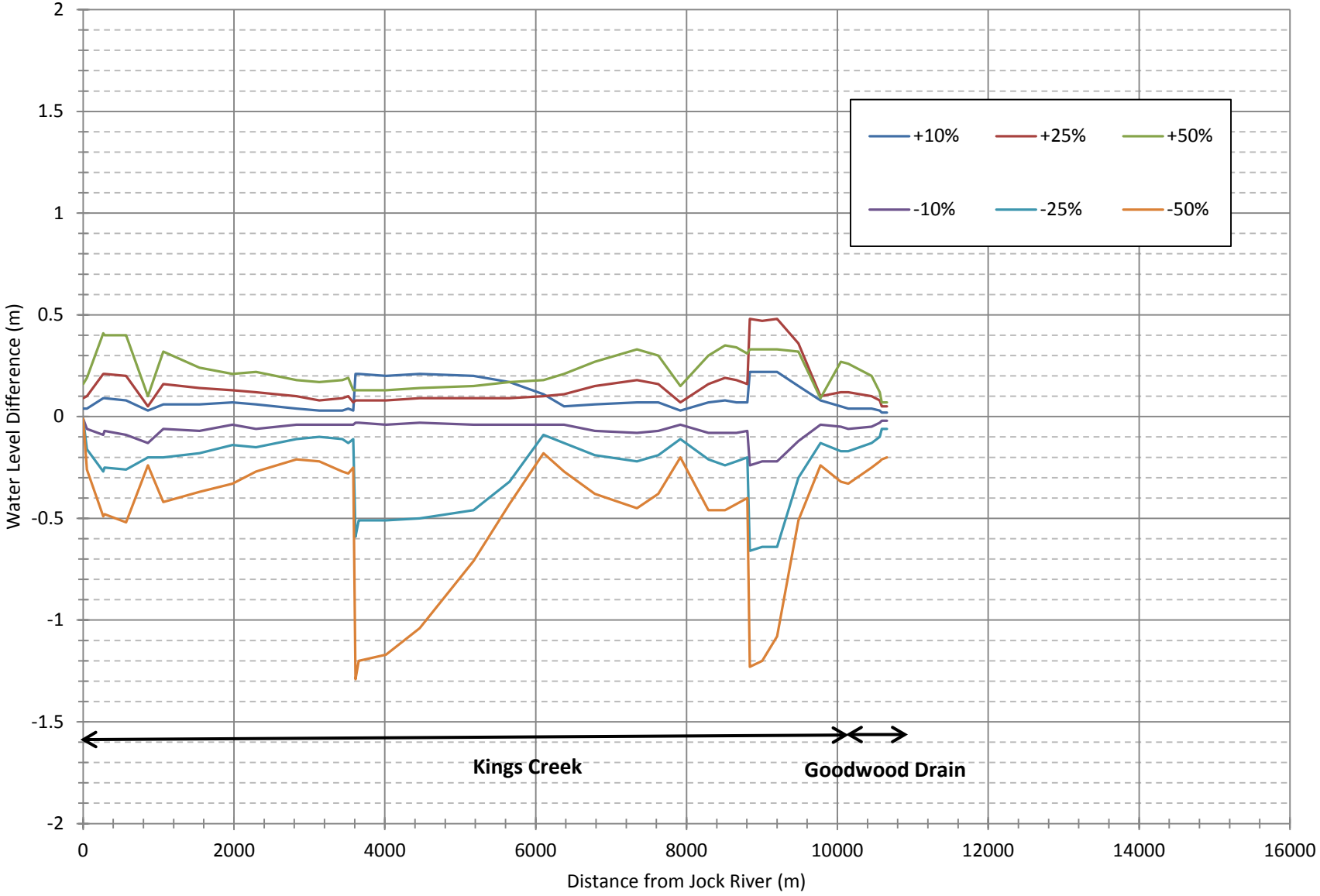


Figure 20c Sensitivity analysis - water level difference (Kings Tributary)

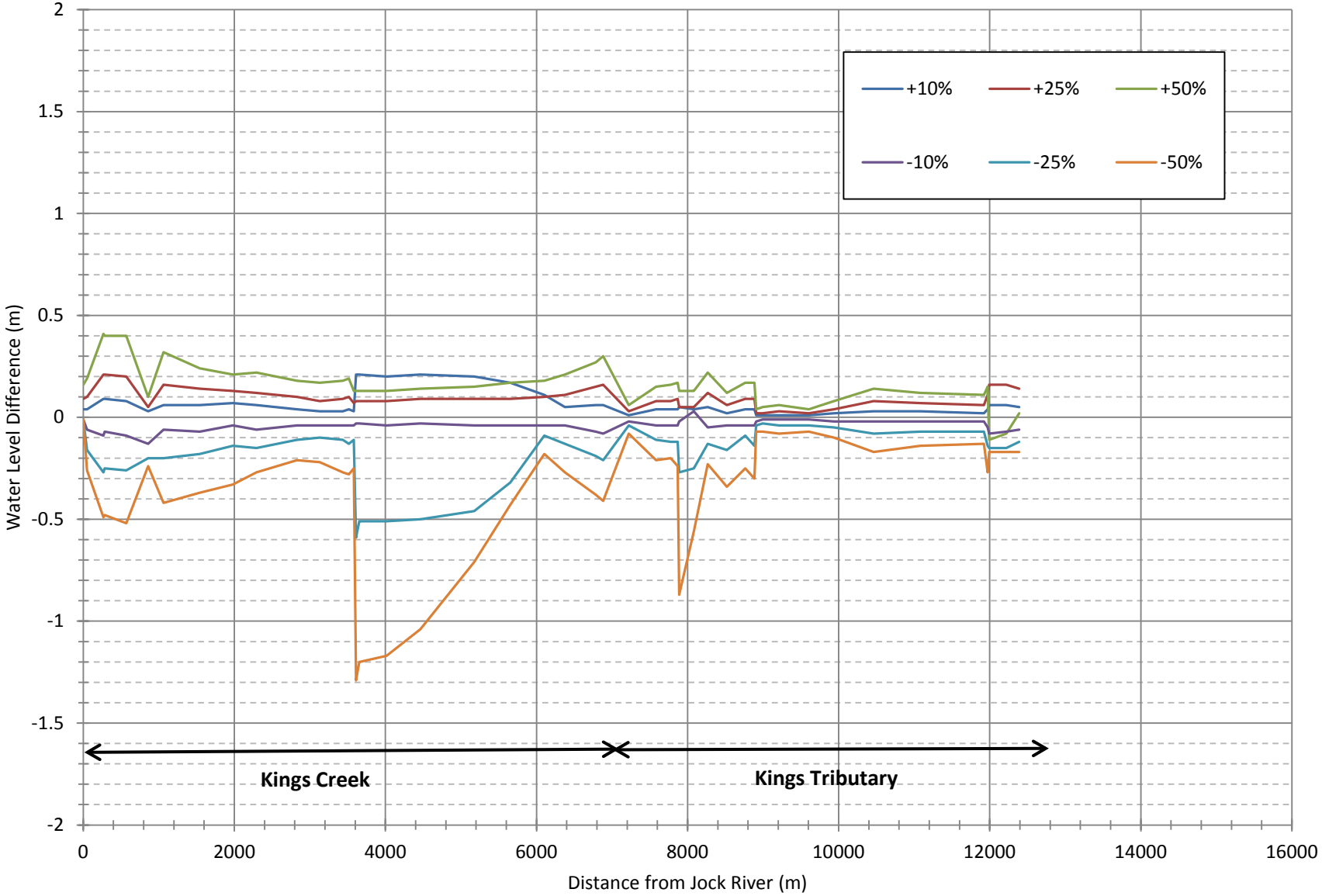


Table1: Land use breakdown in the Kings basin*

	Catchment	M1		M2		M3		M4		M5		D1		T1		T2		Total Kings	
	Description	Area (km^2)	%	Area (km^2)	%	Area (km^2)	%	Area (km^2)	%	Area (km^2)	%	Area (km^2)	%	Area (km^2)	%	Area (km^2)	%	Area (km^2)	%
1	Aggregate Site	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	Aggregate Site-Pit	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	Aggregate Site-Quarry	0.13	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.15	1.16	0.06	0.31	0.00	0.00	0.05	1.02	0.39	0.41
4	Crop and Pasture	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.00	0.00	0.02	0.02
5	Crop and Pasture-Cultivated	1.46	4.46	1.69	19.70	0.06	14.05	2.94	33.82	3.44	26.97	5.14	29.62	1.97	31.47	1.16	22.73	17.86	18.71
6	Crop and Pasture-Fallow	0.54	1.64	0.07	0.85	0.00	0.00	0.36	4.09	0.23	1.80	0.27	1.45	0.15	2.45	0.16	3.16	1.78	1.87
7	Evaluated Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	Evaluated Wetland-Bog	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	Evaluated Wetland-Fen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	Evaluated Wetland-Marsh	0.71	2.19	0.00	0.01	0.00	0.00	0.16	1.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.87	0.91
11	Evaluated Wetland-Open Water	0.07	0.22	0.00	0.00	0.00	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08
12	Evaluated Wetland-Swamp	5.56	17.01	0.05	0.56	0.00	0.00	0.06	1.78	1.34	10.46	0.96	5.16	0.00	0.00	0.00	0.00	7.96	8.34
13	Meadow Thicket	3.40	10.40	0.37	4.26	0.06	9.30	0.34	4.11	0.17	1.34	0.40	2.50	0.26	4.20	0.02	0.49	5.02	5.26
14	Settlement	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	Settlement-Impervious	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.55	0.01	0.06	0.00	0.00	0.00	0.00	0.08	0.09
16	Settlement-Pervious	0.01	0.04	0.04	0.44	0.00	0.80	0.18	2.35	0.11	0.86	0.19	1.16	0.04	0.63	0.07	1.34	0.63	0.66
17	Settlement-Pervious Homestead	0.62	1.89	0.50	5.80	0.03	7.78	0.19	2.14	0.25	1.98	0.64	4.37	0.29	4.58	0.16	3.09	2.67	2.80
18	Settlement-Residential	0.00	0.00	0.04	0.48	0.00	0.00	0.02	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.06
19	Transportation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	Transportation-Rail	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	Transportation-Road	0.31	0.94	0.23	2.69	0.06	2.64	0.17	1.98	0.28	2.18	0.41	2.14	0.16	2.53	0.08	1.61	1.70	1.78
22	Unevaluated Wetland	5.40	16.54	1.85	21.53	0.09	16.05	1.43	16.40	1.53	11.96	3.21	17.91	1.45	23.08	0.79	15.55	15.74	16.49
23	Water	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	Water-Buffer around wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	Water-Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	Water-Pond	0.04	0.13	0.00	0.00	0.00	0.00	0.02	0.28	0.00	0.00	0.02	0.08	0.00	0.00	0.00	0.00	0.08	0.09
27	Water-River	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03
28	Wooded Area	0.05	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.12	0.00	0.00	0.00	0.00	0.07	0.08
29	Wooded Area-Fallow	0.02	0.07	0.08	0.89	0.00	0.16	0.02	0.28	0.04	0.34	0.07	0.51	0.22	3.55	0.05	0.99	0.51	0.53
30	Wooded Area-Hedgerow	0.01	0.02	0.00	0.02	0.00	0.00	0.07	0.81	0.03	0.21	0.03	0.22	0.00	0.00	0.04	0.86	0.18	0.19
31	Wooded Area-Island	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	Wooded Area-Plantation	0.18	0.55	0.00	0.00	0.00	1.08	0.14	1.63	0.35	2.72	0.20	1.34	0.00	0.00	0.00	0.00	0.86	0.90
33	Wooded Area-Treed	14.15	43.32	3.66	42.77	0.37	48.14	2.33	28.22	4.75	37.23	5.76	33.05	1.71	27.36	2.50	49.15	35.23	36.90
34	Prospect**	0.00	0.00	0.01	0.07	1.69	71.34	0.29	3.36	0.00	0.00	1.65	8.66	0.00	0.00	0.00	0.00	3.64	3.81
	Total	32.65	100	8.57	100	2.37	100	8.72	100	12.76	100	19.04	100	6.26	100	5.09	100	95.48	100

* Unless otherwise stated land cover values are based on RVCA in-house work which reprsents conditions of spring 2014

** Prospect represents the Prospect community development area projected for a 20 year planning horizon until 2029 (Beckwith Official Plan, 2012)

Table 2 Hydrological Soil Groups in Kings Basin

		Soil Group area (km^2)					as percent (%) of catchment area				
Catchment	Area (km^2)	A	B	C	D	Unclassified	A	B	C	D	Unclassified
M1	32.65	0.03	20.74	0.34	11.30	0.25	0.08	63.52	1.04	34.60	0.77
M2	8.57	0.14	6.10	0.50	1.83	0.00	1.65	71.19	5.79	21.37	0.00
M3	2.37	0.00	1.77	0.00	0.60	0.00	0.00	74.45	0.00	25.47	0.08
M4	8.72	1.41	4.68	0.99	1.13	0.50	16.22	53.69	11.40	12.94	5.75
M5	12.76	2.36	6.80	1.84	1.42	0.35	18.49	53.25	14.42	11.14	2.71
D1	19.04	0.33	12.49	0.53	5.69	0.00	1.74	65.59	2.77	29.90	0.00
T1	6.26	0.44	4.29	0.18	1.36	0.00	6.95	68.46	2.86	21.73	0.00
T2	5.09	0.27	4.23	0.00	0.50	0.09	5.30	83.13	0.00	9.76	1.82
Kings	95.48	4.98	61.09	4.38	23.83	1.19	5.21	63.99	4.59	24.96	1.25

Note: Based on MNRF's LIO (Land Information System) database and documentation by MNR (2012)

Table 3A Estimated watershed parameters

NASHYD Parameters

Catchment	Area (km^2)	imperviousness (%)	CN [1]	CN* [2]	IA (mm)	Channel Slope (%)	Channel Length (m)	Tc [3] (hr)	Tp [4] (hr)
M1	32.65	0.80	77	67.4	6.13	0.02	7335	11.56	6.94
M2	8.57	1.94	73	63.1	7.43	0.11	4029	5.06	3.04
M3	2.37	24.14	80	71.9	4.97	0.28	2682	1.49	0.89
M4	8.72	2.84	73	62.9	7.48	0.15	5253	2.24	1.34
M5	12.76	2.20	72	61.1	8.10	0.28	3635	2.76	1.66
D1	19.04	1.40	77	68.1	5.96	0.25	6313	4.22	2.53
T1	6.26	2.14	75	65.9	6.56	0.24	5520	2.77	1.66
T2	5.09	1.40	69	57.3	9.48	0.54	2136	3.32	1.99
Kings	95.48	2.72	74.53	64.7	6.94	0.19	19809	13.34	8.00

1) Calculated from land use and TR-55 Curve Number tables (Urban Hydrology for Small Watersheds by USDA-SCS, 1986)

2) Calculated based on equation $CN^*=100/(1.879((100/CN)-1)^{1.15}+1)$ (Curve Number Hydrology by Hawkins et al. Page 35, 2009)

3) Calculated based on the velocity method (National engineering handbook Chapter 15 by USDA-NRCS, 2010)

4) Calculated based on $t_p = 0.6 \times t_c$ (National engineering handbook Chapter 15 by USDA-NRCS, 2010)

Table 3B Impervious area parameters for catchment M3

Parameter	Value	description / estimation procedure
AREA (ha)	237.37	Catchment area. Calculated based on topography.
TIMP	0.24	Ratio of total impervious area to catchment area. Calculated based on bulding footprint, roads, and the projected land use.
XIMP	0.19	Ratio of directly connected impervious area to catchment area. Usually taken as 80% of TIMP as per the SWMHYMO Maunal (2000). This value is typical in the City of Ottawa and widely used by others (SNCA 2014, JFSA 2014)
LOSS	2	A pointer used to select the procedure to be used to calculate the losses over pervious surface. Optoins are: 1= Horton infiltration equation; 2= SCS CN procedure; 3= proportional loss coeffient). We used option 2, which ties well with the overall CN-based calculation.
CN	71.89	Curve number. Calculated based on land use and soil types.
Pervious surface		
IAper (mm)	4.67	Initial abstraction for pervious surface. Typical value selected as per the City of Ottawa Sewer Design Guideline (2012).
SLPP (%)	2	Average pervious surface slope over which runoff travels. The values of SLPP usually represents the value of an average lot in rural subdivisions. This value is typical in the City of Ottawa and widely used by others (SNCA 2014, JFSA 2014).
LGP (m)	90	The average lot depth which surface water has to travel before it reaches the street or the sewer system. Typical taken as the slope of lots in rural subdivisions. This value is typical in the City of Ottawa and widely used by others (SNCA 2014, JFSA 2014).
MNP	0.25	The representative roughness coefficient of the pervious surface over which water travels before reaching the street or the sewer system. Value selected is typical for SWMHYMO to represent sheet flow over a residential lot, as iidentified by the SWMHYMO Manual (2000).
SCP (min)	0	The storage coefficient for the linear reservoir of the pervious portion of the area. When set to '0', the model will compute the value of SCP based on the values of LGP, MNP, SLPP and maximum effective rainfall intensity over the pervious area/ SWMHYMO Manual (2000).
Impervious surface		
IAimp (mm)	1.57	Initial abstraction for impervious surface. Typical value selected as per the City of Ottawa Sewer Design Guideline (2012).
SLPI (%)	0.5	Average impervious surface slope over which runoff travels. The values of SLPI usually represents the slope of conveyance pipes. This value is typical in the City of Ottawa and widely used by others (SNCA 2014, JFSA 2014).
LGI (m)	1257	The drainage area's average representative overflow travel length of the main conveyance system which usually includes sewer pipes and roadside ditches. Calculated as (AREA/CLI)^(0.5); CLI = 1.5; as per SWMHYMO Manual (2000).
MNI	0.045	The average roughness coefficient of the impervious surface over which water travels. Values are a weighted average for typical road and ditch systems in the City of Ottawa. Typical taken as the slope of lots in rural subdivisions. This value is typical in the City of Ottawa and widely used by others (SNCA 2014, JFSA 2014).
SCI (min)	0	The storage coefficient for the linear reservoir of the impervious portion of the area. When set to '0', the model will compute the value of SCI based on the values of LGI, MNI, SLPI and maximum effective rainfall intensity as per SWMHYMO Manual (2000). No other option is available.

Table 4 Curve number for different land cover and soil groups

	RVCA Land Cover[1]	Corresponding TR-55 land cover category [2]		Assigned Curve Number (CN)			
		Cover description		Soil group			
	Land cover Class	Cover type	Hydrologic condition	A	B	C	D
1	Aggregate Site - Quarry	Industrial	N/A	81	88	91	93
2	Aggregate Site - Pit	Industrial	N/A	81	88	91	93
3	Aggregate Site - unclassfied	Industrial	N/A	81	88	91	93
4	Settlement - Pervious	Open space (lawns, parks, golf courses, cemeteries, etc)	Good condition (grass cover >75%)	39	61	74	80
5	Settlement - Impervious	Commercial and business	N/A	89	92	94	95
6	Settlement - Pervious Homestead	Residential district (average lot size 2 acres)	N/A	46	65	77	82
7	Settlement - Residential	Residential district (average lot size 1/8 acre or less (townhouse))	N/A	77	85	90	92
8	Settlement - unclassified			77	85	90	92
9	Transportation - Rail	Streets and roads	N/A	98	98	98	98
10	Transportation - Road	Streets and roads	N/A	98	98	98	98
11	Transportation - unclassified	Streets and roads	N/A	98	98	98	98
12	Water - Lake	N/A	N/A	98	98	98	98
13	Water - River	N/A	N/A	98	98	98	98
14	Water - Buffer around wetland	N/A	N/A	98	98	98	98
15	Water - Pond	N/A	N/A	98	98	98	98
16	Water - unclassified	N/A	N/A	98	98	98	98
17	Unevaluated Wetland	N/A	N/A	98	98	98	98
18	Evaluated Wetland - Swamp	N/A	N/A	98	98	98	98
19	Evaluated Wetland - Open Water	N/A	N/A	98	98	98	98
20	Evaluated Wetland - Bog	N/A	N/A	98	98	98	98
21	Evaluated Wetland - Marsh	N/A	N/A	98	98	98	98
22	Evaluated Wetland - Fen	N/A	N/A	98	98	98	98
23	Evaluated Wetland - unclassified	N/A	N/A	98	98	98	98
24	Wooded Area - Treed	Wood	Good	30	55	70	77
25	Wooded Area - Plantation	Wood	Poor	45	66	77	83
26	Wooded Area - Hedgerow	Wood	Poor	45	66	77	83
27	Wooded Area - Island	Wood	Good	30	55	70	77
28	Wooded Area - Fallow	Pasture	Fair	49	69	79	84
29	Wooded Area - unclassified	Wood	Good	30	55	70	77
30	Crop and Pasture - Cultivated	Row Crops	Good	64	75	82	85
31	Crop and Pasture - Fallow	Fallow	Poor	76	85	90	93
32	Crop and Pasture - unclassified			64	75	82	85
33	Meadow Thicket	Herbaceous - mixture of grass, weeds, and low-growing brush, with brush the minor element.	Fair	60	71	81	89
34	Prospect [3]			70.5	80.75	87.25	90

1) Land cover classifications based on in-house RVCA work which represent conditions in the spring of 2014

2) Values and descriptors extracted from TR-55 "Urban Hydrology for Small Watersheds", USDA, Natural Resources Conservation Service, June 1986

3) Prospect community development area projected CN values based on a ratio of two TR-55 categories: 1/8 acre or less (townhouse) at 75% and 1 acre at 25%

Table 5 Characteristics of design storms

	Duration	Total volume	Peak intensity	Time step	Source of hyetograph shape
	(hour)	(mm)	(mm/hr)	(minutes)	
Chicago 3 hour	3	74.43	168.71	10	generated by STORMS osftware
Chicago 6 hour	6	88.42	168.71	10	generated by STORMS osftware
Chicago 12 hour	12	104.44	168.71	10	generated by STORMS osftware
Chicago 24 hour	24	123.02	168.71	10	generated by STORMS osftware
SCS 3 hour	3	74.47	80.87	30	City of Ottawa Sewer Design Guidelines 2012
SCS 6 hour	6	88.43	85.25	30	City of Ottawa Sewer Design Guidelines 2012
SCS 12 hour	12	104.44	89.40	30	City of Ottawa Sewer Design Guidelines 2012
SCS 24 hour	24	123.01	93.49	30	generated by STORMS osftware

Table 6 Estimated peak flows genrated by various storms

Storm	3H Chicago	6H Chicago	12H Chicago	24H Chicago	3H SCS	6H SCS	12H SCS	24H SCS
Return Period	100 year	100 year	100 year	100 year	100 year	100 year	100 year	100 year
Flow	(cms)	(cms)	(cms)	(cms)	(cms)	(cms)	(cms)	(cms)
Catchment								
M1	17.63	23.33	28.28	31.16	17.69	23.64	29.82	33.82
M2	8.57	10.46	11.66	13.05	8.71	11.19	12.94	14.72
M3	12.52	13.79	14.96	16.26	12.42	14.11	15.91	18.09
M4	16.53	18.70	21.15	23.88	17.79	20.86	24.09	27.75
M5	19.46	22.02	24.89	28.15	20.54	24.47	28.26	32.68
D1	26.90	31.33	34.84	38.78	27.52	33.90	38.60	43.64
T1	11.47	12.90	14.48	16.23	12.09	14.25	16.29	18.59
T2	5.82	6.71	7.60	8.63	6.05	7.42	8.62	10.05
Nodes								
N2	20.23	27.44	33.72	37.16	20.28	27.72	35.57	40.40
N3	38.57	50.10	56.18	62.77	38.98	51.98	61.60	70.35
N4	58.24	70.31	78.65	88.64	59.49	75.82	87.87	101.59
N6	16.87	19.22	21.66	24.41	17.60	21.22	24.43	28.15
N7	68.23	79.01	87.26	96.63	69.49	83.91	95.81	108.73

Table 7 SCS Type II 24 hour design storms for different return periods

Return Period	Total volume	Peak intensity	Time step	hyetograph genarated by
(year)	(mm)	(mm/hr)	(minutes)	
2	50.48	38.08	30	STORMS software
5	70.01	53.21	30	STORMS software
10	82.57	62.75	30	STORMS software
20	95.07	72.25	30	STORMS software
50	110.92	84.3	30	STORMS software
100	123.01	93.49	30	STORMS software
200	134.57	102.27	30	STORMS software
350	144.20	109.59	30	STORMS software
500	150.84	114.64	30	STORMS software

Table 8 Estimated peak flows for SCS Type II 24 hour design storm

Storm	24 hour SCS Type II								
Return Period (year)	2	5	10	20	50	100	200	350	500
Flow	(cms)	(cms)	(cms)	(cms)	(cms)	(cms)	(cms)	(cms)	(cms)
Catchments									
M1	6.72	12.81	17.26	22.05	28.58	33.82	39.03	43.51	46.65
M2	2.62	5.24	7.20	9.35	12.31	14.72	17.12	19.20	20.67
M3	3.24	6.25	8.63	11.23	15.02	18.09	21.29	23.79	25.70
M4	4.87	9.81	13.52	17.58	23.18	27.75	32.32	36.26	39.04
M5	5.52	11.31	15.70	20.52	27.20	32.68	38.16	42.91	46.27
D1	8.54	16.40	22.16	28.37	36.82	43.64	50.39	56.18	60.25
T1	3.48	6.81	9.28	11.96	15.62	18.59	21.55	24.09	25.88
T2	1.56	3.33	4.68	6.19	8.31	10.05	11.81	13.34	14.42
Nodes									
N2	7.53	14.76	20.13	25.95	33.95	40.40	46.81	52.33	56.15
N3	12.04	24.63	34.19	44.53	58.67	70.35	81.86	91.92	98.87
N4	16.24	34.06	47.78	63.08	84.23	101.59	116.98	128.92	137.18
N6	4.72	9.77	13.55	17.71	23.45	28.15	32.84	36.85	39.72
N7	19.73	42.14	58.41	72.14	91.86	108.73	124.31	137.24	146.25

Table 9 Estimated flows for hydraulic modeling (HEC-RAS)

			Return Period (year)	2	5	10	20	50	100	200	350	500
Stream	Reach	Nearest Cross Section	Distance from Jock Confluence (m)	Flow (cms)								
Kings Creek	Reach 1	1300	15794.99	6.723	12.806	17.260	22.049	28.575	33.823	39.034	43.508	46.647
Kings Creek	Reach 1	1280	15319.9	7.532	14.762	20.134	25.949	33.947	40.396	46.814	52.334	56.148
Kings Creek	Reach 1	1205	11406.62	12.035	24.630	34.189	44.529	58.666	70.345	81.860	91.916	98.865
Kings Creek	Reach 2	1180	10044.8	12.035	24.630	34.189	44.529	58.666	70.345	81.860	91.916	98.865
Kings Creek	Reach 2	1145	8661.25	16.244	34.056	47.782	63.077	84.233	101.593	116.984	128.919	137.179
Kings Creek	Reach 3	1115	6782.59	16.244	34.056	47.782	63.077	84.233	101.593	116.984	128.919	137.179
Kings Creek	Reach 3	1060	3438.03	19.731	42.143	58.412	72.144	91.859	108.726	124.306	137.239	146.250
Goodwood Drain	Reach 1	2020	10656.41	8.544	16.398	22.155	28.369	36.820	43.637	50.391	56.182	60.251
Kings Trib	Reach 1	3110	12391.65	3.478	6.809	9.276	11.957	15.623	18.594	21.549	24.089	25.877
Kings Trib	Reach 1	3045	8762.07	4.717	9.766	13.546	17.709	23.453	28.151	32.843	36.854	39.721

Table 10 Structures on Kings Creek

Stream	Location	Bridge or Culvert	Chainage (m)	Bounding Cross Sections	Width (m)	Height (m)	Length (m)	Upstream Invert[1] (m)	Downstream Invert[1] (m)	Upstream Obvert[1] (m)	Downstream Obvert[1] (m)	Source(s)
Kings Creek	Brunton Side Road #1	C	15510	1290 & 1285	2.00	1.20	9.00	122.78	122.74	123.98	123.94	RVCA Survey August 27th 2010
	Brunton Side Road #2				2.00	1.15	9.00	122.69	122.60	123.84	123.75	
	Brunton Side Road #3				2.00	1.10	9.00	122.53	122.64	123.63	123.74	
	Brunton Side Road #4				2.00	1.20	9.00	122.60	122.65	123.80	123.85	
Kings Creek	Kings Creek Road #1	C	11476	1215 & 1210	2.00	1.70	10.00	119.33	119.35	121.03	121.05	RVCA Survey August 27th 2010
	Kings Creek Road #2				2.00	1.70	10.00	119.54	119.45	121.24	121.15	
	Kings Creek Road #3				2.00	1.80	10.00	119.47	119.51	121.27	121.31	
	Kings Creek Road #4				2.00	1.75	10.00	119.52	119.53	121.27	121.28	
	Kings Creek Road #5				2.00	1.80	10.00	119.37	119.51	121.17	121.31	
Kings Creek	Ashton Station Road	B	8816	1155 & 1150	7.80	2.86	7.00	113.37	113.36	116.23	116.22	RVCA Survey August 27th 2010, and City of Ottawa drawing: Prospect Bridge Rehabilitation, Drawing # B-75762001-003,-004 Remisz. September 30th 2008.
Kings Creek	Dwyer Hill Road	B	3590	1075 & 1070	9.00	2.54	10.00	106.20	105.86	108.74	108.74	RVCA Survey August 27th 2010, and City of Ottawa drawing: Kings Creek Bridge Rehabilitation, Drawing # B-7576103-1,2,3 Parker Consultants. July 2000.
Kings Creek	Private Crossing #1	C	274	1015 & 1010	1.45	1.23	5.00	99.00	99.00	100.23	100.23	RVCA Survey September 26th 2016
Goodwood Drain	Richmond Road	C	10562	2015 & 2010	4.40	1.90	19.50	118.51	118.51	120.41	120.41	RVCA Survey September 9th 2016
Kings Tributary	Beckwith Boundary Road	C	11977	3100 & 3095	Diameter	0.80	10.00	123.24	123.27	124.04	124.07	RVCA Survey September 9th 2016
Kings Tributary	Ashton Station Road	C	8894	3055 & 3050	Diameter	2.00	10.50	118.33	118.27	120.33	120.27	RVCA Survey September 9th 2016
Kings Tributary	Purdy Road	C	7872	3025 & 3020	4.80	1.40	10.00	113.74	113.71	115.14	115.11	RVCA Survey September 9th 2016

1) RVCA Surveys (2010, 2014, 2015, and 2016) as well as design drawings

Table 11 Calculated head loss at road crossings (during 1:100 Year flood)

Stream	Location	Chainage (m)	Bounding Cross Sections	Upstream Energy Grade (m)	Downstream Energy Grade (m)	Head Loss (cm)	Road Overtopped
Kings Creek	Brunton Side Road	15510	1290 & 1285	124.37	123.89	48	Yes
Kings Creek	Kings Creek Road	11476	1215 & 1210	121.57	121.09	48	Yes
Kings Creek	Ashton Station Road	8816	1155 & 1150	116.79	115.64	115	Yes
Kings Creek	Dwyer Hill Road	3590	1075 & 1070	109.86	108.46	140	Yes
Kings Creek	Private Crossing #1	274	1015 & 1010	101.85	101.85	0	Yes
Goodwood Drain	Richmond Road	10562	2015 & 2010	121.81	120.59	122	Yes
Kings Tributary	Beckwith Boundary Road	11977	3100 & 3095	124.58	124.02	56	Yes
Kings Tributary	Ashton Station Road	8894	3055 & 3050	121.00	119.62	138	Yes
Kings Tributary	Purdy Road	7872	3025 & 3020	116.25	115.20	105	Yes

Table 12 Regulatory Flood Levels for 100 Year Flood Event

River	Reach	Xsec ID	Q (total)	Computed WSEL (m)	EGL (m)	RFL (m)
Kings Creek	Reach 1	1300	33.82	124.37	124.37	124.37
	Reach 1	1295	33.82	124.37	124.37	124.37
	Reach 1	1290	33.82	124.37	124.37	124.37
	Reach 1	1288	Brunton Side Road			
	Reach 1	1285	33.82	123.66	123.89	123.89
	Reach 1	1280	40.40	123.51	123.53	123.53
	Reach 1	1275	40.40	123.34	123.36	123.36
	Reach 1	1270	40.40	122.98	122.98	122.98
	Reach 1	1265	40.40	122.75	122.75	122.75
	Reach 1	1260	40.40	122.52	122.52	122.52
	Reach 1	1255	40.40	122.52	122.52	122.52
	Reach 1	1250	40.40	122.46	122.46	122.46
	Reach 1	1245	40.40	122.31	122.32	122.32
	Reach 1	1240	40.40	121.91	121.92	121.92
	Reach 1	1235	40.40	121.67	121.68	121.68
	Reach 1	1230	40.40	121.61	121.61	121.61
	Reach 1	1225	40.40	121.59	121.59	121.59
	Reach 1	1220	40.40	121.57	121.58	121.58
	Reach 1	1215	40.40	121.57	121.57	121.57
	Reach 1	1213	Kings Creek Road			
	Reach 1	1210	40.40	121.03	121.09	121.09
	Reach 1	1205	70.34	120.95	121.00	121.00
	Reach 1	1200	70.34	120.85	120.87	120.87
	Reach 1	1195	70.34	120.76	120.77	120.77
	Reach 1	1190	70.34	120.54	120.57	120.57
	Reach 1	1185	70.34	119.89	120.00	120.00
	Reach 2	1180	70.34	119.60	119.62	119.62
	Reach 2	1175	70.34	118.85	119.11	119.11
	Reach 2	1170	70.34	117.03	117.08	117.08
	Reach 2	1165	70.34	116.78	116.84	116.84
	Reach 2	1160	70.34	116.79	116.79	116.79
	Reach 2	1155	70.34	116.78	116.79	116.79
	Reach 2	1153	Ashton Station Road			
	Reach 2	1150	70.34	115.54	115.64	115.64
	Reach 2	1145	101.59	115.25	115.35	115.35
	Reach 2	1140	101.59	115.06	115.11	115.11
	Reach 2	1135	101.59	114.52	114.70	114.70
	Reach 2	1130	101.59	112.88	113.05	113.05
	Reach 2	1125	101.59	112.02	112.09	112.09
	Reach 2	1120	101.59	111.70	111.74	111.74
	Reach 3	1115	101.59	111.05	111.13	111.13
	Reach 3	1110	101.59	110.48	110.51	110.51
	Reach 3	1105	101.59	110.13	110.16	110.16
	Reach 3	1100	101.59	109.96	109.96	109.96
	Reach 3	1095	101.59	109.90	109.90	109.90
	Reach 3	1090	101.59	109.87	109.87	109.87
	Reach 3	1085	101.59	109.87	109.87	109.87
	Reach 3	1080	101.59	109.86	109.86	109.86

River	Reach	Xsec ID	Q (total)	Computed WSEL (m)	EGL (m)	RFL (m)
	Reach 3	1075	101.59	109.86	109.86	109.86
	Reach 3	1073	Dwyer Hill Road			
	Reach 3	1070	101.59	108.30	108.46	108.46
	Reach 3	1065	101.59	108.29	108.31	108.31
	Reach 3	1060	108.73	108.17	108.23	108.23
	Reach 3	1055	108.73	107.76	107.78	107.78
	Reach 3	1050	108.73	107.55	107.56	107.56
	Reach 3	1045	108.73	107.23	107.24	107.24
	Reach 3	1040	108.73	106.73	106.81	106.81
	Reach 3	1035	108.73	105.44	105.56	105.56
	Reach 3	1030	108.73	104.46	104.54	104.54
	Reach 3	1025	108.73	103.60	103.87	103.87
	Reach 3	1020	108.73	102.15	102.23	102.23
	Reach 3	1015	108.73	101.78	101.85	101.85
	Reach 3	1013	Private Crossing #1			
	Reach 3	1010	108.73	101.80	101.85	101.85
	Reach 3	1005	108.73	101.32	101.53	101.53
	Reach 3	1000	108.73	100.97	101.24	101.24
Goodwood Drain	Reach 1	2020	43.64	121.81	121.81	121.81
	Reach 1	2015	43.64	121.81	121.81	121.81
	Reach 1	2013	Richmond Road			
	Reach 1	2010	43.64	120.38	120.59	120.59
	Reach 1	2005	43.64	120.11	120.14	120.14
	Reach 1	2000	43.64	119.67	119.70	119.70
Kings Tributary	Reach 1	3110	18.59	124.64	124.64	124.64
	Reach 1	3105	18.59	124.59	124.59	124.59
	Reach 1	3100	18.59	124.58	124.58	124.58
	Reach 1	3098	Beckwith Boundary Road			
	Reach 1	3095	18.59	124.22	124.57	124.57
	Reach 1	3090	18.59	124.02	124.02	124.02
	Reach 1	3085	18.59	123.94	123.94	123.94
	Reach 1	3080	18.59	123.80	123.82	123.82
	Reach 1	3075	18.59	123.44	123.44	123.44
	Reach 1	3070	18.59	122.29	122.36	122.36
	Reach 1	3065	18.59	121.01	121.02	121.02
	Reach 1	3060	18.59	121.00	121.00	121.00
	Reach 1	3055	18.59	121.00	121.00	121.00
	Reach 1	3053	Ashton Station Road			
	Reach 1	3050	18.59	119.57	119.62	119.62
	Reach 1	3045	28.15	119.17	119.24	119.24
	Reach 1	3040	28.15	117.90	118.07	118.07
	Reach 1	3035	28.15	116.90	116.95	116.95
	Reach 1	3030	28.15	116.24	116.37	116.37
	Reach 1	3025	28.15	116.24	116.25	116.25
	Reach 1	3023	Purdy Road			
	Reach 1	3020	28.15	115.14	115.20	115.20
	Reach 1	3015	28.15	114.44	114.66	114.66
	Reach 1	3010	28.15	113.95	113.98	113.98
	Reach 1	3005	28.15	112.62	112.72	112.72
	Reach 1	3000	28.15	111.19	111.19	111.19

Table 13 Flows and Computed Water Levels for the 100, 200, 350 and 500 Year Flood Events

River	Reach	Xsec ID	Flow (m^3/s) and Computed WSEL (m) for Different Flood Events							
			Q500	WL500	Q350	WL350	Q200	WL200	Q100	WL100
Kings Creek	Reach 1	1300	46.65	124.40	43.51	124.39	39.03	124.39	33.82	124.37
	Reach 1	1295	46.65	124.40	43.51	124.39	39.03	124.39	33.82	124.37
	Reach 1	1290	46.65	124.39	43.51	124.39	39.03	124.38	33.82	124.36
	Reach 1	1288	Brunton Side Road							
	Reach 1	1285	46.65	123.71	43.51	123.69	39.03	123.67	33.82	123.63
	Reach 1	1280	56.26	123.59	52.35	123.58	46.83	123.55	40.41	123.51
	Reach 1	1275	56.26	123.41	52.35	123.39	46.83	123.37	40.41	123.34
	Reach 1	1270	56.26	123.03	52.35	123.02	46.83	123.00	40.41	122.98
	Reach 1	1265	56.26	122.85	52.35	122.83	46.83	122.79	40.41	122.75
	Reach 1	1260	56.26	122.71	52.35	122.68	46.83	122.64	40.41	122.58
	Reach 1	1255	56.26	122.71	52.35	122.68	46.83	122.64	40.41	122.58
	Reach 1	1250	56.26	122.67	52.35	122.64	46.83	122.60	40.41	122.54
	Reach 1	1245	56.26	122.54	52.35	122.51	46.83	122.48	40.41	122.43
	Reach 1	1240	56.26	122.09	52.35	122.06	46.83	122.03	40.41	121.99
	Reach 1	1235	56.26	121.85	52.35	121.83	46.83	121.79	40.41	121.73
	Reach 1	1230	56.26	121.75	52.35	121.74	46.83	121.69	40.41	121.64
	Reach 1	1225	56.26	121.72	52.35	121.70	46.83	121.67	40.41	121.61
	Reach 1	1220	56.26	121.68	52.35	121.67	46.83	121.64	40.41	121.59
	Reach 1	1215	56.26	121.68	52.35	121.67	46.83	121.63	40.41	121.59
	Reach 1	1213	Kings Creek Road							
	Reach 1	1210	56.26	121.37	52.35	121.31	46.83	121.23	40.41	121.13
	Reach 1	1205	99.91	121.23	92.85	121.18	82.83	121.11	71.19	121.02
	Reach 1	1200	99.91	121.14	92.85	121.10	82.83	121.03	71.19	120.95
	Reach 1	1195	99.91	121.00	92.85	120.96	82.83	120.90	71.19	120.83
	Reach 1	1190	99.91	120.72	92.85	120.69	82.83	120.63	71.19	120.55
	Reach 1	1185	99.91	120.20	92.85	120.16	82.83	120.08	71.19	119.99
	Reach 2	1180	99.91	119.94	92.85	119.90	82.83	119.80	71.19	119.70
	Reach 2	1175	99.91	119.09	92.85	118.95	82.83	119.01	71.19	118.93
	Reach 2	1170	99.91	117.24	92.85	117.19	82.83	117.12	71.19	117.02
	Reach 2	1165	99.91	116.81	92.85	116.78	82.83	116.73	71.19	116.67
	Reach 2	1160	99.91	116.79	92.85	116.77	82.83	116.72	71.19	116.66
	Reach 2	1155	99.91	116.78	92.85	116.75	82.83	116.71	71.19	116.65
	Reach 2	1153	Ashton Station Road							
	Reach 2	1150	99.91	115.86	92.85	115.79	82.83	115.69	71.19	115.56
	Reach 2	1145	144.70	115.54	134.02	115.48	118.87	115.37	101.27	115.25
	Reach 2	1140	144.70	115.37	134.02	115.30	118.87	115.19	101.27	115.06
	Reach 2	1135	144.70	114.78	134.02	114.73	118.87	114.63	101.27	114.51
	Reach 2	1130	144.70	113.10	134.02	113.06	118.87	113.00	101.27	112.93
	Reach 2	1125	144.70	112.30	134.02	112.24	118.87	112.15	101.27	112.03
	Reach 2	1120	144.70	112.00	134.02	111.94	118.87	111.83	101.27	111.71
	Reach 3	1115	144.70	111.40	134.02	111.34	118.87	111.26	101.27	111.15
	Reach 3	1110	144.70	110.81	134.02	110.76	118.87	110.69	101.27	110.61
	Reach 3	1105	144.70	110.31	134.02	110.28	118.87	110.24	101.27	110.16
	Reach 3	1100	144.70	110.09	134.02	110.06	118.87	110.08	101.27	109.95
	Reach 3	1095	144.70	110.01	134.02	109.99	118.87	110.03	101.27	109.88
	Reach 3	1090	144.70	109.98	134.02	109.95	118.87	110.01	101.27	109.86
	Reach 3	1085	144.70	109.96	134.02	109.94	118.87	110.00	101.27	109.85
	Reach 3	1080	144.70	109.96	134.02	109.93	118.87	110.00	101.27	109.85

River	Reach	Xsec ID	Flow (m^3/s) and Computed WSEL (m) for Different Flood Events							
			Q500	WL500	Q350	WL350	Q200	WL200	Q100	WL100
	Reach 3	1075	144.70	109.95	134.02	109.93	118.87	109.99	101.27	109.85
	Reach 3	1073	Dwyer Hill Road							
	Reach 3	1070	144.70	108.56	134.02	108.52	118.87	108.47	101.27	108.39
	Reach 3	1065	144.70	108.52	134.02	108.49	118.87	108.44	101.27	108.36
	Reach 3	1060	183.31	108.39	169.52	108.36	150.18	108.31	127.74	108.24
	Reach 3	1055	183.31	107.98	169.52	107.94	150.18	107.89	127.74	107.82
	Reach 3	1050	183.31	107.79	169.52	107.75	150.18	107.69	127.74	107.62
	Reach 3	1045	183.31	107.52	169.52	107.46	150.18	107.40	127.74	107.32
	Reach 3	1040	183.31	106.98	169.52	106.94	150.18	106.90	127.74	106.83
	Reach 3	1035	183.31	105.78	169.52	105.72	150.18	105.64	127.74	105.54
	Reach 3	1030	183.31	104.83	169.52	104.76	150.18	104.70	127.74	104.57
	Reach 3	1025	183.31	103.85	169.52	103.83	150.18	103.68	127.74	103.65
	Reach 3	1020	183.31	102.66	169.52	102.58	150.18	102.45	127.74	102.28
	Reach 3	1015	183.31	102.28	169.52	102.21	150.18	102.07	127.74	101.91
	Reach 3	1013	Private Crossing #1							
	Reach 3	1010	183.31	102.30	169.52	102.21	150.18	102.08	127.74	101.92
	Reach 3	1005	183.31	101.57	169.52	101.53	150.18	101.47	127.74	101.39
	Reach 3	1000	183.31	101.20	169.52	101.16	150.18	101.10	127.74	101.04
Goodwood Drain	Reach 1	2020	60.25	121.87	56.18	121.86	50.39	121.84	43.64	121.81
	Reach 1	2015	60.25	121.87	56.18	121.86	50.39	121.84	43.64	121.80
	Reach 1	2013	Richmond Road							
	Reach 1	2010	60.25	120.47	56.18	120.44	50.39	120.38	43.64	120.32
	Reach 1	2005	60.25	120.29	56.18	120.25	50.39	120.18	43.64	120.11
	Reach 1	2000	60.25	120.00	56.18	119.97	50.39	119.87	43.64	119.77
Kings Tributary	Reach 1	3110	25.88	124.64	24.09	124.63	21.55	124.60	18.59	124.58
	Reach 1	3105	25.88	124.50	24.09	124.49	21.55	124.48	18.59	124.46
	Reach 1	3100	25.88	124.46	24.09	124.46	21.55	124.45	18.59	124.44
	Reach 1	3098	Beckwith Boundary Road							
	Reach 1	3095	25.88	124.11	24.09	124.09	21.55	124.06	18.59	124.03
	Reach 1	3090	25.88	124.10	24.09	124.08	21.55	124.06	18.59	124.02
	Reach 1	3085	25.88	124.04	24.09	124.02	21.55	123.98	18.59	123.94
	Reach 1	3080	25.88	123.91	24.09	123.89	21.55	123.85	18.59	123.80
	Reach 1	3075	25.88	123.51	24.09	123.49	21.55	123.47	18.59	123.44
	Reach 1	3070	25.88	122.32	24.09	122.31	21.55	122.30	18.59	122.29
	Reach 1	3065	25.88	121.06	24.09	121.05	21.55	121.03	18.59	121.01
	Reach 1	3060	25.88	121.04	24.09	121.03	21.55	121.01	18.59	121.00
	Reach 1	3055	25.88	121.03	24.09	121.02	21.55	121.01	18.59	121.00
	Reach 1	3053	Ashton Station Road							
	Reach 1	3050	25.88	119.71	24.09	119.67	21.55	119.62	18.59	119.56
	Reach 1	3045	39.74	119.31	36.87	119.28	32.84	119.23	28.16	119.17
	Reach 1	3040	39.74	118.01	36.87	117.98	32.84	117.94	28.16	117.90
	Reach 1	3035	39.74	117.08	36.87	117.04	32.84	116.98	28.16	116.90
	Reach 1	3030	39.74	116.38	36.87	116.38	32.84	116.58	28.16	116.35
	Reach 1	3025	39.74	116.38	36.87	116.38	32.84	116.57	28.16	116.35
	Reach 1	3023	Purdy Road							
	Reach 1	3020	39.74	115.29	36.87	115.25	32.84	115.20	28.16	115.13
	Reach 1	3015	39.74	114.57	36.87	114.54	32.84	114.50	28.16	114.44
	Reach 1	3010	39.74	114.08	36.87	114.05	32.84	114.01	28.16	113.95
	Reach 1	3005	39.74	112.67	36.87	112.66	32.84	112.64	28.16	112.62
	Reach 1	3000	39.74	111.53	36.87	111.47	32.84	111.37	28.16	111.26

