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UCC File: 2159

FUNCTIONAL SERVICING REPORT

294 QUAKER ROAD

CITY OF WELLAND December 2024

INTRODUCTION

The purpose of this Functional Servicing Report (FSR) is to address the municipal servicing requirements for the proposed subdivision and condominium development located at 294 Quaker Road in the north-eastern portion of the Northwest Welland Secondary Plan (NWWSP) Area in the City of Welland, north of Quaker Road, west of Niagara Street, east of First Avenue, and south of the municipal boundary with the City of Thorold.

The proposed Draft Plan of Subdivision for the 294 Quaker Road property consists of 5 Blocks of townhouse dwellings (Blocks 1 to 5) fronting on a future municipal roadway (Street 'A'), a watercourse Block (Block 7), and a Block for a future residential multiple family condominium development (Block 6) which will be subject to a future Site Plan application.

The following FSR will assess the available municipal servicing capacity for the entire 'Block' of development area bound by Quaker Road on the south, First Avenue on the west, to the eastern limit of 210 Quaker Road, and south of the municipal boundary with the City of Thorold as shown in Figure 1 as Block 3. Therefore, this Block (Block 3) will hereafter be referred to as 'subject lands' in this report.

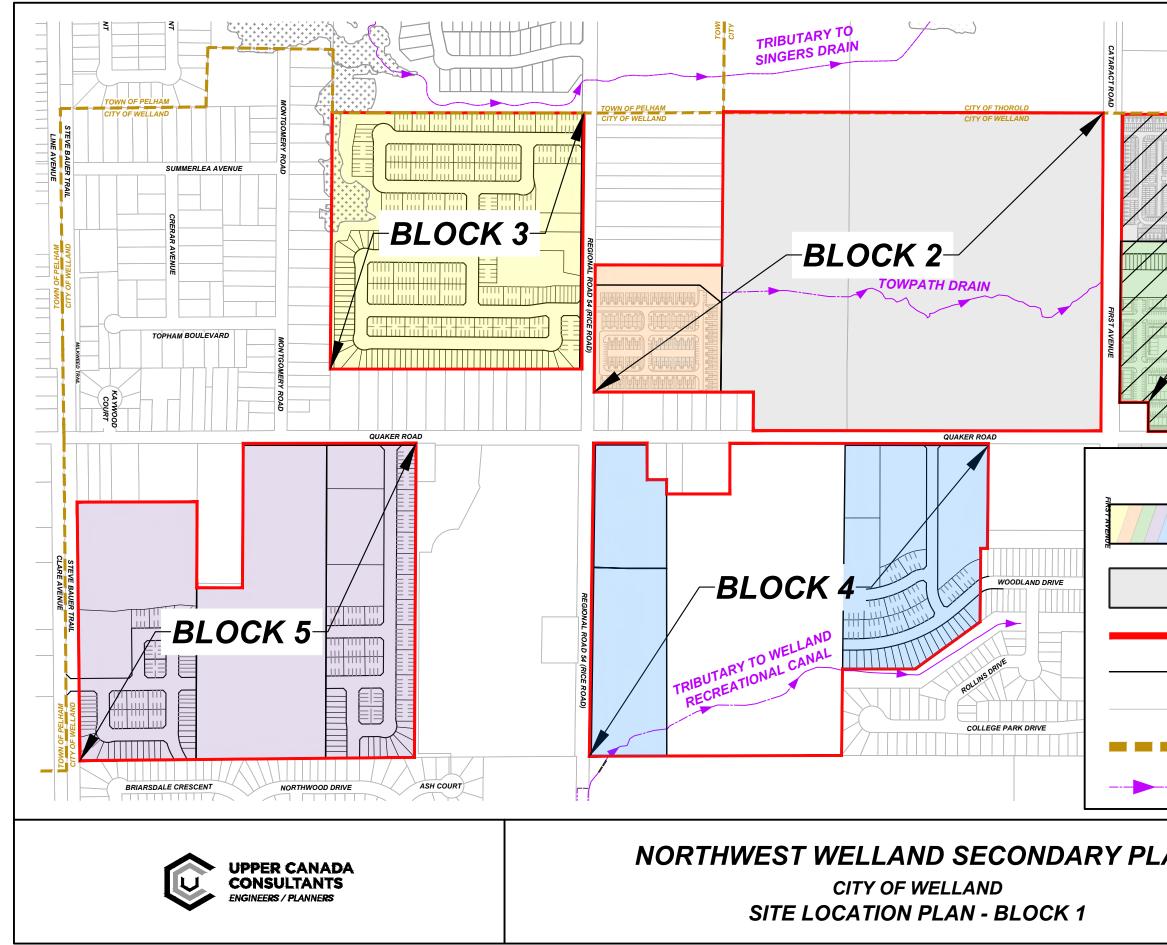
The subject lands are approximately 28.99 hectares and will consist of a mix of subdivision and condominium developments, comprising of an overall mix of residential single detached, street townhouse, stacked townhouse, and apartment dwellings. The subject lands will be developed to include associated asphalt roadways, concrete curb, catch basins, storm sewers, sanitary sewers, and watermain.