Table 14 Flows and Computed Water Levels for the 2, 5, 10, 20 and 50 Year Flood Events

River	Reach	Xsec ID	Flow (m^3/s) and Computed WSEL (m) for Different Flood Events									
			Q50	WL50	Q20	WL20	Q10	WL10	Q5	WL5	Q2	WL2
Kings Creek	Reach 1	1300	28.58	124.34	22.05	124.32	17.26	124.29	12.81	124.04	6.72	123.59
	Reach 1	1295	28.58	124.34	22.05	124.32	17.26	124.29	12.81	124.04	6.72	123.59
	Reach 1	1290	28.58	124.34	22.05	124.31	17.26	124.29	12.81	124.04	6.72	123.58
	Reach 1	1288	Brunton Side Road									
	Reach 1	1285	28.58	123.64	22.05	123.58	17.26	123.52	12.81	123.44	6.72	123.26
	Reach 1	1280	33.95	123.47	25.95	123.42	20.13	123.36	14.76	123.30	7.53	123.17
	Reach 1	1275	33.95	123.31	25.95	123.26	20.13	123.22	14.76	123.17	7.53	123.08
	Reach 1	1270	33.95	122.95	25.95	122.91	20.13	122.88	14.76	122.84	7.53	122.77
	Reach 1	1265	33.95	122.71	25.95	122.67	20.13	122.63	14.76	122.60	7.53	122.55
	Reach 1	1260	33.95	122.47	25.95	122.39	20.13	122.33	14.76	122.26	7.53	122.15
	Reach 1	1255	33.95	122.46	25.95	122.39	20.13	122.33	14.76	122.26	7.53	122.15
	Reach 1	1250	33.95	122.40	25.95	122.33	20.13	122.27	14.76	122.21	7.53	122.10
	Reach 1	1245	33.95	122.27	25.95	122.20	20.13	122.14	14.76	122.08	7.53	121.98
	Reach 1	1240	33.95	121.87	25.95	121.85	20.13	121.82	14.76	121.79	7.53	121.72
	Reach 1	1235	33.95	121.63	25.95	121.50	20.13	121.44	14.76	121.39	7.53	121.32
	Reach 1	1230	33.95	121.56	25.95	121.39	20.13	121.19	14.76	121.06	7.53	120.87
	Reach 1	1225	33.95	121.55	25.95	121.36	20.13	121.11	14.76	120.88	7.53	120.52
	Reach 1	1220	33.95	121.53	25.95	121.35	20.13	121.08	14.76	120.82	7.53	120.41
	Reach 1	1215	33.95	121.53	25.95	121.34	20.13	121.08	14.76	120.82	7.53	120.41
	Reach 1	1213	Kings Creek Road									
	Reach 1	1210	33.95	120.92	25.95	120.77	20.13	120.65	14.76	120.49	7.53	120.21
	Reach 1	1205	58.67	120.85	44.53	120.70	34.19	120.58	24.63	120.42	12.04	120.16
	Reach 1	1200	58.67	120.76	44.53	120.63	34.19	120.52	24.63	120.38	12.04	120.13
	Reach 1	1195	58.67	120.67	44.53	120.56	34.19	120.46	24.63	120.32	12.04	120.09
	Reach 1	1190	58.67	120.47	44.53	120.37	34.19	120.28	24.63	120.15	12.04	119.92
	Reach 1	1185	58.67	119.80	44.53	119.68	34.19	119.58	24.63	119.48	12.04	119.30
	Reach 2	1180	58.67	119.50	44.53	119.37	34.19	119.27	24.63	119.15	12.04	118.97
	Reach 2	1175	58.67	118.78	44.53	118.68	34.19	118.60	24.63	118.53	12.04	118.38
	Reach 2	1170	58.67	116.84	44.53	116.64	34.19	116.51	24.63	116.35	12.04	116.08
	Reach 2	1165	58.67	116.41	44.53	115.92	34.19	115.68	24.63	115.59	12.04	115.45
	Reach 2	1160	58.67	116.42	44.53	115.90	34.19	115.55	24.63	115.24	12.04	114.73
	Reach 2	1155	58.67	116.39	44.53	115.87	34.19	115.51	24.63	115.20	12.04	114.70
	Reach 2	1153	Ashton Station Road									
	Reach 2	1150	58.67	115.42	44.53	115.26	34.19	115.12	24.63	114.95	12.04	114.60
	Reach 2	1145	84.23	115.11	63.08	114.93	47.78	114.78	34.06	114.62	16.24	114.26
	Reach 2	1140	84.23	114.92	63.08	114.72	47.78	114.56	34.06	114.38	16.24	114.03
	Reach 2	1135	84.23	114.39	63.08	114.20	47.78	114.03	34.06	113.86	16.24	113.56
	Reach 2	1130	84.23	112.82	63.08	112.73	47.78	112.66	34.06	112.56	16.24	112.33
	Reach 2	1125	84.23	111.90	63.08	111.75	47.78	111.62	34.06	111.48	16.24	111.28
	Reach 2	1120	84.23	111.57	63.08	111.38	47.78	111.22	34.06	111.07	16.24	110.82
	Reach 3	1115	84.23	110.93	63.08	110.77	47.78	110.64	34.06	110.50	16.24	110.26
	Reach 3	1110	84.23	110.40	63.08	110.29	47.78	110.19	34.06	110.09	16.24	109.91
	Reach 3	1105	84.23	110.05	63.08	110.00	47.78	109.93	34.06	109.85	16.24	109.72
	Reach 3	1100	84.23	109.78	63.08	109.58	47.78	109.51	34.06	109.43	16.24	109.30
	Reach 3	1095	84.23	109.69	63.08	109.26	47.78	109.18	34.06	109.09	16.24	108.89
	Reach 3	1090	84.23	109.65	63.08	109.10	47.78	108.79	34.06	108.67	16.24	108.49
	Reach 3	1085	84.23	109.64	63.08	109.06	47.78	108.64	34.06	108.41	16.24	108.14
	Reach 3	1080	84.23	109.64	63.08	109.05	47.78	108.59	34.06	108.26	16.24	107.71
	Reach 3	1075	84.23	109.63	63.08	108.96	47.78	108.49	34.06	108.15	16.24	107.64
	Reach 3	1073	Dwyer Hill Road									
	Reach 3	1070	84.23	108.24	63.08	108.16	47.78	108.07	34.06	107.95	16.24	107.59
	Reach 3	1065	84.23	108.22	63.08	108.13	47.78	108.03	34.06	107.91	16.24	107.56
	Reach 3	1060	91.86	108.11	72.14	108.03	58.41	107.93	42.14	107.81	19.73	107.49
	Reach 3	1055	91.86	107.70	72.14	107.63	58.41	107.57	42.14	107.47	19.73	107.27
	Reach 3	1050	91.86	107.49	72.14	107.41	58.41	107.36	42.14	107.27	19.73	107.11

River	Reach	Xsec ID	Flow (m^3/s) and Computed WSEL (m) for Different Flood Events									
			Q50	WL50	Q20	WL20	Q10	WL10	Q5	WL5	Q2	WL2
	Reach 3	1045	91.86	107.15	72.14	107.05	58.41	106.98	42.14	106.88	19.73	106.66
	Reach 3	1040	91.86	106.67	72.14	106.54	58.41	106.44	42.14	106.30	19.73	105.98
	Reach 3	1035	91.86	105.33	72.14	105.21	58.41	105.10	42.14	104.93	19.73	104.59
	Reach 3	1030	91.86	104.37	72.14	104.21	58.41	104.08	42.14	103.90	19.73	103.60
	Reach 3	1025	91.86	103.42	72.14	103.39	58.41	103.37	42.14	103.28	19.73	103.04
	Reach 3	1020	91.86	102.01	72.14	101.83	58.41	101.68	42.14	101.51	19.73	101.29
	Reach 3	1015	91.86	101.67	72.14	101.47	58.41	101.33	42.14	101.13	19.73	100.78
	Reach 3	1013	Private Crossing #1									
	Reach 3	1010	91.86	101.67	72.14	101.48	58.41	101.33	42.14	101.11	19.73	100.74
	Reach 3	1005	91.86	101.26	72.14	101.14	58.41	101.05	42.14	100.87	19.73	100.57
	Reach 3	1000	91.86	100.89	72.14	100.74	58.41	100.59	42.14	100.49	19.73	100.28
Goodwood Drain	Reach 1	2020	36.82	121.79	28.37	121.74	22.16	121.66	16.40	120.92	8.54	120.17
	Reach 1	2015	36.82	121.79	28.37	121.74	22.16	121.64	16.40	120.90	8.54	120.15
	Reach 1	2013	Richmond Road									
	Reach 1	2010	36.82	120.33	28.37	120.24	22.16	120.17	16.40	120.07	8.54	119.86
	Reach 1	2005	36.82	120.04	28.37	119.95	22.16	119.87	16.40	119.79	8.54	119.62
	Reach 1	2000	36.82	119.57	28.37	119.44	22.16	119.33	16.40	119.22	8.54	119.03
Kings Tributary	Reach 1	3110	15.62	124.55	11.96	124.50	9.28	124.47	6.81	124.44	3.48	124.40
	Reach 1	3105	15.62	124.47	11.96	124.43	9.28	124.42	6.81	124.41	3.48	124.39
	Reach 1	3100	15.62	124.46	11.96	124.42	9.28	124.41	6.81	124.41	3.48	124.39
	Reach 1	3098	Beckwith Boundary Road									
	Reach 1	3095	15.62	124.14	11.96	124.04	9.28	123.95	6.81	123.87	3.48	123.65
	Reach 1	3090	15.62	123.98	11.96	123.94	9.28	123.89	6.81	123.84	3.48	123.70
	Reach 1	3085	15.62	123.90	11.96	123.84	9.28	123.80	6.81	123.74	3.48	123.60
	Reach 1	3080	15.62	123.76	11.96	123.69	9.28	123.63	6.81	123.59	3.48	123.46
	Reach 1	3075	15.62	123.41	11.96	123.37	9.28	123.34	6.81	123.23	3.48	123.21
	Reach 1	3070	15.62	122.27	11.96	122.26	9.28	122.22	6.81	122.40	3.48	122.27
	Reach 1	3065	15.62	120.98	11.96	120.96	9.28	120.92	6.81	120.57	3.48	120.59
	Reach 1	3060	15.62	120.97	11.96	120.95	9.28	120.92	6.81	120.47	3.48	119.76
	Reach 1	3055	15.62	120.97	11.96	120.95	9.28	120.92	6.81	120.47	3.48	119.76
	Reach 1	3053	Ashton Station Road									
	Reach 1	3050	15.62	119.49	11.96	119.37	9.28	119.26	6.81	119.15	3.48	118.93
	Reach 1	3045	23.45	119.12	17.71	119.02	13.55	118.91	9.77	118.79	4.72	118.58
	Reach 1	3040	23.45	117.81	17.71	117.69	13.55	117.55	9.77	117.46	4.72	117.31
	Reach 1	3035	23.45	116.81	17.71	116.75	13.55	116.65	9.77	116.52	4.72	116.33
	Reach 1	3030	23.45	116.27	17.71	115.78	13.55	115.67	9.77	115.55	4.72	115.36
	Reach 1	3025	23.45	116.23	17.71	115.68	13.55	115.33	9.77	115.05	4.72	114.68
	Reach 1	3023	Purdy Road									
	Reach 1	3020	23.45	115.07	17.71	114.97	13.55	114.89	9.77	114.79	4.72	114.61
	Reach 1	3015	23.45	114.37	17.71	114.29	13.55	114.23	9.77	114.14	4.72	113.95
	Reach 1	3010	23.45	113.89	17.71	113.80	13.55	113.73	9.77	113.65	4.72	113.50
	Reach 1	3005	23.45	112.59	17.71	112.56	13.55	112.53	9.77	112.51	4.72	112.47
	Reach 1	3000	23.45	111.06	17.71	110.89	13.55	110.76	9.77	110.62	4.72	110.41

Appendix A

Buildings in Floodplain – RVCA Policy

Ferdous Ahmed

From: Ewan Hardie
Sent: Wednesday, June 29, 2016 10:35 AM
To: Ferdous Ahmed
Subject: Buildings in the Floodplain Guidelines

Hi Ferdous,
As discussed at recent meetings please consider the following guidelines when undertaking floodplain mapping projects

Effective June 13th 2016, when plotting floodlines RVCA staff will use the following guidelines in order to apply a conservative approach to the delineation of the regulatory floodplain, specifically in areas that have buildings that are in the floodplain or affected by the floodplain:

1. Include any buildings in the floodplain that have any part of the footprint touching the floodplain. This is done to be conservative based on the lack of knowledge on the conditions around the buildings: soil conditions, window wells, walk out doors, building egress are all not known at the time of a floodplain mapping study so it is wise to adopt a conservative approach and include building footprints in the floodplain.
2. With regards to dry islands in and around buildings, islands will be removed if they did not meet the minimum mapping unit acceptable for the data. An envelope of 2 metres around building footprints is to be considered. If the floodplain comes close to or is in this 2m building envelope the entire envelope should be included in the floodplain. This approach is also consistent with the above approach (building footprints) in that the lack of knowledge of the conditions around the building forces the uses of a conservative approach, which is to remove the islands
3. In cases where a building has been included in the floodplain (because of the above criteria), the adjacent building will need to be included in the floodplain as well because of a lack of data in between the buildings and/or the 2m building envelope rule.
4. In the case of townhome or connected type buildings and the floodplain touching the foundations, the building footprint should be included up to the next visible unit partition where the elevation changes

Thanks

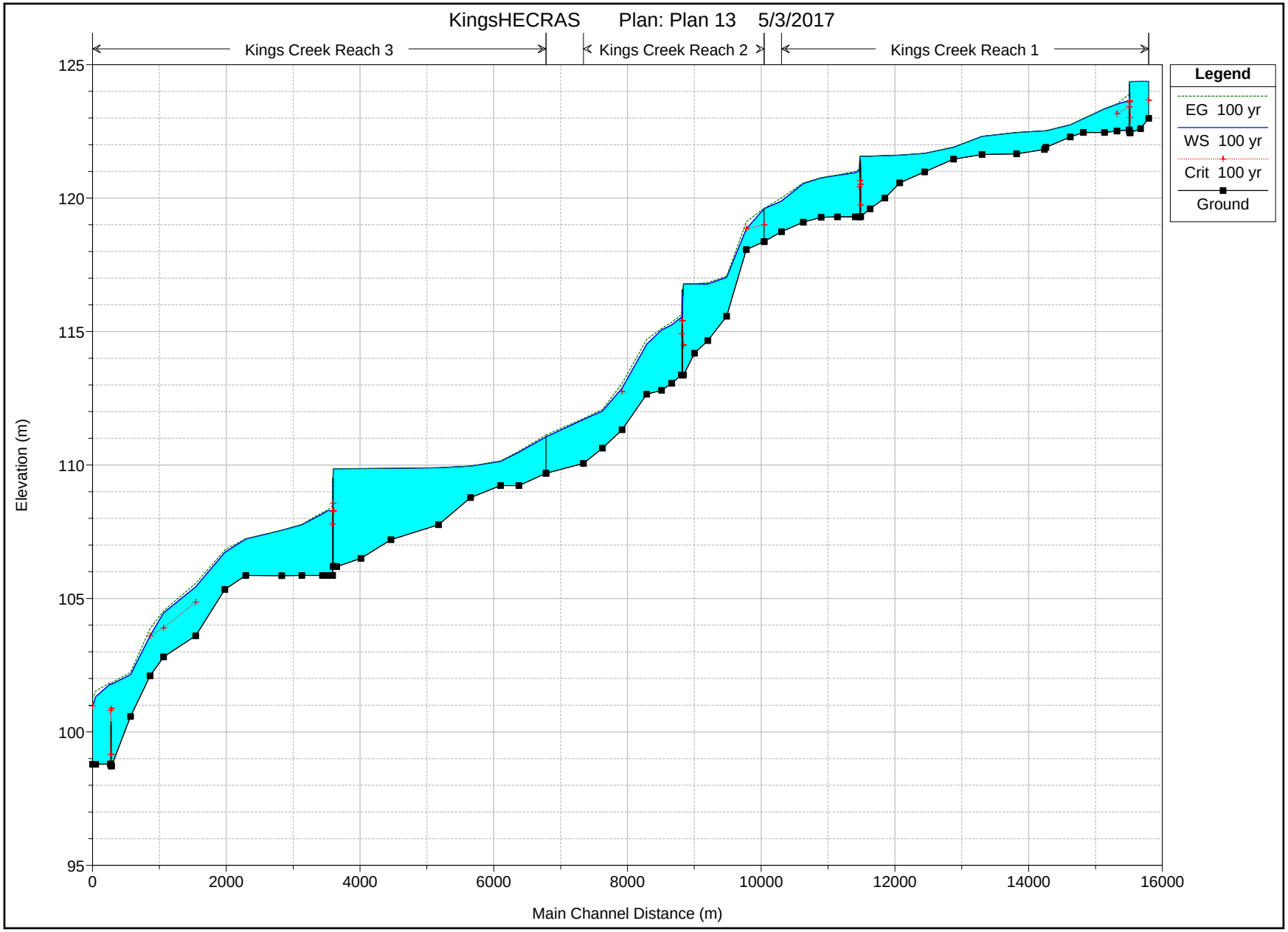
Ewan Hardie

Director
Watershed Science and Engineering Services
Rideau Valley Conservation Authority
ewan.hardie@rvca.ca
Tel: 613 692-3571 ext 1130
Fax: 613 692-0334

Rideau Valley Conservation Authority
3889 Rideau Valley Drive, Manotick, ON
K4M 1A5
www.rvca.ca

Appendix B

HEC-RAS Profiles and Cross-Sections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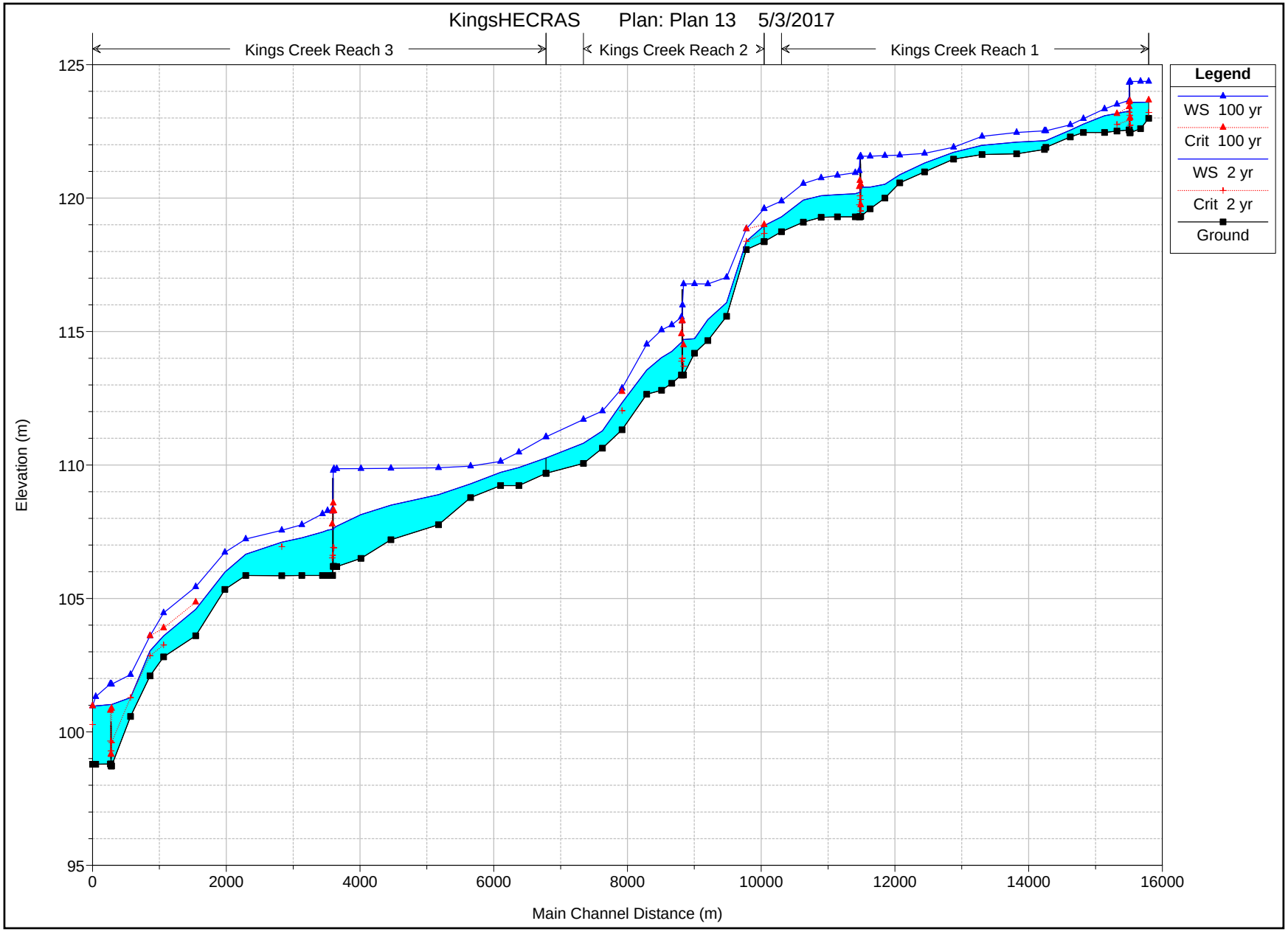
Kings Creek Reach 3
Kings Creek Reach 2
Kings Creek Reach 1
Legend
EG 100 yr
WS 100 yr
Crit 100 yr
Ground
Elevation (m)
Main Channel Distance (m)
125
120
115
110
105
100
95
0
2000
4000
6000
8000
10000
12000
14000
16000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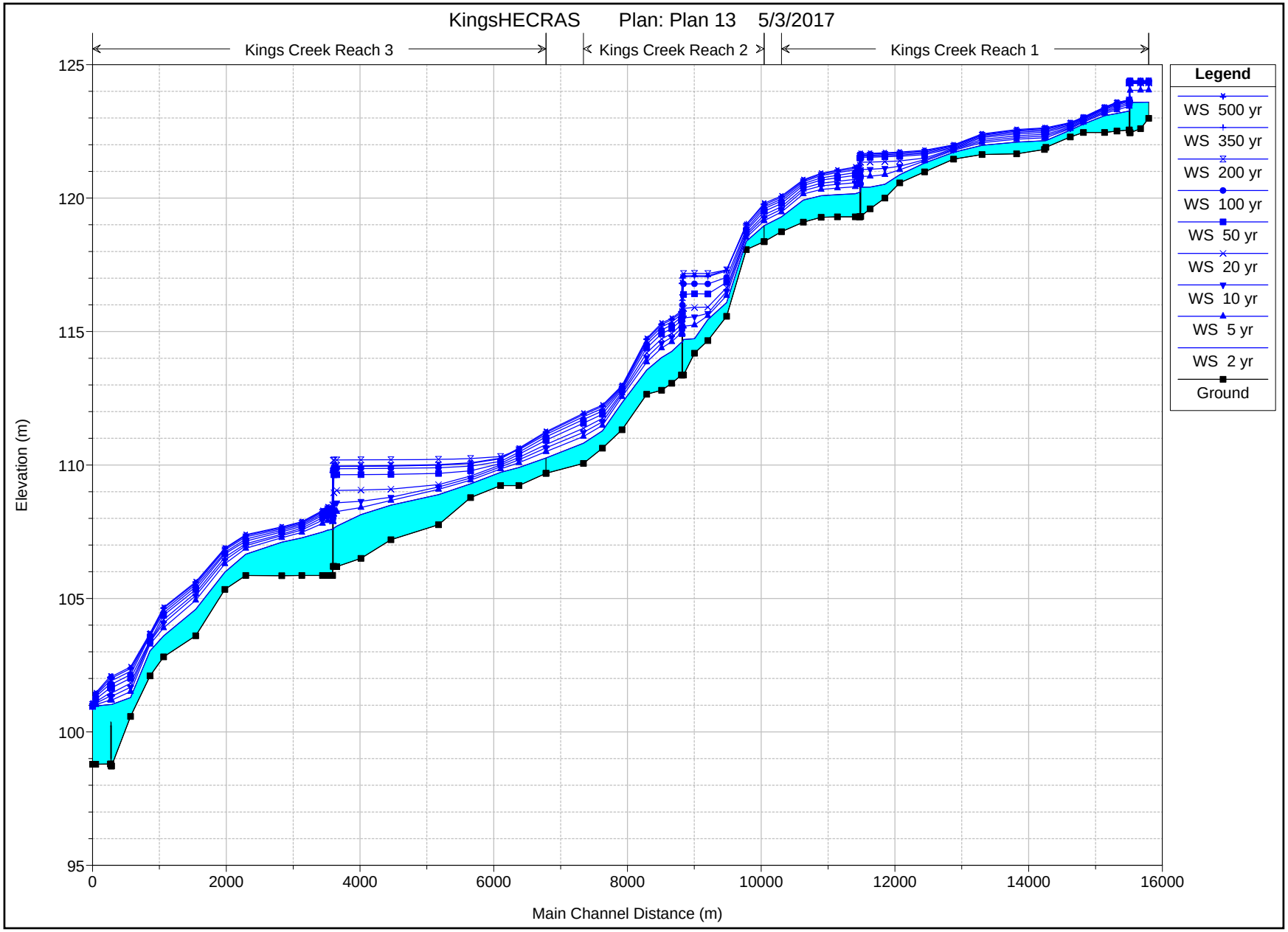
Kings Creek Reach 3
Kings Creek Reach 2
Kings Creek Reach 1
Legend
WS 100 yr
Crit 100 yr
WS 2 yr
Crit 2 yr
Ground
Elevation (m)
125
120
115
110
105
100
95
0
2000
4000
6000
8000
10000
12000
14000
16000
Main Channel Distance (m)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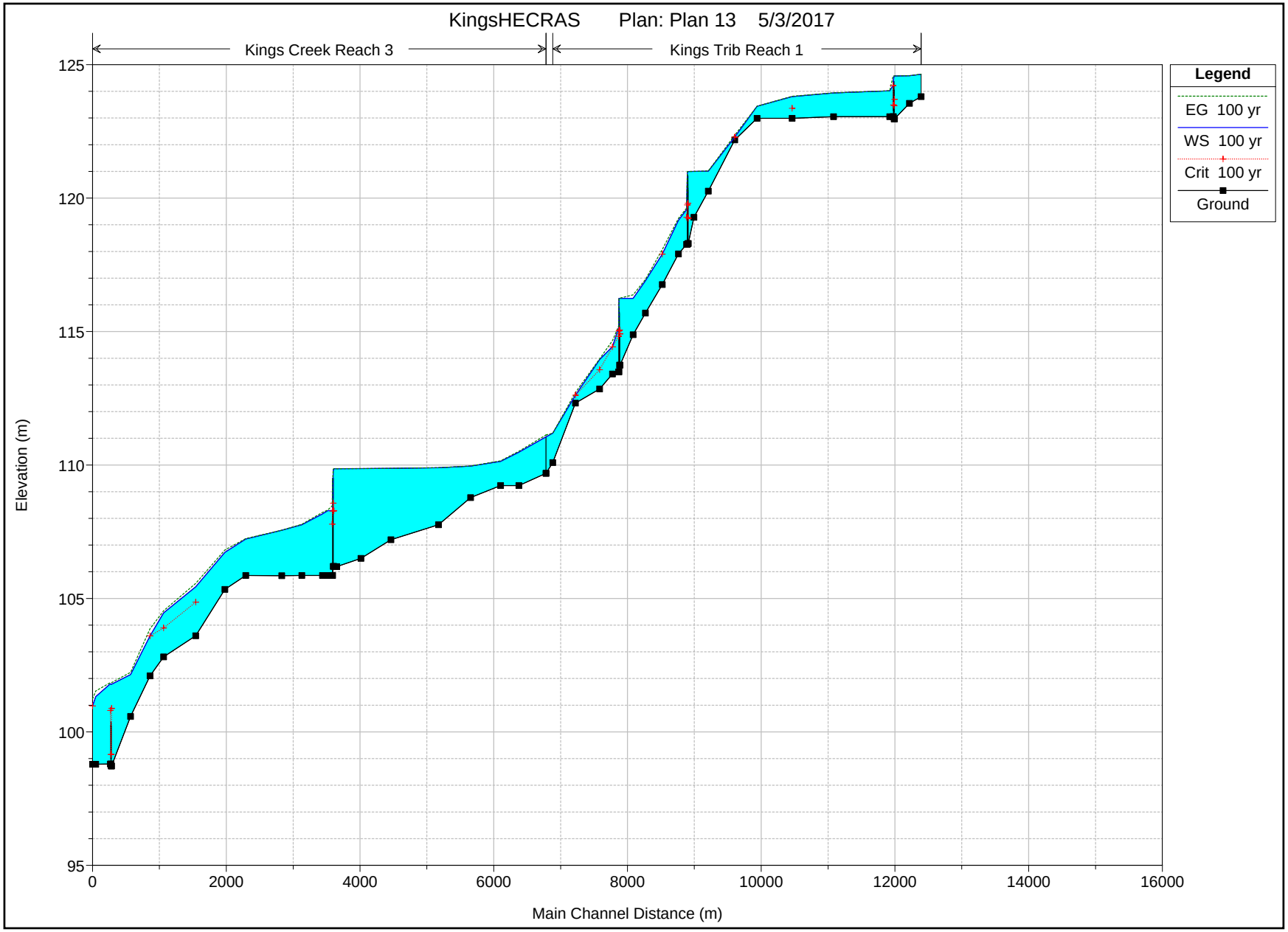
Kings Creek Reach 2
Kings Creek Reach 1
Legend
WS 500 yr
WS 350 yr
WS 200 yr
WS 100 yr
WS 50 yr
WS 20 yr
WS 10 yr
WS 5 yr
WS 2 yr
Ground
Elevation (m)
125
120
115
110
105
100
95
0
2000
4000
6000
8000
10000
12000
14000
16000
Main Channel Distance (m)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Kings Creek Reach 3
Kings Trib Reach 1
Legend
EG 100 yr
WS 100 yr
Crit 100 yr
Ground
Elevation (m)
Main Channel Distance (m)
125
120
115
110
105
100
95
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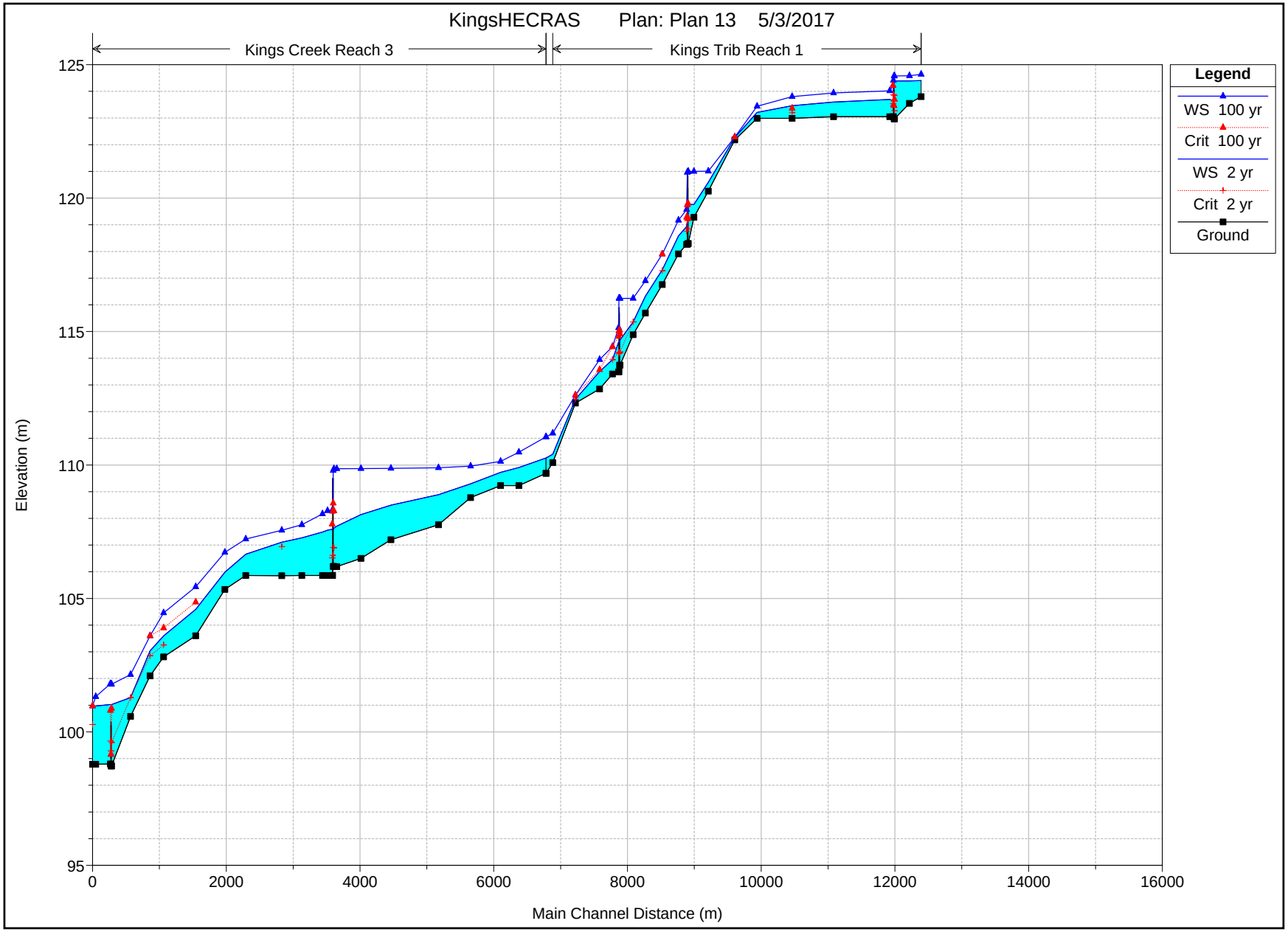
14000
16000


KingsHECRAS Plan: Plan 13 5/3/2017
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Kings Trib Reach 1
Legend
WS 100 yr
Crit 100 yr
WS 2 yr
Crit 2 yr
Ground
Elevation (m)
Main Channel Distance (m)
125
120
115
110
105
100
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8000
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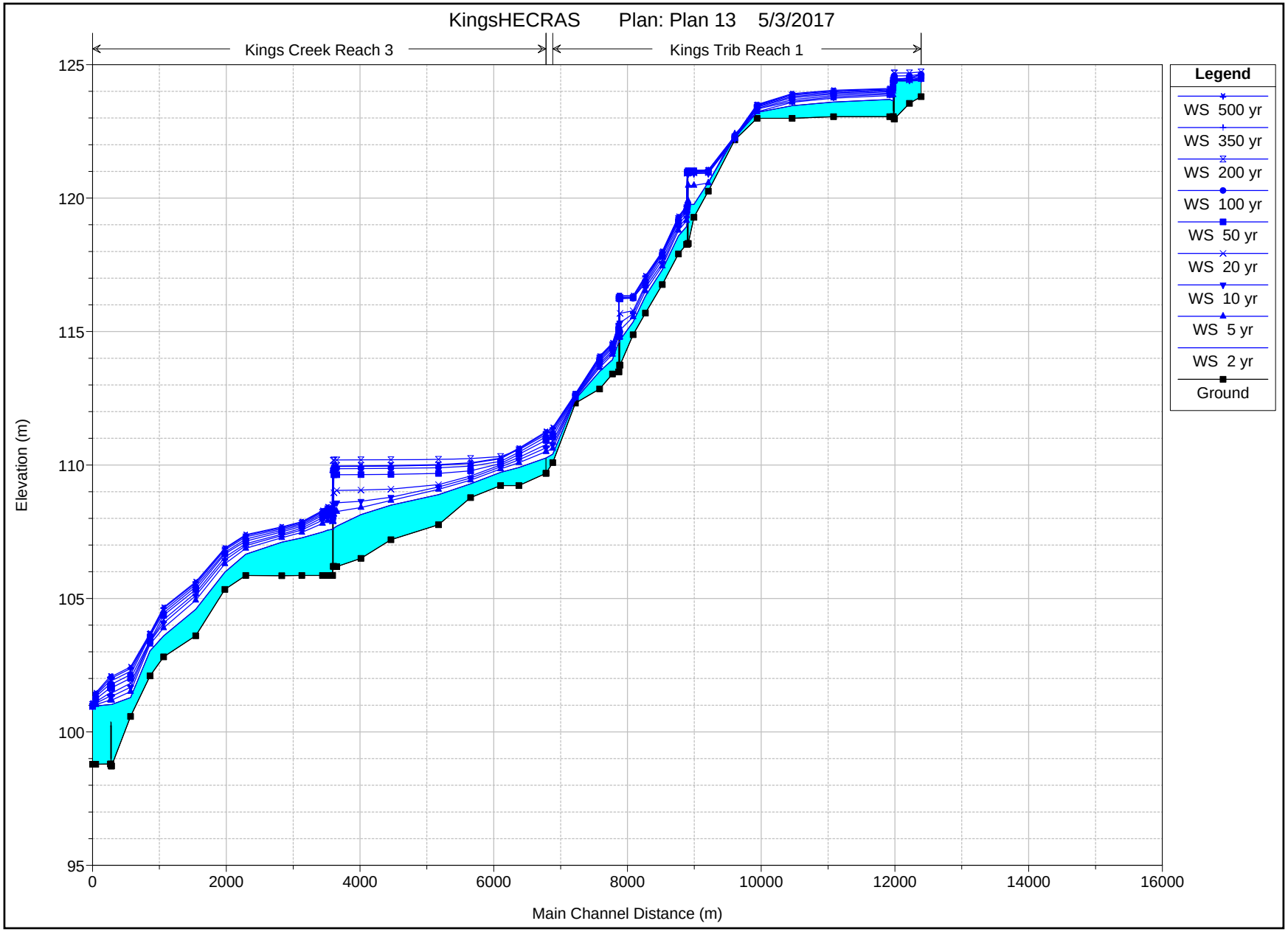
12000
14000
16000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Kings Creek Reach 3
Kings Trib Reach 1
Elevation (m)
125
120
115
110
105
100
95
0
2000
4000
6000
8000
10000
12000
14000
16000
Main Channel Distance (m)
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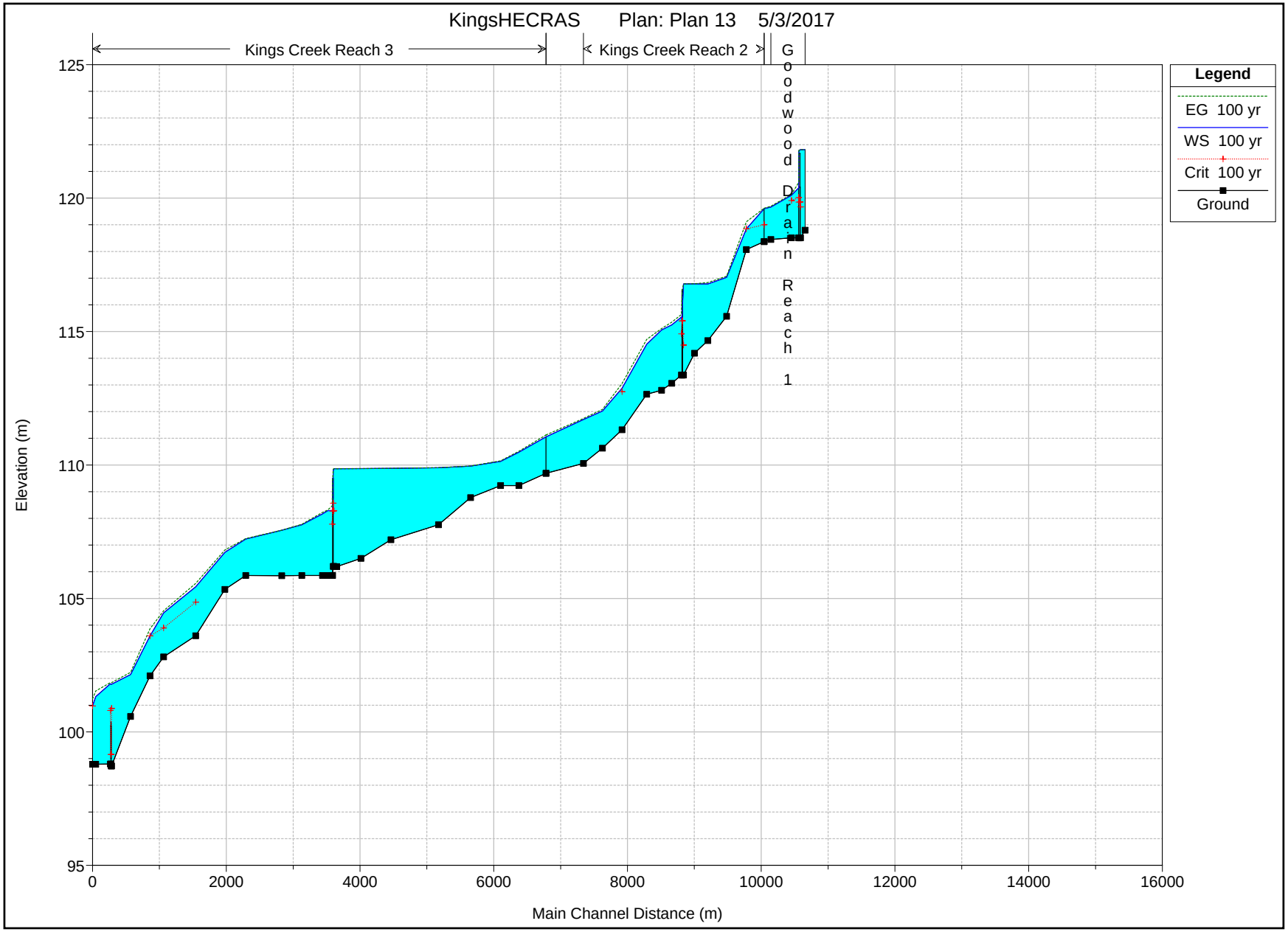
WS 350 yr
WS 200 yr
WS 100 yr
WS 50 yr
WS 20 yr
WS 10 yr
WS 5 yr
WS 2 yr
Ground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Kings Creek Reach 3
Kings Creek Reach 2
Goodwood Drain Reach 1
Legend
EG 100 yr
WS 100 yr
Crit 100 yr
Ground
Elevation (m)
Main Channel Distance (m)
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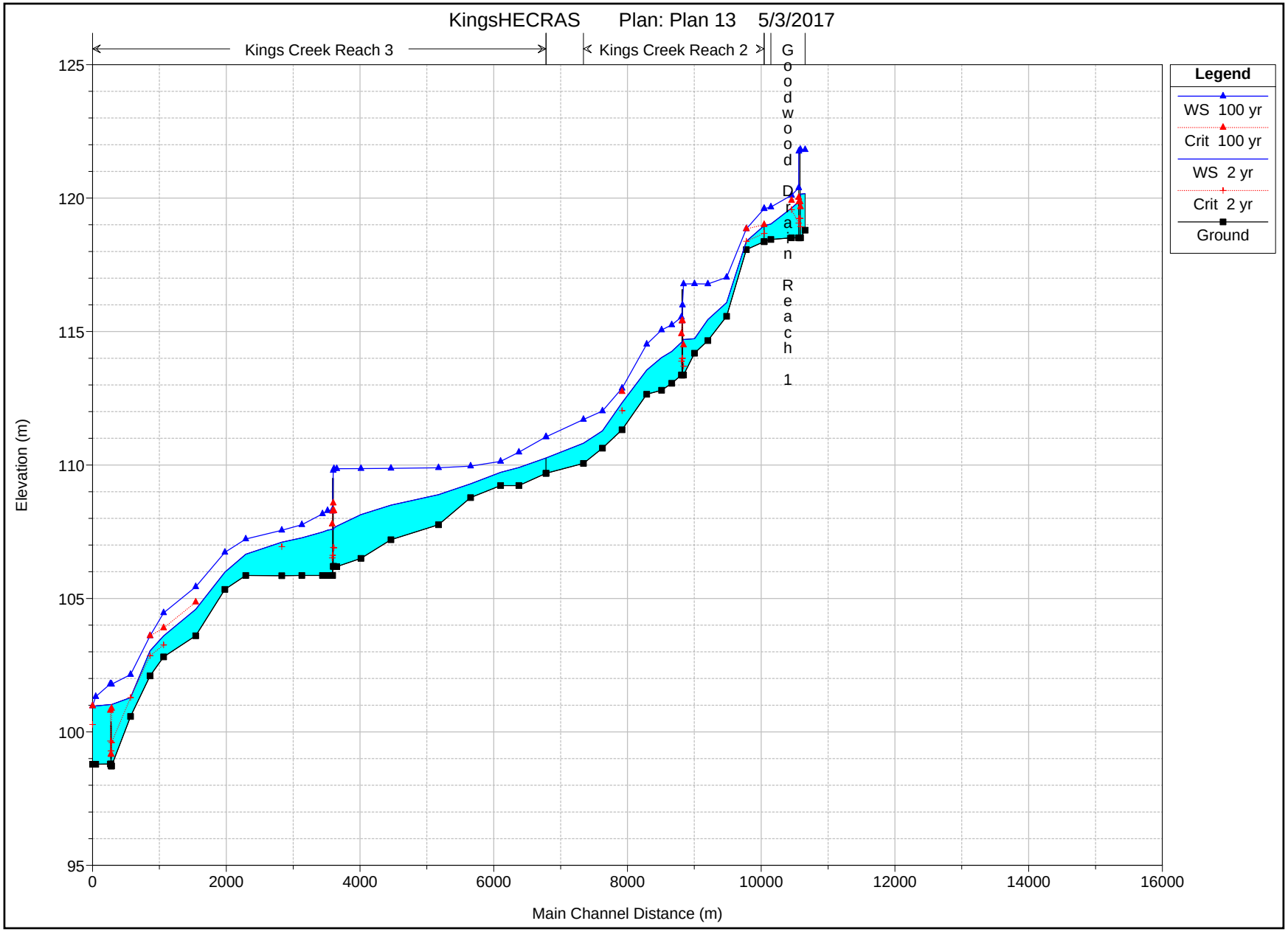
120
115
110
105
100
95
0
2000
4000
6000
8000
10000
12000
14000
16000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Goodwood Drain Reach 1
Legend
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Crit 100 yr
WS 2 yr
Crit 2 yr
Ground
Elevation (m)
Main Channel Distance (m)
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120
115
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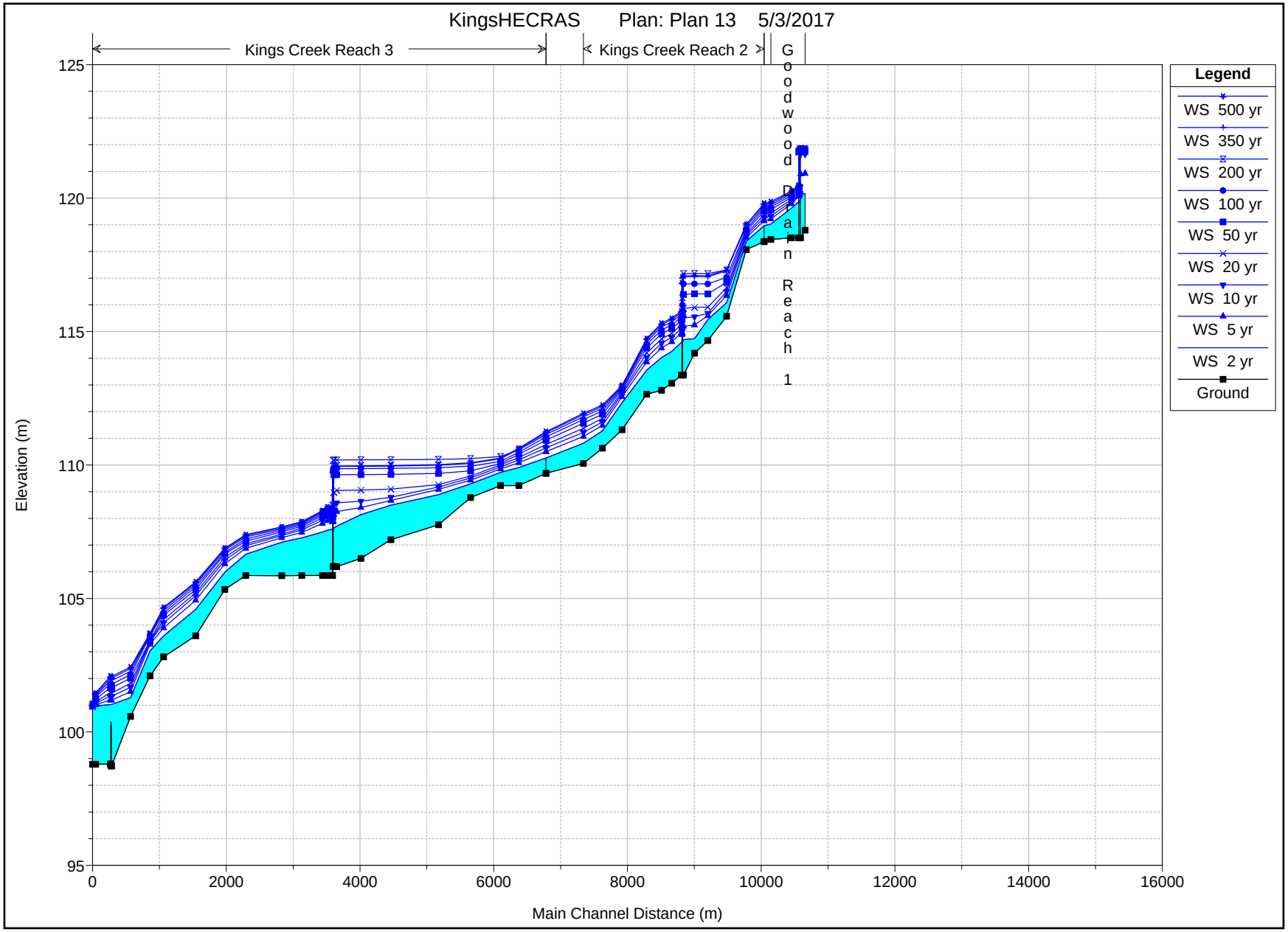
12000
14000
16000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Kings Creek Reach 2
Goodwood Dam Reach 1
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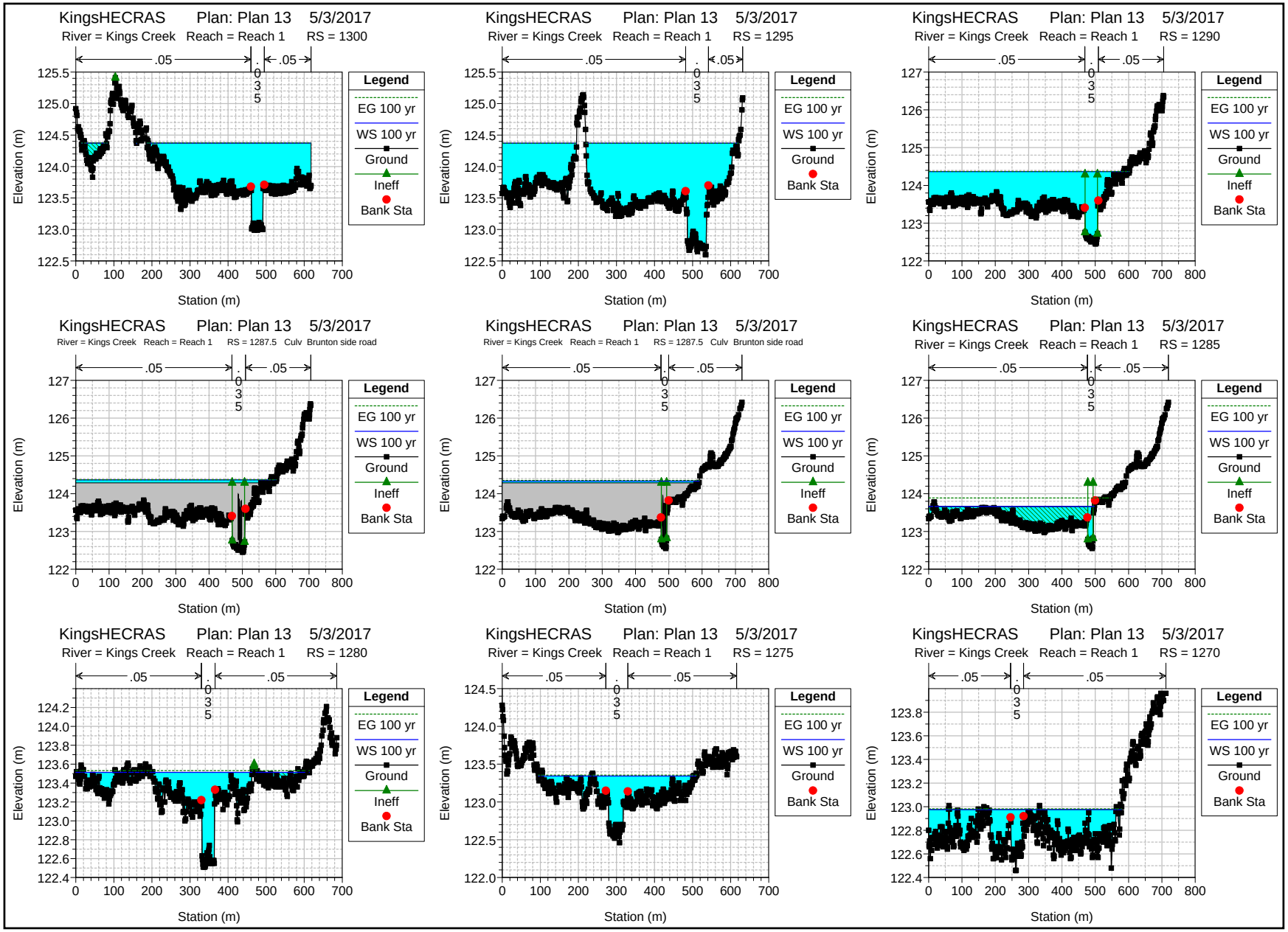
WS 350 yr
WS 200 yr
WS 100 yr
WS 50 yr
WS 20 yr
WS 10 yr
WS 5 yr
WS 2 yr
Ground
Elevation (m)
125
120
115
110
105
100
95
0
2000
4000
6000
8000
10000
12000
14000
16000
Main Channel Distance (m)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River = Kings Creek Reach = Reach 1 RS = 1287.5 Culv Brunton side road
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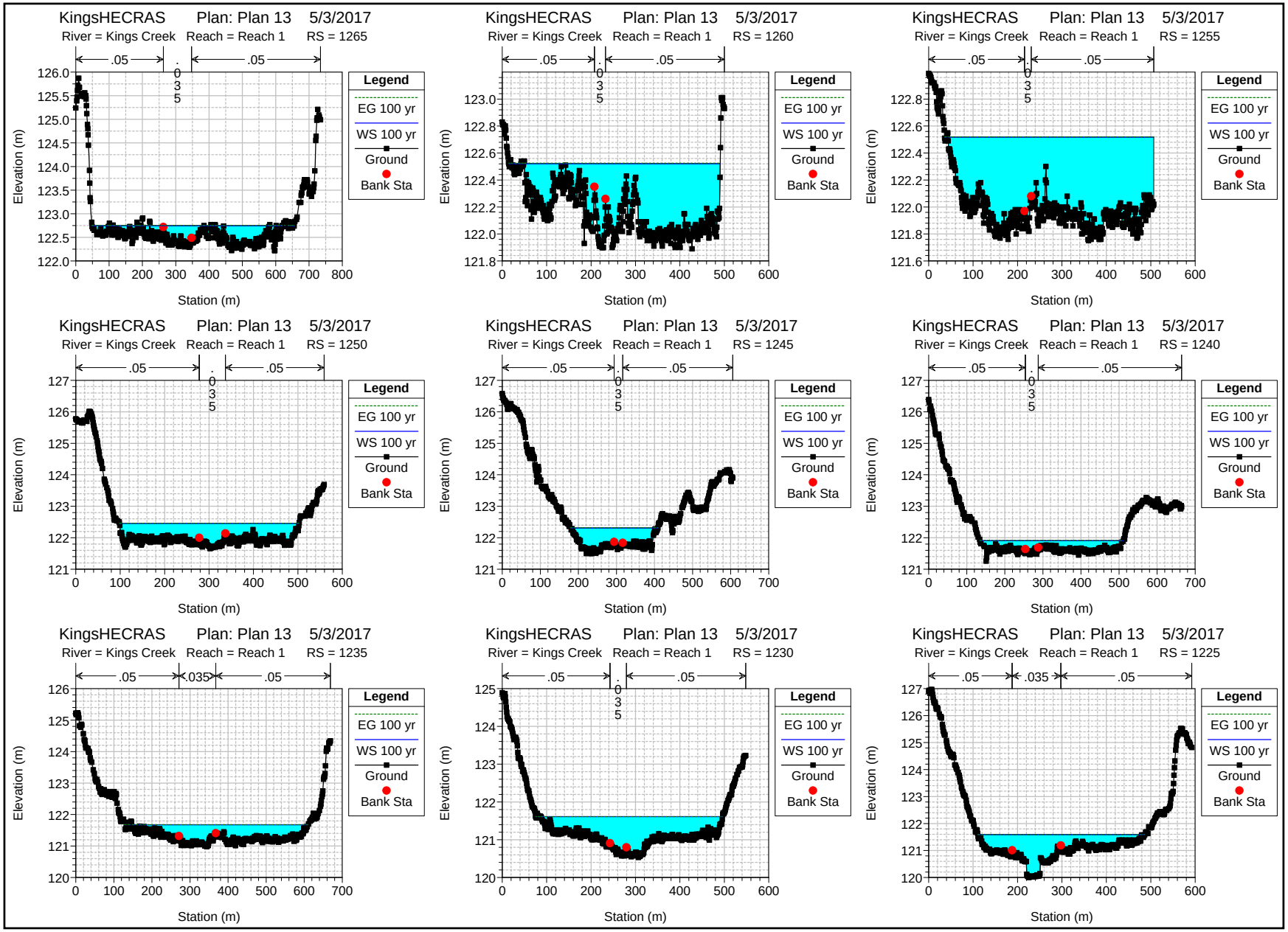
.05
.035
Legend
EG 100 yr
WS 100 yr
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)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KingsHECRAS Plan: Plan 13 5/3/2017
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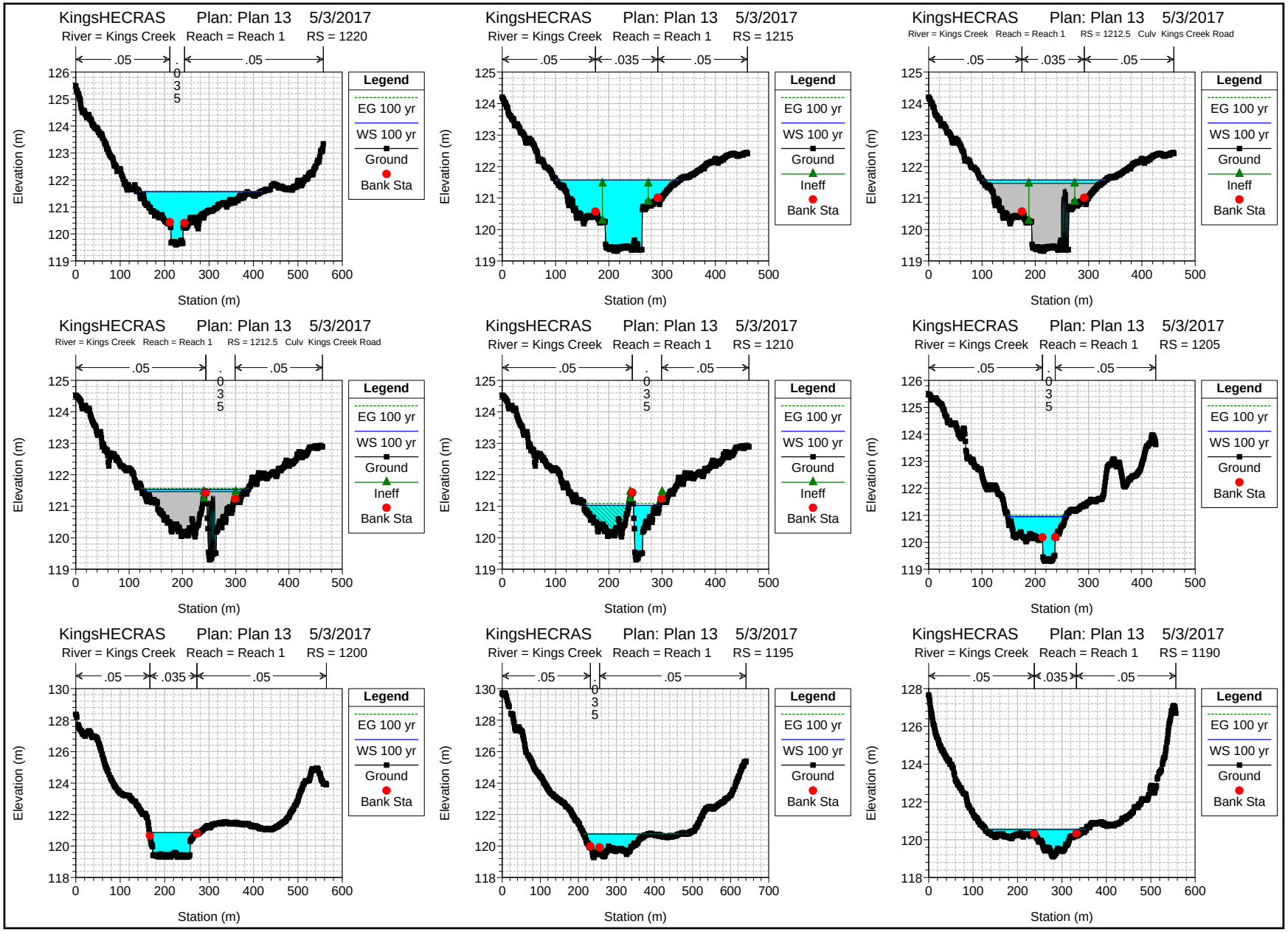
.035
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
Elevation (m)
Station (m)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WS 100 yr
Ground
Bank Sta
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Station (m)
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.05 .035 .05
Legend
EG 100 yr
WS 100 yr
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
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River = Kings Creek Reach = Reach 1 RS = 1212.5 Culv Kings Creek Road
.05 .035 .05
Legend
EG 100 yr
WS 100 yr
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
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.05 .035 .05
Legend
EG 100 yr
WS 100 yr
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
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Legend
EG 100 yr
WS 100 yr
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
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.05 .035 .05
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
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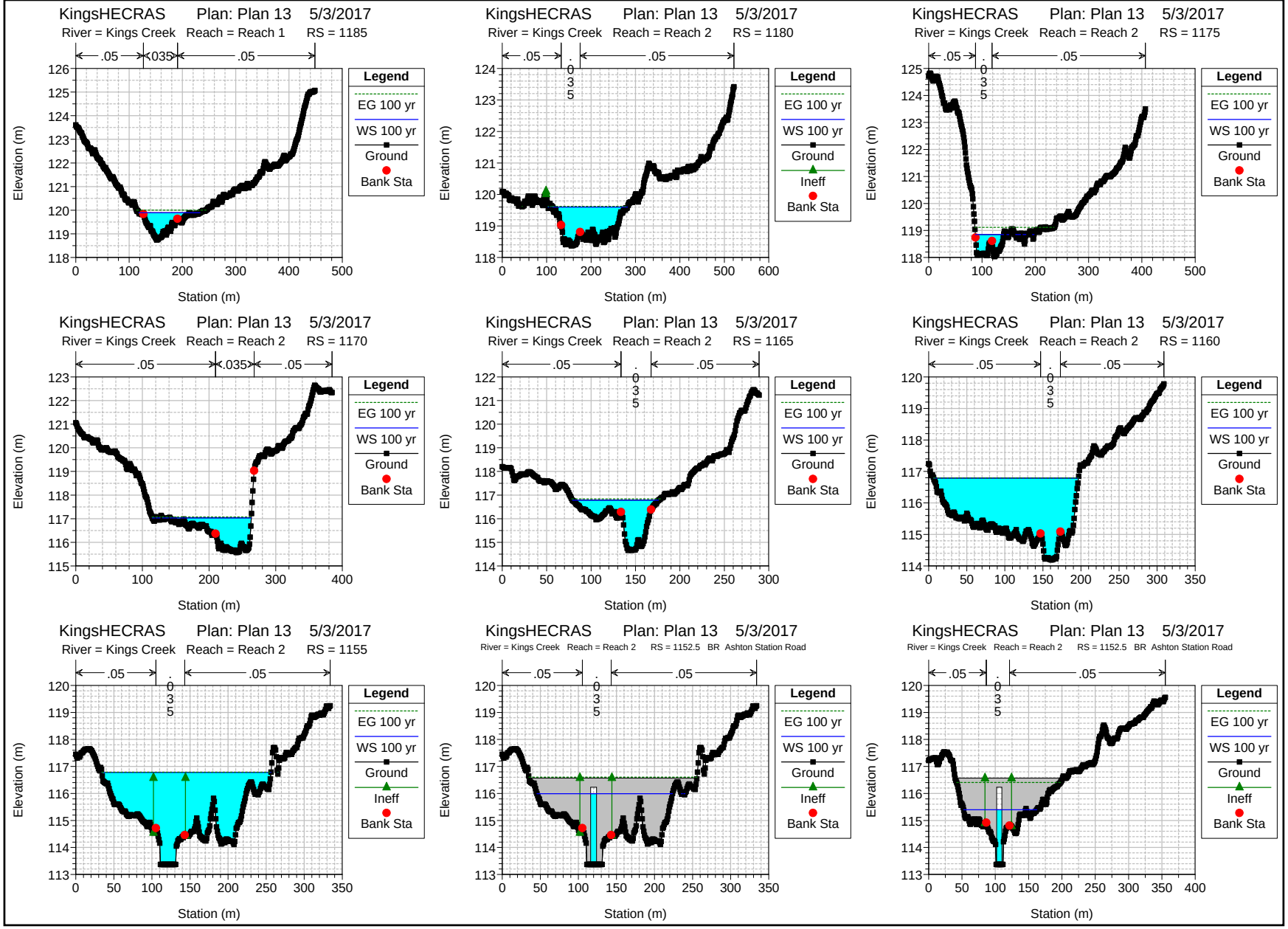
.05 .035 .05
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 1 RS = 1195
.05 .035 .05
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 1 RS = 1190
.05 .035 .05
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
Elevation (m)
Station (m)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KingsHECRAS Plan: Plan 13 5/3/2017
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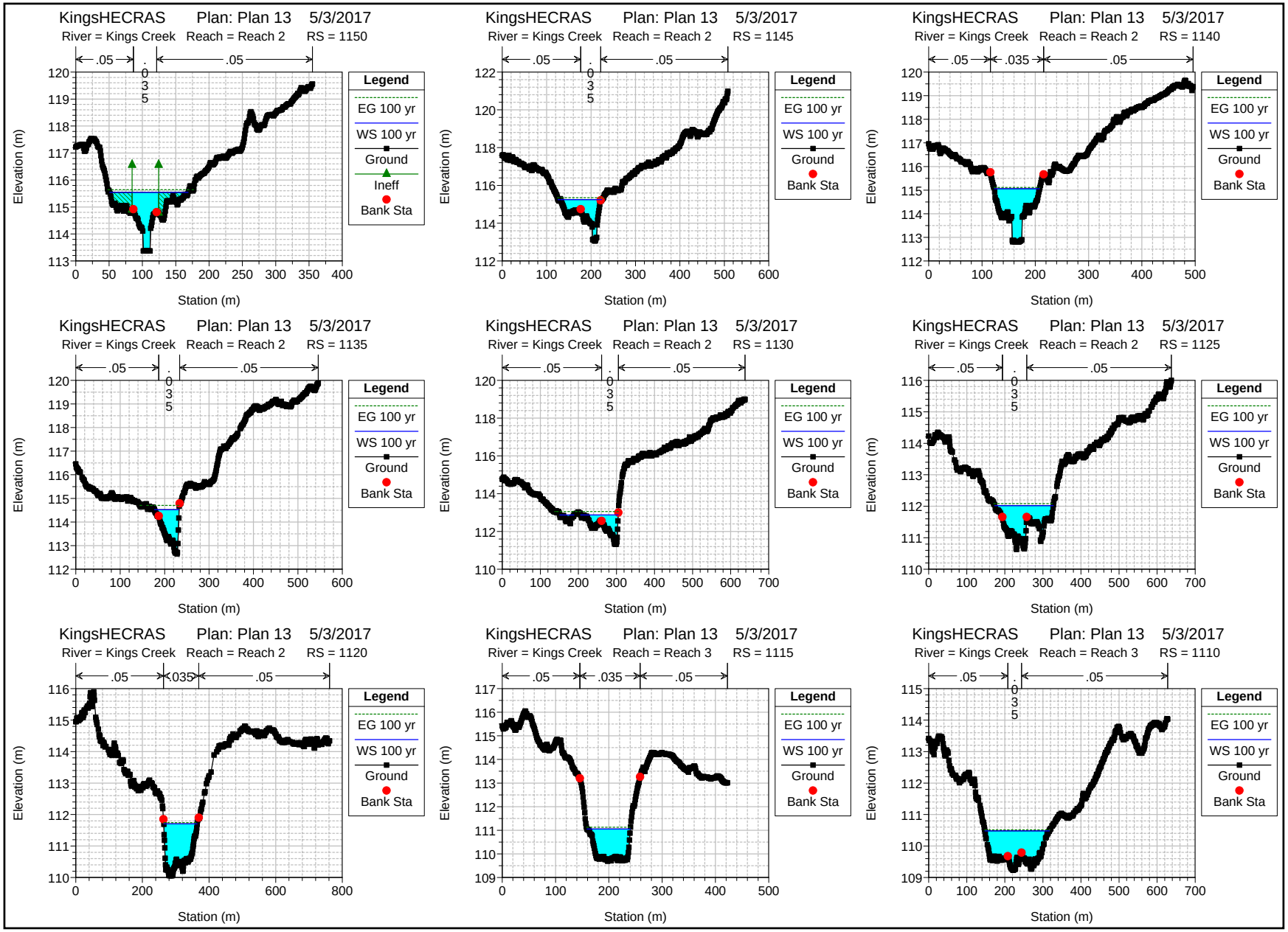
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 2 RS = 1170
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 2 RS = 1165
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 2 RS = 1160
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 2 RS = 1155
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 2 RS = 1152.5 BR Ashton Station Road
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 2 RS = 1152.5 BR Ashton Station Road
Elevation (m)
Station (m)
.05
.035
Legend
EG 100 yr
WS 100 yr
Ground
Ineff
Bank Sta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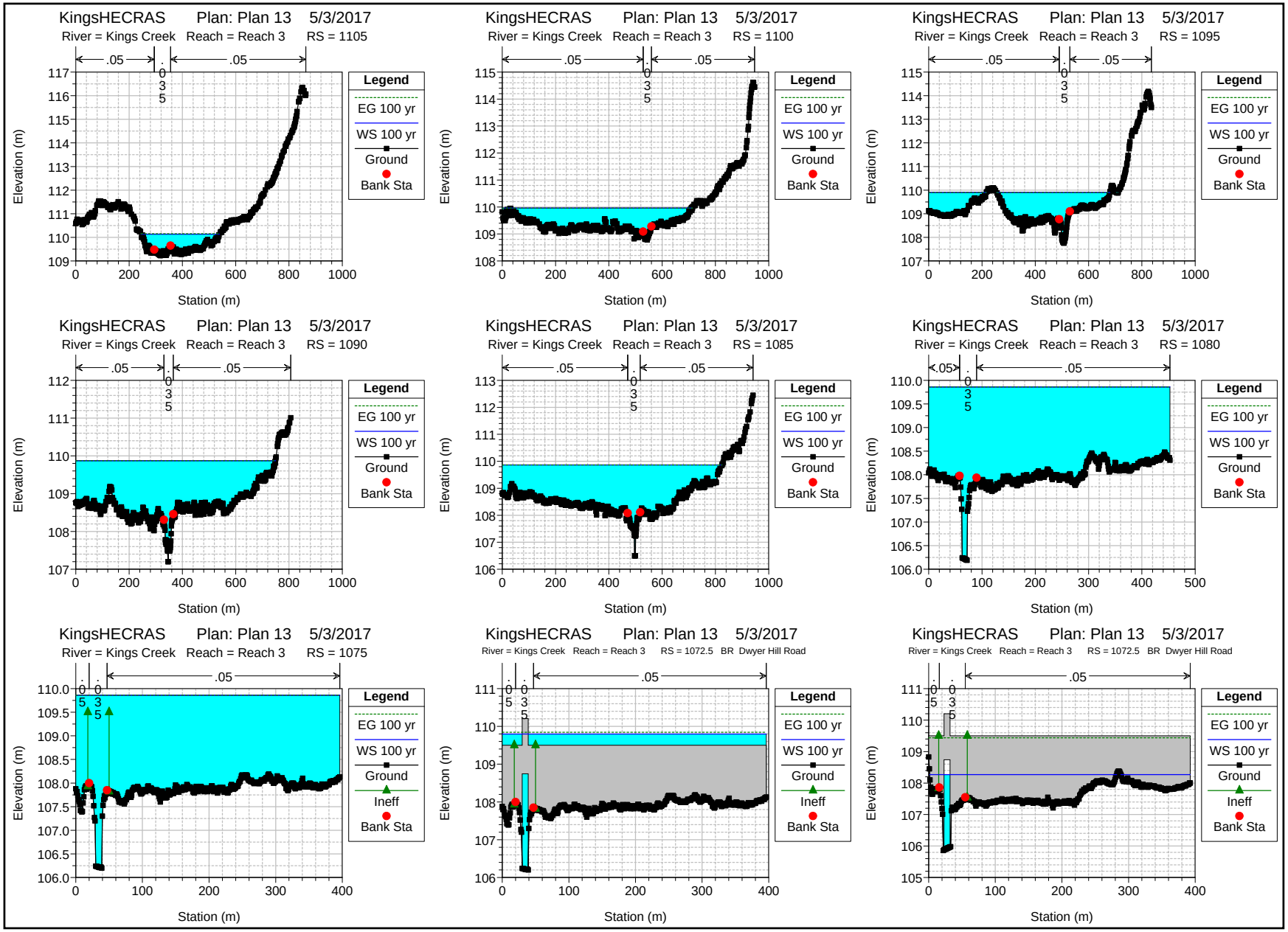
River = Kings Creek Reach = Reach 2 RS = 1150
.05 .035 .05
Legend
EG 100 yr
WS 100 yr
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 2 RS = 1145
.05 .035 .05
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 2 RS = 1140
.05 .035 .05
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 2 RS = 1135
.05 .035 .05
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 2 RS = 1130
.05 .035 .05
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 2 RS = 1125
.05 .035 .05
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 2 RS = 1120
.05 .035 .05
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 3 RS = 1115
.05 .035 .05
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 3 RS = 1110
.05 .035 .05
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
Elevation (m)
Station (m)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KingsHECRAS Plan: Plan 13 5/3/2017
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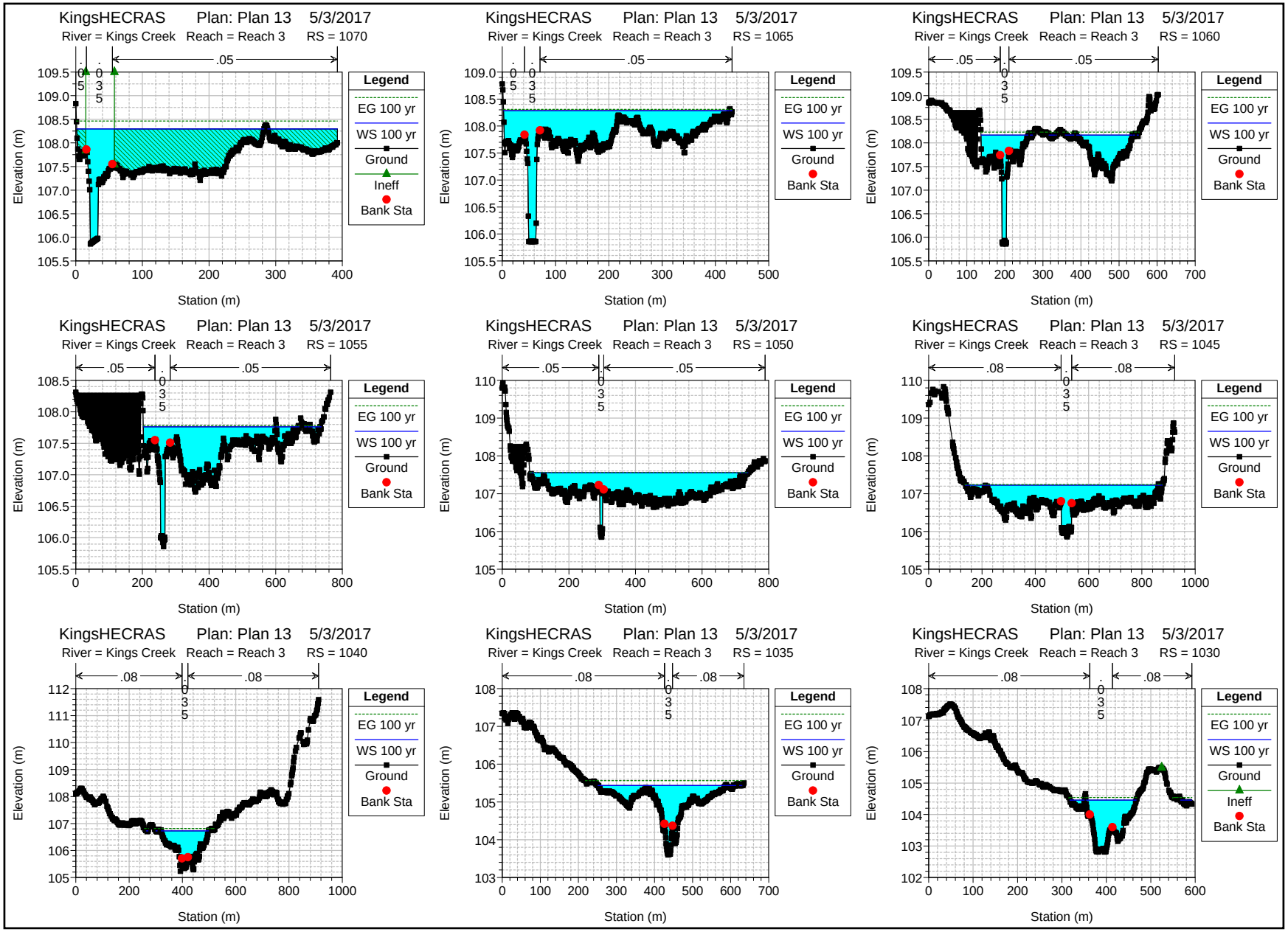
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 3 RS = 1090
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 3 RS = 1085
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 3 RS = 1080
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 3 RS = 1075
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 3 RS = 1072.5 BR Dwyer Hill Road
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 3 RS = 1072.5 BR Dwyer Hill Road
Elevation (m)
Station (m)
.05
.035
Legend
EG 100 yr
WS 100 yr
Ground
Ineff
Bank Sta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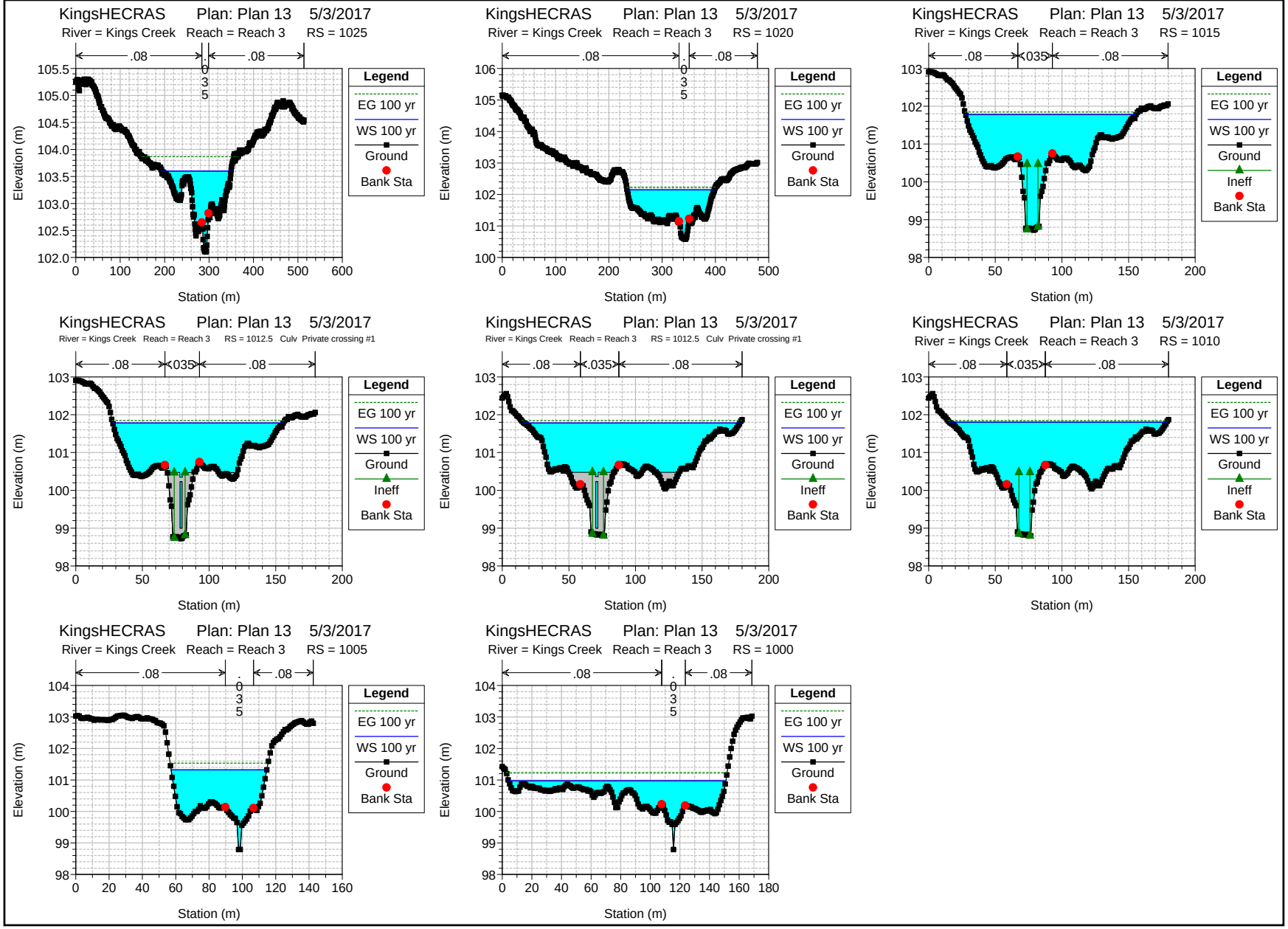
River = Kings Creek Reach = Reach 3 RS = 1065
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 3 RS = 1060
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 3 RS = 1055
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 3 RS = 1050
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 3 RS = 1045
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 3 RS = 1040
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 3 RS = 1035
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 3 RS = 1030
Legend
EG 100 yr
WS 100 yr
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)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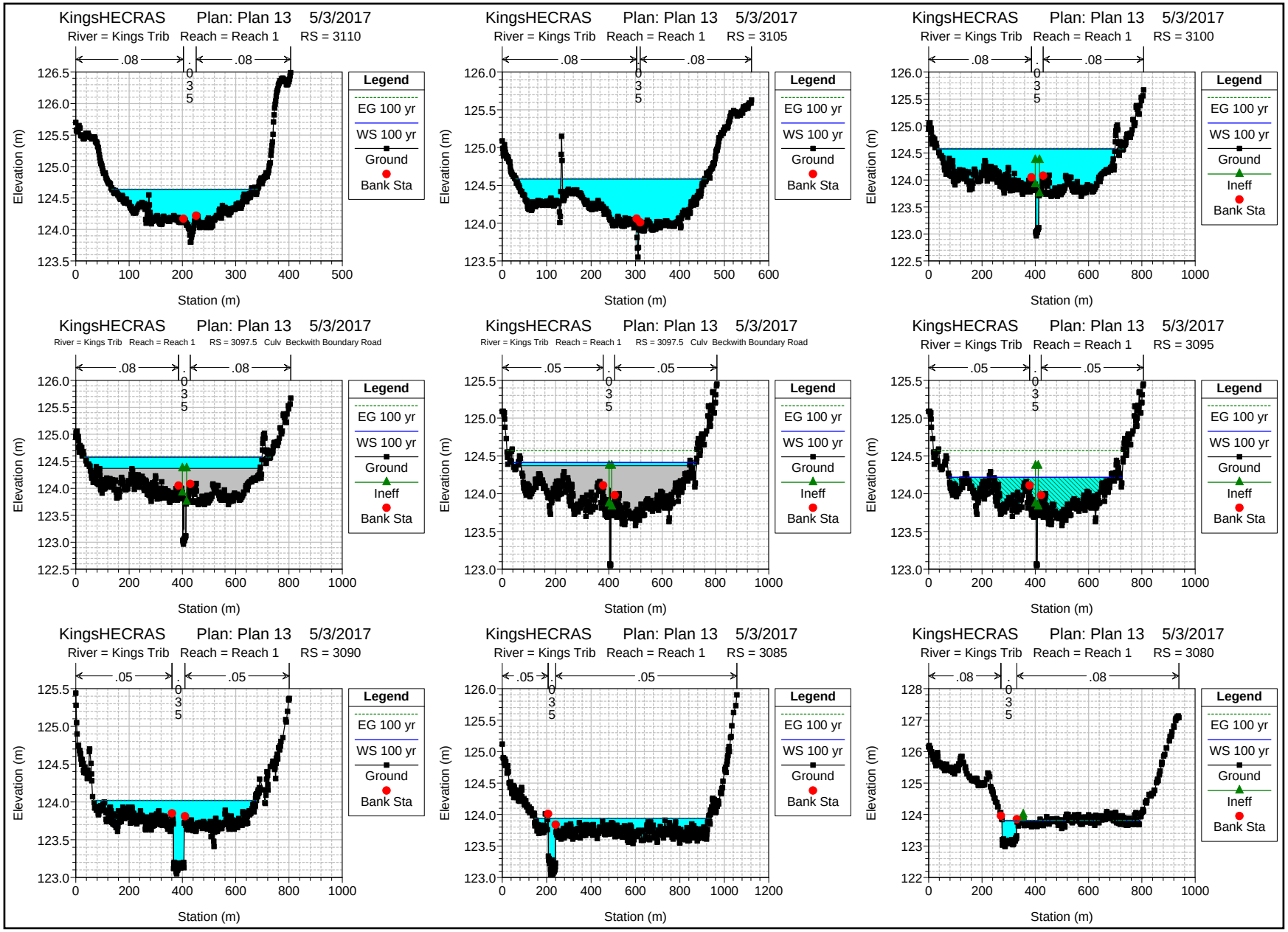
River = Kings Creek Reach = Reach 3 RS = 1025
.08
.035
.08
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 3 RS = 1020
.08
.035
.08
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 3 RS = 1015
.08
.035
.08
Legend
EG 100 yr
WS 100 yr
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 3 RS = 1012.5 Culv Private crossing #1
.08
.035
.08
Legend
EG 100 yr
WS 100 yr
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 3 RS = 1012.5 Culv Private crossing #1
.08
.035
.08
Legend
EG 100 yr
WS 100 yr
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 3 RS = 1010
.08
.035
.08
Legend
EG 100 yr
WS 100 yr
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 3 RS = 1005
.08
.035
.08
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Creek Reach = Reach 3 RS = 1000
.08
.035
.08
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
Elevation (m)
Station (m)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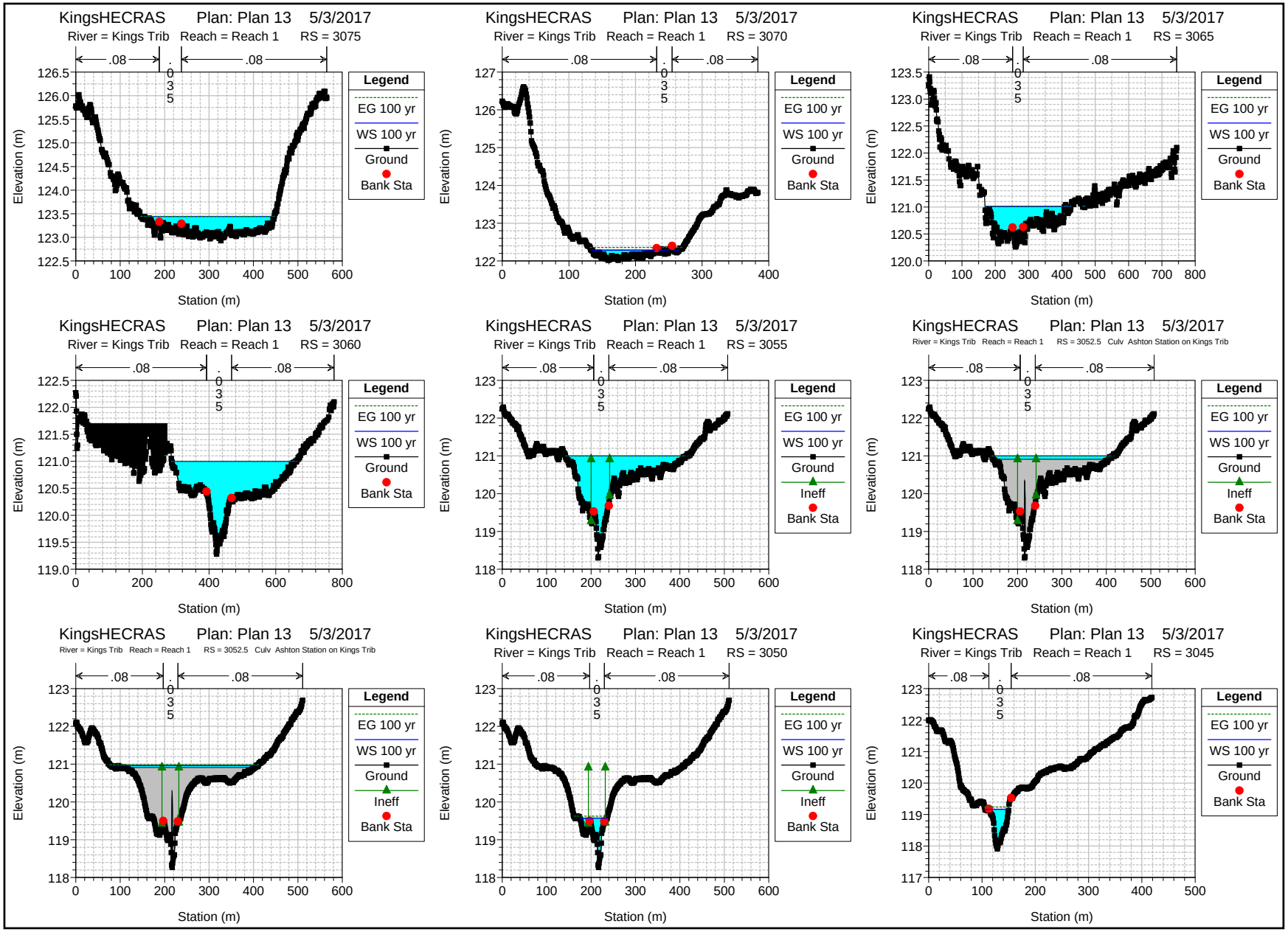
River = Kings Trib Reach = Reach 1 RS = 3110
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Trib Reach = Reach 1 RS = 3105
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Trib Reach = Reach 1 RS = 3100
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Trib Reach = Reach 1 RS = 3097.5 Culv Beckwith Boundary Road
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Trib Reach = Reach 1 RS = 3097.5 Culv Beckwith Boundary Road
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Trib Reach = Reach 1 RS = 3095
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Trib Reach = Reach 1 RS = 3090
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Trib Reach = Reach 1 RS = 3085
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Trib Reach = Reach 1 RS = 3080
Legend
EG 100 yr
WS 100 yr
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)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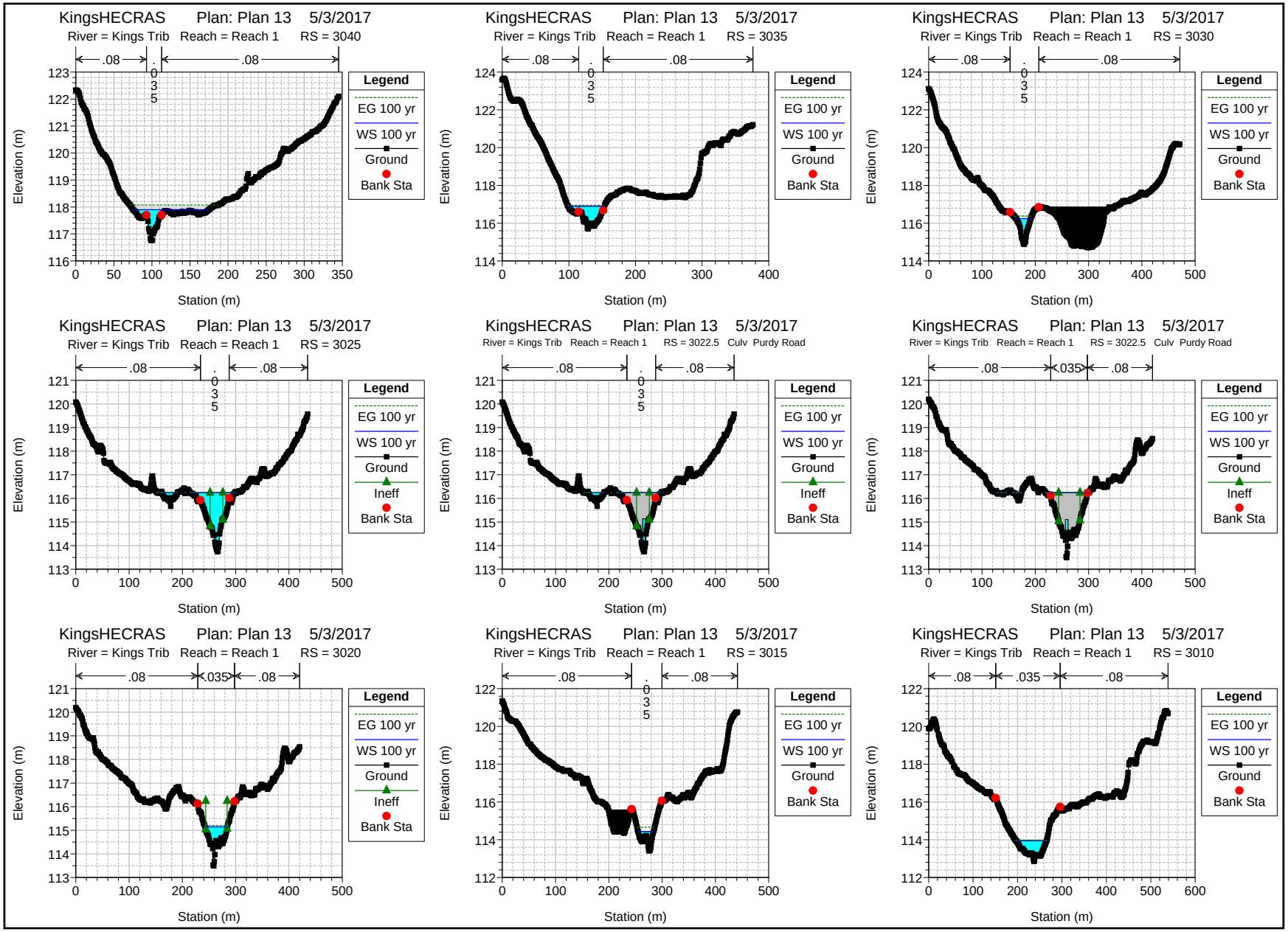
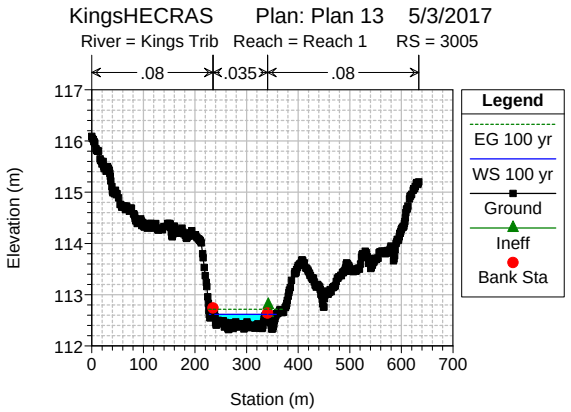
River = Kings Trib Reach = Reach 1 RS = 3075
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Trib Reach = Reach 1 RS = 3070
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Trib Reach = Reach 1 RS = 3065
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Trib Reach = Reach 1 RS = 3060
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Trib Reach = Reach 1 RS = 3055
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Trib Reach = Reach 1 RS = 3052.5 Culv Ashton Station on Kings Trib
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Trib Reach = Reach 1 RS = 3052.5 Culv Ashton Station on Kings Trib
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Trib Reach = Reach 1 RS = 3050
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Trib Reach = Reach 1 RS = 3045
.08
.035
Legend
EG 100 yr
WS 100 yr
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)


KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Trib Reach = Reach 1 RS = 3040
.08 .035 .08
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Trib Reach = Reach 1 RS = 3035
.08 .035 .08
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Trib Reach = Reach 1 RS = 3030
.08 .035 .08
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Trib Reach = Reach 1 RS = 3025
.08 .035 .08
Legend
EG 100 yr
WS 100 yr
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Trib Reach = Reach 1 RS = 3022.5 Culv Purdy Road
.08 .035 .08
Legend
EG 100 yr
WS 100 yr
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Trib Reach = Reach 1 RS = 3022.5 Culv Purdy Road
.08 .035 .08
Legend
EG 100 yr
WS 100 yr
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Trib Reach = Reach 1 RS = 3020
.08 .035 .08
Legend
EG 100 yr
WS 100 yr
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Trib Reach = Reach 1 RS = 3015
.08 .035 .08
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Trib Reach = Reach 1 RS = 3010
.08 .035 .08
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
Elevation (m)
Station (m)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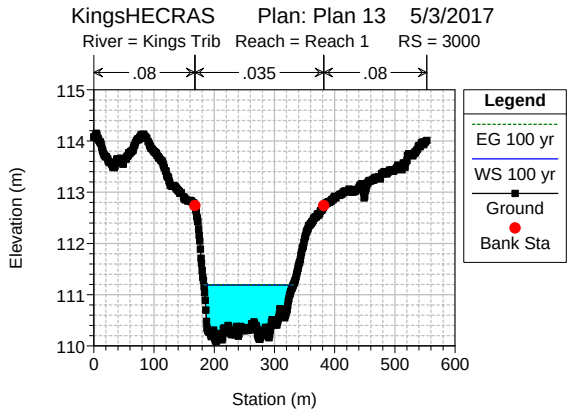
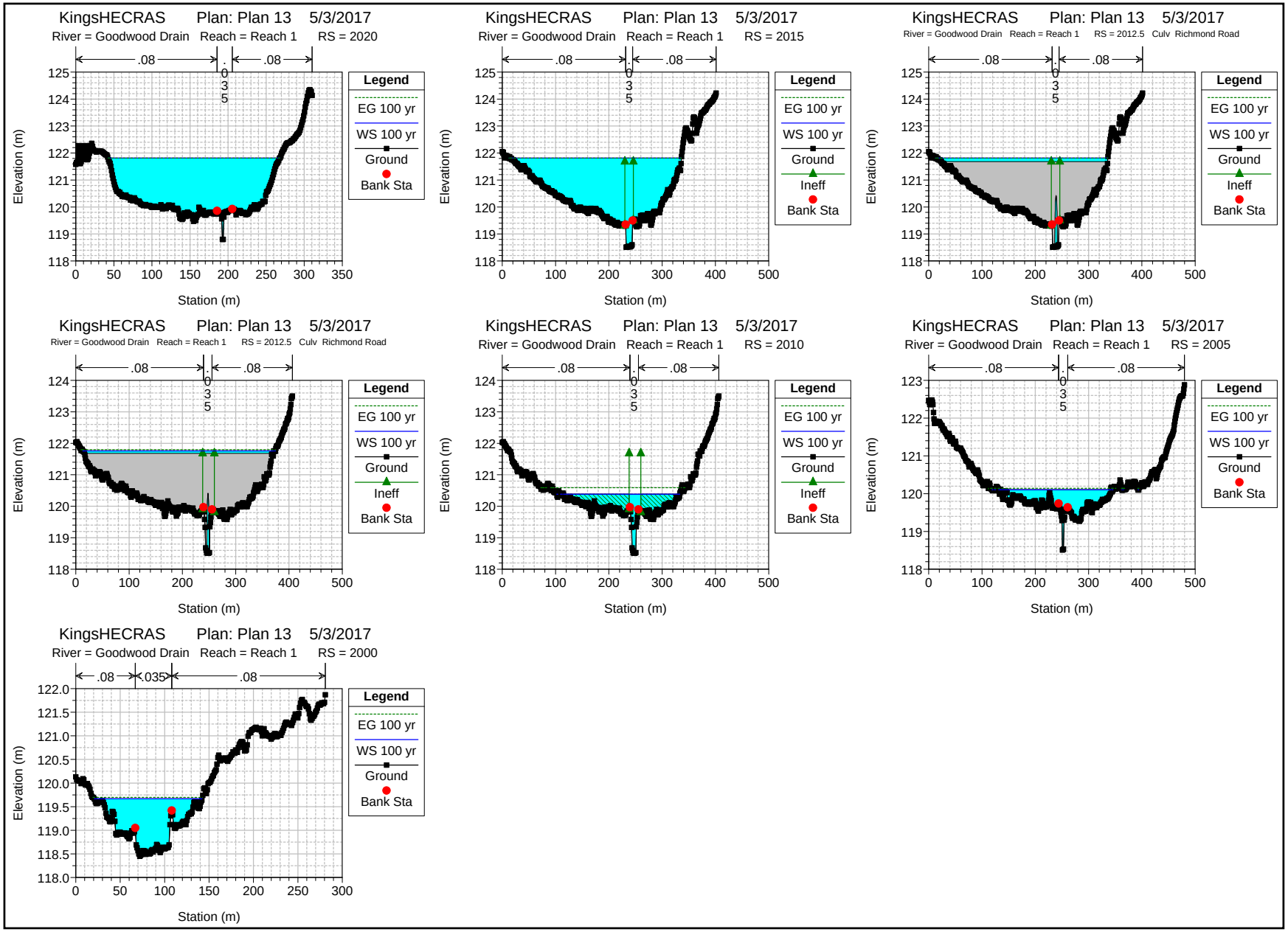
River = Kings Trib Reach = Reach 1 RS = 3005
.08
.035
.08
Elevation (m)
117
116
115
114
113
112
0
100
200
300
400
500
600
700
Station (m)
Legend
EG 100 yr
WS 100 yr
Ground
Ineff
Bank Sta


KingsHECRAS Plan: Plan 13 5/3/2017
River = Kings Trib Reach = Reach 1 RS = 3000
.08
.035
.08
Elevation (m)
115
114
113
112
111
110
0
100
200
300
400
500
600
Station (m)
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta


KingsHECRAS Plan: Plan 13 5/3/2017
River = Goodwood Drain Reach = Reach 1 RS = 2020
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Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Goodwood Drain Reach = Reach 1 RS = 2015
.08 .035 .08
Legend
EG 100 yr
WS 100 yr
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Goodwood Drain Reach = Reach 1 RS = 2012.5 Culv Richmond Road
.08 .035 .08
Legend
EG 100 yr
WS 100 yr
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Goodwood Drain Reach = Reach 1 RS = 2012.5 Culv Richmond Road
.08 .035 .08
Legend
EG 100 yr
WS 100 yr
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Goodwood Drain Reach = Reach 1 RS = 2010
.08 .035 .08
Legend
EG 100 yr
WS 100 yr
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Goodwood Drain Reach = Reach 1 RS = 2005
.08 .035 .08
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
Elevation (m)
Station (m)
KingsHECRAS Plan: Plan 13 5/3/2017
River = Goodwood Drain Reach = Reach 1 RS = 2000
.08 .035 .08
Legend
EG 100 yr
WS 100 yr
Ground
Bank Sta
Elevation (m)
Station (m)

Table B1 Manning n values

River	Reach	Xsec ID	Left Overbank n	Channel n	Right Overbank n
Kings Creek	Reach 1	1300	0.05	0.035	0.05
	Reach 1	1295	0.05	0.035	0.05
	Reach 1	1290	0.05	0.035	0.05
	Reach 1	1288	Brunton Side Road		
	Reach 1	1285	0.05	0.035	0.05
	Reach 1	1280	0.05	0.035	0.05
	Reach 1	1275	0.05	0.035	0.05
	Reach 1	1270	0.05	0.035	0.05
	Reach 1	1265	0.05	0.035	0.05
	Reach 1	1260	0.05	0.035	0.05
	Reach 1	1255	0.05	0.035	0.05
	Reach 1	1250	0.05	0.035	0.05
	Reach 1	1245	0.05	0.035	0.05
	Reach 1	1240	0.05	0.035	0.05
	Reach 1	1235	0.05	0.035	0.05
	Reach 1	1230	0.05	0.035	0.05
	Reach 1	1225	0.05	0.035	0.05
	Reach 1	1220	0.05	0.035	0.05
	Reach 1	1215	0.05	0.035	0.05
	Reach 1	1213	Kings Creek Road		
	Reach 1	1210	0.05	0.035	0.05
	Reach 1	1205	0.05	0.035	0.05
	Reach 1	1200	0.05	0.035	0.05
	Reach 1	1195	0.05	0.035	0.05
	Reach 1	1190	0.05	0.035	0.05
	Reach 1	1185	0.05	0.035	0.05
	Reach 2	1180	0.05	0.035	0.05
	Reach 2	1175	0.05	0.035	0.05
	Reach 2	1170	0.05	0.035	0.05
	Reach 2	1165	0.05	0.035	0.05
	Reach 2	1160	0.05	0.035	0.05
	Reach 2	1155	0.05	0.035	0.05
	Reach 2	1153	Ashton Station Road		
	Reach 2	1150	0.05	0.035	0.05
	Reach 2	1145	0.05	0.035	0.05
	Reach 2	1140	0.05	0.035	0.05
	Reach 2	1135	0.05	0.035	0.05
	Reach 2	1130	0.05	0.035	0.05
	Reach 2	1125	0.05	0.035	0.05
	Reach 2	1120	0.05	0.035	0.05
	Reach 3	1115	0.05	0.035	0.05
	Reach 3	1110	0.05	0.035	0.05
	Reach 3	1105	0.05	0.035	0.05
	Reach 3	1100	0.05	0.035	0.05
	Reach 3	1095	0.05	0.035	0.05
	Reach 3	1090	0.05	0.035	0.05
	Reach 3	1085	0.05	0.035	0.05
	Reach 3	1080	0.05	0.035	0.05

River	Reach	Xsec ID	Left Overbank n	Channel n	Right Overbank n
	Reach 3	1075	0.05	0.035	0.05
	Reach 3	1073	Dwyer Hill Road		
	Reach 3	1070	0.05	0.035	0.05
	Reach 3	1065	0.05	0.035	0.05
	Reach 3	1060	0.05	0.035	0.05
	Reach 3	1055	0.05	0.035	0.05
	Reach 3	1050	0.05	0.035	0.05
	Reach 3	1045	0.08	0.035	0.08
	Reach 3	1040	0.08	0.035	0.08
	Reach 3	1035	0.08	0.035	0.08
	Reach 3	1030	0.08	0.035	0.08
	Reach 3	1025	0.08	0.035	0.08
	Reach 3	1020	0.08	0.035	0.08
	Reach 3	1015	0.08	0.035	0.08
	Reach 3	1013	Private Crossing #1		
	Reach 3	1010	0.08	0.035	0.08
	Reach 3	1005	0.08	0.035	0.08
	Reach 3	1000	0.08	0.035	0.08
Goodwood Drain	Reach 1	2020	0.08	0.035	0.08
	Reach 1	2015	0.08	0.035	0.08
	Reach 1	2013	Richmond Road		
	Reach 1	2010	0.08	0.035	0.08
	Reach 1	2005	0.08	0.035	0.08
	Reach 1	2000	0.08	0.035	0.08
Kings Tributary	Reach 1	3110	0.08	0.035	0.08
	Reach 1	3105	0.08	0.035	0.08
	Reach 1	3100	0.08	0.035	0.08
	Reach 1	3098	Beckwith Boundary Road		
	Reach 1	3095	0.05	0.035	0.05
	Reach 1	3090	0.05	0.035	0.05
	Reach 1	3085	0.05	0.035	0.05
	Reach 1	3080	0.08	0.035	0.08
	Reach 1	3075	0.08	0.035	0.08
	Reach 1	3070	0.08	0.035	0.08
	Reach 1	3065	0.08	0.035	0.08
	Reach 1	3060	0.08	0.035	0.08
	Reach 1	3055	0.08	0.035	0.08
	Reach 1	3053	Ashton Station Road		
	Reach 1	3050	0.08	0.035	0.08
	Reach 1	3045	0.08	0.035	0.08
	Reach 1	3040	0.08	0.035	0.08
	Reach 1	3035	0.08	0.035	0.08
	Reach 1	3030	0.08	0.035	0.08
	Reach 1	3025	0.08	0.035	0.08
	Reach 1	3023	Purdy Road		
	Reach 1	3020	0.08	0.035	0.08
	Reach 1	3015	0.08	0.035	0.08
	Reach 1	3010	0.08	0.035	0.08
	Reach 1	3005	0.08	0.035	0.08
	Reach 1	3000	0.08	0.035	0.08

Appendix C

Field Verification of LIDAR Data

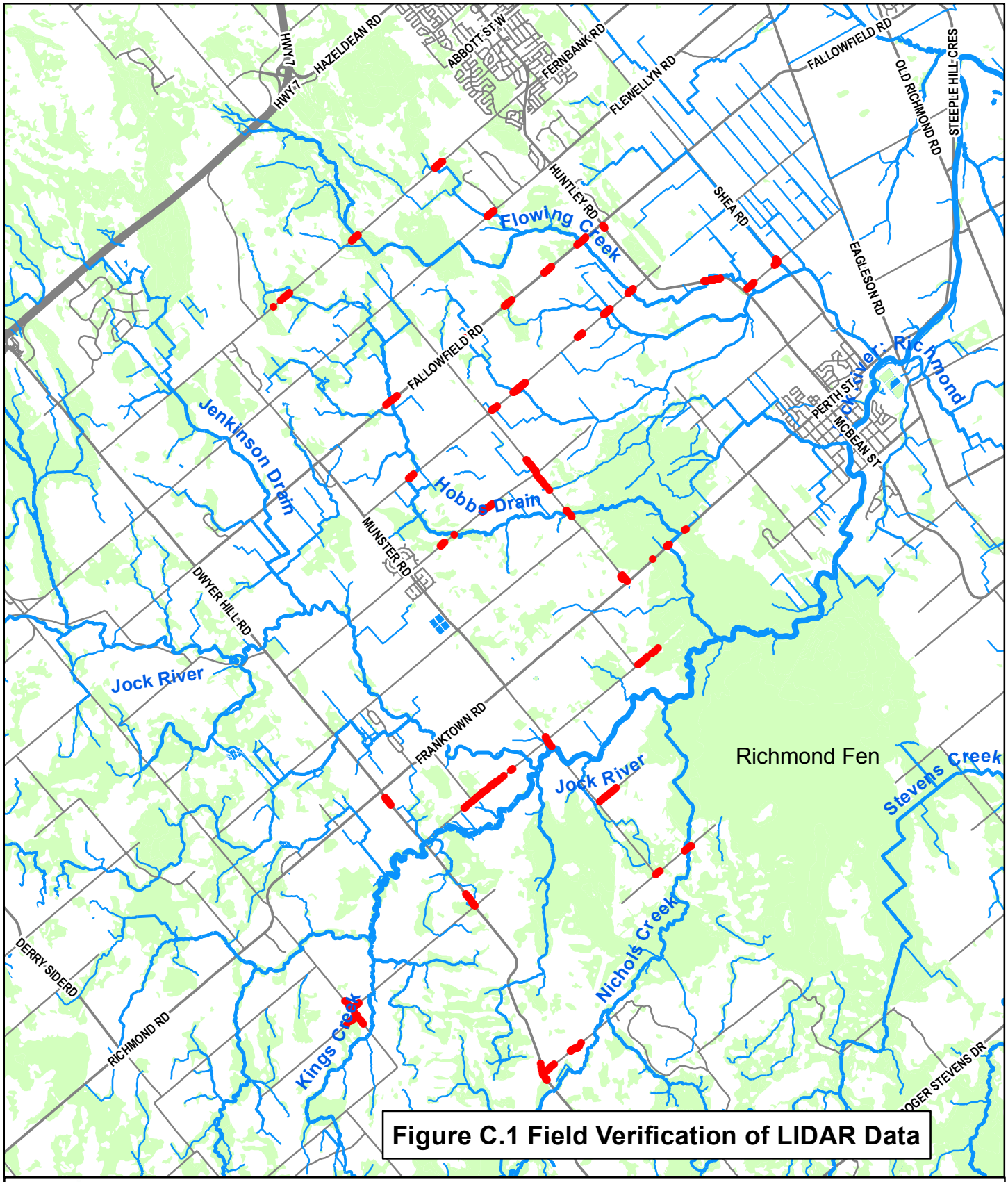


Figure C.1 Field Verification of LIDAR Data

RIDEAU VALLEY CONSERVATION AUTHORITY

0 0.5 1 2 Kilometers

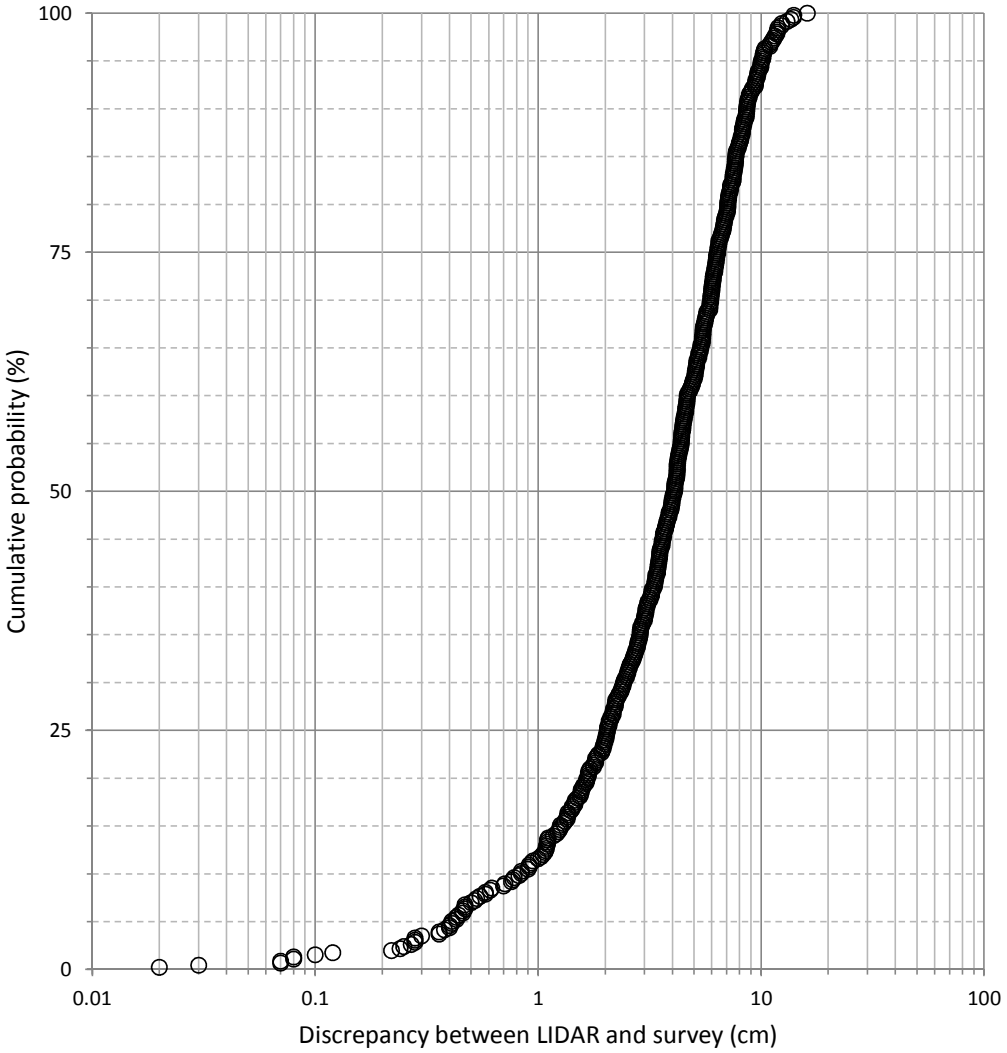
N

Trimble Points

Wetlands

Map Scale: 1:100,000 Date Modified: 4/20/2016

Figure C.2 Field Verification of LIDAR Data
(Flowing, Hobbs, Kings and Nichols Basins)



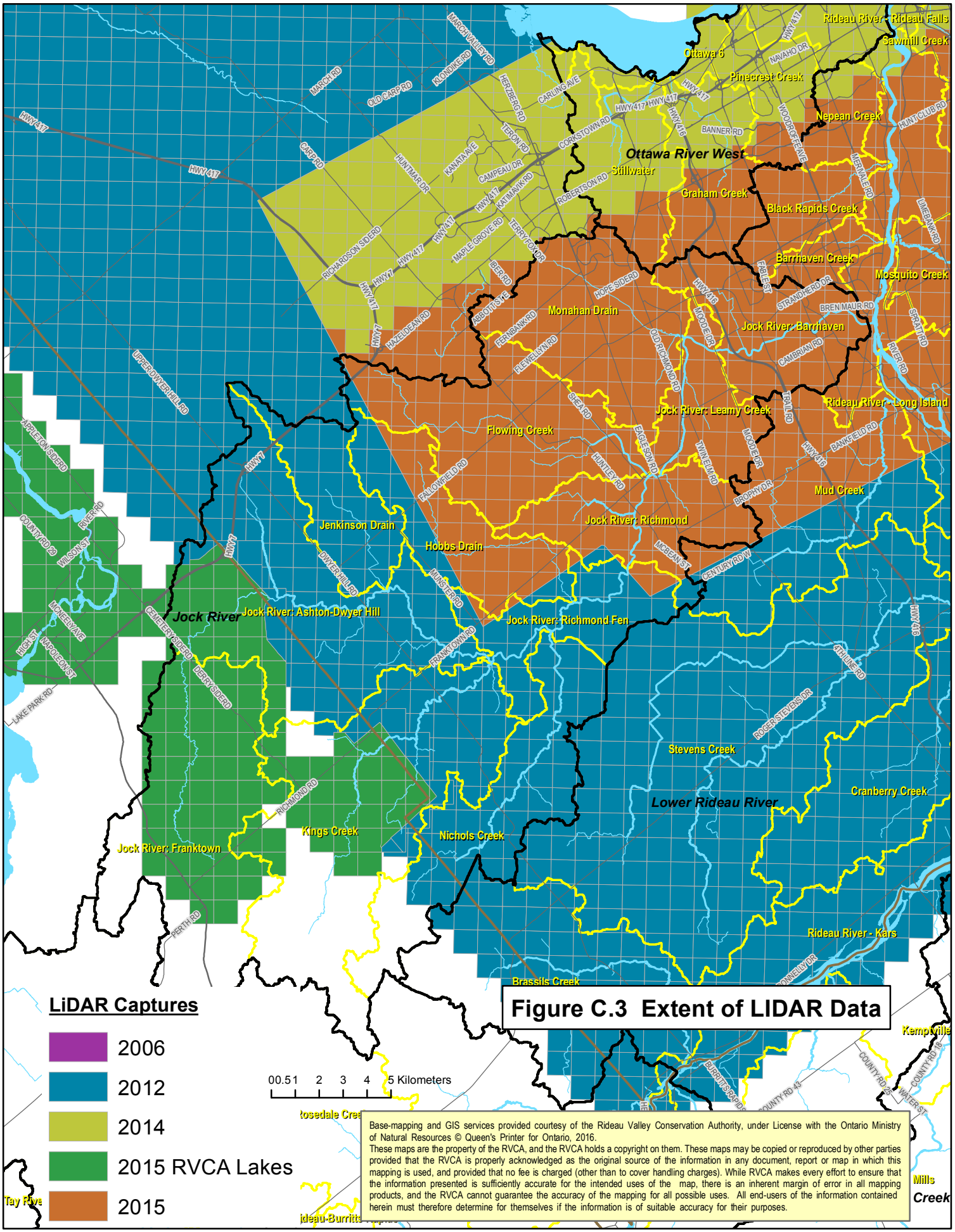


Figure C.3 Extent of LIDAR Data

Table C.1 Field verification of LIDAR data (spot heights)

	RVCA Field Survey (August 28, 29 and Seprember 3, 2014)							Nearest Lidar Point			
Location ID	**X (m)**	**Y (m)**	**Z (m)**	**Horizontal Accuracy (m)**	**Veritcal Accuracy (m)**	**Date/Time**	**Field Observations**	**Z (m)**	**△Z (m)**	**|△Z | (cm)**	**|△Z| > 0.33m**
gra rd 1	4993233.286	425168.503	121.51	0.008	0.012	8/28/2014 9:28	road centre line	121.625	0.118	11.8	
gra rd 2	4993224.945	425159.245	121.42	0.009	0.013	8/28/2014 9:29	road centre line	121.576	0.161	16.1	
gra rd 3	4993216.678	425149.373	121.50	0.009	0.013	8/28/2014 9:30	road centre line	121.578	0.080	8.0	
gra rd 4	4993208.592	425139.579	121.62	0.008	0.014	8/28/2014 9:30	road centre line	121.573	-0.044	4.4	
gra rd 5	4993197.902	425126.930	121.77	0.011	0.018	8/28/2014 9:31	road centre line	121.729	-0.044	4.4	
gra rd 6	4993186.914	425114.147	121.92	0.012	0.019	8/28/2014 9:31	road centre line	121.823	-0.096	9.6	
gra rd 7	4993176.040	425101.479	122.07	0.010	0.014	8/28/2014 9:33	road centre line	122.078	0.008	0.8	
gra rd 8	4993161.773	425084.432	122.24	0.015	0.020	8/28/2014 9:41	road centre line	122.209	-0.030	3.0	
gra rd 9	4993148.084	425068.611	122.31	0.014	0.019	8/28/2014 9:42	road centre line	122.304	-0.005	0.5	
gra rd 10	4993132.058	425049.631	122.46	0.013	0.019	8/28/2014 9:44	road centre line	122.369	-0.092	9.2	
gra rd 11	4993062.350	424967.057	123.05	0.014	0.020	8/28/2014 9:46	road centre line	123.126	0.075	7.5	
ash rd 1	4993087.249	425291.836	122.53	0.015	0.020	8/28/2014 9:54	road centre line	122.507	-0.023	2.3	
ash rd 2	4993106.936	425276.573	122.37	0.015	0.020	8/28/2014 9:56	road centre line	122.319	-0.052	5.2	
ash rd 3	4993142.712	425248.156	121.79	0.015	0.020	8/28/2014 9:57	road centre line	121.817	0.025	2.5	
ash rd 4	4993179.081	425219.078	121.63	0.014	0.020	8/28/2014 9:58	road centre line	121.559	-0.068	6.8	
ash rd 5	4993223.491	425184.663	121.53	0.014	0.020	8/28/2014 10:06	road centre line	121.517	-0.013	1.3	
ash rd 6	4993236.194	425174.230	121.62	0.014	0.020	8/28/2014 10:07	road centre line	121.573	-0.042	4.2	
ash rd 7	4993252.583	425161.255	121.67	0.015	0.020	8/28/2014 10:09	road centre line	121.704	0.031	3.1	
ash rd 8	4993296.485	425126.189	121.91	0.015	0.018	8/28/2014 10:15	road centre line	121.835	-0.071	7.1	
ash rd 9	4993366.419	425072.296	123.86	0.014	0.019	8/28/2014 10:18	road centre line	123.787	-0.077	7.7	
ash rd 10	4993402.791	425042.782	124.80	0.014	0.020	8/28/2014 10:20	road centre line	124.700	-0.100	10.0	
ash rd 11	4993449.808	425004.282	124.91	0.014	0.020	8/28/2014 10:21	road centre line	124.776	-0.136	13.6	
ash rd 12	4993520.806	424945.344	125.44	0.014	0.020	8/28/2014 10:24	road centre line	125.295	-0.140	14.0	
purdy 1	4993383.778	425091.227	123.60	0.013	0.018	8/28/2014 10:27	road centre line	123.562	-0.040	4.0	
purdy 2	4993413.515	425126.887	123.52	0.013	0.018	8/28/2014 10:28	road centre line	123.494	-0.028	2.8	
purdy 3	4993438.550	425156.183	123.53	0.013	0.018	8/28/2014 10:29	road centre line	123.461	-0.069	6.9	
purdy 4	4993478.904	425202.929	122.99	0.014	0.018	8/28/2014 10:30	road centre line	122.976	-0.014	1.4	
purdy 5	4993461.696	425183.142	123.35	0.013	0.018	8/28/2014 10:31	road centre line	123.321	-0.029	2.9	
purdy 6	4993449.633	425169.144	123.51	0.013	0.017	8/28/2014 10:31	road centre line	123.467	-0.044	4.4	
mont 1	4989479.637	426616.853	126.54	0.009	0.011	8/28/2014 10:51	road centre line	126.460	-0.082	8.2	
mont 2	4989466.703	426627.746	126.05	0.013	0.017	8/28/2014 10:51	road centre line	126.000	-0.053	5.3	
mont 3	4989453.525	426638.637	125.62	0.011	0.016	8/28/2014 10:52	road centre line	125.579	-0.038	3.8	
mont 4	4989405.199	426678.298	124.97	0.014	0.020	8/28/2014 10:53	road centre line	124.952	-0.019	1.9	
mont 5	4989391.520	426689.372	124.76	0.014	0.020	8/28/2014 10:54	road centre line	124.739	-0.017	1.7	

mont 6	4989378.270	426700.348	124.55	0.014	0.020	8/28/2014 10:54	road centre line	124.494	-0.060	6.0	
mont 7	4989312.327	426754.214	124.63	0.014	0.020	8/28/2014 10:56	road centre line	124.609	-0.024	2.4	
mont 8	4989298.679	426765.264	124.73	0.014	0.020	8/28/2014 10:57	road centre line	124.699	-0.034	3.4	
mont 9	4989284.414	426776.893	124.74	0.014	0.020	8/28/2014 10:58	road centre line	124.693	-0.045	4.5	
mont 10	4989194.677	426851.413	125.03	0.015	0.020	8/28/2014 11:04	road centre line	124.968	-0.064	6.4	
dwy hill1	4992008.016	428791.032	118.77	0.012	0.020	8/28/2014 11:31	edge of road	118.796	0.022	2.2	
dwy hill2	4992021.944	428781.391	119.02	0.012	0.020	8/28/2014 11:33	edge of road	118.985	-0.036	3.6	
dwy hill3	4992034.617	428771.069	119.27	0.012	0.020	8/28/2014 11:34	edge of road	119.314	0.042	4.2	
dwy hill4	4992048.312	428760.110	119.61	0.011	0.019	8/28/2014 11:35	edge of road	119.655	0.046	4.6	
dwy hill5	4992102.280	428721.502	122.05	0.010	0.017	8/28/2014 11:36	edge of road	122.040	-0.011	1.1	
dwy hill6	4992121.878	428711.226	122.92	0.014	0.020	8/28/2014 11:37	edge of road	122.939	0.017	1.7	
dwy hill7	4992138.083	428704.057	123.48	0.014	0.020	8/28/2014 11:38	edge of road	123.552	0.073	7.3	
dwy hill8	4992211.438	428685.464	124.40	0.014	0.020	8/28/2014 11:40	edge of road	124.406	0.008	0.8	
dwy hill9	4992260.980	428678.327	124.52	0.015	0.019	8/28/2014 11:41	edge of road	124.567	0.050	5.0	
dwy hill10	4992322.272	428670.229	124.80	0.013	0.020	8/28/2014 11:42	edge of road	124.792	-0.003	0.3	
oneil1	4992142.736	428720.506	123.03	0.010	0.014	8/28/2014 11:45	road centre line	123.042	0.012	1.2	
oneil2	4992153.720	428734.939	123.16	0.010	0.014	8/28/2014 11:46	road centre line	123.168	0.011	1.1	
oneil3	4992164.663	428748.833	123.30	0.012	0.018	8/28/2014 11:46	road centre line	123.312	0.015	1.5	
oneil4	4992175.512	428761.868	123.49	0.014	0.018	8/28/2014 11:47	road centre line	123.504	0.011	1.1	
oneil5	4992191.946	428781.488	123.48	0.012	0.018	8/28/2014 11:47	road centre line	123.477	-0.005	0.5	
oneil6	4992211.220	428805.017	123.04	0.015	0.020	8/28/2014 11:48	road centre line	123.057	0.021	2.1	
oneil7	4992238.746	428839.076	122.80	0.014	0.019	8/28/2014 11:49	road centre line	122.797	-0.001	0.1	
oneil8	4992254.969	428858.852	122.52	0.015	0.020	8/28/2014 11:50	road centre line	122.483	-0.036	3.6	
oneil9	4992280.898	428890.892	120.93	0.012	0.016	8/28/2014 11:51	road centre line	120.857	-0.071	7.1	
oneil10	4992304.843	428920.760	118.96	0.012	0.017	8/28/2014 11:51	road centre line	118.896	-0.063	6.3	
oneil11	4992560.709	429237.257	115.33	0.008	0.014	8/28/2014 11:59	road centre line	115.322	-0.004	0.4	
oneil12	4992571.049	429248.010	115.17	0.007	0.011	8/28/2014 12:00	road centre line	115.238	0.067	6.7	
oneil13	4992581.106	429260.438	114.90	0.007	0.011	8/28/2014 12:00	road centre line	114.929	0.032	3.2	
oneil14	4992592.304	429273.656	114.62	0.008	0.013	8/28/2014 12:01	road centre line	114.682	0.060	6.0	
oneil15	4992607.151	429294.360	114.31	0.008	0.013	8/28/2014 12:02	road centre line	114.340	0.030	3.0	
oneil16	4992612.098	429325.023	114.39	0.009	0.015	8/28/2014 12:02	road centre line	114.419	0.032	3.2	
oneil17	4992610.288	429348.359	114.32	0.010	0.017	8/28/2014 12:03	road centre line	114.411	0.091	9.1	
oneil18	4992620.816	429375.882	114.32	0.011	0.020	8/28/2014 12:04	road centre line	114.403	0.086	8.6	
oneil19	4992642.766	429392.612	114.32	0.010	0.016	8/28/2014 12:04	road centre line	114.352	0.029	2.9	
oneil20	4992666.385	429405.770	114.18	0.009	0.016	8/28/2014 12:05	road centre line	114.191	0.015	1.5	
oneil21	4992723.454	429437.409	113.29	0.011	0.018	8/28/2014 12:06	road centre line	113.373	0.082	8.2	
dwy hill2 1	4995330.728	427416.869	118.54	0.009	0.012	8/28/2014 12:46	edge of road	118.606	0.071	7.1	
dwy hill2 2	4995347.869	427403.657	118.34	0.012	0.017	8/28/2014 12:47	edge of road	118.459	0.118	11.8	
dwy hill2 3	4995360.540	427394.171	118.20	0.012	0.017	8/28/2014 12:47	edge of road	118.294	0.090	9.0	
dwy hill2 4	4995371.379	427386.141	118.08	0.010	0.014	8/28/2014 12:48	edge of road	118.144	0.069	6.9	
dwy hill2 5	4995382.626	427377.761	117.98	0.009	0.013	8/28/2014 12:49	edge of road	118.044	0.065	6.5	
dwy hill2 6	4995406.878	427359.683	117.89	0.010	0.014	8/28/2014 12:50	edge of road	118.010	0.119	11.9	
dwy hill2 7	4995426.099	427345.365	117.79	0.010	0.014	8/28/2014 12:50	edge of road	117.847	0.061	6.1	
dwy hill2 8	4995460.464	427319.447	117.61	0.013	0.018	8/28/2014 12:52	edge of road	117.683	0.071	7.1	

dwy hill2 9	4995482.816	427302.304	117.36	0.015	0.020	8/28/2014 12:52	edge of road	117.427	0.066	6.6	
dwy hill2 10	4995502.394	427286.994	116.82	0.014	0.020	8/28/2014 12:53	edge of road	116.933	0.111	11.1	
dwy hill2 11	4995518.188	427274.543	116.30	0.015	0.020	8/28/2014 12:54	edge of road	116.379	0.077	7.7	
dwy hill2 12	4995533.234	427262.501	115.70	0.007	0.010	8/28/2014 12:54	edge of road	115.766	0.070	7.0	
dwy hill2 13	4995556.265	427244.217	114.81	0.009	0.013	8/28/2014 12:55	edge of road	114.893	0.087	8.7	
dwy hill3 1	4997386.748	425706.107	114.88	0.007	0.011	8/28/2014 13:04	edge of road	114.862	-0.016	1.6	
dwy hill3 2	4997368.649	425721.165	114.55	0.011	0.016	8/28/2014 13:05	edge of road	114.527	-0.020	2.0	
dwy hill3 3	4997357.704	425730.518	114.40	0.008	0.012	8/28/2014 13:06	edge of road	114.435	0.033	3.3	
dwy hill3 4	4997349.492	425737.281	114.31	0.010	0.014	8/28/2014 13:06	edge of road	114.408	0.103	10.3	
dwy hill3 5	4997334.569	425749.724	114.09	0.009	0.012	8/28/2014 13:07	edge of road	114.188	0.097	9.7	
dwy hill3 6	4997312.192	425768.753	113.79	0.009	0.012	8/28/2014 13:08	edge of road	113.806	0.016	1.6	
dwy hill3 7	4997300.114	425778.733	113.65	0.011	0.015	8/28/2014 13:09	edge of road	113.712	0.061	6.1	
dwy hill3 8	4997286.127	425790.575	113.45	0.011	0.014	8/28/2014 13:09	edge of road	113.507	0.060	6.0	
dwy hill3 9	4997270.780	425803.333	113.22	0.010	0.014	8/28/2014 13:10	edge of road	113.305	0.087	8.7	
dwy hill3 10	4997255.432	425816.193	112.92	0.012	0.016	8/28/2014 13:10	edge of road	112.974	0.055	5.5	
jock tr 1	4997189.214	427210.597	109.94	0.007	0.010	8/28/2014 13:19	road centre line	109.951	0.014	1.4	
jock tr 2	4997201.098	427224.768	110.30	0.011	0.013	8/28/2014 13:20	road centre line	110.341	0.040	4.0	
jock tr 3	4997211.579	427241.529	110.32	0.013	0.017	8/28/2014 13:20	road centre line	110.350	0.027	2.7	
jock tr 4	4997231.380	427261.568	110.15	0.013	0.016	8/28/2014 13:21	road centre line	110.118	-0.028	2.8	
jock tr 5	4997257.756	427293.195	109.65	0.014	0.020	8/28/2014 13:22	road centre line	109.676	0.031	3.1	
jock tr 6	4997284.655	427325.141	109.33	0.015	0.019	8/28/2014 13:23	road centre line	109.323	-0.009	0.9	
jock tr 7	4997315.827	427362.352	109.00	0.015	0.019	8/28/2014 13:24	road centre line	108.999	0.001	0.1	
jock tr 8	4997342.902	427394.925	108.97	0.015	0.017	8/28/2014 13:26	road centre line	108.979	0.011	1.1	
jock tr 9	4997369.192	427426.725	109.09	0.015	0.019	8/28/2014 13:27	road centre line	109.113	0.020	2.0	
jock tr 10	4997390.982	427453.399	108.94	0.015	0.019	8/28/2014 13:28	road centre line	108.947	0.011	1.1	
jock tr 11	4997418.262	427486.435	108.63	0.015	0.019	8/28/2014 13:29	road centre line	108.638	0.009	0.9	
jock tr 12	4997440.306	427513.303	108.66	0.012	0.017	8/28/2014 13:30	road centre line	108.664	0.002	0.2	
jock tr 13	4997454.913	427531.148	108.65	0.015	0.017	8/28/2014 13:31	road centre line	108.666	0.012	1.2	
jock tr 14	4997478.344	427559.480	108.47	0.015	0.019	8/28/2014 13:32	road centre line	108.466	-0.001	0.1	
jock tr 15	4997495.160	427580.199	108.36	0.014	0.019	8/28/2014 13:33	road centre line	108.371	0.010	1.0	
jock tr 16	4997516.618	427606.476	108.29	0.015	0.019	8/28/2014 13:34	road centre line	108.297	0.004	0.4	
jock tr 17	4997538.821	427633.859	108.20	0.015	0.020	8/28/2014 13:35	road centre line	108.226	0.026	2.6	
jock tr 18	4997558.086	427658.109	108.09	0.013	0.018	8/28/2014 13:35	road centre line	108.068	-0.022	2.2	
jock tr 19	4997597.192	427707.525	108.07	0.015	0.020	8/28/2014 13:37	road centre line	108.093	0.022	2.2	
jock tr 20	4997620.045	427736.499	108.21	0.014	0.020	8/28/2014 13:38	road centre line	108.251	0.043	4.3	
jock tr 21	4997637.958	427758.949	108.66	0.013	0.018	8/28/2014 13:39	road centre line	108.706	0.047	4.7	
jock tr 22	4997654.149	427779.377	109.08	0.014	0.020	8/28/2014 13:39	road centre line	109.095	0.011	1.1	
jock tr 23	4997671.858	427802.041	109.16	0.014	0.019	8/28/2014 13:40	road centre line	109.199	0.043	4.3	
jock tr 24	4997690.969	427826.471	108.98	0.014	0.019	8/28/2014 13:41	road centre line	109.010	0.035	3.5	
jock tr 25	4997716.023	427858.003	108.70	0.014	0.019	8/28/2014 13:41	road centre line	108.783	0.084	8.4	
jock tr 26	4997754.827	427906.639	108.28	0.014	0.020	8/28/2014 13:42	road centre line	108.313	0.037	3.7	
jock tr 27	4997802.594	427966.280	107.83	0.014	0.020	8/28/2014 13:44	road centre line	107.888	0.055	5.5	
jock tr 28	4997916.364	428106.392	106.88	0.010	0.015	8/28/2014 13:50	road centre line	106.943	0.060	6.0	
jock tr 29	4997941.369	428137.050	106.30	0.012	0.017	8/28/2014 13:50	road centre line	106.303	0.006	0.6	