The objectives of this report are as follows:

- 1. Identify domestic and fire protection water servicing needs for the site;
- 2. Identify sanitary servicing needs for the site; and,
- 3. Identify stormwater management needs for the site.



As part of the Northwest Welland Secondary Plan (NWWSP), a Conceptual Municipal Servicing Design Report was prepared by Associated Engineering on behalf of the City of Welland This design report assessed the existing municipal infrastructure (water, sanitary, and storm) to service the Secondary Plan Area, and provided a conceptual framework to identify the locations where new or upgraded infrastructure will be required to support future development. The updated report (June 2024) has been included in Appendix A.



SUBJECT LANDS				
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WATER SERVICING

There is an existing 300mm diameter municipal watermain located on Quaker Road, in front of the subject lands and no existing watermain on First Avenue.

The Conceptual Municipal Servicing Design Report assessed the City of Welland watermain model to determine the required watermain sizes to provide adequate domestic water supply and fire protection to a minimum fire flow of 133 L/s within the Secondary Plan Area.

It was determined in the Design Report that a new 300mm diameter trunk watermain would be required within the subject lands and on First Avenue, extending from the existing 300mm watermain on Quaker Road. Smaller diameter mains connecting the new 300mm diameter trunk watermains can provide domestic water supply and fire protection within the proposed local roads and a new 250mm diameter watermain connecting to the existing 200mm watermain on Niagara Street may be required following further modelling at the detailed engineering design stage.

A Watermain Distribution Plan has been prepared by Upper Canada Consultants which shows the watermain locations within the "Block 3" in accordance with Figure 3-4 in the Conceptual Municipal Design Report and is enclosed in Appendix B. As shown in this Plan:

- A 300mm diameter looped watermain will be provided on First Avenue, Street G and Street C extending from the existing 300 watermain on Quaker Road;
- A 200mm diameter watermain will be provided on Street E connecting to the new 300mm trunk on Street G;
- A 200mm diameter watermain will be provided on Street A connecting the new 300mm trunk on Street C and existing 300mm trunk on Quaker Road; and,
- The remaining streets will be serviced with local 150mm diameter watermains.

Blocks 1 to 5 will be provided individual water services for each dwelling unit from the proposed 300mm diameter watermain on Street A. Block 6 is proposed to be serviced from the 300mm diameter watermain on First Avenue. The size and location of the proposed service to Block 6 will be determined as part of detailed engineering design for the future Site Plan Application for Block 6.

The subject lands are expected to consist of a total population of 2,929 persons, divided as follows:

- 1,071 persons within 744 First Avenue;
- 874 persons within 294 Quaker Road;
- 159 persons within 232 238 Quaker Road; and,
- 825 persons within 210, 256 & 276 Quaker Road.