ket rd 1	4996467.561	431537.597	101.74	0.009	0.015	8/28/2014 14:02	road centre line	101.787	0.050	5.0	
ket rd 2	4996466.128	431512.851	101.51	0.010	0.015	8/28/2014 14:03	road centre line	101.571	0.059	5.9	
ket rd 3	4996451.792	431493.685	100.98	0.010	0.016	8/28/2014 14:03	road centre line	101.037	0.059	5.9	
ket rd 4	4996434.447	431472.484	100.80	0.010	0.016	8/28/2014 14:04	road centre line	100.840	0.043	4.3	
ket rd 5	4996409.239	431441.468	100.77	0.011	0.017	8/28/2014 14:05	road centre line	100.786	0.013	1.3	
ket rd 6	4996384.032	431409.623	100.75	0.013	0.020	8/28/2014 14:06	road centre line	100.820	0.067	6.7	
ket rd 7	4995930.548	430865.040	104.29	0.012	0.019	8/28/2014 14:12	road centre line	104.320	0.032	3.2	
ket rd 8	4995950.305	430891.107	104.11	0.011	0.018	8/28/2014 14:12	road centre line	104.094	-0.018	1.8	
ket rd 9	4995971.233	430913.615	103.85	0.013	0.020	8/28/2014 14:15	road centre line	103.886	0.035	3.5	
ket rd 10	4995990.470	430936.463	103.88	0.010	0.019	8/28/2014 14:17	road centre line	103.920	0.045	4.5	
sold ln 1	4997580.216	430107.182	104.38	0.012	0.020	8/28/2014 14:29	road centre line	104.455	0.075	7.5	
sold ln 2	4997558.391	430082.750	104.10	0.012	0.020	8/28/2014 14:31	road centre line	104.126	0.027	2.7	
sold ln 3	4997531.417	430051.719	103.87	0.006	0.011	8/28/2014 14:33	road centre line	103.882	0.009	0.9	
sold ln 4	4997508.558	430024.652	103.65	0.009	0.016	8/28/2014 14:34	road centre line	103.627	-0.018	1.8	
sold ln 5	4997474.804	429984.571	103.59	0.011	0.020	8/28/2014 14:34	road centre line	103.607	0.020	2.0	
sold ln 6	4997441.723	429945.130	103.53	0.011	0.019	8/28/2014 14:35	road centre line	103.592	0.062	6.2	
sold ln 7	4997419.141	429918.234	103.42	0.011	0.017	8/28/2014 14:36	road centre line	103.437	0.019	1.9	
sold ln 8	4997386.575	429879.416	103.21	0.011	0.017	8/28/2014 14:37	road centre line	103.310	0.100	10.0	
sold ln 9	4997386.575	429879.415	103.21	0.011	0.017	8/28/2014 14:37	road centre line	103.310	0.102	10.2	
sold ln 10	4997355.434	429841.549	103.20	0.013	0.020	8/28/2014 14:38	road centre line	103.194	-0.008	0.8	
sold ln 11	4997316.349	429795.552	103.06	0.011	0.018	8/28/2014 14:39	road centre line	103.102	0.045	4.5	
mun side1	4998545.423	428766.949	104.85	0.013	0.020	8/28/2014 14:49	road centre line	104.871	0.024	2.4	
mun side2	4998522.133	428775.258	104.61	0.010	0.017	8/28/2014 14:50	road centre line	104.572	-0.037	3.7	
mun side3	4998486.982	428786.885	104.00	0.007	0.010	8/28/2014 14:51	road centre line	103.967	-0.029	2.9	
mun side4	4998450.094	428809.579	103.56	0.010	0.020	8/28/2014 14:54	road centre line	103.544	-0.020	2.0	
mun side5	4998430.641	428824.183	103.62	0.011	0.018	8/28/2014 14:55	road centre line	103.646	0.022	2.2	
mun side6	4998410.563	428839.719	103.67	0.012	0.019	8/28/2014 14:55	road centre line	103.675	0.001	0.1	
mun side7	4998361.316	428878.607	103.52	0.012	0.020	8/28/2014 14:56	road centre line	103.548	0.030	3.0	
jock tr2 1	4999917.507	430524.909	102.85	0.011	0.018	8/28/2014 15:04	road centre line	102.854	0.005	0.5	
jock tr2 2	4999934.182	430545.053	102.77	0.009	0.015	8/28/2014 15:05	road centre line	102.847	0.077	7.7	
jock tr2 3	4999953.472	430568.106	102.82	0.009	0.015	8/28/2014 15:05	road centre line	102.862	0.044	4.4	
jock tr2 4	4999970.330	430588.741	102.59	0.009	0.015	8/28/2014 15:06	road centre line	102.717	0.123	12.3	
jock tr2 5	4999990.237	430613.083	102.28	0.009	0.015	8/28/2014 15:07	road centre line	102.327	0.047	4.7	
jock tr2 6	5000035.628	430667.542	100.88	0.010	0.017	8/28/2014 15:08	road centre line	100.955	0.073	7.3	
jock tr2 7	5000060.684	430697.087	100.34	0.011	0.020	8/28/2014 15:09	road centre line	100.467	0.131	13.1	
jock tr2 8	5000133.837	430783.475	99.89	0.011	0.020	8/28/2014 15:13	road centre line	99.975	0.083	8.3	
jock tr2 9	5000177.382	430835.699	99.83	0.010	0.020	8/28/2014 15:17	road centre line	99.882	0.051	5.1	
jock tr2 10	5000194.312	430855.520	99.73	0.010	0.020	8/28/2014 15:19	road centre line	99.802	0.071	7.1	
jock tr2 11	5000230.572	430901.209	99.71	0.010	0.019	8/28/2014 15:22	road centre line	99.764	0.051	5.1	
bleeks 1	5002182.304	426761.424	113.56	0.010	0.017	8/29/2014 9:34	road centre line	113.513	-0.042	4.2	
bleeks 2	5002193.050	426774.949	113.52	0.014	0.020	8/29/2014 9:35	road centre line	113.555	0.035	3.5	
bleeks 3	5002204.823	426788.271	113.44	0.011	0.020	8/29/2014 9:37	road centre line	113.457	0.017	1.7	
bleeks 4	5002215.963	426801.809	113.37	0.011	0.020	8/29/2014 9:38	road centre line	113.422	0.055	5.5	
bleeks 5	5002227.772	426815.901	113.31	0.014	0.020	8/29/2014 9:38	road centre line	113.340	0.031	3.1	

bleeks 6	5002247.569	426839.460	113.13	0.011	0.020	8/29/2014 9:40	road centre line	113.143	0.016	1.6	
bleeks 7	5002404.593	427024.384	110.23	0.011	0.020	8/29/2014 9:45	road centre line	110.221	-0.004	0.4	
bleeks 9	5002832.782	427556.886	108.90	0.011	0.014	8/29/2014 9:52	road centre line	109.022	0.124	12.4	
bleeks 10	5002847.671	427576.865	108.82	0.012	0.017	8/29/2014 9:52	road centre line	108.901	0.077	7.7	
bleeks 11	5002863.569	427596.015	108.68	0.014	0.020	8/29/2014 9:53	road centre line	108.791	0.116	11.6	
bleeks 12	5002880.230	427621.577	108.75	0.013	0.019	8/29/2014 9:54	road centre line	108.750	0.004	0.4	
bleeks 13	5002892.171	427637.369	108.67	0.012	0.018	8/29/2014 9:55	road centre line	108.660	-0.006	0.6	
bleeks 14	5002908.020	427658.212	108.49	0.013	0.018	8/29/2014 9:55	road centre line	108.510	0.022	2.2	
bleeks 15	5002927.684	427683.750	108.38	0.013	0.018	8/29/2014 9:56	road centre line	108.387	0.005	0.5	
bleeks 16	5002945.616	427703.704	108.20	0.012	0.017	8/29/2014 9:57	road centre line	108.220	0.020	2.0	
bleeks 17	5002958.879	427724.393	108.23	0.014	0.020	8/29/2014 9:57	road centre line	108.186	-0.041	4.1	
bleeks 18	5002971.106	427740.043	108.18	0.014	0.019	8/29/2014 9:58	road centre line	108.184	0.005	0.5	
bleeks 19	5002991.038	427766.712	108.04	0.013	0.020	8/29/2014 9:59	road centre line	108.067	0.025	2.5	
conley 1	5003820.181	428400.572	108.36	0.015	0.020	8/29/2014 10:13	road centre line	108.374	0.017	1.7	
conley 2	5003807.419	428411.895	108.22	0.014	0.019	8/29/2014 10:14	road centre line	108.213	-0.006	0.6	
conley 3	5003788.607	428427.212	107.97	0.015	0.020	8/29/2014 10:15	road centre line	108.004	0.039	3.9	
conley 4	5003764.546	428446.985	107.52	0.015	0.020	8/29/2014 10:16	road centre line	107.574	0.054	5.4	
conley 5	5003743.869	428464.297	107.27	0.014	0.020	8/29/2014 10:17	road centre line	107.365	0.100	10.0	
conley 6	5003724.961	428479.596	107.19	0.014	0.019	8/29/2014 10:17	road centre line	107.266	0.072	7.2	
conley 7	5003706.092	428495.465	107.00	0.014	0.019	8/29/2014 10:18	road centre line	107.107	0.104	10.4	
conley 8	5003687.144	428510.944	106.88	0.014	0.019	8/29/2014 10:19	road centre line	106.962	0.087	8.7	
conley 9	5003667.497	428527.147	106.70	0.014	0.019	8/29/2014 10:19	road centre line	106.778	0.077	7.7	
conley 10	5003647.522	428543.795	106.62	0.014	0.019	8/29/2014 10:20	road centre line	106.649	0.034	3.4	
conley 11	5003629.604	428558.713	106.39	0.014	0.019	8/29/2014 10:21	road centre line	106.466	0.072	7.2	
conley 12	5003610.414	428574.001	106.27	0.014	0.019	8/29/2014 10:21	road centre line	106.337	0.064	6.4	
conley 13	5003558.576	428587.763	106.85	0.014	0.020	8/29/2014 10:23	road centre line	106.930	0.084	8.4	
conley 14	5003534.080	428596.063	106.82	0.014	0.020	8/29/2014 10:24	road centre line	106.890	0.072	7.2	
conley 15	5003512.145	428614.088	107.05	0.014	0.020	8/29/2014 10:25	road centre line	107.038	-0.015	1.5	
conley 16	5003486.154	428636.204	106.92	0.015	0.020	8/29/2014 10:26	road centre line	106.925	0.007	0.7	
conley 17	5003456.891	428660.523	106.80	0.015	0.020	8/29/2014 10:27	road centre line	106.841	0.046	4.6	
conley 18	5003425.588	428686.549	106.67	0.015	0.020	8/29/2014 10:29	road centre line	106.664	-0.005	0.5	
conley 19	5003386.083	428719.737	106.80	0.014	0.020	8/29/2014 10:30	road centre line	106.854	0.059	5.9	
conley 20	5003349.753	428750.088	106.23	0.013	0.020	8/29/2014 10:31	road centre line	106.235	0.010	1.0	
conley 21	5003308.462	428785.115	105.22	0.014	0.019	8/29/2014 10:32	road centre line	105.230	0.006	0.6	
conley 22	5003248.860	428835.169	104.80	0.014	0.019	8/29/2014 10:34	road centre line	104.790	-0.011	1.1	
conley 23	5002860.775	429164.129	103.49	0.014	0.020	8/29/2014 10:39	road centre line	103.438	-0.049	4.9	
conley 24	5002847.077	429175.335	103.32	0.014	0.020	8/29/2014 10:40	road centre line	103.264	-0.054	5.4	
conley 25	5002831.789	429187.998	103.23	0.014	0.020	8/29/2014 10:41	road centre line	103.265	0.038	3.8	
conley 29	5002767.534	429242.201	103.23	0.013	0.019	8/29/2014 10:43	road centre line	103.271	0.046	4.6	
conley 30	5002755.376	429252.350	103.19	0.013	0.019	8/29/2014 10:43	road centre line	103.239	0.045	4.5	
conley 31	5002740.367	429265.470	103.24	0.012	0.017	8/29/2014 10:44	road centre line	103.242	0.003	0.3	
conley 32	5001507.037	430321.551	103.78	0.013	0.020	8/29/2014 10:54	road centre line	103.838	0.063	6.3	
conley 33	5001520.417	430309.762	103.81	0.013	0.020	8/29/2014 10:54	road centre line	103.820	0.015	1.5	
conley 34	5001533.645	430299.068	103.91	0.013	0.020	8/29/2014 10:55	road centre line	103.901	-0.007	0.7	

conley 35	5001546.634	430288.435	103.95	0.012	0.019	8/29/2014 10:56	road centre line	103.977	0.024	2.4	
conley 36	5001558.930	430278.039	103.94	0.013	0.020	8/29/2014 10:58	road centre line	104.021	0.078	7.8	
conley 37	5001577.365	430262.505	103.82	0.012	0.018	8/29/2014 10:58	road centre line	103.844	0.028	2.8	
conley 38	5001598.022	430244.924	103.56	0.012	0.019	8/29/2014 10:59	road centre line	103.546	-0.018	1.8	
conley 39	5001620.321	430226.259	103.31	0.012	0.019	8/29/2014 10:59	road centre line	103.299	-0.010	1.0	
conley 40	5001558.070	430253.156	103.33	0.013	0.020	8/29/2014 11:01	parking lot	103.385	0.060	6.0	
conley 41	5001564.810	430247.483	103.28	0.013	0.019	8/29/2014 11:02	parking lot	103.345	0.061	6.1	
conley 42	5001571.881	430241.719	103.22	0.013	0.020	8/29/2014 11:02	parking lot	103.258	0.040	4.0	
conley 43	5001578.314	430236.169	103.10	0.013	0.020	8/29/2014 11:03	parking lot	103.139	0.042	4.2	
conley 44	5001584.551	430230.956	102.98	0.013	0.020	8/29/2014 11:03	parking lot	103.031	0.052	5.2	
conley 45	5001590.962	430225.439	102.90	0.013	0.020	8/29/2014 11:03	parking lot	102.978	0.079	7.9	
conley 46	5001586.482	430219.298	102.88	0.013	0.020	8/29/2014 11:04	parking lot	102.920	0.040	4.0	
conley 47	5001591.813	430215.595	102.81	0.013	0.020	8/29/2014 11:04	parking lot	102.850	0.044	4.4	
conley 48	5001598.668	430210.166	102.66	0.013	0.020	8/29/2014 11:05	parking lot	102.760	0.097	9.7	
conley 49	5001580.696	430225.196	102.98	0.013	0.020	8/29/2014 11:05	parking lot	103.032	0.051	5.1	
conley 50	5001574.378	430230.938	103.08	0.013	0.020	8/29/2014 11:06	parking lot	103.145	0.065	6.5	
conley 51	5001568.144	430236.635	103.22	0.013	0.020	8/29/2014 11:06	parking lot	103.280	0.062	6.2	
conley 52	5001561.866	430242.048	103.30	0.013	0.020	8/29/2014 11:07	parking lot	103.360	0.061	6.1	
conley 53	5001555.516	430247.579	103.39	0.015	0.020	8/29/2014 11:07	parking lot	103.462	0.075	7.5	
conley 54	5001550.921	430240.658	103.44	0.015	0.019	8/29/2014 11:07	parking lot	103.489	0.047	4.7	
conley 55	5001557.177	430235.519	103.36	0.013	0.017	8/29/2014 11:08	parking lot	103.418	0.055	5.5	
conley 56	5001563.753	430230.488	103.21	0.013	0.017	8/29/2014 11:08	parking lot	103.269	0.060	6.0	
conley 57	5001570.250	430225.293	103.10	0.013	0.017	8/29/2014 11:08	parking lot	103.153	0.050	5.0	
conley 58	5001576.820	430220.183	102.98	0.013	0.018	8/29/2014 11:09	parking lot	103.011	0.029	2.9	
conley 59	5001583.398	430214.813	102.88	0.013	0.017	8/29/2014 11:09	parking lot	102.920	0.036	3.6	
conley 60	5001589.701	430209.660	102.77	0.013	0.018	8/29/2014 11:10	parking lot	102.796	0.024	2.4	
conley 61	5001596.049	430204.833	102.66	0.013	0.017	8/29/2014 11:10	parking lot	102.722	0.064	6.4	
hobbs 1	5002500.449	431436.124	100.68	0.014	0.019	8/29/2014 11:18	edge of road	100.706	0.026	2.6	
hobbs 2	5002483.582	431417.588	100.50	0.015	0.020	8/29/2014 11:19	edge of road	100.522	0.027	2.7	
hobbs 3	5002208.019	431113.498	100.11	0.014	0.020	8/29/2014 11:36	edge of road	100.133	0.021	2.1	
hobbs 4	5002202.650	431106.899	100.11	0.014	0.02	8/29/2014 11:38	edge of road	100.115	0.005	0.5	
hobbs 5	5002196.240	431099.921	100.158	0.013	0.02	8/29/2014 11:39	edge of road	100.193	0.035	3.5	
hobbs 6	5002189.462	431092.320	100.218	0.012	0.018	8/29/2014 11:43	edge of road	100.259	0.041	4.1	
hobbs 7	5002183.680	431086.219	100.23	0.012	0.019	8/29/2014 11:44	edge of road	100.254	0.024	2.4	
hobbs 8	5002178.099	431080.164	100.2	0.014	0.02	8/29/2014 11:44	edge of road	100.248	0.048	4.8	
hobbs 9	5002171.552	431073.091	100.171	0.013	0.02	8/29/2014 11:45	edge of road	100.201	0.030	3.0	
hobbs 10	5001922.637	430803.438	100.215	0.013	0.02	8/29/2014 11:52	edge of road	100.250	0.035	3.5	
fern 1	5006997.698	423887.927	134.328	0.008	0.011	8/29/2014 12:24	edge of road	134.360	0.032	3.2	
fern 2	5006988.074	423876.293	134.346	0.009	0.013	8/29/2014 12:24	edge of road	134.387	0.041	4.1	
fern 3	5006971.539	423856.501	134.41	0.012	0.018	8/29/2014 12:25	edge of road	134.442	0.034	3.4	
fern 4	5006955.506	423837.188	134.67	0.013	0.020	8/29/2014 12:26	edge of road	134.749	0.084	8.4	
fern 5	5006939.100	423817.612	135.295	0.015	0.019	8/29/2014 12:26	edge of road	135.317	0.022	2.2	
fern 6	5006912.782	423785.594	136.26	0.014	0.02	8/29/2014 12:28	edge of road	136.301	0.041	4.1	
fern 7	5006896.230	423766.141	136.486	0.014	0.018	8/29/2014 12:29	edge of road	136.569	0.083	8.3	

fern 8	5006855.826	423718.438	136.948	0.013	0.02	8/29/2014 12:30	edge of road	137.007	0.059	5.9	
fern 9	5006735.481	423577.285	136.069	0.013	0.018	8/29/2014 12:33	edge of road	136.110	0.041	4.1	
ffield1 1	5004868.574	425726.972	119.706	0.015	0.02	8/29/2014 12:58	edge of road	119.786	0.080	8.0	
ffield1 2	5004879.771	425740.360	119.59	0.015	0.019	8/29/2014 12:59	edge of road	119.688	0.098	9.8	
ffield1 3	5004905.498	425771.112	119.44	0.014	0.02	8/29/2014 13:00	edge of road	119.501	0.061	6.1	
ffield1 4	5004931.372	425802.087	119.174	0.013	0.018	8/29/2014 13:01	edge of road	119.255	0.081	8.1	
ffield1 5	5004948.424	425822.515	118.995	0.013	0.019	8/29/2014 13:02	edge of road	119.066	0.071	7.1	
ffield1 6	5004956.927	425832.643	118.847	0.014	0.019	8/29/2014 13:03	edge of road	118.950	0.103	10.3	
ffield1 7	5004966.929	425844.500	118.871	0.013	0.019	8/29/2014 13:03	edge of road	118.948	0.077	7.7	
ffield1 8	5004992.157	425874.954	118.845	0.013	0.019	8/29/2014 13:04	edge of road	118.896	0.051	5.1	
ffield1 9	5005018.966	425906.741	118.913	0.014	0.019	8/29/2014 13:05	edge of road	118.966	0.053	5.3	
ffield1 10	5005042.966	425935.411	119.055	0.014	0.019	8/29/2014 13:06	edge of road	119.128	0.073	7.3	
ffield2 1	5006748.095	427984.247	117.912	0.007	0.009	8/29/2014 13:16	edge of road	117.952	0.040	4.0	
ffield2 2	5006759.004	427997.196	117.896	0.01	0.012	8/29/2014 13:17	edge of road	117.917	0.021	2.1	
ffield2 3	5006769.973	428010.226	117.886	0.011	0.014	8/29/2014 13:18	edge of road	117.887	0.001	0.1	
ffield2 4	5006780.734	428022.977	117.871	0.012	0.015	8/29/2014 13:18	edge of road	117.913	0.042	4.2	
ffield2 5	5006792.014	428036.275	117.864	0.011	0.015	8/29/2014 13:19	edge of road	117.919	0.055	5.5	
ffield2 6	5006804.527	428051.141	117.78	0.012	0.015	8/29/2014 13:20	edge of road	117.815	0.035	3.5	
ffield2 7	5006815.409	428064.171	117.801	0.012	0.015	8/29/2014 13:20	edge of road	117.787	-0.014	1.4	
ffield2 8	5006826.623	428077.280	117.866	0.012	0.016	8/29/2014 13:21	edge of road	117.868	0.002	0.2	
ffield2 9	5006842.315	428095.801	117.934	0.013	0.017	8/29/2014 13:21	edge of road	117.945	0.011	1.1	
ffield2 10	5006865.601	428123.612	118.054	0.014	0.018	8/29/2014 13:22	edge of road	118.058	0.004	0.4	
ffield2a 1	5006093.064	427189.422	118.682	0.011	0.015	8/29/2014 13:29	edge of road	118.721	0.039	3.9	
ffield2a 2	5006103.231	427201.876	118.722	0.011	0.015	8/29/2014 13:30	edge of road	118.765	0.043	4.3	
ffield2a 3	5006114.065	427215.042	118.793	0.012	0.015	8/29/2014 13:30	edge of road	118.835	0.042	4.2	
ffield2a 4	5006121.827	427224.330	118.829	0.012	0.015	8/29/2014 13:31	edge of road	118.853	0.024	2.4	
ffield2a 5	5006129.035	427232.978	118.806	0.012	0.016	8/29/2014 13:32	edge of road	118.835	0.029	2.9	
ffield2a 6	5006139.540	427245.508	118.847	0.012	0.016	8/29/2014 13:32	edge of road	118.883	0.036	3.6	
ffield2a 7	5006150.195	427258.275	118.91	0.012	0.016	8/29/2014 13:33	edge of road	118.935	0.025	2.5	
ffield2a 8	5006160.936	427271.611	118.977	0.013	0.018	8/29/2014 13:33	edge of road	119.005	0.028	2.8	
ffield2a 9	5006171.745	427284.731	119.048	0.012	0.017	8/29/2014 13:34	edge of road	119.110	0.062	6.2	
ffield2a 10	5006182.431	427297.606	119.086	0.013	0.018	8/29/2014 13:34	edge of road	119.106	0.020	2.0	
ffield2a 11	5006182.409	427297.583	119.083	0.012	0.017	8/29/2014 13:35	edge of road	119.104	0.021	2.1	
ffield3 1	5007499.106	428876.096	109.477	0.008	0.011	8/29/2014 13:45	edge of road	109.491	0.014	1.4	
ffield3 2	5007488.044	428863.158	109.625	0.011	0.014	8/29/2014 13:45	edge of road	109.637	0.012	1.2	
ffield3 3	5007476.740	428850.014	109.754	0.012	0.016	8/29/2014 13:46	edge of road	109.769	0.015	1.5	
ffield3 4	5007460.155	428830.552	109.955	0.013	0.018	8/29/2014 13:46	edge of road	109.959	0.004	0.4	
ffield3 5	5007435.917	428802.436	110.177	0.013	0.018	8/29/2014 13:47	edge of road	110.202	0.025	2.5	
ffield3 6	5007425.266	428789.931	110.37	0.012	0.016	8/29/2014 13:48	edge of road	110.395	0.025	2.5	
ffield3 7	5007413.914	428776.877	110.589	0.007	0.009	8/29/2014 13:52	edge of road	110.636	0.047	4.7	
ffield3 8	5007402.937	428764.267	110.816	0.01	0.013	8/29/2014 13:52	edge of road	110.821	0.005	0.5	
ffield3 9	5007390.937	428750.007	111.112	0.01	0.014	8/29/2014 13:53	edge of road	111.145	0.033	3.3	
ffield3 10	5007379.882	428737.046	111.387	0.01	0.014	8/29/2014 13:53	edge of road	111.473	0.086	8.6	
ffield4 1	5007916.614	429366.844	107.174	0.015	0.02	8/29/2014 14:03	edge of road	107.079	-0.095	9.5	

ffield4 2	5007927.714	429379.964	107.165	0.012	0.016	8/29/2014 14:04	edge of road	107.165	0.000	0.0	
ffield4 3	5007939.516	429393.839	107.145	0.01	0.012	8/29/2014 14:05	edge of road	107.101	-0.044	4.4	
ffield4 4	5007955.840	429413.176	107.128	0.012	0.016	8/29/2014 14:07	edge of road	107.091	-0.037	3.7	
ffield4 5	5007998.007	429462.891	107.124	0.013	0.018	8/29/2014 14:08	edge of road	107.107	-0.017	1.7	
ffield4 6	5008009.000	429475.828	107.209	0.012	0.017	8/29/2014 14:08	edge of road	107.186	-0.023	2.3	
ffield4 7	5008020.463	429489.329	107.217	0.011	0.018	8/29/2014 14:09	edge of road	107.160	-0.057	5.7	
ffield4 8	5008031.476	429502.314	107.208	0.013	0.02	8/29/2014 14:09	edge of road	107.151	-0.057	5.7	
ffield4 9	5008042.692	429515.344	107.237	0.013	0.018	8/29/2014 14:10	edge of road	107.208	-0.029	2.9	
ffield4 10	5008054.078	429528.545	107.315	0.015	0.02	8/29/2014 14:10	edge of road	107.279	-0.036	3.6	
mfield1 1	5007071.527	430431.661	102.243	0.01	0.017	8/29/2014 14:21	edge of road	102.352	0.109	10.9	
mfield1 2	5007063.280	430422.201	102.223	0.01	0.017	8/29/2014 14:21	edge of road	102.305	0.082	8.2	
mfield1 3	5007054.728	430412.231	102.269	0.01	0.016	8/29/2014 14:22	edge of road	102.382	0.113	11.3	
mfield1 4	5007043.783	430399.563	102.365	0.011	0.018	8/29/2014 14:22	edge of road	102.433	0.068	6.8	
mfield1 5	5007030.831	430384.899	102.454	0.01	0.017	8/29/2014 14:23	steep road edge	102.492	0.038	3.8	
mfield1 6	5007022.285	430375.207	102.48	0.01	0.017	8/29/2014 14:23	edge of road	102.495	0.015	1.5	
mfield1 7	5007013.975	430365.314	102.465	0.01	0.017	8/29/2014 14:24	edge of road	102.501	0.036	3.6	
mfield1 8	5007004.940	430354.617	102.45	0.01	0.017	8/29/2014 14:24	edge of road	102.492	0.042	4.2	
mfield1 9	5006995.802	430344.096	102.491	0.01	0.017	8/29/2014 14:25	edge of road	102.478	-0.013	1.3	
mfield1 10	5006987.337	430334.310	102.53	0.01	0.017	8/29/2014 14:25	edge of road	102.574	0.044	4.4	
mfield2 1	5006691.232	429991.626	101.761	0.007	0.011	8/29/2014 14:35	edge of road	101.782	0.021	2.1	
mfield2 2	5006682.929	429982.209	101.886	0.008	0.013	8/29/2014 14:35	edge of road	101.914	0.028	2.8	
mfield2 3	5006674.559	429972.579	101.838	0.009	0.013	8/29/2014 14:36	edge of road	101.884	0.046	4.6	
mfield2 4	5006666.236	429963.143	101.746	0.009	0.015	8/29/2014 14:36	edge of road	101.801	0.055	5.5	
mfield2 5	5006657.778	429953.309	101.666	0.01	0.016	8/29/2014 14:37	edge of road	101.701	0.035	3.5	
mfield2 6	5006649.663	429943.862	101.633	0.01	0.016	8/29/2014 14:37	edge of road	101.689	0.056	5.6	
mfield2 7	5006641.051	429934.042	101.611	0.01	0.015	8/29/2014 14:38	edge of road	101.634	0.023	2.3	
mfield2 8	5006633.410	429925.107	101.627	0.01	0.016	8/29/2014 14:39	edge of road	101.708	0.081	8.1	
mfield2 9	5006624.766	429915.871	101.646	0.01	0.016	8/29/2014 14:39	edge of road	101.707	0.061	6.1	
mfield2 10	5006617.379	429907.228	101.693	0.01	0.016	8/29/2014 14:40	edge of road	101.758	0.065	6.5	
mfield2 11	5006609.490	429898.104	101.744	0.01	0.016	8/29/2014 14:40	edge of road	101.773	0.029	2.9	
mfield2 12	5006601.527	429888.367	101.774	0.01	0.015	8/29/2014 14:41	edge of road	101.818	0.044	4.4	
mfield2 13	5006593.480	429879.126	101.788	0.01	0.016	8/29/2014 14:41	edge of road	101.830	0.042	4.2	
mfield2 14	5006584.047	429868.195	101.808	0.01	0.016	8/29/2014 14:42	edge of road	101.836	0.028	2.8	
mfield2 15	5006580.238	429872.716	101.78	0.01	0.016	8/29/2014 14:42	edge of road	101.777	-0.003	0.3	
mfield2 16	5006597.746	429893.123	101.675	0.01	0.016	8/29/2014 14:43	edge of road	101.655	-0.020	2.0	
mfield2 17	5006617.926	429916.709	101.556	0.01	0.016	8/29/2014 14:44	edge of road	101.515	-0.041	4.1	
mfield4 1	5006154.173	429374.244	104.166	0.01	0.017	8/29/2014 14:50	edge of road	104.252	0.086	8.6	
mfield4 2	5006161.697	429382.923	104.153	0.009	0.015	8/29/2014 14:50	edge of road	104.199	0.046	4.6	
mfield4 3	5006169.445	429391.696	104.151	0.009	0.014	8/29/2014 14:51	edge of road	104.193	0.042	4.2	
mfield4 4	5006177.391	429400.790	104.2	0.008	0.014	8/29/2014 14:51	edge of road	104.263	0.063	6.3	
mfield4 5	5006189.927	429415.059	104.188	0.009	0.015	8/29/2014 14:52	edge of road	104.218	0.030	3.0	
mfield4 6	5006198.177	429424.749	104.197	0.009	0.014	8/29/2014 14:52	edge of road	104.253	0.056	5.6	
mfield4 7	5006206.503	429434.429	104.166	0.008	0.014	8/29/2014 14:53	edge of road	104.203	0.037	3.7	
mfield4 8	5006214.864	429443.767	104.147	0.008	0.013	8/29/2014 14:54	edge of road	104.167	0.020	2.0	

mfield4 9	5006221.142	429455.374	104.262	0.008	0.013	8/29/2014 14:54	road centre line	104.282	0.020	2.0	
mfield4 10	5006229.259	429464.715	104.295	0.008	0.013	8/29/2014 14:55	road centre line	104.330	0.035	3.5	
mfield5 1	5005251.889	428333.370	109.211	0.007	0.012	8/29/2014 15:03	road centre line	109.263	0.052	5.2	
mfield5 2	5005260.161	428342.850	109.288	0.007	0.012	8/29/2014 15:04	road centre line	109.351	0.063	6.3	
mfield5 3	5005268.229	428352.625	109.294	0.007	0.012	8/29/2014 15:04	road centre line	109.364	0.070	7.0	
mfield5 4	5005276.456	428362.196	109.315	0.007	0.012	8/29/2014 15:05	road centre line	109.370	0.055	5.5	
mfield5 5	5005284.826	428371.784	109.316	0.007	0.012	8/29/2014 15:05	road centre line	109.405	0.089	8.9	
mfield5 6	5005243.461	428323.418	109.236	0.008	0.014	8/29/2014 15:06	road centre line	109.312	0.076	7.6	
mfield5 7	5005235.036	428313.531	109.271	0.007	0.013	8/29/2014 15:07	road centre line	109.324	0.053	5.3	
mfield5 8	5005227.103	428304.125	109.356	0.007	0.013	8/29/2014 15:07	road centre line	109.359	0.003	0.3	
mfield5 9	5005219.127	428294.613	109.444	0.007	0.013	8/29/2014 15:07	road centre line	109.495	0.051	5.1	
mfield5 10	5005210.600	428284.834	109.535	0.007	0.013	8/29/2014 15:08	road centre line	109.553	0.018	1.8	
mfield6 1	5005100.342	428148.510	110.813	0.007	0.013	8/29/2014 15:13	road centre line	110.899	0.086	8.6	
mfield6 2	5005110.448	428160.604	110.706	0.006	0.012	8/29/2014 15:14	edge of road	110.720	0.014	1.4	
mfield6 3	5005121.205	428173.515	110.484	0.007	0.013	8/29/2014 15:15	edge of road	110.530	0.046	4.6	
mfield6 4	5005132.341	428186.847	110.322	0.006	0.012	8/29/2014 15:15	edge of road	110.367	0.045	4.5	
mfield6 5	5005150.473	428208.634	110.198	0.009	0.017	8/29/2014 15:16	edge of road	110.258	0.060	6.0	
mfield6 6	5005156.644	428225.542	109.965	0.007	0.013	8/29/2014 15:16	edge of road	109.870	-0.095	9.5	
mfield6 7	5005171.572	428233.527	109.964	0.009	0.018	8/29/2014 15:17	edge of road	110.028	0.064	6.4	
mfield6 8	5005182.012	428245.942	109.866	0.008	0.015	8/29/2014 15:17	edge of road	109.910	0.044	4.4	
mfield6 9	5005192.876	428258.770	109.748	0.008	0.016	8/29/2014 15:18	edge of road	109.834	0.086	8.6	
mfield6 10	5005203.894	428271.885	109.61	0.007	0.014	8/29/2014 15:18	edge of road	109.699	0.089	8.9	
mfield7 1	5004759.504	427734.397	113.888	0.005	0.011	8/29/2014 15:23	edge of road	113.875	-0.013	1.3	
mfield7 2	5004767.417	427744.145	113.764	0.006	0.013	8/29/2014 15:24	edge of road	113.760	-0.004	0.4	
mfield7 3	5004777.694	427756.774	113.662	0.006	0.013	8/29/2014 15:24	edge of road	113.661	-0.001	0.1	
mfield7 4	5004786.595	427767.735	113.646	0.006	0.013	8/29/2014 15:25	edge of road	113.701	0.055	5.5	
mfield7 5	5004800.665	427785.062	113.713	0.007	0.014	8/29/2014 15:25	edge of road	113.750	0.037	3.7	
mfield7 6	5004809.008	427795.480	113.769	0.006	0.013	8/29/2014 15:26	edge of road	113.796	0.027	2.7	
mfield7 7	5004816.966	427805.181	113.848	0.007	0.014	8/29/2014 15:26	edge of road	113.831	-0.017	1.7	
mfield7 8	5004824.524	427814.875	113.958	0.009	0.018	8/29/2014 15:27	edge of road	113.988	0.030	3.0	
mfield7 9	5004835.213	427827.646	114.162	0.007	0.015	8/29/2014 15:27	edge of road	114.178	0.016	1.6	
mfield7 10	5004843.606	427837.912	114.358	0.008	0.017	8/29/2014 15:28	edge of road	114.350	-0.008	0.8	
mfield8 1	5003466.724	426155.816	113.281	0.01	0.02	8/29/2014 15:36	edge of road	113.281	0.000	0.0	
mfield8 2	5003470.108	426169.875	113.235	0.009	0.018	8/29/2014 15:37	edge of road	113.212	-0.023	2.3	
mfield8 3	5003483.188	426175.638	113.253	0.008	0.016	8/29/2014 15:37	edge of road	113.285	0.032	3.2	
mfield8 4	5003488.222	426191.075	113.183	0.006	0.012	8/29/2014 15:38	edge of road	113.209	0.026	2.6	
mfield8 5	5003502.332	426198.369	113.335	0.007	0.013	8/29/2014 15:38	edge of road	113.369	0.034	3.4	
mfield8 6	5003507.436	426213.500	113.266	0.007	0.013	8/29/2014 15:39	edge of road	113.300	0.034	3.4	
mfield8 7	5003521.841	426220.793	113.363	0.008	0.015	8/29/2014 15:39	edge of road	113.414	0.051	5.1	
mfield8 8	5003526.654	426235.924	113.34	0.007	0.014	8/29/2014 15:39	edge of road	113.346	0.006	0.6	
mfield8 9	5003541.503	426244.130	113.427	0.008	0.015	8/29/2014 15:40	edge of road	113.394	-0.033	3.3	
brown1 1	5007579.217	433182.519	96.837	0.008	0.011	9/2/2014 10:17	road centre line	96.880	0.043	4.3	
brown1 2	5007602.128	433185.275	96.938	0.01	0.014	9/2/2014 10:17	road centre line	97.026	0.088	8.8	
brown1 3	5007614.122	433173.629	96.952	0.01	0.014	9/2/2014 10:18	road centre line	97.008	0.056	5.6	

brown1 4	5007627.039	433162.399	97.084	0.01	0.014	9/2/2014 10:18	road centre line	97.160	0.076	7.6	
brown1 5	5007639.748	433151.707	97.185	0.01	0.014	9/2/2014 10:19	road centre line	97.256	0.071	7.1	
brown1 6	5007569.078	433172.221	96.955	0.01	0.015	9/2/2014 10:20	road centre line	97.023	0.068	6.8	
brown1 7	5007558.357	433159.065	97.117	0.01	0.015	9/2/2014 10:21	road centre line	97.133	0.016	1.6	
brown1 8	5007547.894	433146.716	97.267	0.01	0.014	9/2/2014 10:22	road centre line	97.284	0.017	1.7	
brown1 9	5007537.528	433134.749	97.351	0.01	0.015	9/2/2014 10:22	road centre line	97.391	0.040	4.0	
brown1 10	5007526.733	433123.024	97.408	0.01	0.015	9/2/2014 10:23	road centre line	97.476	0.068	6.8	
brown2 2	5007112.218	432640.641	97.638	0.013	0.019	9/2/2014 10:29	road centre line	97.604	-0.034	3.4	
brown2 3	5007100.794	432626.610	97.734	0.013	0.02	9/2/2014 10:30	road centre line	97.720	-0.014	1.4	
brown2 4	5007090.222	432613.809	97.735	0.014	0.02	9/2/2014 10:31	road centre line	97.721	-0.014	1.4	
brown2 5	5007078.857	432601.263	97.718	0.013	0.02	9/2/2014 10:33	road centre line	97.686	-0.032	3.2	
brown2 6	5007132.456	432665.487	97.523	0.013	0.019	9/2/2014 10:34	road centre line	97.501	-0.022	2.2	
brown2 7	5007143.973	432678.037	97.637	0.012	0.018	9/2/2014 10:35	road centre line	97.618	-0.019	1.9	
brown2 8	5007155.155	432690.515	97.801	0.012	0.018	9/2/2014 10:35	road centre line	97.791	-0.010	1.0	
brown2 9	5007166.177	432702.968	98.02	0.014	0.02	9/2/2014 10:37	road centre line	97.975	-0.045	4.5	
brown2 10	5007189.776	432730.150	98.339	0.012	0.02	9/2/2014 10:37	road centre line	98.294	-0.045	4.5	
hunt 1	5007275.430	432094.628	98.338	0.01	0.015	9/2/2014 10:45	edge of road	98.440	0.102	10.2	
hunt 2	5007272.912	432078.886	98.306	0.01	0.015	9/2/2014 10:45	edge of road	98.420	0.114	11.4	
hunt 3	5007270.180	432062.445	98.348	0.01	0.015	9/2/2014 10:46	edge of road	98.410	0.062	6.2	
hunt 4	5007267.356	432045.260	98.362	0.011	0.016	9/2/2014 10:46	edge of road	98.437	0.075	7.5	
hunt 5	5007264.443	432028.139	98.442	0.01	0.015	9/2/2014 10:47	edge of road	98.524	0.082	8.2	
hunt 6	5007261.551	432011.218	98.462	0.01	0.015	9/2/2014 10:48	edge of road	98.521	0.059	5.9	
hunt 7	5007258.909	431995.006	98.456	0.01	0.014	9/2/2014 10:48	edge of road	98.522	0.066	6.6	
hunt 8	5007255.657	431975.205	98.498	0.01	0.015	9/2/2014 10:49	edge of road	98.595	0.097	9.7	
hunt 9	5007253.118	431958.830	98.516	0.01	0.015	9/2/2014 10:49	edge of road	98.610	0.094	9.4	
hunt 10	5007250.389	431942.963	98.569	0.011	0.016	9/2/2014 10:50	edge of road	98.642	0.073	7.3	
hunt 11	5007247.470	431925.559	98.549	0.011	0.016	9/2/2014 10:51	edge of road	98.624	0.075	7.5	
hunt 12	5007244.751	431909.582	98.523	0.011	0.014	9/2/2014 10:51	edge of road	98.602	0.079	7.9	
hunt 13	5007241.900	431893.534	98.53	0.011	0.014	9/2/2014 10:51	edge of road	98.630	0.100	10.0	
hunt 14	5007238.894	431876.535	98.501	0.011	0.015	9/2/2014 10:52	edge of road	98.603	0.102	10.2	
hunt 15	5007236.042	431860.520	98.525	0.01	0.014	9/2/2014 10:53	edge of road	98.619	0.094	9.4	
hunt 16	5007233.041	431844.178	98.566	0.01	0.013	9/2/2014 10:54	edge of road	98.675	0.109	10.9	
hunt 17	5007229.936	431827.730	98.613	0.01	0.013	9/2/2014 10:54	edge of road	98.699	0.086	8.6	
hunt 18	5007226.844	431810.763	98.685	0.01	0.014	9/2/2014 10:55	edge of road	98.804	0.119	11.9	
hunt 19	5007220.568	431794.699	98.869	0.01	0.013	9/2/2014 10:56	road centre line	98.946	0.077	7.7	
hunt 20	5007220.493	431777.278	98.852	0.01	0.013	9/2/2014 10:58	edge of road	98.992	0.140	14.0	
hunt2 1	5008235.799	429886.313	109.652	0.01	0.013	9/2/2014 11:03	edge of road	109.690	0.038	3.8	
hunt2 2	5008250.444	429877.234	109.473	0.012	0.016	9/2/2014 11:04	edge of road	109.482	0.009	0.9	
hunt2 3	5008264.716	429868.453	109.261	0.013	0.016	9/2/2014 11:04	edge of road	109.257	-0.004	0.4	
hunt2 4	5008279.472	429859.555	109.002	0.012	0.016	9/2/2014 11:05	edge of road	109.029	0.027	2.7	
flew1 1	5008452.781	427652.607	121.726	0.013	0.017	9/2/2014 11:13	edge of road	121.775	0.049	4.9	
flew1 2	5008463.825	427665.199	121.61	0.014	0.017	9/2/2014 11:14	edge of road	121.663	0.053	5.3	
flew1 3	5008475.828	427676.615	121.574	0.013	0.018	9/2/2014 11:14	edge of road	121.615	0.041	4.1	
flew1 4	5008485.757	427690.051	121.751	0.014	0.018	9/2/2014 11:15	edge of road	121.782	0.031	3.1	

flew1 5	5008496.896	427702.632	121.811	0.014	0.019	9/2/2014 11:15	edge of road	121.887	0.076	7.6	
flew1 6	5008508.602	427716.284	121.717	0.015	0.019	9/2/2014 11:16	edge of road	121.774	0.057	5.7	
flew1 7	5008520.350	427729.874	121.646	0.013	0.02	9/2/2014 11:17	edge of road	121.700	0.054	5.4	
flew1 8	5008533.761	427745.899	121.461	0.013	0.02	9/2/2014 11:18	edge of road	121.490	0.029	2.9	
flew1 9	5008545.678	427759.089	121.23	0.013	0.02	9/2/2014 11:19	edge of road	121.286	0.056	5.6	
flew1 10	5008563.737	427779.822	121.081	0.013	0.02	9/2/2014 11:20	edge of road	121.123	0.042	4.2	
fern3 1	5008100.216	425193.622	128.206	0.009	0.014	9/2/2014 11:37	edge of road	128.198	-0.008	0.8	
fern3 2	5008088.324	425179.390	128.103	0.009	0.015	9/2/2014 11:37	edge of road	128.083	-0.020	2.0	
fern3 3	5008076.573	425165.384	128.009	0.01	0.016	9/2/2014 11:38	edge of road	127.964	-0.045	4.5	
fern3 4	5008064.678	425151.148	127.923	0.01	0.015	9/2/2014 11:39	edge of road	127.905	-0.018	1.8	
fern3 5	5008054.097	425138.552	127.871	0.01	0.015	9/2/2014 11:40	edge of road	127.851	-0.020	2.0	
fern3 6	5008042.992	425125.375	127.895	0.009	0.015	9/2/2014 11:41	edge of road	127.832	-0.063	6.3	
fern3 7	5008032.369	425112.938	127.891	0.009	0.015	9/2/2014 11:42	edge of road	127.843	-0.048	4.8	
fern3 8	5008021.442	425099.913	127.825	0.008	0.013	9/2/2014 11:42	edge of road	127.760	-0.065	6.5	
fern3 9	5008008.102	425084.226	127.757	0.01	0.016	9/2/2014 11:43	edge of road	127.735	-0.022	2.2	
fern3 10	5007997.008	425071.039	127.719	0.011	0.017	9/2/2014 11:44	edge of road	127.722	0.003	0.3	
fern4 1	5009377.717	426651.800	126.679	0.012	0.019	9/2/2014 11:54	edge of road	126.644	-0.035	3.5	
fern4 2	5009389.255	426664.730	126.885	0.008	0.012	9/2/2014 11:55	edge of road	126.881	-0.004	0.4	
fern4 3	5009402.854	426679.990	127.123	0.007	0.011	9/2/2014 11:55	edge of road	127.141	0.018	1.8	
fern4 4	5009414.626	426693.229	127.265	0.007	0.013	9/2/2014 11:56	edge of road	127.231	-0.034	3.4	
fern4 5	5009426.259	426706.189	127.205	0.009	0.014	9/2/2014 11:57	edge of road	127.217	0.012	1.2	
fern4 6	5009439.035	426720.463	126.984	0.011	0.017	9/2/2014 11:57	edge of road	126.945	-0.039	3.9	
fern4 7	5009452.829	426736.244	126.664	0.013	0.019	9/2/2014 11:58	edge of road	126.666	0.002	0.2	
fern4 8	5009464.436	426749.568	126.373	0.013	0.02	9/2/2014 11:59	edge of road	126.334	-0.039	3.9	
fern4 9	5009474.359	426761.008	126.115	0.012	0.017	9/2/2014 12:00	edge of road	126.111	-0.004	0.4	
fern4 10	5009484.650	426772.791	125.901	0.013	0.02	9/2/2014 12:01	edge of road	125.893	-0.008	0.8	
fern4 11	5009495.096	426784.835	125.768	0.013	0.019	9/2/2014 12:01	edge of road	125.719	-0.049	4.9	
fern4 12	5009507.253	426798.884	125.758	0.013	0.02	9/2/2014 12:05	edge of road	125.718	-0.040	4.0	
									Mean △Z :	4.5	
									Median△Z :	4.1	0 Yes out of 458
									Max △Z :	16.1	
									Min △Z :	0.0	