The estimated peak domestic water demands have been summarized in Table 1 below using an average residential flow rate of 270 L/capita/day. Peaking factors for the maximum daily demand and maximum hourly demand were taken from the Table 3-1 of the Ministry of Environment Design Guidelines for Drinking Water Systems for a population between 2,001 - 3,000. The peak demands will be confirmed as part of the detailed engineering design.

Table 1. Estimated Peak Domestic Water Demand		
Average Domestic Demand		
270 L/cap/day; 2,929 persons	9.15 L/s	
Maximum Day Peaking Factor		
	2.25	
Maximum Day Domestic Demand		
	20.59 L/s	
Peak Hour Peaking Factor		
_	3.38	
Peak Hour Domestic Demand		
	30.93 L/s	

The fire hydrants located within the development site will be prepared to provide fire protection for the proposed dwellings. The spacing and location of the proposed fire hydrants will be provided in accordance with the City of Welland design standards as part of the detailed engineering design.

Therefore, there is expected to be adequate capacity to provide domestic water supply and fire protection within the subject lands and adjacent development lands.

SANITARY SERVICING

There is presently a 750mm diameter Regional trunk sanitary sewer flowing easterly on Quaker Road, in front of the subject site which ultimately outlets to Towpath Road Sanitary Pumping Station.

A Sanitary Drainage Area Plan for the subject lands, enclosed in Appendix C, shows a total sanitary drainage area (including the subject lands as Drainage Area A1 and A5) of approximately 24.84 ha and a population of 2,929.

Blocks 1 to 5 will be provided individual sanitary services for each dwelling unit from the proposed 200mm diameter watermain on Street A. Block 6 is proposed to be serviced from the proposed sanitary sewers constructed within the adjacent 210, 256 & 276 Quaker Road to the west.



It is proposed to provide a single sanitary connection for the subject lands to the existing 750mm diameter Regional sanitary sewer on Quaker Road. As shown in the Sanitary Drainage Area Plan, it is proposed to extend a new 300mm diameter sanitary sewer within the subject lands from Street 'C'.

The existing 750mm diameter Regional trunk sanitary sewer on Quaker Road in front of the subject lands has a capacity of 556.99 L/s. The future peak sanitary flow from the subject lands will is calculated to be 36.94 L/s, which will occupy 6.6% of the existing 750mm diameter sanitary sewer on Quaker Road. Therefore, the receiving sanitary sewer system is expected to have adequate capacity to receive future sanitary flows from the subject lands. The sanitary sewer design is attached in Appendix C for reference.

The Conceptual Municipal Servicing Design Report assessed the City of Welland InfoSWMM sanitary sewer model and the available capacities in the Towpath SPS and associated forcemain and the Welland WWTP.

Per the conclusions in the Design Report, there is expected to be adequate capacity in the existing Towpath SPS and associated forcemain following upgrades planned to this infrastructure by the Niagara Region, and Welland WWTP without upgrades for the entire NWWSP Area. The Design Report indicates that the capacity in the downstream sanitary sewer system will need to be reevaluated as part of detailed engineering design, prior to build-out of the NWWSP Area.

Therefore, there is expected to be adequate capacity in the receiving sanitary network for the subject lands.

STORMWATER MANAGEMENT

A Storm Servicing Plan has been included in Appendix D showing a preliminary layout of the proposed internal storm sewers discharging to the proposed stormwater management facilities (P30 and P31).

A separate Stormwater Management Plan has been prepared by Upper Canada Consultants (UCC) which includes the future Storm Drainage Areas for the subject lands and detailed calculations for each proposed stormwater management facility. The 294 Quaker Road property was included with the future storm drainage areas for SWM facilities P30 and P31. The Stormwater Management Plan has been enclosed in Appendix E for reference.



CONCLUSIONS AND RECOMMENDATIONS

Therefore, based on the above comments and design calculations provided for this site, the following summarizes the servicing for this site:

- 1. The existing municipal watermain system is expected to have adequate capacity to provide both domestic and fire protection water supply for the subject lands.
- 2. The receiving 750mm diameter Regional sanitary sewer on Quaker Road, the Towpath SPS and associated forcemain, and Welland WWTP are expected to have adequate capacity for the subject lands upon full build-out of the NWWSP Area.
- 3. Detailed calculations, conclusions, and recommendations regarding Stormwater Management can be found in the Stormwater Management Plan found in Appendix E.

Based on the above and the accompanying calculations, there exists adequate municipal infrastructure for this development. We trust the above comments and enclosed calculations are satisfactory for approval. If you have any questions or require additional information, please do not hesitate to contact our office.

Respectfully Submitted,

Reviewed By:

Kapl

Brendan Kapteyn, P.Eng.





APPENDICES



APPENDIX A

NW Welland Secondary Plan Municipal Servicing Conceptual Design Report (Associated Engineering, June 2024)



REPORT

City of Welland

Northwest Welland Secondary Plan Municipal Servicing Conceptual Design Report

JUNE 2024





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REVISIONS PAGE

Northwest Welland Secondary Plan Municipal Servicing Conceptual Design Report		
Client: Engineer:		
Upper Canada Consultants	Associated Engineering (Ont.) Ltd.	

Revision/ Issue	Date	Description	Prepared by/ Reviewed by	Client Review
1	2023-11-22	Municipal Servicing Report_v1	AL & BB/ RC & MG	
3	2024-03-26	Municipal Servicing Report_v3	AL & BB/ RC & MG	
5	2024-06-24	Municipal Servicing Report_v5	AL & BB/ RC & MG	
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1 INTRODUCTION

The City of Welland identified the development of the Northwest Secondary Plan as a priority to provide for detailed land use planning policies for a mix of uses, including policies that address infrastructure requirements, and natural and cultural heritage considerations. The Northwest Welland Secondary Plan (NWSP) will guide future growth and development within the study area. This report (previously issued May 2021) reviews background information and provides capacity analysis for existing water, sanitary, and storm sewer servicing in the study area. In addition, an initial assessment was completed for proposed conceptual water, sanitary, and storm servicing. These analyses were used to develop general recommendations for municipal water, sanitary, and storm servicing requirements in the Secondary Area.

1.1 Study Area

The study area (Figure 1-1) includes the land within the urban area boundary of Welland that is bounded by Clare Avenue to the west, Niagara Street to the east, land on the south side of Quaker Road to a depth of approximately 500m to the south and 500m to the north and comprises approximately 190ha. Quaker Road bisects through the Study Area and is identified as an arterial road and all other streets are considered local roads.

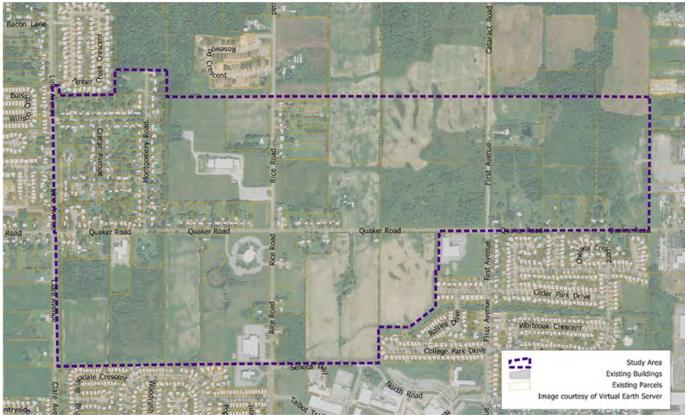


Figure 1-1: Northwest Welland Secondary Plan Study Area

Existing land uses are primarily residential, institutional, agricultural, and open space. Currently, municipal services for water, sanitary and storm exist in parts of the NWSP area, which will be leveraged to accommodate the NWSP area.