Discarded Points										
bleeks 8	5002414.959	427040.093	110.18	0.014	0.020	8/29/2014 9:46	newly renovated bridge	108.620	-1.560	156.0
conley 26	5002809.183	429206.861	103.44	0.014	0.020	8/29/2014 10:41	newly renovated bridge	103.067	-0.373	37.3
conley 27	5002796.862	429217.127	103.50	0.014	0.020	8/29/2014 10:42	newly renovated bridge	103.108	-0.390	39.0
mfield8 10	5003556.394	426266.441	113.619	0.006	0.012	8/29/2014 15:41	newly resurfaced road	113.062	-0.557	55.7
brown2 1	5007123.022	432653.744	97.565	0.013	0.02	9/2/2014 10:28	newly renovated bridge	93.869	-3.696	369.6
conley 28	5002784.438	429227.998	103.42	0.013	0.019	8/29/2014 10:42	newly renovated bridge	102.625	-0.791	79.1

Appendix D

SWMHYMO Model Files

```
2     Metric units
*#************************************************************************
*#  Project Name: [Kings (future)]    Project Number: [M800-200-050-206]
*#  Date        : 18-04-2017
*#  Modeller    : [   AA     ]
*#  Company     : Rideau Valley Conservation Authority
*#  License #   :  5329846
*#************************************************************************
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[3]
*%                   ["100YC3H.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|------------------------------------------------------------|
READ STORM          STORM_FILENAME=["storm.001"]
*%-----------------|------------------------------------------------------------|
DEFAULT VALUES      ICASEdef=[1],  read and print values
                    DEFVAL_FILENAME=["KingsVal.val"]
*%-----------------|------------------------------------------------------------|



*# Main Channel



CALIB NASHYD        ID=[1], NHYD=["M1"], DT=[1]min, AREA=[3265.36](ha),
                    DWF=[0](cms),  CN/C=[67.44], IA=[6.13](mm),
                    N=[3], TP=[6.94]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|------------------------------------------------------------|
SAVE HYD            ID=[1],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Runoff Hydrograph for M1"]
*%-----------------|------------------------------------------------------------|
ROUTE CHANNEL       IDout=[2], NHYD=["R1"], IDin=[1],
                    RDT=[1](min),
                    CHLGTH=[4028.72](m),  CHSLOPE=[0.11](%),
                                       FPSLOPE=[0.11](%),
                    SECNUM=[1],       NSEG=[3]
                    ( SEGROUGH, SEGDIST (m))=[0.05, 200] NSEG times
                                            -0.035, 227
                                              0.05, 427
                    ( DISTANCE (m), ELEVATION (m))=[0.00 ,123.0]
                                                    0.00 ,122.5
                                                 200.00 ,121.5
                                                 201.00 ,120.0
                                                 226.00 ,120.0
                                                 227.00 ,121.5
                                                 427.00 ,122.5
                                                 427.00 ,123.0
*%-----------------|------------------------------------------------------------|
SAVE HYD            ID=[2],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Routing Hydrograph for R1"]
*%-----------------|------------------------------------------------------------|
CALIB NASHYD        ID=[3], NHYD=["M2"], DT=[1]min, AREA=[856.86](ha),
                    DWF=[0](cms),  CN/C=[63.09], IA=[7.43](mm),
                    N=[3], TP=[3.04]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|------------------------------------------------------------|
SAVE HYD            ID=[3],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Routing Hydrograph for M2"]
*%-----------------|------------------------------------------------------------|
ADD HYD             IDsum=[4], NHYD=["N2"], IDs to add=[2 + 3]
*%-----------------|------------------------------------------------------------|
SAVE HYD            ID=[4],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Hydrograph for N2"]
*%-----------------|------------------------------------------------------------|
ROUTE CHANNEL       IDout=[5], NHYD=["R2"], IDin=[4],
                    RDT=[1](min),
                    CHLGTH=[2682.15](m),  CHSLOPE=[0.28](%),
                                       FPSLOPE=[0.28](%),
                    SECNUM=[1],       NSEG=[3]
                    ( SEGROUGH, SEGDIST (m))=[0.05, 50] NSEG times
                                            -0.035, 82
```

```
                                        0.05, 132
                    ( DISTANCE (m), ELEVATION (m))=[0.00 ,118.00]
                                                    0.00 ,117.66
                                                   50.00 ,116.66
                                                   51.00 ,114.66
                                                   81.00 ,114.66
                                                   82.00 ,116.66
                                                  132.00 ,117.66
                                                  132.00 ,118.00
*%-----------------|-------------------------------------------------------------|
SAVE HYD            ID=[5],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Routing Hydrograph for R2"]
*%-----------------|-------------------------------------------------------------|
CALIB STANDHYD      ID=[6], NHYD=["M3"], DT=[1](min), AREA=[237.37](ha),
                    XIMP=[0.1931], TIMP=[0.2414], DWF=[0](cms), LOSS=[2],
                    SCS curve number CN=[71.89],
                    Pervious   surfaces: IAper=[4.67](mm), SLPP=[2](%),
                                         LGP=[90](m), MNP=[0.25], SCP=[0](min),
                    Impervious surfaces: IAimp=[1.57](mm), SLPI=[0.5](%),
                                         LGI=[1257](m), MNI=[0.045], SCI=[0](min),
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
*%-----------------|-------------------------------------------------------------|
SAVE HYD            ID=[6],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Routing Hydrograph for M3"]
*%-----------------|-------------------------------------------------------------|
CALIB NASHYD        ID=[7], NHYD=["D1"], DT=[1]min, AREA=[1904.20](ha),
                    DWF=[0](cms),  CN/C=[68.07], IA=[5.96](mm),
                    N=[3], TP=[2.53]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
SAVE HYD            ID=[7],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Routing Hydrograph for D1"]
*%-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[8], NHYD=["N3"], IDs to add=[5 + 6 + 7]
*%-----------------|-------------------------------------------------------------|
SAVE HYD            ID=[8],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Hydrograph for N3"]
*%-----------------|-------------------------------------------------------------|
ROUTE CHANNEL       IDout=[9], NHYD=["R3"], IDin=[8],
                    RDT=[1](min),
                    CHLGTH=[5252.78](m),  CHSLOPE=[0.15](%),
                                        FPSLOPE=[0.15](%),
                    SECNUM=[1],       NSEG=[3]
                    ( SEGROUGH, SEGDIST (m))=[0.05, 200] NSEG times
                                           -0.035, 222
                                            0.05, 422
                    ( DISTANCE (m), ELEVATION (m))=[0.00 ,113.50]
                                                    0.00 ,113.06
                                                  200.00 ,112.06
                                                  201.00 ,110.06
                                                  221.00 ,110.06
                                                  222.00 ,112.06
                                                  422.00 ,113.06
                                                  422.00 ,113.50
*%-----------------|-------------------------------------------------------------|
SAVE HYD            ID=[9],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Routing Hydrograph for R3"]
*%-----------------|-------------------------------------------------------------|



CALIB NASHYD        ID=[1], NHYD=["T1"], DT=[1]min, AREA=[626.45](ha),
                    DWF=[0](cms),  CN/C=[65.93], IA=[6.56](mm),
                    N=[3], TP=[1.66]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
SAVE HYD            ID=[1],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Routing Hydrograph for T1"]
*%-----------------|-------------------------------------------------------------|
ROUTE CHANNEL       IDout=[2], NHYD=["R4"], IDin=[1],
```

```
                    RDT=[1](min),
                    CHLGTH=[2136](m),  CHSLOPE=[0.54](%),
                                        FPSLOPE=[0.54](%),
                    SECNUM=[1],       NSEG=[3]
                    ( SEGROUGH, SEGDIST (m))=[0.08, 50] NSEG times
                                             -0.035, 67
                                               0.08, 117
                    ( DISTANCE (m), ELEVATION (m))=[0.00 ,115.50]
                                                    0.00 ,114.85
                                                   50.00 ,113.85
                                                   51.00 ,112.85
                                                   66.00 ,112.85
                                                   67.00 ,113.85
                                                  117.00 ,114.85
                                                  117.00 ,115.50
*%-----------------|-------------------------------------------------------------|
SAVE HYD            ID=[2],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Routing Hydrograph for R4"]
*%-----------------|-------------------------------------------------------------|
CALIB NASHYD        ID=[3], NHYD=["T2"], DT=[1]min, AREA=[509](ha),
                    DWF=[0](cms),  CN/C=[57.26], IA=[9.48](mm),
                    N=[3], TP=[1.99]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
SAVE HYD            ID=[3],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Routing Hydrograph for T2"]
*%-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[4], NHYD=["N6"], IDs to add=[2 + 3]
*%-----------------|-------------------------------------------------------------|
SAVE HYD            ID=[4],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Hydrograph for N6"]
*%-----------------|-------------------------------------------------------------|


*%-----------------|-------------------------------------------------------------|
CALIB NASHYD        ID=[5], NHYD=["M4"], DT=[1]min, AREA=[872.08](ha),
                    DWF=[0](cms),  CN/C=[62.93], IA=[7.48](mm),
                    N=[3], TP=[1.34]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
SAVE HYD            ID=[5],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Routing Hydrograph for M4"]
*%-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[6], NHYD=["N4"], IDs to add=[4 + 5 + 9]
*%-----------------|-------------------------------------------------------------|
SAVE HYD            ID=[6],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Hydrograph for N4"]
*%-----------------|-------------------------------------------------------------|
ROUTE CHANNEL       IDout=[7], NHYD=["R5"], IDin=[6],
                    RDT=[1](min),
                    CHLGTH=[3635.36](m),  CHSLOPE=[0.28](%),
                                           FPSLOPE=[0.28](%),
                    SECNUM=[1],       NSEG=[3]
                    ( SEGROUGH, SEGDIST (m))=[0.08, 200] NSEG times
                                             -0.035, 212
                                               0.08, 412
                    ( DISTANCE (m), ELEVATION (m))=[0.00 ,107.00]
                                                    0.00 ,106.60
                                                  200.00 ,105.60
                                                  201.00 ,103.60
                                                  211.00 ,103.60
                                                  212.00 ,105.60
                                                  412.00 ,106.60
                                                  412.00 ,107.00
*%-----------------|-------------------------------------------------------------|
SAVE HYD            ID=[7],   # OF PCYCLES=[1],  ICASEsh=[1]
                    HYD_COMMENT=["Routing Hydrograph for R5"]
*%-----------------|-------------------------------------------------------------|
CALIB NASHYD        ID=[8], NHYD=["M5"], DT=[1]min, AREA=[1276.33](ha),
                    DWF=[0](cms),  CN/C=[61.07], IA=[8.10](mm),
                    N=[3], TP=[1.66]hrs,
```

```
                  RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%----------------|---------------------------------------------------------|
SAVE HYD          ID=[8],   # OF PCYCLES=[1],  ICASEsh=[1]
                  HYD_COMMENT=["Routing Hydrograph for M5"]
*%----------------|---------------------------------------------------------|
ADD HYD           IDsum=[9], NHYD=["N7"], IDs to add=[7 + 8]
*%----------------|---------------------------------------------------------|
SAVE HYD          ID=[9],   # OF PCYCLES=[1],  ICASEsh=[1]
                  HYD_COMMENT=["Routing Hydrograph for N7"]
*%----------------|---------------------------------------------------------|
*% 100 Year 6 Hour Chicago Design Storm
START             TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[6]
*                 ["100YC6H.stm"] <--storm filename, one per line for NSTORM time
*%----------------|---------------------------------------------------------|
*% 100 Year 12 Hour Chicago Design Storm
START             TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[7]
*                 ["100YC12H.stm"] <--storm filename, one per line for NSTORM time
*%----------------|---------------------------------------------------------|
*% 100 Year 24 Hour Chicago Design Storm
START             TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[8]
*                 ["100YC24H.stm"] <--storm filename, one per line for NSTORM time
*%----------------|---------------------------------------------------------|
*%100 Year 3 Hour SCS Design Storm
START             TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1], NRUN=[9]
*                 ["100YS3.stm"] <--storm filename, one per line for NSTORM time
*%----------------|---------------------------------------------------------|
*%100 Year 6 Hour SCS Design Storm
START             TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1], NRUN=[10]
*                 ["100YS6.stm"] <--storm filename, one per line for NSTORM time
*%----------------|---------------------------------------------------------|
*%100 Year 12 Hour SCS Design Storm
START             TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1], NRUN=[11]
*                 ["100YS12.stm"] <--storm filename, one per line for NSTORM time
*%----------------|---------------------------------------------------------|
*%100 Year 24 Hour SCS Design Storm
START             TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1], NRUN=[12]
*                 ["100YS24.stm"] <--storm filename, one per line for NSTORM time
*%----------------|---------------------------------------------------------|
*% 2 Year 24 Hour SCS Design Storm
START             TZERO=[0.0]hrs or date,  METOUT=[2], NSTORM=[1],  NRUN=[102]
*                 ["2YS24.stm"] <--storm filename, one per line for NSTORM time
*%----------------|---------------------------------------------------------|
*% 5 Year 24 Hour SCS Design Storm
START             TZERO=[0.0]hrs or date,  METOUT=[2], NSTORM=[1],  NRUN=[105]
*                 ["5YS24.stm"] <--storm filename, one per line for NSTORM time
*%----------------|---------------------------------------------------------|
*% 10 Year 24 Hour SCS Design Storm
START             TZERO=[0.0]hrs or date,  METOUT=[2], NSTORM=[1],  NRUN=[110]
*                 ["10YS24.stm"] <--storm filename, one per line for NSTORM time
*%----------------|---------------------------------------------------------|
*% 20 Year 24 Hour SCS Design Storm
START             TZERO=[0.0]hrs or date,  METOUT=[2], NSTORM=[1],  NRUN=[120]
*                 ["20YS24.stm"] <--storm filename, one per line for NSTORM time
*%----------------|---------------------------------------------------------|
*% 50 Year 24 Hour SCS Design Storm
START             TZERO=[0.0]hrs or date,  METOUT=[2], NSTORM=[1],  NRUN=[150]
*                 ["50YS24.stm"] <--storm filename, one per line for NSTORM time
*%----------------|---------------------------------------------------------|
*% 200 Year 24 Hour SCS Design Storm
START             TZERO=[0.0]hrs or date,  METOUT=[2], NSTORM=[1],  NRUN=[200]
*                 ["200YS24.stm"] <--storm filename, one per line for NSTORM time
*%----------------|---------------------------------------------------------|
*% 350 Year 24 Hour SCS Design Storm
START             TZERO=[0.0]hrs or date,  METOUT=[2], NSTORM=[1],  NRUN=[350]
*                 ["350YS24.stm"] <--storm filename, one per line for NSTORM time
*%----------------|---------------------------------------------------------|
*% 500 Year 24 Hour SCS Design Storm
START             TZERO=[0.0]hrs or date,  METOUT=[2], NSTORM=[1],  NRUN=[500]
*                 ["500YS24.stm"] <--storm filename, one per line for NSTORM time
*%----------------|---------------------------------------------------------|
FINISH
```

```
================================================================================

   SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999    =========
   S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
   SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
       S  W W W  M   M  H   H    Y    M   M  O   O       9999   9999   Sept 2011
   SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9    =========
                                                          9   9  9   9   # 5329846
        StormWater Management HYdrologic Model            999    999    =========

 ********************************************************************************
 ***************************** SWMHYMO Ver/4.05  ********************************
 *********  A single event and continuous hydrologic simulation model  *********
 *********     based on the principles of HYMO and its successors      *********
 *********                 OTTHYMO-83 and OTTHYMO-89.                  *********
 ********************************************************************************
 ******** Distributed by:  J.F. Sabourin and Associates Inc.           *********
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 *********                  E-Mail: swmhymo@jfsa.Com                   *********
 ********************************************************************************

 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 +++++++++ Licensed user: Rideau Valley Conservation Authority         +++++++++
 +++++++++                Manotick             SERIAL#:5329846        +++++++++
 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

 ********************************************************************************
 *********          ++++++ PROGRAM ARRAY DIMENSIONS ++++++             *********
 *********          Maximum value for ID numbers  :     10            *********
 *********          Max. number of rainfall points: 105408            *********
 *********          Max. number of flow points    : 105408            *********
 ********************************************************************************

 ***** DESCRIPTION SUMMARY TABLE HEADERS (units depend on METOUT in START) *****
 *****-------------------------------------------------------------------*****
 *****    ID:  Hydrograph IDentification numbers, (1-10).                *****
 *****  NHYD:  Hydrograph reference numbers, (6 digits or characters).   *****
 *****  AREA:  Drainage area associated with hydrograph, (ac.) or (ha.).  *****
 ***** QPEAK:  Peak flow of simulated hydrograph, (ft^3/s) or (m^3/s).   *****
 ***** TpeakDate_hh:mm is the date and time of the peak flow.            *****
 *****  R.V.:  Runoff Volume of simulated hydrograph, (in) or (mm).      *****
 *****  R.C.:  Runoff Coefficient of simulated hydrograph, (ratio).      *****
 *****     *:  see WARNING or NOTE message printed at end of run.        *****
 *****    **:  see  ERROR  message printed at end of run.                *****
 ********************************************************************************
 ********************************************************************************

::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::

 ********************************************************************************

 **********************   S U M M A R Y   O U T P U T   **********************
 ********************************************************************************
 *         DATE: 2017-05-15     TIME: 12:10:28     RUN COUNTER: 000288         *
 ********************************************************************************
 * Input   filename: C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\Kings.dat *
 * Output  filename: C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\Kings.out *
 * Summary filename: C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\Kings.sum *
 * User comments:                                                             *
 * 1:_____________________________________________________________________*
 * 2:_____________________________________________________________________*
 * 3:_____________________________________________________________________*
 ********************************************************************************


#*******************************************************************************
#  Project Name: [Kings (future)]    Project Number: [M800-200-050-206]
#  Date        : 18-04-2017
#  Modeller    : [   AA     ]
#  Company     : Rideau Valley Conservation Authority
#  License #   :  5329846
#*******************************************************************************
  ** 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: [Kings (future)]    Project Number: [M800-200-050-206]
#  Date        : 18-04-2017
#  Modeller    : [   AA     ]
#  Company     : Rideau Valley Conservation Authority
#  License #   :  5329846
#*******************************************************************************
 003:0002----------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=10.00:SDUR=   3.00:PTOT=  74.43]
 003:0003----------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\KingsVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [RVCA Kings Creek FPM]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      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=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
# Main Channel
 003:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:M1          3265.36   17.628 No_date    8:23   24.43 .328
      [CN= 67.4: N= 3.00]
      [Tp= 6.94:DT= 1.00]
 003:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:M1          3265.36   17.628 No_date    8:23   24.43  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M1.003
      remark:Runoff Hydrograph for M1
 003:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:M1          3265.36   17.628 No_date    8:23   24.43  n/a
      [RDT= 1.00] out<- 02:R1          3265.36   17.000 No_date    9:29   24.43  n/a
      [L/S/n= 4029./ .110/.035]
      {Vmax=  .813:Dmax=  .844}
 003:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:R1          3265.36   17.000 No_date    9:29   24.43  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R1.003
      remark:Routing Hydrograph for R1
 003:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:M2           856.86    8.566 No_date    4:34   20.82 .280
      [CN= 63.1: N= 3.00]
      [Tp= 3.04:DT= 1.00]
 003:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M2           856.86    8.566 No_date    4:34   20.82  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M2.003
      remark:Routing Hydrograph for M2
 003:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:R1          3265.36   17.000 No_date    9:29   24.43  n/a
                      + 03:M2           856.86    8.566 No_date    4:34   20.82  n/a
      [DT= 1.00]  SUM=  04:N2          4122.22   20.225 No_date    7:53   23.68  n/a
 003:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:N2          4122.22   20.225 No_date    7:53   23.68  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N2.003
      remark:Hydrograph for N2
 003:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 04:N2          4122.22   20.225 No_date    7:53   23.68  n/a
      [RDT= 1.00] out<- 05:R2          4122.22   20.107 No_date    8:18   23.68  n/a
      [L/S/n= 2682./ .280/.035]
      {Vmax= 1.074:Dmax=  .620}
 003:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:R2          4122.22   20.107 No_date    8:18   23.68  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R2.003
      remark:Routing Hydrograph for R2
 003:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     06:M3           237.37   12.520 No_date    1:48   38.29 .514
      [XIMP=.19:TIMP=.24]
      [LOSS= 2 :CN= 71.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1257.:MNI=.045:SCI=   .0]
 003:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:M3           237.37   12.520 No_date    1:48   38.29  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M3.003
      remark:Routing Hydrograph for M3
 003:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:D1          1904.20   26.895 No_date    4:03   24.99 .336
      [CN= 68.1: N= 3.00]
      [Tp= 2.53:DT= 1.00]
 003:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:D1          1904.20   26.895 No_date    4:03   24.99  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-D1.003
      remark:Routing Hydrograph for D1
 003:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            05:R2          4122.22   20.107 No_date    8:18   23.68  n/a
                      + 06:M3           237.37   12.520 No_date    1:48   38.29  n/a
                      + 07:D1          1904.20   26.895 No_date    4:03   24.99  n/a
      [DT= 1.00]  SUM=  08:N3          6263.79   38.567 No_date    4:46   24.63  n/a
 003:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           08:N3          6263.79   38.567 No_date    4:46   24.63  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N3.003
      remark:Hydrograph for N3
 003:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 08:N3          6263.79   38.567 No_date    4:46   24.63  n/a
      [RDT= 1.00] out<- 09:R3          6263.79   36.183 No_date    5:37   24.63  n/a
      [L/S/n= 5253./ .150/.035]
      {Vmax= 1.300:Dmax= 1.429}
 003:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           09:R3          6263.79   36.183 No_date    5:37   24.63  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R3.003
      remark:Routing Hydrograph for R3
 003:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:T1           626.45   11.472 No_date    3:13   23.13 .311
      [CN= 65.9: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 003:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:T1           626.45   11.472 No_date    3:13   23.13  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T1.003
      remark:Routing Hydrograph for T1
 003:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:T1           626.45   11.472 No_date    3:13   23.13  n/a
      [RDT= 1.00] out<- 02:R4           626.45   11.052 No_date    3:34   23.13  n/a
      [L/S/n= 2136./ .540/.035]
      {Vmax= 1.340:Dmax=  .546}
 003:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:R4           626.45   11.052 No_date    3:34   23.13  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R4.003
      remark:Routing Hydrograph for R4
 003:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:T2           509.00    5.815 No_date    3:36   16.57 .223
      [CN= 57.3: N= 3.00]
      [Tp= 1.99:DT= 1.00]
 003:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:T2           509.00    5.815 No_date    3:36   16.57  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T2.003
      remark:Routing Hydrograph for T2
 003:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:R4           626.45   11.052 No_date    3:34   23.13  n/a
                      + 03:T2           509.00    5.815 No_date    3:36   16.57  n/a
      [DT= 1.00]  SUM=  04:N6          1135.45   16.866 No_date    3:34   20.20  n/a
 003:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:N6          1135.45   16.866 No_date    3:34   20.20  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N6.003
      remark:Hydrograph for N6
 003:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       05:M4           872.08   16.528 No_date    2:51   20.70 .278
      [CN= 62.9: N= 3.00]
      [Tp= 1.34:DT= 1.00]
 003:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:M4           872.08   16.528 No_date    2:51   20.70  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M4.003
      remark:Routing Hydrograph for M4
 003:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:N6          1135.45   16.866 No_date    3:34   20.20  n/a
                      + 05:M4           872.08   16.528 No_date    2:51   20.70  n/a
                      + 09:R3          6263.79   36.183 No_date    5:37   24.63  n/a
      [DT= 1.00]  SUM=  06:N4          8271.32   58.236 No_date    3:55   23.61  n/a
 003:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:N4          8271.32   58.236 No_date    3:55   23.61  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N4.003
      remark:Hydrograph for N4
 003:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 06:N4          8271.32   58.236 No_date    3:55   23.61  n/a
      [RDT= 1.00] out<- 07:R5          8271.32   55.304 No_date    5:06   23.61  n/a
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     [L/S/n= 3635./ .280/.035]
     {Vmax= 1.442:Dmax= 2.268}
 003:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          07:R5          8271.32   55.304 No_date    5:06   23.61  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R5.003
      remark:Routing Hydrograph for R5
 003:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      08:M5          1276.33   19.455 No_date    3:15   19.28 .259
      [CN= 61.1: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 003:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          08:M5          1276.33   19.455 No_date    3:15   19.28  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M5.003
      remark:Routing Hydrograph for M5
 003:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           07:R5          8271.32   55.304 No_date    5:06   23.61  n/a
                    +  08:M5          1276.33   19.455 No_date    3:15   19.28  n/a
      [DT= 1.00]  SUM=  09:N7          9547.65   68.229 No_date    4:12   23.03  n/a
 003:0039--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          09:N7          9547.65   68.229 No_date    4:12   23.03  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N7.003
      remark:Routing Hydrograph for N7
  ** 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: [Kings (future)]    Project Number: [M800-200-050-206]
#  Date        : 18-04-2017
#  Modeller    : [   AA     ]
#  Company     : Rideau Valley Conservation Authority
#  License #   :  5329846
#*******************************************************************************
 006:0002--------------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=10.00:SDUR=   6.00:PTOT=  88.42]
 006:0003--------------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\KingsVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [RVCA Kings Creek FPM]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      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=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
# Main Channel
 006:0004--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      01:M1          3265.36   23.332 No_date    9:55   33.05 .374
      [CN= 67.4: N= 3.00]
      [Tp= 6.94:DT= 1.00]
 006:0005--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          01:M1          3265.36   23.332 No_date    9:55   33.05  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M1.006
      remark:Runoff Hydrograph for M1
 006:0006--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:M1          3265.36   23.332 No_date    9:55   33.05  n/a
      [RDT= 1.00] out<- 02:R1          3265.36   22.711 No_date   10:50   33.05  n/a
      [L/S/n= 4029./ .110/.035]
      {Vmax=  .908:Dmax= 1.001}
 006:0007--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          02:R1          3265.36   22.711 No_date   10:50   33.05  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R1.006
      remark:Routing Hydrograph for R1
 006:0008--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      03:M2           856.86   10.456 No_date    6:07   28.57 .323
      [CN= 63.1: N= 3.00]
      [Tp= 3.04:DT= 1.00]
 006:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          03:M2           856.86   10.456 No_date    6:07   28.57  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M2.006
      remark:Routing Hydrograph for M2
 006:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           02:R1          3265.36   22.711 No_date   10:50   33.05  n/a
                    +  03:M2           856.86   10.456 No_date    6:07   28.57  n/a
      [DT= 1.00]  SUM=  04:N2          4122.22   27.437 No_date    9:12   32.12  n/a
 006:0011--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          04:N2          4122.22   27.437 No_date    9:12   32.12  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N2.006
      remark:Hydrograph for N2
 006:0012--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 04:N2          4122.22   27.437 No_date    9:12   32.12  n/a
      [RDT= 1.00] out<- 05:R2          4122.22   27.300 No_date    9:37   32.12  n/a
      [L/S/n= 2682./ .280/.035]
      {Vmax= 1.204:Dmax=  .745}
 006:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          05:R2          4122.22   27.300 No_date    9:37   32.12  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R2.006
      remark:Routing Hydrograph for R2
 006:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD    06:M3           237.37   13.789 No_date    2:46   48.89 .553
      [XIMP=.19:TIMP=.24]
      [LOSS= 2 :CN= 71.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1257.:MNI=.045:SCI=   .0]
 006:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          06:M3           237.37   13.789 No_date    2:46   48.89  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M3.006
      remark:Routing Hydrograph for M3
 006:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      07:D1          1904.20   31.328 No_date    5:21   33.73 .381
      [CN= 68.1: N= 3.00]
      [Tp= 2.53:DT= 1.00]
 006:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          07:D1          1904.20   31.328 No_date    5:21   33.73  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-D1.006
      remark:Routing Hydrograph for D1
 006:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           05:R2          4122.22   27.300 No_date    9:37   32.12  n/a
                    +  06:M3           237.37   13.789 No_date    2:46   48.89  n/a
                    +  07:D1          1904.20   31.328 No_date    5:21   33.73  n/a
      [DT= 1.00]  SUM=  08:N3          6263.79   50.103 No_date    6:26   33.24  n/a
 006:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          08:N3          6263.79   50.103 No_date    6:26   33.24  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N3.006
      remark:Hydrograph for N3
 006:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 08:N3          6263.79   50.103 No_date    6:26   33.24  n/a
      [RDT= 1.00] out<- 09:R3          6263.79   47.902 No_date    7:10   33.24  n/a
      [L/S/n= 5253./ .150/.035]
      {Vmax= 1.432:Dmax= 1.678}
 006:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          09:R3          6263.79   47.902 No_date    7:10   33.24  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R3.006
      remark:Routing Hydrograph for R3
 006:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      01:T1           626.45   12.896 No_date    4:12   31.45 .356
      [CN= 65.9: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 006:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          01:T1           626.45   12.896 No_date    4:12   31.45  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T1.006
      remark:Routing Hydrograph for T1
 006:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:T1           626.45   12.896 No_date    4:12   31.45  n/a
      [RDT= 1.00] out<- 02:R4           626.45   12.535 No_date    4:32   31.45  n/a
      [L/S/n= 2136./ .540/.035]
      {Vmax= 1.405:Dmax=  .587}
 006:0025--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          02:R4           626.45   12.535 No_date    4:32   31.45  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R4.006
      remark:Routing Hydrograph for R4
 006:0026--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      03:T2           509.00    6.710 No_date    4:44   23.21 .262
      [CN= 57.3: N= 3.00]
      [Tp= 1.99:DT= 1.00]
 006:0027--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          03:T2           509.00    6.710 No_date    4:44   23.21  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T2.006
      remark:Routing Hydrograph for T2
 006:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           02:R4           626.45   12.535 No_date    4:32   31.45  n/a
                    +  03:T2           509.00    6.710 No_date    4:44   23.21  n/a
      [DT= 1.00]  SUM=  04:N6          1135.45   19.218 No_date    4:35   27.76  n/a
 006:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          04:N6          1135.45   19.218 No_date    4:35   27.76  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N6.006
      remark:Hydrograph for N6
 006:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      05:M4           872.08   18.696 No_date    3:47   28.42 .321
      [CN= 62.9: N= 3.00]
      [Tp= 1.34:DT= 1.00]
 006:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          05:M4           872.08   18.696 No_date    3:47   28.42  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M4.006
      remark:Routing Hydrograph for M4
 006:0032--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           04:N6          1135.45   19.218 No_date    4:35   27.76  n/a
                    +  05:M4           872.08   18.696 No_date    3:47   28.42  n/a
                    +  09:R3          6263.79   47.902 No_date    7:10   33.24  n/a
      [DT= 1.00]  SUM=  06:N4          8271.32   70.307 No_date    5:41   31.98  n/a
 006:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          06:N4          8271.32   70.307 No_date    5:41   31.98  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N4.006
      remark:Hydrograph for N4
 006:0034--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 06:N4          8271.32   70.307 No_date    5:41   31.98  n/a
      [RDT= 1.00] out<- 07:R5          8271.32   67.143 No_date    7:13   31.98  n/a
      [L/S/n= 3635./ .280/.035]
      {Vmax= 1.143:Dmax= 2.413}
 006:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          07:R5          8271.32   67.143 No_date    7:13   31.98  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R5.006
      remark:Routing Hydrograph for R5
 006:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      08:M5          1276.33   22.021 No_date    4:14   26.63 .301
      [CN= 61.1: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 006:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          08:M5          1276.33   22.021 No_date    4:14   26.63  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M5.006
      remark:Routing Hydrograph for M5
 006:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           07:R5          8271.32   67.143 No_date    7:13   31.98  n/a
                    +  08:M5          1276.33   22.021 No_date    4:14   26.63  n/a
      [DT= 1.00]  SUM=  09:N7          9547.65   79.007 No_date    6:24   31.27  n/a
 006:0039--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          09:N7          9547.65   79.007 No_date    6:24   31.27  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N7.006
      remark:Routing Hydrograph for N7
  ** END OF RUN :   6

********************************************************************************




 RUN:COMMAND#
 007:0001--------------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   7 ]
#*******************************************************************************
#  Project Name: [Kings (future)]    Project Number: [M800-200-050-206]
#  Date        : 18-04-2017
#  Modeller    : [   AA     ]
#  Company     : Rideau Valley Conservation Authority
#  License #   :  5329846
#*******************************************************************************
 007:0002--------------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=10.00:SDUR=  12.00:PTOT= 104.44]
 007:0003--------------------------------------------------------------------------------
     DEFAULT VALUES
```

```
      Filename = C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\KingsVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [RVCA Kings Creek FPM]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      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=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
# Main Channel
 007:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:M1          3265.36   28.284 No_date   12:59   43.74 .419
      [CN= 67.4: N= 3.00]
      [Tp= 6.94:DT= 1.00]
 007:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:M1          3265.36   28.284 No_date   12:59   43.74  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M1.007
      remark:Runoff Hydrograph for M1
 007:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:M1          3265.36   28.284 No_date   12:59   43.74  n/a
      [RDT= 1.00] out<- 02:R1          3265.36   27.838 No_date   13:44   43.74  n/a
      [L/S/n= 4029./ .110/.035]
      {Vmax=  .976:Dmax= 1.125}
 007:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:R1          3265.36   27.838 No_date   13:44   43.74  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R1.007
      remark:Routing Hydrograph for R1
 007:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:M2           856.86   11.659 No_date    8:00   38.32 .367
      [CN= 63.1: N= 3.00]
      [Tp= 3.04:DT= 1.00]
 007:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M2           856.86   11.659 No_date    8:00   38.32  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M2.007
      remark:Routing Hydrograph for M2
 007:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:R1          3265.36   27.838 No_date   13:44   43.74  n/a
                      +  03:M2           856.86   11.659 No_date    8:00   38.32  n/a
      [DT= 1.00]  SUM=  04:N2          4122.22   33.717 No_date   12:35   42.62  n/a
 007:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:N2          4122.22   33.717 No_date   12:35   42.62  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N2.007
      remark:Hydrograph for N2
 007:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 04:N2          4122.22   33.717 No_date   12:35   42.62  n/a
      [RDT= 1.00] out<- 05:R2          4122.22   33.612 No_date   12:53   42.62  n/a
      [L/S/n= 2682./ .280/.035]
      {Vmax= 1.302:Dmax=  .844}
 007:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:R2          4122.22   33.612 No_date   12:53   42.62  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R2.007
      remark:Routing Hydrograph for R2
 007:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     06:M3           237.37   14.956 No_date    4:46   61.62 .590
      [XIMP=.19:TIMP=.24]
      [LOSS= 2 :CN= 71.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=    .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1257.:MNI=.045:SCI=    .0]
 007:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:M3           237.37   14.956 No_date    4:46   61.62  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M3.007
      remark:Routing Hydrograph for M3
 007:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:D1          1904.20   34.836 No_date    7:16   44.56 .427
      [CN= 68.1: N= 3.00]
      [Tp= 2.53:DT= 1.00]
 007:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:D1          1904.20   34.836 No_date    7:16   44.56  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-D1.007
      remark:Routing Hydrograph for D1
 007:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            05:R2          4122.22   33.612 No_date   12:53   42.62  n/a
                      +  06:M3           237.37   14.956 No_date    4:46   61.62  n/a
                      +  07:D1          1904.20   34.836 No_date    7:16   44.56  n/a
      [DT= 1.00]  SUM=  08:N3          6263.79   56.178 No_date    8:49   43.93  n/a
 007:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           08:N3          6263.79   56.178 No_date    8:49   43.93  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N3.007
      remark:Hydrograph for N3
 007:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 08:N3          6263.79   56.178 No_date    8:49   43.93  n/a
      [RDT= 1.00] out<- 09:R3          6263.79   55.034 No_date    9:41   43.93  n/a
      [L/S/n= 5253./ .150/.035]
      {Vmax= 1.491:Dmax= 1.800}
 007:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           09:R3          6263.79   55.034 No_date    9:41   43.93  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R3.007
      remark:Routing Hydrograph for R3
 007:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:T1           626.45   14.475 No_date    6:07   41.81 .400
      [CN= 65.9: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 007:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:T1           626.45   14.475 No_date    6:07   41.81  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T1.007
      remark:Routing Hydrograph for T1
 007:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:T1           626.45   14.475 No_date    6:07   41.81  n/a
      [RDT= 1.00] out<- 02:R4           626.45   14.088 No_date    6:27   41.81  n/a
      [L/S/n= 2136./ .540/.035]
      {Vmax= 1.466:Dmax=  .629}
 007:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:R4           626.45   14.088 No_date    6:27   41.81  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R4.007
      remark:Routing Hydrograph for R4
 007:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:T2           509.00    7.596 No_date    6:39   31.69 .303
      [CN= 57.3: N= 3.00]
      [Tp= 1.99:DT= 1.00]
 007:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:T2           509.00    7.596 No_date    6:39   31.69  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T2.007
      remark:Routing Hydrograph for T2
 007:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:R4           626.45   14.088 No_date    6:27   41.81  n/a
                      +  03:T2           509.00    7.596 No_date    6:39   31.69  n/a
      [DT= 1.00]  SUM=  04:N6          1135.45   21.657 No_date    6:31   37.28  n/a
 007:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:N6          1135.45   21.657 No_date    6:31   37.28  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N6.007
      remark:Hydrograph for N6
 007:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       05:M4           872.08   21.148 No_date    5:43   38.13 .365
      [CN= 62.9: N= 3.00]
      [Tp= 1.34:DT= 1.00]
 007:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:M4           872.08   21.148 No_date    5:43   38.13  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M4.007
      remark:Routing Hydrograph for M4
 007:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:N6          1135.45   21.657 No_date    6:31   37.28  n/a
                      +  05:M4           872.08   21.148 No_date    5:43   38.13  n/a
                      +  09:R3          6263.79   55.034 No_date    9:41   43.93  n/a
      [DT= 1.00]  SUM=  06:N4          8271.32   78.649 No_date    7:33   42.40  n/a
 007:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:N4          8271.32   78.649 No_date    7:33   42.40  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N4.007
      remark:Hydrograph for N4
 007:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 06:N4          8271.32   78.649 No_date    7:33   42.40  n/a
      [RDT= 1.00] out<- 07:R5          8271.32   74.504 No_date    9:27   42.40  n/a
      [L/S/n= 3635./ .280/.035]
      {Vmax= 1.014:Dmax= 2.498}
 007:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:R5          8271.32   74.504 No_date    9:27   42.40  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R5.007
      remark:Routing Hydrograph for R5
 007:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       08:M5          1276.33   24.888 No_date    6:10   35.94 .344
      [CN= 61.1: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 007:0037---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           08:M5          1276.33   24.888 No_date    6:10   35.94  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M5.007
      remark:Routing Hydrograph for M5
 007:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            07:R5          8271.32   74.504 No_date    9:27   42.40  n/a
                      +  08:M5          1276.33   24.888 No_date    6:10   35.94  n/a
      [DT= 1.00]  SUM=  09:N7          9547.65   87.262 No_date    8:25   41.54  n/a
 007:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           09:N7          9547.65   87.262 No_date    8:25   41.54  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N7.007
      remark:Routing Hydrograph for N7
  ** 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: [Kings (future)]    Project Number: [M800-200-050-206]
#  Date        : 18-04-2017
#  Modeller    : [   AA     ]
#  Company     : Rideau Valley Conservation Authority
#  License #   :  5329846
#*******************************************************************************
 008:0002---------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=10.00:SDUR=  24.00:PTOT= 123.02]
 008:0003---------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\KingsVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [RVCA Kings Creek FPM]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      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=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
# Main Channel
 008:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:M1          3265.36   31.159 No_date   16:56   57.04 .464
      [CN= 67.4: N= 3.00]
      [Tp= 6.94:DT= 1.00]
 008:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:M1          3265.36   31.159 No_date   16:56   57.04  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M1.008
      remark:Runoff Hydrograph for M1
 008:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:M1          3265.36   31.159 No_date   16:56   57.04  n/a
      [RDT= 1.00] out<- 02:R1          3265.36   30.763 No_date   17:45   57.04  n/a
      [L/S/n= 4029./ .110/.035]
      {Vmax= 1.010:Dmax= 1.192}
 008:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:R1          3265.36   30.763 No_date   17:45   57.04  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R1.008
      remark:Routing Hydrograph for R1
 008:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:M2           856.86   13.047 No_date   11:53   50.57 .411
      [CN= 63.1: N= 3.00]
      [Tp= 3.04:DT= 1.00]
 008:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M2           856.86   13.047 No_date   11:53   50.57  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M2.008
      remark:Routing Hydrograph for M2
 008:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:R1          3265.36   30.763 No_date   17:45   57.04  n/a
                      +  03:M2           856.86   13.047 No_date   11:53   50.57  n/a
      [DT= 1.00]  SUM=  04:N2          4122.22   37.155 No_date   16:19   55.70  n/a
 008:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:N2          4122.22   37.155 No_date   16:19   55.70  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N2.008
      remark:Hydrograph for N2
 008:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 04:N2          4122.22   37.155 No_date   16:19   55.70  n/a
      [RDT= 1.00] out<- 05:R2          4122.22   37.065 No_date   16:37   55.70  n/a
      [L/S/n= 2682./ .280/.035]
      {Vmax= 1.356:Dmax=  .896}
```

```
008:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          05:R2         4122.22   37.065 No_date   16:37   55.70  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R2.008
     remark:Routing Hydrograph for R2
008:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD    06:M3          237.37   16.256 No_date    8:45   77.01 .626
     [XIMP=.19:TIMP=.24]
     [LOSS= 2 :CN= 71.9]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1257.:MNI=.045:SCI=   .0]
008:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          06:M3          237.37   16.256 No_date    8:45   77.01  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M3.008
     remark:Routing Hydrograph for M3
008:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      07:D1         1904.20   38.781 No_date   11:10   58.01 .472
     [CN= 68.1: N= 3.00]
     [Tp= 2.53:DT= 1.00]
008:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          07:D1         1904.20   38.781 No_date   11:10   58.01  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-D1.008
     remark:Routing Hydrograph for D1
008:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           05:R2         4122.22   37.065 No_date   16:37   55.70  n/a
                  +   06:M3          237.37   16.256 No_date    8:45   77.01  n/a
                  +   07:D1         1904.20   38.781 No_date   11:10   58.01  n/a
     [DT= 1.00]  SUM=  08:N3         6263.79   62.767 No_date   12:36   57.21  n/a
008:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          08:N3         6263.79   62.767 No_date   12:36   57.21  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N3.008
     remark:Hydrograph for N3
008:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 08:N3         6263.79   62.767 No_date   12:36   57.21  n/a
     [RDT= 1.00] out<- 09:R3         6263.79   61.285 No_date   13:23   57.21  n/a
     [L/S/n= 5253./ .150/.035]
     {Vmax= 1.551:Dmax= 1.927}
008:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          09:R3         6263.79   61.285 No_date   13:23   57.21  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R3.008
     remark:Routing Hydrograph for R3
008:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      01:T1          626.45   16.228 No_date   10:03   54.75 .445
     [CN= 65.9: N= 3.00]
     [Tp= 1.66:DT= 1.00]
008:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          01:T1          626.45   16.228 No_date   10:03   54.75  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T1.008
     remark:Routing Hydrograph for T1
008:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:T1          626.45   16.228 No_date   10:03   54.75  n/a
     [RDT= 1.00] out<- 02:R4          626.45   15.817 No_date   10:22   54.75  n/a
     [L/S/n= 2136./ .540/.035]
     {Vmax= 1.530:Dmax=  .673}
008:0025--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          02:R4          626.45   15.817 No_date   10:22   54.75  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R4.008
     remark:Routing Hydrograph for R4
008:0026--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      03:T2          509.00    8.629 No_date   10:33   42.52 .346
     [CN= 57.3: N= 3.00]
     [Tp= 1.99:DT= 1.00]
008:0027--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          03:T2          509.00    8.629 No_date   10:33   42.52  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T2.008
     remark:Routing Hydrograph for T2
008:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           02:R4          626.45   15.817 No_date   10:22   54.75  n/a
                  +   03:T2          509.00    8.629 No_date   10:33   42.52  n/a
     [DT= 1.00]  SUM=  04:N6         1135.45   24.413 No_date   10:25   49.27  n/a
008:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          04:N6         1135.45   24.413 No_date   10:25   49.27  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N6.008
     remark:Hydrograph for N6
008:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      05:M4          872.08   23.882 No_date    9:40   50.34 .409
     [CN= 62.9: N= 3.00]
     [Tp= 1.34:DT= 1.00]
008:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          05:M4          872.08   23.882 No_date    9:40   50.34  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M4.008
     remark:Routing Hydrograph for M4
008:0032--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           04:N6         1135.45   24.413 No_date   10:25   49.27  n/a
                  +   05:M4          872.08   23.882 No_date    9:40   50.34  n/a
                  +   09:R3         6263.79   61.285 No_date   13:23   57.21  n/a
     [DT= 1.00]  SUM=  06:N4         8271.32   88.640 No_date   11:15   55.39  n/a
008:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          06:N4         8271.32   88.640 No_date   11:15   55.39  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N4.008
     remark:Hydrograph for N4
008:0034--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 06:N4         8271.32   88.640 No_date   11:15   55.39  n/a
     [RDT= 1.00] out<- 07:R5         8271.32   82.437 No_date   13:23   55.39  n/a
     [L/S/n= 3635./ .280/.035]
     {Vmax=  .940:Dmax= 2.570}
008:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          07:R5         8271.32   82.437 No_date   13:23   55.39  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R5.008
     remark:Routing Hydrograph for R5
008:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD      08:M5         1276.33   28.150 No_date   10:05   47.70 .388
     [CN= 61.1: N= 3.00]
     [Tp= 1.66:DT= 1.00]
008:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          08:M5         1276.33   28.150 No_date   10:05   47.70  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M5.008
     remark:Routing Hydrograph for M5
008:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD           07:R5         8271.32   82.437 No_date   13:23   55.39  n/a
                  +   08:M5         1276.33   28.150 No_date   10:05   47.70  n/a
     [DT= 1.00]  SUM=  09:N7         9547.65   96.629 No_date   12:11   54.37  n/a
008:0039--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD          09:N7         9547.65   96.629 No_date   12:11   54.37  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N7.008
     remark:Routing Hydrograph for N7
 ** END OF RUN :   8

************************************************************************************
```

```
 RUN:COMMAND#
 009:0001--------------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   9 ]
#*************************************************************************
#  Project Name: [Kings (future)]    Project Number: [M800-200-050-206]
#  Date        : 18-04-2017
#  Modeller    : [   AA     ]
#  Company     : Rideau Valley Conservation Authority
#  License #   :  5329846
#*************************************************************************
 009:0002--------------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=30.00:SDUR=   3.00:PTOT=  74.46]
 009:0003--------------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\KingsVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [RVCA Kings Creek FPM]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      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=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
# Main Channel
 009:0004--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      01:M1          3265.36   17.690 No_date    8:40   24.45 .328
      [CN= 67.4: N= 3.00]
      [Tp= 6.94:DT= 1.00]
 009:0005--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          01:M1          3265.36   17.690 No_date    8:40   24.45  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M1.009
      remark:Runoff Hydrograph for M1
 009:0006--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:M1          3265.36   17.690 No_date    8:40   24.45  n/a
      [RDT= 1.00] out<- 02:R1          3265.36   17.054 No_date    9:45   24.45  n/a
      [L/S/n= 4029./ .110/.035]
      {Vmax=  .815:Dmax=  .846}
 009:0007--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          02:R1          3265.36   17.054 No_date    9:45   24.45  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R1.009
      remark:Routing Hydrograph for R1
 009:0008--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      03:M2           856.86    8.707 No_date    4:49   20.84 .280
      [CN= 63.1: N= 3.00]
      [Tp= 3.04:DT= 1.00]
 009:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          03:M2           856.86    8.707 No_date    4:49   20.84  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M2.009
      remark:Routing Hydrograph for M2
 009:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           02:R1          3265.36   17.054 No_date    9:45   24.45  n/a
                   +   03:M2           856.86    8.707 No_date    4:49   20.84  n/a
      [DT= 1.00]  SUM=  04:N2         4122.22   20.280 No_date    8:08   23.70  n/a
 009:0011--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          04:N2          4122.22   20.280 No_date    8:08   23.70  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N2.009
      remark:Hydrograph for N2
 009:0012--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 04:N2          4122.22   20.280 No_date    8:08   23.70  n/a
      [RDT= 1.00] out<- 05:R2          4122.22   20.147 No_date    8:34   23.70  n/a
      [L/S/n= 2682./ .280/.035]
      {Vmax= 1.074:Dmax=  .621}
 009:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          05:R2          4122.22   20.147 No_date    8:34   23.70  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R2.009
      remark:Routing Hydrograph for R2
 009:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD    06:M3           237.37   12.417 No_date    2:16   38.32 .515
      [XIMP=.19:TIMP=.24]
      [LOSS= 2 :CN= 71.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1257.:MNI=.045:SCI=   .0]
 009:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          06:M3           237.37   12.417 No_date    2:16   38.32  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M3.009
      remark:Routing Hydrograph for M3
 009:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      07:D1          1904.20   27.515 No_date    4:18   25.01 .336
      [CN= 68.1: N= 3.00]
      [Tp= 2.53:DT= 1.00]
 009:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          07:D1          1904.20   27.515 No_date    4:18   25.01  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-D1.009
      remark:Routing Hydrograph for D1
 009:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           05:R2          4122.22   20.147 No_date    8:34   23.70  n/a
                   +   06:M3           237.37   12.417 No_date    2:16   38.32  n/a
                   +   07:D1          1904.20   27.515 No_date    4:18   25.01  n/a
      [DT= 1.00]  SUM=  08:N3         6263.79   38.970 No_date    4:59   24.65  n/a
 009:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          08:N3          6263.79   38.970 No_date    4:59   24.65  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N3.009
      remark:Hydrograph for N3
 009:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 08:N3          6263.79   38.970 No_date    4:59   24.65  n/a
      [RDT= 1.00] out<- 09:R3          6263.79   36.495 No_date    5:50   24.65  n/a
      [L/S/n= 5253./ .150/.035]
      {Vmax= 1.305:Dmax= 1.438}
 009:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          09:R3          6263.79   36.495 No_date    5:50   24.65  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R3.009
      remark:Routing Hydrograph for R3
 009:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      01:T1           626.45   12.093 No_date    3:28   23.15 .311
      [CN= 65.9: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 009:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          01:T1           626.45   12.093 No_date    3:28   23.15  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T1.009
      remark:Routing Hydrograph for T1
 009:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:T1           626.45   12.093 No_date    3:28   23.15  n/a
      [RDT= 1.00] out<- 02:R4           626.45   11.558 No_date    3:47   23.15  n/a
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     [L/S/n= 2136./ .540/.035]
     {Vmax= 1.367:Dmax=  .564}
 009:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          02:R4          626.45   11.558 No_date    3:47   23.15  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R4.009
      remark:Routing Hydrograph for R4
 009:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      03:T2           509.00    6.046 No_date    3:49   16.59 .223
      [CN= 57.3: N= 3.00]
      [Tp= 1.99:DT= 1.00]
 009:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          03:T2           509.00    6.046 No_date    3:49   16.59  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T2.009
      remark:Routing Hydrograph for T2
 009:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           02:R4           626.45   11.558 No_date    3:47   23.15  n/a
                     +  03:T2           509.00    6.046 No_date    3:49   16.59  n/a
      [DT= 1.00]  SUM=  04:N6          1135.45   17.603 No_date    3:48   20.22  n/a
 009:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          04:N6          1135.45   17.603 No_date    3:48   20.22  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N6.009
      remark:Hydrograph for N6
 009:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      05:M4           872.08   17.789 No_date    3:10   20.71 .278
      [CN= 62.9: N= 3.00]
      [Tp= 1.34:DT= 1.00]
 009:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          05:M4           872.08   17.789 No_date    3:10   20.71  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M4.009
      remark:Routing Hydrograph for M4
 009:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           04:N6          1135.45   17.603 No_date    3:48   20.22  n/a
                     +  05:M4           872.08   17.789 No_date    3:10   20.71  n/a
                     +  09:R3          6263.79   36.495 No_date    5:50   24.65  n/a
      [DT= 1.00]  SUM=  06:N4          8271.32   59.486 No_date    4:05   23.63  n/a
 009:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          06:N4          8271.32   59.486 No_date    4:05   23.63  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N4.009
      remark:Hydrograph for N4
 009:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 06:N4          8271.32   59.486 No_date    4:05   23.63  n/a
      [RDT= 1.00] out<- 07:R5          8271.32   56.145 No_date    5:21   23.63  n/a
      [L/S/n= 3635./ .280/.035]
      {Vmax= 1.397:Dmax= 2.287}
 009:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          07:R5          8271.32   56.145 No_date    5:21   23.63  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R5.009
      remark:Routing Hydrograph for R5
 009:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      08:M5          1276.33   20.538 No_date    3:29   19.29 .259
      [CN= 61.1: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 009:0037---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          08:M5          1276.33   20.538 No_date    3:29   19.29  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M5.009
      remark:Routing Hydrograph for M5
 009:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           07:R5          8271.32   56.145 No_date    5:21   23.63  n/a
                     +  08:M5          1276.33   20.538 No_date    3:29   19.29  n/a
      [DT= 1.00]  SUM=  09:N7          9547.65   69.490 No_date    4:22   23.05  n/a
 009:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          09:N7          9547.65   69.490 No_date    4:22   23.05  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N7.009
      remark:Routing Hydrograph for N7
  ** 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: [Kings (future)]    Project Number: [M800-200-050-206]
#  Date        : 18-04-2017
#  Modeller    : [   AA     ]
#  Company     : Rideau Valley Conservation Authority
#  License #   :  5329846
#*******************************************************************************
 010:0002---------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=30.00:SDUR=   6.00:PTOT=  88.43]
 010:0003---------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\KingsVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [RVCA Kings Creek FPM]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      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=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
# Main Channel
 010:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      01:M1          3265.36   23.636 No_date   10:25   33.05 .374
      [CN= 67.4: N= 3.00]
      [Tp= 6.94:DT= 1.00]
 010:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          01:M1          3265.36   23.636 No_date   10:25   33.05  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M1.010
      remark:Runoff Hydrograph for M1
 010:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:M1          3265.36   23.636 No_date   10:25   33.05  n/a
      [RDT= 1.00] out<- 02:R1          3265.36   22.995 No_date   11:20   33.05  n/a
      [L/S/n= 4029./ .110/.035]
      {Vmax=  .912:Dmax= 1.009}
 010:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          02:R1          3265.36   22.995 No_date   11:20   33.05  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R1.010
      remark:Routing Hydrograph for R1
 010:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      03:M2           856.86   11.188 No_date    6:38   28.58 .323
      [CN= 63.1: N= 3.00]
      [Tp= 3.04:DT= 1.00]
 010:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          03:M2           856.86   11.188 No_date    6:38   28.58  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M2.010
      remark:Routing Hydrograph for M2
 010:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           02:R1          3265.36   22.995 No_date   11:20   33.05  n/a
                     +  03:M2           856.86   11.188 No_date    6:38   28.58  n/a
      [DT= 1.00]  SUM=  04:N2          4122.22   27.720 No_date    9:43   32.12  n/a
 010:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          04:N2          4122.22   27.720 No_date    9:43   32.12  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N2.010
      remark:Hydrograph for N2
 010:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 04:N2          4122.22   27.720 No_date    9:43   32.12  n/a
      [RDT= 1.00] out<- 05:R2          4122.22   27.558 No_date   10:08   32.12  n/a
      [L/S/n= 2682./ .280/.035]
      {Vmax= 1.210:Dmax=  .750}
 010:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          05:R2          4122.22   27.558 No_date   10:08   32.12  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R2.010
      remark:Routing Hydrograph for R2
 010:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD    06:M3           237.37   14.111 No_date    3:41   48.90 .553
      [XIMP=.19:TIMP=.24]
      [LOSS= 2 :CN= 71.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1257.:MNI=.045:SCI=   .0]
 010:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          06:M3           237.37   14.111 No_date    3:41   48.90  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M3.010
      remark:Routing Hydrograph for M3
 010:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      07:D1          1904.20   33.901 No_date    6:03   33.74 .381
      [CN= 68.1: N= 3.00]
      [Tp= 2.53:DT= 1.00]
 010:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          07:D1          1904.20   33.901 No_date    6:03   33.74  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-D1.010
      remark:Routing Hydrograph for D1
 010:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           05:R2          4122.22   27.558 No_date   10:08   32.12  n/a
                     +  06:M3           237.37   14.111 No_date    3:41   48.90  n/a
                     +  07:D1          1904.20   33.901 No_date    6:03   33.74  n/a
      [DT= 1.00]  SUM=  08:N3          6263.79   51.982 No_date    6:42   33.25  n/a
 010:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          08:N3          6263.79   51.982 No_date    6:42   33.25  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N3.010
      remark:Hydrograph for N3
 010:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 08:N3          6263.79   51.982 No_date    6:42   33.25  n/a
      [RDT= 1.00] out<- 09:R3          6263.79   49.438 No_date    7:36   33.25  n/a
      [L/S/n= 5253./ .150/.035]
      {Vmax= 1.451:Dmax= 1.716}
 010:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          09:R3          6263.79   49.438 No_date    7:36   33.25  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R3.010
      remark:Routing Hydrograph for R3
 010:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      01:T1           626.45   14.245 No_date    4:59   31.45 .356
      [CN= 65.9: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 010:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          01:T1           626.45   14.245 No_date    4:59   31.45  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T1.010
      remark:Routing Hydrograph for T1
 010:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:T1           626.45   14.245 No_date    4:59   31.45  n/a
      [RDT= 1.00] out<- 02:R4           626.45   13.818 No_date    5:19   31.45  n/a
      [L/S/n= 2136./ .540/.035]
      {Vmax= 1.458:Dmax=  .623}
 010:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          02:R4           626.45   13.818 No_date    5:19   31.45  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R4.010
      remark:Routing Hydrograph for R4
 010:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      03:T2           509.00    7.417 No_date    5:28   23.21 .262
      [CN= 57.3: N= 3.00]
      [Tp= 1.99:DT= 1.00]
 010:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          03:T2           509.00    7.417 No_date    5:28   23.21  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T2.010
      remark:Routing Hydrograph for T2
 010:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           02:R4           626.45   13.818 No_date    5:19   31.45  n/a
                     +  03:T2           509.00    7.417 No_date    5:28   23.21  n/a
      [DT= 1.00]  SUM=  04:N6          1135.45   21.216 No_date    5:22   27.76  n/a
 010:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          04:N6          1135.45   21.216 No_date    5:22   27.76  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N6.010
      remark:Hydrograph for N6
 010:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      05:M4           872.08   20.856 No_date    4:37   28.42 .321
      [CN= 62.9: N= 3.00]
      [Tp= 1.34:DT= 1.00]
 010:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          05:M4           872.08   20.856 No_date    4:37   28.42  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M4.010
      remark:Routing Hydrograph for M4
 010:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           04:N6          1135.45   21.216 No_date    5:22   27.76  n/a
                     +  05:M4           872.08   20.856 No_date    4:37   28.42  n/a
                     +  09:R3          6263.79   49.438 No_date    7:36   33.25  n/a
      [DT= 1.00]  SUM=  06:N4          8271.32   75.820 No_date    6:10   31.99  n/a
 010:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          06:N4          8271.32   75.820 No_date    6:10   31.99  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N4.010
      remark:Hydrograph for N4
 010:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 06:N4          8271.32   75.820 No_date    6:10   31.99  n/a
      [RDT= 1.00] out<- 07:R5          8271.32   70.333 No_date    7:39   31.99  n/a
      [L/S/n= 3635./ .280/.035]
      {Vmax= 1.054:Dmax= 2.469}
 010:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          07:R5          8271.32   70.333 No_date    7:39   31.99  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R5.010
      remark:Routing Hydrograph for R5
 010:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      08:M5          1276.33   24.468 No_date    5:01   26.64 .301
      [CN= 61.1: N= 3.00]
```

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     [Tp= 1.66:DT= 1.00]
 010:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           08:M5          1276.33   24.468 No_date    5:01   26.64  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M5.010
      remark:Routing Hydrograph for M5
 010:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            07:R5          8271.32   70.333 No_date    7:39   31.99  n/a
                    +  08:M5          1276.33   24.468 No_date    5:01   26.64  n/a
      [DT= 1.00]  SUM=  09:N7          9547.65   83.909 No_date    6:36   31.27  n/a
 010:0039--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           09:N7          9547.65   83.909 No_date    6:36   31.27  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N7.010
      remark:Routing Hydrograph for N7
  ** 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: [Kings (future)]    Project Number: [M800-200-050-206]
#  Date        : 18-04-2017
#  Modeller    : [   AA     ]
#  Company     : Rideau Valley Conservation Authority
#  License #   : 5329846
#*******************************************************************************
 011:0002--------------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=30.00:SDUR=  12.00:PTOT= 104.44]
 011:0003--------------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\KingsVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [RVCA Kings Creek FPM]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      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=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
# Main Channel
 011:0004--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:M1          3265.36   29.817 No_date   14:02   43.75 .419
      [CN= 67.4: N= 3.00]
      [Tp= 6.94:DT= 1.00]
 011:0005--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:M1          3265.36   29.817 No_date   14:02   43.75  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M1.011
      remark:Runoff Hydrograph for M1
 011:0006--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:M1          3265.36   29.817 No_date   14:02   43.75  n/a
      [RDT= 1.00] out<- 02:R1          3265.36   29.231 No_date   14:52   43.75  n/a
      [L/S/n= 4029./ .110/.035]
      {Vmax=  .994:Dmax= 1.161}
 011:0007--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:R1          3265.36   29.231 No_date   14:52   43.75  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R1.011
      remark:Routing Hydrograph for R1
 011:0008--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:M2           856.86   12.943 No_date    9:38   38.32 .367
      [CN= 63.1: N= 3.00]
      [Tp= 3.04:DT= 1.00]
 011:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M2           856.86   12.943 No_date    9:38   38.32  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M2.011
      remark:Routing Hydrograph for M2
 011:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:R1          3265.36   29.231 No_date   14:52   43.75  n/a
                    +  03:M2           856.86   12.943 No_date    9:38   38.32  n/a
      [DT= 1.00]  SUM=  04:N2          4122.22   35.569 No_date   13:21   42.62  n/a
 011:0011--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:N2          4122.22   35.569 No_date   13:21   42.62  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N2.011
      remark:Hydrograph for N2
 011:0012--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 04:N2          4122.22   35.569 No_date   13:21   42.62  n/a
      [RDT= 1.00] out<- 05:R2          4122.22   35.393 No_date   13:43   42.62  n/a
      [L/S/n= 2682./ .280/.035]
      {Vmax= 1.331:Dmax=  .872}
 011:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:R2          4122.22   35.393 No_date   13:43   42.62  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R2.011
      remark:Routing Hydrograph for R2
 011:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     06:M3           237.37   15.913 No_date    6:36   61.63 .590
      [XIMP=.19:TIMP=.24]
      [LOSS= 2 :CN= 71.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1257.:MNI=.045:SCI=   .0]
 011:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:M3           237.37   15.913 No_date    6:36   61.63  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M3.011
      remark:Routing Hydrograph for M3
 011:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:D1          1904.20   38.595 No_date    8:56   44.57 .427
      [CN= 68.1: N= 3.00]
      [Tp= 2.53:DT= 1.00]
 011:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:D1          1904.20   38.595 No_date    8:56   44.57  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-D1.011
      remark:Routing Hydrograph for D1
 011:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            05:R2          4122.22   35.393 No_date   13:43   42.62  n/a
                    +  06:M3           237.37   15.913 No_date    6:36   61.63  n/a
                    +  07:D1          1904.20   38.595 No_date    8:56   44.57  n/a
      [DT= 1.00]  SUM=  08:N3          6263.79   61.598 No_date   10:14   43.93  n/a
 011:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           08:N3          6263.79   61.598 No_date   10:14   43.93  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N3.011
      remark:Hydrograph for N3
 011:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 08:N3          6263.79   61.598 No_date   10:14   43.93  n/a
      [RDT= 1.00] out<- 09:R3          6263.79   60.108 No_date   11:04   43.93  n/a
      [L/S/n= 5253./ .150/.035]
      {Vmax= 1.541:Dmax= 1.905}
 011:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           09:R3          6263.79   60.108 No_date   11:04   43.93  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R3.011
      remark:Routing Hydrograph for R3
 011:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:T1          626.45   16.287 No_date    7:51   41.81 .400
      [CN= 65.9: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 011:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:T1          626.45   16.287 No_date    7:51   41.81  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T1.011
      remark:Routing Hydrograph for T1
 011:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:T1          626.45   16.287 No_date    7:51   41.81  n/a
      [RDT= 1.00] out<- 02:R4          626.45   15.833 No_date    8:10   41.81  n/a
      [L/S/n= 2136./ .540/.035]
      {Vmax= 1.532:Dmax=  .675}
 011:0025--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:R4          626.45   15.833 No_date    8:10   41.81  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R4.011
      remark:Routing Hydrograph for R4
 011:0026--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:T2          509.00    8.624 No_date    8:20   31.69 .303
      [CN= 57.3: N= 3.00]
      [Tp= 1.99:DT= 1.00]
 011:0027--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:T2          509.00    8.624 No_date    8:20   31.69  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T2.011
      remark:Routing Hydrograph for T2
 011:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:R4          626.45   15.833 No_date    8:10   41.81  n/a
                    +  03:T2          509.00    8.624 No_date    8:20   31.69  n/a
      [DT= 1.00]  SUM=  04:N6          1135.45   24.431 No_date    8:13   37.28  n/a
 011:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:N6          1135.45   24.431 No_date    8:13   37.28  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N6.011
      remark:Hydrograph for N6
 011:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       05:M4           872.08   24.089 No_date    7:28   38.13 .365
      [CN= 62.9: N= 3.00]
      [Tp= 1.34:DT= 1.00]
 011:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:M4           872.08   24.089 No_date    7:28   38.13  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M4.011
      remark:Routing Hydrograph for M4
 011:0032--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:N6          1135.45   24.431 No_date    8:13   37.28  n/a
                    +  05:M4           872.08   24.089 No_date    7:28   38.13  n/a
                    +  09:R3          6263.79   60.108 No_date   11:04   43.93  n/a
      [DT= 1.00]  SUM=  06:N4          8271.32   87.868 No_date    9:03   42.41  n/a
 011:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:N4          8271.32   87.868 No_date    9:03   42.41  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N4.011
      remark:Hydrograph for N4
 011:0034--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 06:N4          8271.32   87.868 No_date    9:03   42.41  n/a
      [RDT= 1.00] out<- 07:R5          8271.32   81.156 No_date   10:49   42.41  n/a
      [L/S/n= 3635./ .280/.035]
      {Vmax=  .945:Dmax= 2.565}
 011:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:R5          8271.32   81.156 No_date   10:49   42.41  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R5.011
      remark:Routing Hydrograph for R5
 011:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       08:M5          1276.33   28.258 No_date    7:53   35.94 .344
      [CN= 61.1: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 011:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           08:M5          1276.33   28.258 No_date    7:53   35.94  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M5.011
      remark:Routing Hydrograph for M5
 011:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            07:R5          8271.32   81.156 No_date   10:49   42.41  n/a
                    +  08:M5          1276.33   28.258 No_date    7:53   35.94  n/a
      [DT= 1.00]  SUM=  09:N7          9547.65   95.808 No_date    9:50   41.54  n/a
 011:0039--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           09:N7          9547.65   95.808 No_date    9:50   41.54  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N7.011
      remark:Routing Hydrograph for N7
  ** 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: [Kings (future)]    Project Number: [M800-200-050-206]
#  Date        : 18-04-2017
#  Modeller    : [   AA     ]
#  Company     : Rideau Valley Conservation Authority
#  License #   : 5329846
#*******************************************************************************
 012:0002--------------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=30.00:SDUR=  24.00:PTOT= 123.01]
 012:0003--------------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\KingsVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [RVCA Kings Creek FPM]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      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=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
```

```
     [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
     Parameters used in NASHYD:
     [Ia=   1.50 mm] [N= 3.00]
# Main Channel
 012:0004--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:M1          3265.36   33.823 No_date   20:11   57.04 .464
      [CN= 67.4: N= 3.00]
      [Tp= 6.94:DT= 1.00]
 012:0005--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:M1          3265.36   33.823 No_date   20:11   57.04  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M1.012
      remark:Runoff Hydrograph for M1
 012:0006--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:M1          3265.36   33.823 No_date   20:11   57.04  n/a
      [RDT= 1.00] out<- 02:R1          3265.36   33.394 No_date   20:57   57.04  n/a
      [L/S/n= 4029./ .110/.035]
      {Vmax= 1.044:Dmax= 1.254}
 012:0007--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:R1          3265.36   33.394 No_date   20:57   57.04  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R1.012
      remark:Routing Hydrograph for R1
 012:0008--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:M2           856.86   14.716 No_date   15:23   50.57 .411
      [CN= 63.1: N= 3.00]
      [Tp= 3.04:DT= 1.00]
 012:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M2           856.86   14.716 No_date   15:23   50.57  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M2.012
      remark:Routing Hydrograph for M2
 012:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:R1          3265.36   33.394 No_date   20:57   57.04  n/a
                      + 03:M2           856.86   14.716 No_date   15:23   50.57  n/a
     [DT= 1.00]  SUM=  04:N2          4122.22   40.396 No_date   19:32   55.69  n/a
 012:0011--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:N2          4122.22   40.396 No_date   19:32   55.69  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N2.012
      remark:Hydrograph for N2
 012:0012--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 04:N2          4122.22   40.396 No_date   19:32   55.69  n/a
      [RDT= 1.00] out<- 05:R2          4122.22   40.277 No_date   19:49   55.69  n/a
      [L/S/n= 2682./ .280/.035]
      {Vmax= 1.402:Dmax=  .943}
 012:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:R2          4122.22   40.277 No_date   19:49   55.69  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R2.012
      remark:Routing Hydrograph for R2
 012:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     06:M3           237.37   18.085 No_date   12:31   77.01 .626
      [XIMP=.19:TIMP=.24]
      [LOSS= 2 :CN= 71.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1257.:MNI=.045:SCI=   .0]
 012:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:M3           237.37   18.085 No_date   12:31   77.01  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M3.012
      remark:Routing Hydrograph for M3
 012:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:D1          1904.20   43.637 No_date   14:44   58.01 .472
      [CN= 68.1: N= 3.00]
      [Tp= 2.53:DT= 1.00]
 012:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:D1          1904.20   43.637 No_date   14:44   58.01  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-D1.012
      remark:Routing Hydrograph for D1
 012:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            05:R2          4122.22   40.277 No_date   19:49   55.69  n/a
                      + 06:M3           237.37   18.085 No_date   12:31   77.01  n/a
                      + 07:D1          1904.20   43.637 No_date   14:44   58.01  n/a
     [DT= 1.00]  SUM=  08:N3          6263.79   70.345 No_date   15:56   57.20  n/a
 012:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           08:N3          6263.79   70.345 No_date   15:56   57.20  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N3.012
      remark:Hydrograph for N3
 012:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 08:N3          6263.79   70.345 No_date   15:56   57.20  n/a
      [RDT= 1.00] out<- 09:R3          6263.79   68.352 No_date   16:45   57.20  n/a
      [L/S/n= 5253./ .150/.035]
      {Vmax= 1.563:Dmax= 2.058}
 012:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           09:R3          6263.79   68.352 No_date   16:45   57.20  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R3.012
      remark:Routing Hydrograph for R3
 012:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:T1           626.45   18.594 No_date   13:44   54.75 .445
      [CN= 65.9: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 012:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:T1           626.45   18.594 No_date   13:44   54.75  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T1.012
      remark:Routing Hydrograph for T1
 012:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:T1           626.45   18.594 No_date   13:44   54.75  n/a
      [RDT= 1.00] out<- 02:R4          626.45   18.127 No_date   14:01   54.75  n/a
      [L/S/n= 2136./ .540/.035]
      {Vmax= 1.610:Dmax=  .731}
 012:0025--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:R4          626.45   18.127 No_date   14:01   54.75  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R4.012
      remark:Routing Hydrograph for R4
 012:0026--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:T2           509.00   10.051 No_date   14:10   42.52 .346
      [CN= 57.3: N= 3.00]
      [Tp= 1.99:DT= 1.00]
 012:0027--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:T2           509.00   10.051 No_date   14:10   42.52  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T2.012
      remark:Routing Hydrograph for T2
 012:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:R4          626.45   18.127 No_date   14:01   54.75  n/a
                      + 03:T2           509.00   10.051 No_date   14:10   42.52  n/a
     [DT= 1.00]  SUM=  04:N6          1135.45   28.151 No_date   14:04   49.27  n/a
 012:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:N6          1135.45   28.151 No_date   14:04   49.27  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N6.012
      remark:Hydrograph for N6
 012:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       05:M4           872.08   27.752 No_date   13:22   50.34 .409
      [CN= 62.9: N= 3.00]
      [Tp= 1.34:DT= 1.00]
 012:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:M4           872.08   27.752 No_date   13:22   50.34  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M4.012
      remark:Routing Hydrograph for M4
 012:0032--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:N6          1135.45   28.151 No_date   14:04   49.27  n/a
                      + 05:M4           872.08   27.752 No_date   13:22   50.34  n/a
                      + 09:R3          6263.79   68.352 No_date   16:45   57.20  n/a
     [DT= 1.00]  SUM=  06:N4          8271.32  101.593 No_date   14:42   55.39  n/a
 012:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:N4          8271.32  101.593 No_date   14:42   55.39  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N4.012
      remark:Hydrograph for N4
 012:0034--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 06:N4          8271.32  101.593 No_date   14:42   55.39  n/a
      [RDT= 1.00] out<- 07:R5          8271.32   92.094 No_date   16:48   55.39  n/a
      [L/S/n= 3635./ .280/.035]
      {Vmax=  .860:Dmax= 2.664}
 012:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:R5          8271.32   92.094 No_date   16:48   55.39  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R5.012
      remark:Routing Hydrograph for R5
 012:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       08:M5          1276.33   32.678 No_date   13:45   47.70 .388
      [CN= 61.1: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 012:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           08:M5          1276.33   32.678 No_date   13:45   47.70  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M5.012
      remark:Routing Hydrograph for M5
 012:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            07:R5          8271.32   92.094 No_date   16:48   55.39  n/a
                      + 08:M5          1276.33   32.678 No_date   13:45   47.70  n/a
     [DT= 1.00]  SUM=  09:N7          9547.65  108.726 No_date   15:33   54.36  n/a
 012:0039--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           09:N7          9547.65  108.726 No_date   15:33   54.36  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N7.012
      remark:Routing Hydrograph for N7
  ** END OF RUN : 101

*******************************************************************************




 RUN:COMMAND#
 102:0001--------------------------------------------------------------------------------
      START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 102 ]
#*******************************************************************************
#  Project Name: [Kings (future)]    Project Number: [M800-200-050-206]
#  Date        : 18-04-2017
#  Modeller    : [   AA     ]
#  Company     : Rideau Valley Conservation Authority
#  License #   :  5329846
#*******************************************************************************
 102:0002--------------------------------------------------------------------------------
      READ STORM
       Filename = storm.001
       Comment  =
       [SDT=30.00:SDUR=  24.00:PTOT=  50.07]
 102:0003--------------------------------------------------------------------------------
      DEFAULT VALUES
       Filename = C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\KingsVal.val
       ICASEdv  = 1 (read and print data)
       FileTitle= File comment: [RVCA Kings Creek FPM]
                  THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
       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=90.00 m] [MNP= .250]
       Parameters for IMPERVIOUS surfaces in STANDHYD:
       [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
       Parameters used in NASHYD:
       [Ia=   1.50 mm] [N= 3.00]
# Main Channel
 102:0004--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:M1          3265.36    6.723 No_date   20:45   11.59 .232
      [CN= 67.4: N= 3.00]
      [Tp= 6.94:DT= 1.00]
 102:0005--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:M1          3265.36    6.723 No_date   20:45   11.59  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M1.102
      remark:Runoff Hydrograph for M1
 102:0006--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:M1          3265.36    6.723 No_date   20:45   11.59  n/a
      [RDT= 1.00] out<- 02:R1          3265.36    6.430 No_date   22:25   11.59  n/a
      [L/S/n= 4029./ .110/.035]
      {Vmax=  .556:Dmax=  .470}
 102:0007--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:R1          3265.36    6.430 No_date   22:25   11.59  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R1.102
      remark:Routing Hydrograph for R1
 102:0008--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:M2           856.86    2.621 No_date   15:39    9.51 .190
      [CN= 63.1: N= 3.00]
      [Tp= 3.04:DT= 1.00]
 102:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M2           856.86    2.621 No_date   15:39    9.51  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M2.102
      remark:Routing Hydrograph for M2
 102:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:R1          3265.36    6.430 No_date   22:25   11.59  n/a
                      + 03:M2           856.86    2.621 No_date   15:39    9.51  n/a
     [DT= 1.00]  SUM=  04:N2          4122.22    7.532 No_date   21:15   11.16  n/a
 102:0011--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:N2          4122.22    7.532 No_date   21:15   11.16  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N2.102
      remark:Hydrograph for N2
 102:0012--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 04:N2          4122.22    7.532 No_date   21:15   11.16  n/a
 *    [RDT= 1.00] out<- 05:R2          4122.22    7.454 No_date   22:07   11.16  n/a
      [L/S/n= 2682./ .280/.035]
      {Vmax=  .714:Dmax=  .338}
 102:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:R2          4122.22    7.454 No_date   22:07   11.16  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R2.102
      remark:Routing Hydrograph for R2
 102:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     06:M3           237.37    3.236 No_date   13:02   21.48 .429
      [XIMP=.19:TIMP=.24]
      [LOSS= 2 :CN= 71.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
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     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1257.:MNI=.045:SCI=   .0]
 102:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:M3           237.37    3.236 No_date   13:02   21.48  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M3.102
      remark:Routing Hydrograph for M3
 102:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:D1          1904.20    8.544 No_date   14:55   11.92 .238
      [CN= 68.1: N= 3.00]
      [Tp= 2.53:DT= 1.00]
 102:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:D1          1904.20    8.544 No_date   14:55   11.92  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-D1.102
      remark:Routing Hydrograph for D1
 102:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            05:R2          4122.22    7.454 No_date   22:07   11.16  n/a
                    +   06:M3           237.37    3.236 No_date   13:02   21.48  n/a
                    +   07:D1          1904.20    8.544 No_date   14:55   11.92  n/a
      [DT= 1.00]  SUM=  08:N3          6263.79   12.035 No_date   16:16   11.78  n/a
 102:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           08:N3          6263.79   12.035 No_date   16:16   11.78  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N3.102
      remark:Hydrograph for N3
 102:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 08:N3          6263.79   12.035 No_date   16:16   11.78  n/a
      [RDT= 1.00] out<- 09:R3          6263.79   11.443 No_date   18:27   11.78  n/a
      [L/S/n= 5253./ .150/.035]
      {Vmax=  .834:Dmax=  .700}
 102:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           09:R3          6263.79   11.443 No_date   18:27   11.78  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R3.102
      remark:Routing Hydrograph for R3
 102:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:T1           626.45    3.478 No_date   13:51   10.83 .216
      [CN= 65.9: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 102:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:T1           626.45    3.478 No_date   13:51   10.83  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T1.102
      remark:Routing Hydrograph for T1
 102:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:T1           626.45    3.478 No_date   13:51   10.83  n/a
      [RDT= 1.00] out<- 02:R4           626.45    3.156 No_date   14:28   10.83  n/a
      [L/S/n= 2136./ .540/.035]
      {Vmax=  .830:Dmax=  .264}
 102:0025--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:R4           626.45    3.156 No_date   14:28   10.83  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R4.102
      remark:Routing Hydrograph for R4
 102:0026--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:T2           509.00    1.563 No_date   14:22    7.16 .143
      [CN= 57.3: N= 3.00]
      [Tp= 1.99:DT= 1.00]
 102:0027--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:T2           509.00    1.563 No_date   14:22    7.16  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T2.102
      remark:Routing Hydrograph for T2
 102:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:R4           626.45    3.156 No_date   14:28   10.83  n/a
                    +   03:T2           509.00    1.563 No_date   14:22    7.16  n/a
      [DT= 1.00]  SUM=  04:N6          1135.45    4.717 No_date   14:26    9.19  n/a
 102:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:N6          1135.45    4.717 No_date   14:26    9.19  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N6.102
      remark:Hydrograph for N6
 102:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       05:M4           872.08    4.870 No_date   13:28    9.44 .188
      [CN= 62.9: N= 3.00]
      [Tp= 1.34:DT= 1.00]
 102:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:M4           872.08    4.870 No_date   13:28    9.44  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M4.102
      remark:Routing Hydrograph for M4
 102:0032--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:N6          1135.45    4.717 No_date   14:26    9.19  n/a
                    +   05:M4           872.08    4.870 No_date   13:28    9.44  n/a
                    +   09:R3          6263.79   11.443 No_date   18:27   11.78  n/a
      [DT= 1.00]  SUM=  06:N4          8271.32   16.244 No_date   15:16   11.18  n/a
 102:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:N4          8271.32   16.244 No_date   15:16   11.18  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N4.102
      remark:Hydrograph for N4
 102:0034--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 06:N4          8271.32   16.244 No_date   15:16   11.18  n/a
      [RDT= 1.00] out<- 07:R5          8271.32   15.881 No_date   15:56   11.18  n/a
      [L/S/n= 3635./ .280/.035]
      {Vmax= 1.427:Dmax= 1.080}
 102:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:R5          8271.32   15.881 No_date   15:56   11.18  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R5.102
      remark:Routing Hydrograph for R5
 102:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       08:M5          1276.33    5.523 No_date   13:54    8.64 .173
      [CN= 61.1: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 102:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           08:M5          1276.33    5.523 No_date   13:54    8.64  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M5.102
      remark:Routing Hydrograph for M5
 102:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            07:R5          8271.32   15.881 No_date   15:56   11.18  n/a
                    +   08:M5          1276.33    5.523 No_date   13:54    8.64  n/a
      [DT= 1.00]  SUM=  09:N7          9547.65   19.731 No_date   15:17   10.84  n/a
 102:0039--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           09:N7          9547.65   19.731 No_date   15:17   10.84  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N7.102
      remark:Routing Hydrograph for N7
  ** END OF RUN : 104

*******************************************************************************




 RUN:COMMAND#
 105:0001--------------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 105 ]
#*******************************************************************************
#  Project Name: [Kings (future)]    Project Number: [M800-200-050-206]
#  Date        : 18-04-2017
#  Modeller    : [   AA     ]
#  Company     : Rideau Valley Conservation Authority
#  License #   :  5329846
#*******************************************************************************
 105:0002--------------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=30.00:SDUR=  24.00:PTOT=  70.01]
 105:0003--------------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\KingsVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [RVCA Kings Creek FPM]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      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=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
# Main Channel
 105:0004--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:M1          3265.36   12.806 No_date   20:31   21.88 .312
      [CN= 67.4: N= 3.00]
      [Tp= 6.94:DT= 1.00]
 105:0005--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:M1          3265.36   12.806 No_date   20:31   21.88  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M1.105
      remark:Runoff Hydrograph for M1
 105:0006--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:M1          3265.36   12.806 No_date   20:31   21.88  n/a
      [RDT= 1.00] out<- 02:R1          3265.36   12.461 No_date   21:47   21.88  n/a
      [L/S/n= 4029./ .110/.035]
      {Vmax=  .718:Dmax=  .695}
 105:0007--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:R1          3265.36   12.461 No_date   21:47   21.88  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R1.105
      remark:Routing Hydrograph for R1
 105:0008--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:M2           856.86    5.239 No_date   15:32   18.54 .265
      [CN= 63.1: N= 3.00]
      [Tp= 3.04:DT= 1.00]
 105:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M2           856.86    5.239 No_date   15:32   18.54  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M2.105
      remark:Routing Hydrograph for M2
 105:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:R1          3265.36   12.461 No_date   21:47   21.88  n/a
                    +   03:M2           856.86    5.239 No_date   15:32   18.54  n/a
      [DT= 1.00]  SUM=  04:N2          4122.22   14.762 No_date   20:25   21.18  n/a
 105:0011--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:N2          4122.22   14.762 No_date   20:25   21.18  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N2.105
      remark:Hydrograph for N2
 105:0012--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 04:N2          4122.22   14.762 No_date   20:25   21.18  n/a
      [RDT= 1.00] out<- 05:R2          4122.22   14.681 No_date   21:07   21.18  n/a
      [L/S/n= 2682./ .280/.035]
      {Vmax=  .938:Dmax=  .510}
 105:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:R2          4122.22   14.681 No_date   21:07   21.18  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R2.105
      remark:Routing Hydrograph for R2
 105:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     06:M3           237.37    6.249 No_date   12:49   35.07 .501
      [XIMP=.19:TIMP=.24]
      [LOSS= 2 :CN= 71.9]
      [Pervious    area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1257.:MNI=.045:SCI=   .0]
 105:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:M3           237.37    6.249 No_date   12:49   35.07  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M3.105
      remark:Routing Hydrograph for M3
 105:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:D1          1904.20   16.398 No_date   14:50   22.39 .320
      [CN= 68.1: N= 3.00]
      [Tp= 2.53:DT= 1.00]
 105:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:D1          1904.20   16.398 No_date   14:50   22.39  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-D1.105
      remark:Routing Hydrograph for D1
 105:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            05:R2          4122.22   14.681 No_date   21:07   21.18  n/a
                    +   06:M3           237.37    6.249 No_date   12:49   35.07  n/a
                    +   07:D1          1904.20   16.398 No_date   14:50   22.39  n/a
      [DT= 1.00]  SUM=  08:N3          6263.79   24.630 No_date   16:08   22.08  n/a
 105:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           08:N3          6263.79   24.630 No_date   16:08   22.08  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N3.105
      remark:Hydrograph for N3
 105:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 08:N3          6263.79   24.630 No_date   16:08   22.08  n/a
      [RDT= 1.00] out<- 09:R3          6263.79   23.682 No_date   17:24   22.08  n/a
      [L/S/n= 5253./ .150/.035]
      {Vmax= 1.102:Dmax= 1.086}
 105:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           09:R3          6263.79   23.682 No_date   17:24   22.08  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R3.105
      remark:Routing Hydrograph for R3
 105:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:T1           626.45    6.809 No_date   13:48   20.67 .295
      [CN= 65.9: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 105:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:T1           626.45    6.809 No_date   13:48   20.67  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T1.105
      remark:Routing Hydrograph for T1
 105:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:T1           626.45    6.809 No_date   13:48   20.67  n/a
      [RDT= 1.00] out<- 02:R4           626.45    6.442 No_date   14:13   20.67  n/a
      [L/S/n= 2136./ .540/.035]
      {Vmax= 1.105:Dmax=  .400}
 105:0025--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:R4           626.45    6.442 No_date   14:13   20.67  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R4.105
      remark:Routing Hydrograph for R4
 105:0026--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:T2           509.00    3.325 No_date   14:16   14.65 .209
      [CN= 57.3: N= 3.00]
```

```
     [Tp= 1.99:DT= 1.00]
 105:0027--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:T2           509.00    3.325 No_date   14:16   14.65  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T2.105
      remark:Routing Hydrograph for T2
 105:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:R4           626.45    6.442 No_date   14:13   20.67  n/a
                    +  03:T2           509.00    3.325 No_date   14:16   14.65  n/a
      [DT= 1.00]  SUM=  04:N6          1135.45    9.766 No_date   14:14   17.97  n/a
 105:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:N6           1135.45    9.766 No_date   14:14   17.97  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N6.105
      remark:Hydrograph for N6
 105:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       05:M4           872.08    9.809 No_date   13:25   18.43 .263
      [CN= 62.9: N= 3.00]
      [Tp= 1.34:DT= 1.00]
 105:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:M4           872.08    9.809 No_date   13:25   18.43  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M4.105
      remark:Routing Hydrograph for M4
 105:0032--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:N6          1135.45    9.766 No_date   14:14   17.97  n/a
                    +  05:M4           872.08    9.809 No_date   13:25   18.43  n/a
                    +  09:R3          6263.79   23.682 No_date   17:24   22.08  n/a
      [DT= 1.00]  SUM=  06:N4          8271.32   34.056 No_date   15:01   21.13  n/a
 105:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:N4           8271.32   34.056 No_date   15:01   21.13  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N4.105
      remark:Hydrograph for N4
 105:0034--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 06:N4          8271.32   34.056 No_date   15:01   21.13  n/a
      [RDT= 1.00] out<- 07:R5          8271.32   33.570 No_date   15:34   21.13  n/a
      [L/S/n= 3635./ .280/.035]
      {Vmax= 1.838:Dmax= 1.706}
 105:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:R5           8271.32   33.570 No_date   15:34   21.13  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R5.105
      remark:Routing Hydrograph for R5
 105:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       08:M5           1276.33   11.313 No_date   13:50   17.12 .245
      [CN= 61.1: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 105:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           08:M5           1276.33   11.313 No_date   13:50   17.12  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M5.105
      remark:Routing Hydrograph for M5
 105:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            07:R5           8271.32   33.570 No_date   15:34   21.13  n/a
                    +  08:M5           1276.33   11.313 No_date   13:50   17.12  n/a
      [DT= 1.00]  SUM=  09:N7          9547.65   42.143 No_date   14:52   20.59  n/a
 105:0039--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           09:N7           9547.65   42.143 No_date   14:52   20.59  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N7.105
      remark:Routing Hydrograph for N7
  ** END OF RUN : 109

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 RUN:COMMAND#
 110:0001--------------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 110 ]
#*********************************************************************************
#  Project Name: [Kings (future)]    Project Number: [M800-200-050-206]
#  Date        : 18-04-2017
#  Modeller    : [   AA     ]
#  Company     : Rideau Valley Conservation Authority
#  License #   :  5329846
#*********************************************************************************
 110:0002--------------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=30.00:SDUR=  24.00:PTOT=  82.59]
 110:0003--------------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\KingsVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [RVCA Kings Creek FPM]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      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=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
# Main Channel
 110:0004--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:M1          3265.36   17.260 No_date   20:25   29.36 .356
      [CN= 67.4: N= 3.00]
      [Tp= 6.94:DT= 1.00]
 110:0005--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:M1          3265.36   17.260 No_date   20:25   29.36  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M1.110
      remark:Runoff Hydrograph for M1
 110:0006--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:M1          3265.36   17.260 No_date   20:25   29.36  n/a
      [RDT= 1.00] out<- 02:R1          3265.36   16.888 No_date   21:30   29.36  n/a
      [L/S/n= 4029./ .110/.035]
      {Vmax=  .806:Dmax=  .833}
 110:0007--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:R1          3265.36   16.888 No_date   21:30   29.36  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R1.110
      remark:Routing Hydrograph for R1
 110:0008--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:M2           856.86    7.202 No_date   15:29   25.25 .306
      [CN= 63.1: N= 3.00]
      [Tp= 3.04:DT= 1.00]
 110:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M2           856.86    7.202 No_date   15:29   25.25  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M2.110
      remark:Routing Hydrograph for M2
 110:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:R1          3265.36   16.888 No_date   21:30   29.36  n/a
                    +  03:M2           856.86    7.202 No_date   15:29   25.25  n/a
      [DT= 1.00]  SUM=  04:N2          4122.22   20.134 No_date   20:10   28.51  n/a
 110:0011--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:N2          4122.22   20.134 No_date   20:10   28.51  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N2.110
      remark:Hydrograph for N2
 110:0012--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 04:N2          4122.22   20.134 No_date   20:10   28.51  n/a
      [RDT= 1.00] out<- 05:R2          4122.22   20.061 No_date   20:37   28.51  n/a
      [L/S/n= 2682./ .280/.035]
      {Vmax= 1.072:Dmax=  .619}
 110:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:R2          4122.22   20.061 No_date   20:37   28.51  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R2.110
      remark:Routing Hydrograph for R2
 110:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     06:M3           237.37    8.633 No_date   12:42   44.40 .538
      [XIMP=.19:TIMP=.24]
      [LOSS= 2 :CN= 71.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1257.:MNI=.045:SCI=   .0]
 110:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:M3           237.37    8.633 No_date   12:42   44.40  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M3.110
      remark:Routing Hydrograph for M3
 110:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:D1          1904.20   22.155 No_date   14:48   29.99 .363
      [CN= 68.1: N= 3.00]
      [Tp= 2.53:DT= 1.00]
 110:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:D1          1904.20   22.155 No_date   14:48   29.99  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-D1.110
      remark:Routing Hydrograph for D1
 110:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            05:R2          4122.22   20.061 No_date   20:37   28.51  n/a
                    +  06:M3           237.37    8.633 No_date   12:42   44.40  n/a
                    +  07:D1          1904.20   22.155 No_date   14:48   29.99  n/a
      [DT= 1.00]  SUM=  08:N3          6263.79   34.189 No_date   15:57   29.56  n/a
 110:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           08:N3          6263.79   34.189 No_date   15:57   29.56  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N3.110
      remark:Hydrograph for N3
 110:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 08:N3          6263.79   34.189 No_date   15:57   29.56  n/a
      [RDT= 1.00] out<- 09:R3          6263.79   32.817 No_date   17:12   29.56  n/a
      [L/S/n= 5253./ .150/.035]
      {Vmax= 1.243:Dmax= 1.327}
 110:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           09:R3          6263.79   32.817 No_date   17:12   29.56  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R3.110
      remark:Routing Hydrograph for R3
 110:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:T1           626.45    9.276 No_date   13:47   27.89 .338
      [CN= 65.9: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 110:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:T1           626.45    9.276 No_date   13:47   27.89  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T1.110
      remark:Routing Hydrograph for T1
 110:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:T1           626.45    9.276 No_date   13:47   27.89  n/a
      [RDT= 1.00] out<- 02:R4           626.45    8.866 No_date   14:10   27.89  n/a
      [L/S/n= 2136./ .540/.035]
      {Vmax= 1.237:Dmax=  .481}
 110:0025--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:R4           626.45    8.866 No_date   14:10   27.89  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R4.110
      remark:Routing Hydrograph for R4
 110:0026--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:T2           509.00    4.683 No_date   14:14   20.35 .246
      [CN= 57.3: N= 3.00]
      [Tp= 1.99:DT= 1.00]
 110:0027--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:T2           509.00    4.683 No_date   14:14   20.35  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T2.110
      remark:Routing Hydrograph for T2
 110:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:R4           626.45    8.866 No_date   14:10   27.89  n/a
                    +  03:T2           509.00    4.683 No_date   14:14   20.35  n/a
      [DT= 1.00]  SUM=  04:N6          1135.45   13.546 No_date   14:11   24.51  n/a
 110:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:N6          1135.45   13.546 No_date   14:11   24.51  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N6.110
      remark:Hydrograph for N6
 110:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       05:M4           872.08   13.516 No_date   13:24   25.10 .304
      [CN= 62.9: N= 3.00]
      [Tp= 1.34:DT= 1.00]
 110:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:M4           872.08   13.516 No_date   13:24   25.10  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M4.110
      remark:Routing Hydrograph for M4
 110:0032--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:N6          1135.45   13.546 No_date   14:11   24.51  n/a
                    +  05:M4           872.08   13.516 No_date   13:24   25.10  n/a
                    +  09:R3          6263.79   32.817 No_date   17:12   29.56  n/a
      [DT= 1.00]  SUM=  06:N4          8271.32   47.782 No_date   14:50   28.40  n/a
 110:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:N4          8271.32   47.782 No_date   14:50   28.40  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N4.110
      remark:Hydrograph for N4
 110:0034--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 06:N4          8271.32   47.782 No_date   14:50   28.40  n/a
      [RDT= 1.00] out<- 07:R5          8271.32   46.838 No_date   15:52   28.40  n/a
      [L/S/n= 3635./ .280/.035]
      {Vmax= 1.862:Dmax= 2.084}
 110:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:R5          8271.32   46.838 No_date   15:52   28.40  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R5.110
      remark:Routing Hydrograph for R5
 110:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       08:M5          1276.33   15.695 No_date   13:48   23.47 .284
      [CN= 61.1: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 110:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           08:M5          1276.33   15.695 No_date   13:48   23.47  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M5.110
      remark:Routing Hydrograph for M5
 110:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            07:R5          8271.32   46.838 No_date   15:52   28.40  n/a
                    +  08:M5          1276.33   15.695 No_date   13:48   23.47  n/a
      [DT= 1.00]  SUM=  09:N7          9547.65   58.412 No_date   14:49   27.74  n/a
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 110:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD          09:N7          9547.65   58.412 No_date   14:49   27.74  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N7.110
      remark:Routing Hydrograph for N7
  ** END OF RUN : 119

********************************************************************************




 RUN:COMMAND#
 120:0001---------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on       0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 120 ]
#*******************************************************************************
#  Project Name: [Kings (future)]    Project Number: [M800-200-050-206]
#  Date        : 18-04-2017
#  Modeller    : [   AA     ]
#  Company     : Rideau Valley Conservation Authority
#  License #   :  5329846
#*******************************************************************************
 120:0002---------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=30.00:SDUR=  24.00:PTOT=  95.06]
 120:0003---------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\KingsVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [RVCA Kings Creek FPM]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      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=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
# Main Channel
 120:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:M1          3265.36   22.049 No_date   20:20   37.38 .393
      [CN= 67.4: N= 3.00]
      [Tp= 6.94:DT= 1.00]
 120:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:M1          3265.36   22.049 No_date   20:20   37.38  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M1.120
      remark:Runoff Hydrograph for M1
 120:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:M1          3265.36   22.049 No_date   20:20   37.38  n/a
      [RDT= 1.00] out<- 02:R1          3265.36   21.647 No_date   21:19   37.38  n/a
      [L/S/n= 4029./ .110/.035]
      {Vmax=  .886:Dmax=  .966}
 120:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:R1          3265.36   21.647 No_date   21:19   37.38  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R1.120
      remark:Routing Hydrograph for R1
 120:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:M2           856.86    9.348 No_date   15:27   32.51 .342
      [CN= 63.1: N= 3.00]
      [Tp= 3.04:DT= 1.00]
 120:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M2           856.86    9.348 No_date   15:27   32.51  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M2.120
      remark:Routing Hydrograph for M2
 120:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:R1          3265.36   21.647 No_date   21:19   37.38  n/a
                      + 03:M2           856.86    9.348 No_date   15:27   32.51  n/a
      [DT= 1.00]  SUM=  04:N2          4122.22   25.949 No_date   19:55   36.37  n/a
 120:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:N2          4122.22   25.949 No_date   19:55   36.37  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N2.120
      remark:Hydrograph for N2
 120:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 04:N2          4122.22   25.949 No_date   19:55   36.37  n/a
      [RDT= 1.00] out<- 05:R2          4122.22   25.849 No_date   20:19   36.37  n/a
      [L/S/n= 2682./ .280/.035]
      {Vmax= 1.175:Dmax=  .719}
 120:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:R2          4122.22   25.849 No_date   20:19   36.37  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R2.120
      remark:Routing Hydrograph for R2
 120:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     06:M3           237.37   11.230 No_date   12:38   54.10 .569
      [XIMP=.19:TIMP=.24]
      [LOSS= 2 :CN= 71.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1257.:MNI=.045:SCI=   .0]
 120:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:M3           237.37   11.230 No_date   12:38   54.10  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M3.120
      remark:Routing Hydrograph for M3
 120:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:D1          1904.20   28.369 No_date   14:46   38.12 .401
      [CN= 68.1: N= 3.00]
      [Tp= 2.53:DT= 1.00]
 120:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:D1          1904.20   28.369 No_date   14:46   38.12  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-D1.120
      remark:Routing Hydrograph for D1
 120:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            05:R2          4122.22   25.849 No_date   20:19   36.37  n/a
                      + 06:M3           237.37   11.230 No_date   12:38   54.10  n/a
                      + 07:D1          1904.20   28.369 No_date   14:46   38.12  n/a
      [DT= 1.00]  SUM=  08:N3          6263.79   44.529 No_date   16:06   37.57  n/a
 120:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           08:N3          6263.79   44.529 No_date   16:06   37.57  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N3.120
      remark:Hydrograph for N3
 120:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 08:N3          6263.79   44.529 No_date   16:06   37.57  n/a
      [RDT= 1.00] out<- 09:R3          6263.79   43.046 No_date   16:57   37.57  n/a
      [L/S/n= 5253./ .150/.035]
      {Vmax= 1.371:Dmax= 1.561}
 120:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           09:R3          6263.79   43.046 No_date   16:57   37.57  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R3.120
      remark:Routing Hydrograph for R3
 120:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:T1           626.45   11.957 No_date   13:45   35.64 .375
      [CN= 65.9: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 120:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:T1           626.45   11.957 No_date   13:45   35.64  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T1.120
      remark:Routing Hydrograph for T1
 120:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:T1           626.45   11.957 No_date   13:45   35.64  n/a
      [RDT= 1.00] out<- 02:R4           626.45   11.522 No_date   14:07   35.64  n/a
      [L/S/n= 2136./ .540/.035]
      {Vmax= 1.361:Dmax=  .560}
 120:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:R4           626.45   11.522 No_date   14:07   35.64  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R4.120
      remark:Routing Hydrograph for R4
 120:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:T2           509.00    6.194 No_date   14:13   26.62 .280
      [CN= 57.3: N= 3.00]
      [Tp= 1.99:DT= 1.00]
 120:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:T2           509.00    6.194 No_date   14:13   26.62  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T2.120
      remark:Routing Hydrograph for T2
 120:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:R4           626.45   11.522 No_date   14:07   35.64  n/a
                      + 03:T2           509.00    6.194 No_date   14:13   26.62  n/a
      [DT= 1.00]  SUM=  04:N6          1135.45   17.709 No_date   14:09   31.60  n/a
 120:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:N6          1135.45   17.709 No_date   14:09   31.60  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N6.120
      remark:Hydrograph for N6
 120:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       05:M4           872.08   17.580 No_date   13:23   32.34 .340
      [CN= 62.9: N= 3.00]
      [Tp= 1.34:DT= 1.00]
 120:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:M4           872.08   17.580 No_date   13:23   32.34  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M4.120
      remark:Routing Hydrograph for M4
 120:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:N6          1135.45   17.709 No_date   14:09   31.60  n/a
                      + 05:M4           872.08   17.580 No_date   13:23   32.34  n/a
                      + 09:R3          6263.79   43.046 No_date   16:57   37.57  n/a
      [DT= 1.00]  SUM=  06:N4          8271.32   63.077 No_date   14:51   36.20  n/a
 120:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:N4          8271.32   63.077 No_date   14:51   36.20  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N4.120
      remark:Hydrograph for N4
 120:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 06:N4          8271.32   63.077 No_date   14:51   36.20  n/a
      [RDT= 1.00] out<- 07:R5          8271.32   60.175 No_date   16:30   36.20  n/a
      [L/S/n= 3635./ .280/.035]
      {Vmax= 1.285:Dmax= 2.339}
 120:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:R5          8271.32   60.175 No_date   16:30   36.20  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R5.120
      remark:Routing Hydrograph for R5
 120:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       08:M5          1276.33   20.521 No_date   13:47   30.38 .320
      [CN= 61.1: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 120:0037---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           08:M5          1276.33   20.521 No_date   13:47   30.38  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M5.120
      remark:Routing Hydrograph for M5
 120:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            07:R5          8271.32   60.175 No_date   16:30   36.20  n/a
                      + 08:M5          1276.33   20.521 No_date   13:47   30.38  n/a
      [DT= 1.00]  SUM=  09:N7          9547.65   72.144 No_date   15:09   35.42  n/a
 120:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           09:N7          9547.65   72.144 No_date   15:09   35.42  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N7.120
      remark:Routing Hydrograph for N7
  ** END OF RUN : 149

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 RUN:COMMAND#
 150:0001---------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on       0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 150 ]
#*******************************************************************************
#  Project Name: [Kings (future)]    Project Number: [M800-200-050-206]
#  Date        : 18-04-2017
#  Modeller    : [   AA     ]
#  Company     : Rideau Valley Conservation Authority
#  License #   :  5329846
#*******************************************************************************
 150:0002---------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=30.00:SDUR=  24.00:PTOT= 110.93]
 150:0003---------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\KingsVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [RVCA Kings Creek FPM]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      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=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
# Main Channel
 150:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:M1          3265.36   28.575 No_date   20:15   48.29 .435
      [CN= 67.4: N= 3.00]
      [Tp= 6.94:DT= 1.00]
 150:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
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    SAVE HYD           01:M1          3265.36   28.575 No_date   20:15   48.29  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M1.150
     remark:Runoff Hydrograph for M1
150:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:M1          3265.36   28.575 No_date   20:15   48.29  n/a
     [RDT= 1.00] out<- 02:R1          3265.36   28.173 No_date   21:07   48.29  n/a
     [L/S/n= 4029./ .110/.035]
     {Vmax=  .980:Dmax= 1.132}
150:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:R1          3265.36   28.173 No_date   21:07   48.29  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R1.150
     remark:Routing Hydrograph for R1
150:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:M2           856.86   12.305 No_date   15:25   42.49 .383
     [CN= 63.1: N= 3.00]
     [Tp= 3.04:DT= 1.00]
150:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:M2           856.86   12.305 No_date   15:25   42.49  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M2.150
     remark:Routing Hydrograph for M2
150:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:R1          3265.36   28.173 No_date   21:07   48.29  n/a
                   +   03:M2           856.86   12.305 No_date   15:25   42.49  n/a
     [DT= 1.00]  SUM=  04:N2          4122.22   33.947 No_date   19:38   47.08  n/a
150:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           04:N2          4122.22   33.947 No_date   19:38   47.08  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N2.150
     remark:Hydrograph for N2
150:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 04:N2          4122.22   33.947 No_date   19:38   47.08  n/a
     [RDT= 1.00] out<- 05:R2          4122.22   33.830 No_date   20:00   47.08  n/a
     [L/S/n= 2682./ .280/.035]
     {Vmax= 1.306:Dmax=  .847}
150:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           05:R2          4122.22   33.830 No_date   20:00   47.08  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R2.150
     remark:Routing Hydrograph for R2
150:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     06:M3           237.37   15.016 No_date   12:33   66.93 .603
     [XIMP=.19:TIMP=.24]
     [LOSS= 2 :CN= 71.9]
     [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1257.:MNI=.045:SCI=   .0]
150:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           06:M3           237.37   15.016 No_date   12:33   66.93  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M3.150
     remark:Routing Hydrograph for M3
150:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       07:D1          1904.20   36.820 No_date   14:45   49.16 .443
     [CN= 68.1: N= 3.00]
     [Tp= 2.53:DT= 1.00]
150:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           07:D1          1904.20   36.820 No_date   14:45   49.16  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-D1.150
     remark:Routing Hydrograph for D1
150:0018---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            05:R2          4122.22   33.830 No_date   20:00   47.08  n/a
                   +   06:M3           237.37   15.016 No_date   12:33   66.93  n/a
                   +   07:D1          1904.20   36.820 No_date   14:45   49.16  n/a
     [DT= 1.00]  SUM=  08:N3          6263.79   58.666 No_date   16:05   48.47  n/a
150:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           08:N3          6263.79   58.666 No_date   16:05   48.47  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N3.150
     remark:Hydrograph for N3
150:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 08:N3          6263.79   58.666 No_date   16:05   48.47  n/a
     [RDT= 1.00] out<- 09:R3          6263.79   57.075 No_date   16:49   48.47  n/a
     [L/S/n= 5253./ .150/.035]
     {Vmax= 1.516:Dmax= 1.849}
150:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           09:R3          6263.79   57.075 No_date   16:49   48.47  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R3.150
     remark:Routing Hydrograph for R3
150:0022---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:T1           626.45   15.623 No_date   13:44   46.23 .417
     [CN= 65.9: N= 3.00]
     [Tp= 1.66:DT= 1.00]
150:0023---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           01:T1           626.45   15.623 No_date   13:44   46.23  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T1.150
     remark:Routing Hydrograph for T1
150:0024---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:T1           626.45   15.623 No_date   13:44   46.23  n/a
     [RDT= 1.00] out<- 02:R4          626.45   15.164 No_date   14:03   46.23  n/a
     [L/S/n= 2136./ .540/.035]
     {Vmax= 1.507:Dmax=  .658}
150:0025---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           02:R4           626.45   15.164 No_date   14:03   46.23  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R4.150
     remark:Routing Hydrograph for R4
150:0026---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       03:T2           509.00    8.306 No_date   14:11   35.36 .319
     [CN= 57.3: N= 3.00]
     [Tp= 1.99:DT= 1.00]
150:0027---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           03:T2           509.00    8.306 No_date   14:11   35.36  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T2.150
     remark:Routing Hydrograph for T2
150:0028---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:R4           626.45   15.164 No_date   14:03   46.23  n/a
                   +   03:T2           509.00    8.306 No_date   14:11   35.36  n/a
     [DT= 1.00]  SUM=  04:N6          1135.45   23.453 No_date   14:06   41.36  n/a
150:0029---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           04:N6          1135.45   23.453 No_date   14:06   41.36  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N6.150
     remark:Hydrograph for N6
150:0030---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       05:M4           872.08   23.180 No_date   13:22   42.28 .381
     [CN= 62.9: N= 3.00]
     [Tp= 1.34:DT= 1.00]
150:0031---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           05:M4           872.08   23.180 No_date   13:22   42.28  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M4.150
     remark:Routing Hydrograph for M4
150:0032---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:N6          1135.45   23.453 No_date   14:06   41.36  n/a
                   +   05:M4           872.08   23.180 No_date   13:22   42.28  n/a
                   +   09:R3          6263.79   57.075 No_date   16:49   48.47  n/a
     [DT= 1.00]  SUM=  06:N4          8271.32   84.233 No_date   14:42   46.84  n/a
150:0033---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           06:N4          8271.32   84.233 No_date   14:42   46.84  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N4.150
     remark:Hydrograph for N4
150:0034---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 06:N4          8271.32   84.233 No_date   14:42   46.84  n/a
     [RDT= 1.00] out<- 07:R5          8271.32   77.653 No_date   16:56   46.84  n/a
     [L/S/n= 3635./ .280/.035]
     {Vmax=  .971:Dmax= 2.539}
150:0035---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           07:R5          8271.32   77.653 No_date   16:56   46.84  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R5.150
     remark:Routing Hydrograph for R5
150:0036---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       08:M5          1276.33   27.203 No_date   13:46   39.94 .360
     [CN= 61.1: N= 3.00]
     [Tp= 1.66:DT= 1.00]
150:0037---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           08:M5          1276.33   27.203 No_date   13:46   39.94  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M5.150
     remark:Routing Hydrograph for M5
150:0038---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            07:R5          8271.32   77.653 No_date   16:56   46.84  n/a
                   +   08:M5          1276.33   27.203 No_date   13:46   39.94  n/a
     [DT= 1.00]  SUM=  09:N7          9547.65   91.859 No_date   15:26   45.92  n/a
150:0039---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    SAVE HYD           09:N7          9547.65   91.859 No_date   15:26   45.92  n/a
     fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N7.150
     remark:Routing Hydrograph for N7
 ** END OF RUN : 199

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 RUN:COMMAND#
 200:0001---------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 200 ]
#*************************************************************************
#  Project Name: [Kings (future)]    Project Number: [M800-200-050-206]
#  Date        : 18-04-2017
#  Modeller    : [   AA     ]
#  Company     : Rideau Valley Conservation Authority
#  License #   :  5329846
#*************************************************************************
 200:0002---------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=30.00:SDUR=  24.00:PTOT= 134.54]
 200:0003---------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\KingsVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [RVCA Kings Creek FPM]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      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=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
# Main Channel
 200:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:M1          3265.36   39.034 No_date   20:08   65.68 .488
      [CN= 67.4: N= 3.00]
      [Tp= 6.94:DT= 1.00]
 200:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:M1          3265.36   39.034 No_date   20:08   65.68  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M1.200
      remark:Runoff Hydrograph for M1
 200:0006---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:M1          3265.36   39.034 No_date   20:08   65.68  n/a
      [RDT= 1.00] out<- 02:R1          3265.36   38.562 No_date   20:54   65.68  n/a
      [L/S/n= 4029./ .110/.035]
      {Vmax= 1.101:Dmax= 1.368}
 200:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:R1          3265.36   38.562 No_date   20:54   65.68  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R1.200
      remark:Routing Hydrograph for R1
 200:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:M2           856.86   17.124 No_date   15:22   58.60 .436
      [CN= 63.1: N= 3.00]
      [Tp= 3.04:DT= 1.00]
 200:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M2           856.86   17.124 No_date   15:22   58.60  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M2.200
      remark:Routing Hydrograph for M2
 200:0010---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:R1          3265.36   38.562 No_date   20:54   65.68  n/a
                    +   03:M2           856.86   17.124 No_date   15:22   58.60  n/a
      [DT= 1.00]  SUM=  04:N2          4122.22   46.814 No_date   19:22   64.21  n/a
 200:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:N2          4122.22   46.814 No_date   19:22   64.21  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N2.200
      remark:Hydrograph for N2
 200:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 04:N2          4122.22   46.814 No_date   19:22   64.21  n/a
      [RDT= 1.00] out<- 05:R2          4122.22   46.712 No_date   19:36   64.21  n/a
      [L/S/n= 2682./ .280/.035]
      {Vmax= 1.481:Dmax= 1.030}
 200:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:R2          4122.22   46.712 No_date   19:36   64.21  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R2.200
      remark:Routing Hydrograph for R2
 200:0014---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     06:M3           237.37   21.286 No_date   12:28   86.82 .645
      [XIMP=.19:TIMP=.24]
      [LOSS= 2 :CN= 71.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1257.:MNI=.045:SCI=   .0]
 200:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:M3           237.37   21.286 No_date   12:28   86.82  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M3.200
      remark:Routing Hydrograph for M3
 200:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:D1          1904.20   50.391 No_date   14:43   66.74 .496
      [CN= 68.1: N= 3.00]
      [Tp= 2.53:DT= 1.00]
 200:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:D1          1904.20   50.391 No_date   14:43   66.74  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-D1.200
      remark:Routing Hydrograph for D1
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 200:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            05:R2          4122.22   46.712 No_date   19:36   64.21  n/a
                    +  06:M3           237.37   21.286 No_date   12:28   86.82  n/a
                    +  07:D1          1904.20   50.391 No_date   14:43   66.74  n/a
      [DT= 1.00]  SUM=  08:N3          6263.79   81.860 No_date   16:00   65.83  n/a
 200:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           08:N3          6263.79   81.860 No_date   16:00   65.83  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N3.200
      remark:Hydrograph for N3
 200:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 08:N3          6263.79   81.860 No_date   16:00   65.83  n/a
      [RDT= 1.00] out<- 09:R3          6263.79   78.894 No_date   17:08   65.83  n/a
      [L/S/n= 5253./ .150/.035]
      {Vmax= 1.437:Dmax= 2.216}
 200:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           09:R3          6263.79   78.894 No_date   17:08   65.83  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R3.200
      remark:Routing Hydrograph for R3
 200:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:T1           626.45   21.549 No_date   13:43   63.18 .470
      [CN= 65.9: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 200:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:T1           626.45   21.549 No_date   13:43   63.18  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T1.200
      remark:Routing Hydrograph for T1
 200:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:T1           626.45   21.549 No_date   13:43   63.18  n/a
      [RDT= 1.00] out<- 02:R4           626.45   21.078 No_date   13:58   63.18  n/a
      [L/S/n= 2136./ .540/.035]
      {Vmax= 1.705:Dmax=  .800}
 200:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:R4           626.45   21.078 No_date   13:58   63.18  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R4.200
      remark:Routing Hydrograph for R4
 200:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:T2           509.00   11.810 No_date   14:09   49.70 .369
      [CN= 57.3: N= 3.00]
      [Tp= 1.99:DT= 1.00]
 200:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:T2           509.00   11.810 No_date   14:09   49.70  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T2.200
      remark:Routing Hydrograph for T2
 200:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:R4           626.45   21.078 No_date   13:58   63.18  n/a
                    +  03:T2           509.00   11.810 No_date   14:09   49.70  n/a
      [DT= 1.00]  SUM=  04:N6          1135.45   32.843 No_date   14:02   57.14  n/a
 200:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:N6          1135.45   32.843 No_date   14:02   57.14  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N6.200
      remark:Hydrograph for N6
 200:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       05:M4           872.08   32.319 No_date   13:21   58.35 .434
      [CN= 62.9: N= 3.00]
      [Tp= 1.34:DT= 1.00]
 200:0031---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:M4           872.08   32.319 No_date   13:21   58.35  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M4.200
      remark:Routing Hydrograph for M4
 200:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:N6          1135.45   32.843 No_date   14:02   57.14  n/a
                    +  05:M4           872.08   32.319 No_date   13:21   58.35  n/a
                    +  09:R3          6263.79   78.894 No_date   17:08   65.83  n/a
      [DT= 1.00]  SUM=  06:N4          8271.32  116.984 No_date   14:32   63.85  n/a
 200:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:N4          8271.32  116.984 No_date   14:32   63.85  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N4.200
      remark:Hydrograph for N4
 200:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 06:N4          8271.32  116.984 No_date   14:32   63.85  n/a
      [RDT= 1.00] out<- 07:R5          8271.32  103.907 No_date   16:45   63.85  n/a
      [L/S/n= 3635./ .280/.035]
      {Vmax=  .819:Dmax= 2.746}
 200:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:R5          8271.32  103.907 No_date   16:45   63.85  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R5.200
      remark:Routing Hydrograph for R5
 200:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       08:M5          1276.33   38.163 No_date   13:44   55.44 .412
      [CN= 61.1: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 200:0037---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           08:M5          1276.33   38.163 No_date   13:44   55.44  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M5.200
      remark:Routing Hydrograph for M5
 200:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            07:R5          8271.32  103.907 No_date   16:45   63.85  n/a
                    +  08:M5          1276.33   38.163 No_date   13:44   55.44  n/a
      [DT= 1.00]  SUM=  09:N7          9547.65  124.306 No_date   15:22   62.73  n/a
 200:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           09:N7          9547.65  124.306 No_date   15:22   62.73  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N7.200
      remark:Routing Hydrograph for N7
  ** END OF RUN : 349

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 RUN:COMMAND#
 350:0001---------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 350 ]
#*******************************************************************************
#  Project Name: [Kings (future)]    Project Number: [M800-200-050-206]
#  Date        : 18-04-2017
#  Modeller    : [   AA     ]
#  Company     : Rideau Valley Conservation Authority
#  License #   :  5329846
#*******************************************************************************
 350:0002---------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=30.00:SDUR=  24.00:PTOT= 144.23]
 350:0003---------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\KingsVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [RVCA Kings Creek FPM]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
                 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=90.00 m] [MNP= .250]
                 Parameters for IMPERVIOUS surfaces in STANDHYD:
                 [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
                 Parameters used in NASHYD:
                 [Ia=   1.50 mm] [N= 3.00]
# Main Channel
 350:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:M1           3265.36   43.508 No_date   20:06   73.14 .507
      [CN= 67.4: N= 3.00]
      [Tp= 6.94:DT= 1.00]
 350:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:M1           3265.36   43.508 No_date   20:06   73.14  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M1.350
      remark:Runoff Hydrograph for M1
 350:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:M1           3265.36   43.508 No_date   20:06   73.14  n/a
      [RDT= 1.00] out<- 02:R1           3265.36   43.013 No_date   20:51   73.14  n/a
      [L/S/n= 4029./ .110/.035]
      {Vmax= 1.145:Dmax= 1.460}
 350:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:R1           3265.36   43.013 No_date   20:51   73.14  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R1.350
      remark:Routing Hydrograph for R1
 350:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:M2            856.86   19.202 No_date   15:21   65.57 .455
      [CN= 63.1: N= 3.00]
      [Tp= 3.04:DT= 1.00]
 350:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M2            856.86   19.202 No_date   15:21   65.57  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M2.350
      remark:Routing Hydrograph for M2
 350:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:R1           3265.36   43.013 No_date   20:51   73.14  n/a
                    +  03:M2            856.86   19.202 No_date   15:21   65.57  n/a
      [DT= 1.00]  SUM=  04:N2          4122.22   52.334 No_date   19:08   71.57  n/a
 350:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:N2          4122.22   52.334 No_date   19:08   71.57  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N2.350
      remark:Hydrograph for N2
 350:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 04:N2          4122.22   52.334 No_date   19:08   71.57  n/a
      [RDT= 1.00] out<- 05:R2          4122.22   52.202 No_date   19:34   71.57  n/a
      [L/S/n= 2682./ .280/.035]
      {Vmax= 1.548:Dmax= 1.103}
 350:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:R2          4122.22   52.202 No_date   19:34   71.57  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R2.350
      remark:Routing Hydrograph for R2
 350:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     06:M3           237.37   23.791 No_date   12:27   95.20 .660
      [XIMP=.19:TIMP=.24]
      [LOSS= 2 :CN= 71.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1257.:MNI=.045:SCI=   .0]
 350:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:M3           237.37   23.791 No_date   12:27   95.20  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M3.350
      remark:Routing Hydrograph for M3
 350:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:D1          1904.20   56.182 No_date   14:42   74.27 .515
      [CN= 68.1: N= 3.00]
      [Tp= 2.53:DT= 1.00]
 350:0017---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:D1          1904.20   56.182 No_date   14:42   74.27  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-D1.350
      remark:Routing Hydrograph for D1
 350:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            05:R2          4122.22   52.202 No_date   19:34   71.57  n/a
                    +  06:M3           237.37   23.791 No_date   12:27   95.20  n/a
                    +  07:D1          1904.20   56.182 No_date   14:42   74.27  n/a
      [DT= 1.00]  SUM=  08:N3          6263.79   91.916 No_date   15:55   73.28  n/a
 350:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           08:N3          6263.79   91.916 No_date   15:55   73.28  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N3.350
      remark:Hydrograph for N3
 350:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 08:N3          6263.79   91.916 No_date   15:55   73.28  n/a
      [RDT= 1.00] out<- 09:R3          6263.79   87.305 No_date   17:43   73.28  n/a
      [L/S/n= 5253./ .150/.035]
      {Vmax= 1.297:Dmax= 2.328}
 350:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           09:R3          6263.79   87.305 No_date   17:43   73.28  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R3.350
      remark:Routing Hydrograph for R3
 350:0022---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:T1           626.45   24.089 No_date   13:43   70.47 .489
      [CN= 65.9: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 350:0023---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:T1           626.45   24.089 No_date   13:43   70.47  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T1.350
      remark:Routing Hydrograph for T1
 350:0024---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:T1           626.45   24.089 No_date   13:43   70.47  n/a
      [RDT= 1.00] out<- 02:R4           626.45   23.560 No_date   13:58   70.47  n/a
      [L/S/n= 2136./ .540/.035]
      {Vmax= 1.772:Dmax=  .854}
 350:0025---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:R4           626.45   23.560 No_date   13:58   70.47  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R4.350
      remark:Routing Hydrograph for R4
 350:0026---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:T2           509.00   13.339 No_date   14:09   55.98 .388
      [CN= 57.3: N= 3.00]
      [Tp= 1.99:DT= 1.00]
 350:0027---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:T2           509.00   13.339 No_date   14:09   55.98  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T2.350
      remark:Routing Hydrograph for T2
 350:0028---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:R4           626.45   23.560 No_date   13:58   70.47  n/a
                    +  03:T2           509.00   13.339 No_date   14:09   55.98  n/a
      [DT= 1.00]  SUM=  04:N6          1135.45   36.854 No_date   14:02   63.98  n/a
 350:0029---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:N6          1135.45   36.854 No_date   14:02   63.98  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N6.350
      remark:Hydrograph for N6
 350:0030---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       05:M4           872.08   36.262 No_date   13:21   65.30 .453
      [CN= 62.9: N= 3.00]
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     [Tp= 1.34:DT= 1.00]
 350:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:M4          872.08   36.262 No_date   13:21   65.30  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M4.350
      remark:Routing Hydrograph for M4
 350:0032--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:N6         1135.45   36.854 No_date   14:02   63.98  n/a
                    +  05:M4          872.08   36.262 No_date   13:21   65.30  n/a
                    +  09:R3         6263.79   87.305 No_date   17:43   73.28  n/a
      [DT= 1.00]  SUM=  06:N4         8271.32  128.919 No_date   14:22   71.17  n/a
 350:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:N4         8271.32  128.919 No_date   14:22   71.17  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N4.350
      remark:Hydrograph for N4
 350:0034--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 06:N4         8271.32  128.919 No_date   14:22   71.17  n/a
      [RDT= 1.00] out<- 07:R5         8271.32  114.340 No_date   16:51   71.17  n/a
      [L/S/n= 3635./ .280/.035]
      {Vmax=  .791:Dmax= 2.810}
 350:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:R5         8271.32  114.340 No_date   16:51   71.17  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R5.350
      remark:Routing Hydrograph for R5
 350:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       08:M5         1276.33   42.911 No_date   13:44   62.17 .431
      [CN= 61.1: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 350:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           08:M5         1276.33   42.911 No_date   13:44   62.17  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M5.350
      remark:Routing Hydrograph for M5
 350:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            07:R5         8271.32  114.340 No_date   16:51   71.17  n/a
                    +  08:M5         1276.33   42.911 No_date   13:44   62.17  n/a
      [DT= 1.00]  SUM=  09:N7         9547.65  137.239 No_date   15:28   69.96  n/a
 350:0039--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           09:N7         9547.65  137.239 No_date   15:28   69.96  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N7.350
      remark:Routing Hydrograph for N7
  ** END OF RUN : 499

********************************************************************************

 RUN:COMMAND#
 500:0001--------------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  = 500 ]
#*******************************************************************************
#  Project Name: [Kings (future)]    Project Number: [M800-200-050-206]
#  Date        : 18-04-2017
#  Modeller    : [   AA     ]
#  Company     : Rideau Valley Conservation Authority
#  License #   :  5329846
#*******************************************************************************
 500:0002--------------------------------------------------------------------------------
     READ STORM
      Filename = storm.001
      Comment  =
      [SDT=30.00:SDUR=  24.00:PTOT= 150.87]
 500:0003--------------------------------------------------------------------------------
     DEFAULT VALUES
      Filename = C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\KingsVal.val
      ICASEdv  = 1 (read and print data)
      FileTitle= File comment: [RVCA Kings Creek FPM]
                 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDHYD COM
      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=90.00 m] [MNP= .250]
      Parameters for IMPERVIOUS surfaces in STANDHYD:
      [IAimp=   1.57 mm] [CLI= 1.50]   [MNI= .045]
      Parameters used in NASHYD:
      [Ia=   1.50 mm] [N= 3.00]
# Main Channel
 500:0004--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:M1         3265.36   46.647 No_date   20:05   78.36 .519
      [CN= 67.4: N= 3.00]
      [Tp= 6.94:DT= 1.00]
 500:0005--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:M1         3265.36   46.647 No_date   20:05   78.36  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M1.500
      remark:Runoff Hydrograph for M1
 500:0006--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:M1         3265.36   46.647 No_date   20:05   78.36  n/a
      [RDT= 1.00] out<- 02:R1         3265.36   46.131 No_date   21:01   78.35  n/a
      [L/S/n= 4029./ .110/.035]
      {Vmax= 1.162:Dmax= 1.521}
 500:0007--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:R1         3265.36   46.131 No_date   21:01   78.35  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R1.500
      remark:Routing Hydrograph for R1
 500:0008--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:M2          856.86   20.668 No_date   15:21   70.45 .467
      [CN= 63.1: N= 3.00]
      [Tp= 3.04:DT= 1.00]
 500:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:M2          856.86   20.668 No_date   15:21   70.45  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M2.500
      remark:Routing Hydrograph for M2
 500:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:R1         3265.36   46.131 No_date   21:01   78.35  n/a
                    +  03:M2          856.86   20.668 No_date   15:21   70.45  n/a
      [DT= 1.00]  SUM=  04:N2         4122.22   56.148 No_date   18:55   76.71  n/a
 500:0011--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:N2         4122.22   56.148 No_date   18:55   76.71  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N2.500
      remark:Hydrograph for N2
 500:0012--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 04:N2         4122.22   56.148 No_date   18:55   76.71  n/a
      [RDT= 1.00] out<- 05:R2         4122.22   56.005 No_date   19:20   76.71  n/a
      [L/S/n= 2682./ .280/.035]
      {Vmax= 1.588:Dmax= 1.151}
 500:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:R2         4122.22   56.005 No_date   19:20   76.71  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R2.500
      remark:Routing Hydrograph for R2
 500:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB STANDHYD     06:M3          237.37   25.698 No_date   12:27  101.01 .670
      [XIMP=.19:TIMP=.24]
      [LOSS= 2 :CN= 71.9]
      [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  90.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=1257.:MNI=.045:SCI=   .0]
 500:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:M3          237.37   25.698 No_date   12:27  101.01  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M3.500
      remark:Routing Hydrograph for M3
 500:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:D1         1904.20   60.251 No_date   14:42   79.53 .527
      [CN= 68.1: N= 3.00]
      [Tp= 2.53:DT= 1.00]
 500:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:D1         1904.20   60.251 No_date   14:42   79.53  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-D1.500
      remark:Routing Hydrograph for D1
 500:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            05:R2         4122.22   56.005 No_date   19:20   76.71  n/a
                    +  06:M3          237.37   25.698 No_date   12:27  101.01  n/a
                    +  07:D1         1904.20   60.251 No_date   14:42   79.53  n/a
      [DT= 1.00]  SUM=  08:N3         6263.79   98.865 No_date   15:51   78.49  n/a
 500:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           08:N3         6263.79   98.865 No_date   15:51   78.49  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N3.500
      remark:Hydrograph for N3
 500:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 08:N3         6263.79   98.865 No_date   15:51   78.49  n/a
      [RDT= 1.00] out<- 09:R3         6263.79   93.179 No_date   17:50   78.49  n/a
      [L/S/n= 5253./ .150/.035]
      {Vmax= 1.226:Dmax= 2.384}
 500:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           09:R3         6263.79   93.179 No_date   17:50   78.49  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R3.500
      remark:Routing Hydrograph for R3
 500:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:T1          626.45   25.877 No_date   13:42   75.57 .501
      [CN= 65.9: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 500:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           01:T1          626.45   25.877 No_date   13:42   75.57  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T1.500
      remark:Routing Hydrograph for T1
 500:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:T1          626.45   25.877 No_date   13:42   75.57  n/a
      [RDT= 1.00] out<- 02:R4          626.45   25.355 No_date   13:57   75.57  n/a
      [L/S/n= 2136./ .540/.035]
      {Vmax= 1.823:Dmax=  .892}
 500:0025--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           02:R4          626.45   25.355 No_date   13:57   75.57  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R4.500
      remark:Routing Hydrograph for R4
 500:0026--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:T2          509.00   14.424 No_date   14:08   60.40 .400
      [CN= 57.3: N= 3.00]
      [Tp= 1.99:DT= 1.00]
 500:0027--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           03:T2          509.00   14.424 No_date   14:08   60.40  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-T2.500
      remark:Routing Hydrograph for T2
 500:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:R4          626.45   25.355 No_date   13:57   75.57  n/a
                    +  03:T2          509.00   14.424 No_date   14:08   60.40  n/a
      [DT= 1.00]  SUM=  04:N6         1135.45   39.721 No_date   14:01   68.78  n/a
 500:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           04:N6         1135.45   39.721 No_date   14:01   68.78  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N6.500
      remark:Hydrograph for N6
 500:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       05:M4          872.08   39.044 No_date   13:21   70.17 .465
      [CN= 62.9: N= 3.00]
      [Tp= 1.34:DT= 1.00]
 500:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           05:M4          872.08   39.044 No_date   13:21   70.17  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M4.500
      remark:Routing Hydrograph for M4
 500:0032--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:N6         1135.45   39.721 No_date   14:01   68.78  n/a
                    +  05:M4          872.08   39.044 No_date   13:21   70.17  n/a
                    +  09:R3         6263.79   93.179 No_date   17:50   78.49  n/a
      [DT= 1.00]  SUM=  06:N4         8271.32  137.179 No_date   14:18   76.28  n/a
 500:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           06:N4         8271.32  137.179 No_date   14:18   76.28  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N4.500
      remark:Hydrograph for N4
 500:0034--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 06:N4         8271.32  137.179 No_date   14:18   76.28  n/a
      [RDT= 1.00] out<- 07:R5         8271.32  121.412 No_date   16:45   76.28  n/a
      [L/S/n= 3635./ .280/.035]
      {Vmax=  .777:Dmax= 2.849}
 500:0035--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           07:R5         8271.32  121.412 No_date   16:45   76.28  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-R5.500
      remark:Routing Hydrograph for R5
 500:0036--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       08:M5         1276.33   46.267 No_date   13:44   66.90 .443
      [CN= 61.1: N= 3.00]
      [Tp= 1.66:DT= 1.00]
 500:0037--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           08:M5         1276.33   46.267 No_date   13:44   66.90  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-M5.500
      remark:Routing Hydrograph for M5
 500:0038--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            07:R5         8271.32  121.412 No_date   16:45   76.28  n/a
                    +  08:M5         1276.33   46.267 No_date   13:44   66.90  n/a
      [DT= 1.00]  SUM=  09:N7         9547.65  146.250 No_date   15:21   75.02  n/a
 500:0039--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     SAVE HYD           09:N7         9547.65  146.250 No_date   15:21   75.02  n/a
      fname :C:\Users\AAHMED~1.000\Desktop\KINGSS~2\NOHTKI~1\H-N7.500
      remark:Routing Hydrograph for N7
 500:0002--------------------------------------------------------------------------------
     FINISH
-------------------------------------------------------------------------------
********************************************************************************
     WARNINGS / ERRORS / NOTES
     -------------------------
   Simulation ended on 2017-05-15     at 12:11:08
================================================================================
```

Appendix E

Road Crossings - Photographs

Dwyer Hill Road (Upstream)

Dwyer Hill Road (Downstream)

Ashton Station Road (Upstream)

Ashton Station Road (Downstream)

Kings Creek Road (Upstream)

Kings Creek Road (Downstream)

Brunton Side Road (Upstream)

Brunton Side Road (Downstream)

Richmond Road (Upstream)

Richmond Road (Downstream)

Montigue Boundary road (Upstream)

Montigue Boundary road (Downstream)

Ashton Station on Kings Tributary (Upstream)

Ashton Station on Kings Tributary (Downstream)

Purdy Road (Upstream)

Purdy Road (Downstream)

Appendix F

Full-Size Drawings

(Drawings KG-1 and KG-2)

RIDEAU VALLEY CONSERVATION AUTHORITY

Projection note: U.T.M. Zone 18 - NAD 83 Datum

File name: Drawing KG-1

Date Modified: 06/06/2017

N

1:10,000

0 500 1,000

Meters

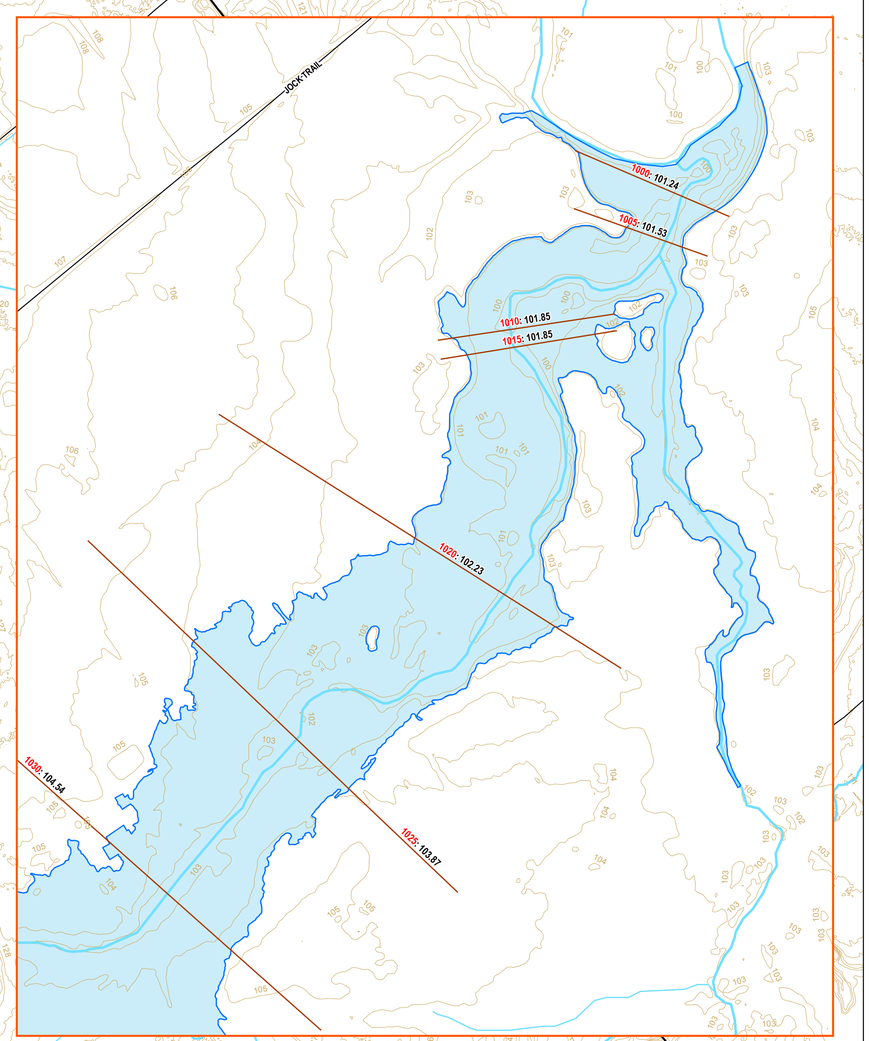
The information in this drawing is for information purposes only. Authoritative information on flood hazard is maintained in RVCA's GIS system and is updated from time to time based on new data.

Jock River

Kings Creek

Kings Creek

Tributary



FRANKTOWN RD
JOCK TRAIL
MUNSTER RD
WOODS RD
COPELAND RD
DWYER HILL RD
CONE TERR
CREEK WAY
MATILDA GATE
SKEELORT
STARLIGHT PL
ASHTON STATION RD
SAUNDERS RD
CROOKED SIDERD
WINDMILL CRES
PURDY RD
RICHMOND RD
CAMS WAY
KINGS CREEK RD
GRAHAM RD
ASHTON STATION RD
BRUNTON SIDERD
BECKWITH BOUNDARY RD
BOURNE RD
PINERY RD
MONTAGUE BOUNDARY RD
ELLEN MALONEY RD

Drawing KG-1 / Kings Creek Cross-sections and regulatory flood levels

- Cross Section
- Study Limit
- 1m LiDAR-derived contours
- 100yr Floodline
- 100yr Floodplain

06 JUNE 2017

RIDEAU VALLEY CONSERVATION AUTHORITY

Projection note: U.T.M. Zone 18 - NAD 83 Datum

File name: Drawing KG-2

Date Modified: 05/23/2017

N

1:10,000

0 500 1,000

Meters

The information in this drawing is for information purposes only. Authoritative information on flood hazard is maintained in RVCA's GIS system and is updated from time to time based on new data.

Jock River

Kings Creek

Kings Creek

Tributary

Drawing KG-2 / Kings Creek Flood hazard area

Study Limit

100yr Floodline

100yr Floodplain

23 MAY 2017