1.2 Proposed Secondary Plan

Figure 1-2 shows the proposed NWSP layout provided by Upper Canada Consultants (September 2023). Based on the proposed layout, population and unit numbers for each development block were also provided by Upper Canada Consultants. Projected units and populations are summarized in Table 1-1.

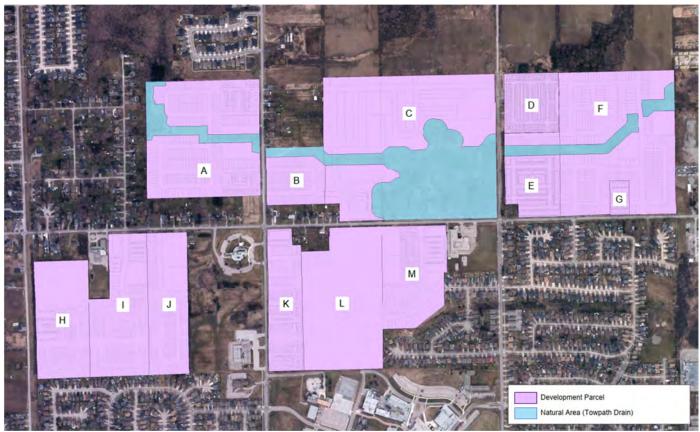


Figure 1-2: NWSP Proposed Population and Unit Plan

Block Number	Area (ha)	Units	Population (+/-)
А	13.25	386	1,081
В	3.36	114	319
С	18.15	800	2,240
D	4.05	360	1,008
E	4.77	401	1,123
F	17.71		1,128
G	0.80	96	269

Table 1-1: NWSP Population and Unit Numbers

Block Number	Area (ha)	Units	Population (+/-)
Н	8.40	226	633
Ι	8.79	227	636
J	7.04		454
К	5.73	439	1,229
L	13.02	500	1,400
Μ	7.05	236	661

2 BACKGROUND INFORMATION

2.1 Sources

Table 2-1 provides a list of sources used to aid in completing the analysis of water, wastewater, and stormwater servicing for the NWSP area.

System	Description	File Type(s)	Author(s)
All	City of Welland Northwest Area Planning and Servicing Study Municipal Class EA	PDF	Earth Tech
All	1m Elevation Contours	SHP	City of Welland
All	City of Welland GIS Data	GIS	City of Welland
All	City of Welland Official Plan	PDF	Dillon Consulting
All	Key Directions Report for the Northwest Welland Secondary Plan Area	PDF	SGL
All	City of Welland Municipal Standards, 2013	PDF	City of Welland
Water/Wastewater	2016 Water and Wastewater Master Servicing Plan Update Hydraulic Model for City of Welland, May 2017	PDF	GM Blue Plan
Water	Welland Water Model (part of the Niagara Region Water Model for the 2017 Niagara Region Master Servicing Plan), 2017	InfoWater	Niagara Region
*Water	City of Welland All Pipe Water Model	InfoWater	City of Welland
Water	Design Guidelines for Drinking-Water Systems, 2008	PDF	MECP
Water	City of Welland Fire Flow Requirements – By Building Zone	PDF	AE

Table 2-1: Water, Sanitary and Storm Data Sources

System	Description	File Type(s)	Author(s)
*Wastewater	Welland All Pipe Wastewater Model	InfoSWMM	City of Welland/ Niagara Region
*Wastewater	City of Welland Pollution Prevention Control Plan Update & Wastewater Master Servicing Plan, 2020	PDF	GM Blue Plan
*Storm	Northwest Welland Stormwater Management Implementation Plan, 2022	PDF	Upper Canada Consultants

*additional/updated data sources since May 2021 Report

2.2 Data Gaps

Data gaps are presented in Table 2-2, which summarizes missing, relevant information that would provide a clearer picture of the existing and future needs of the systems in future steps of this process (i.e. confirmation of criteria to be used in future design of systems).

Table	2-2:	Data	Gaps
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System	Data Gaps	Justification
All	Detailed topographic survey	To confirm elevations for servicing

3 WATER

Water servicing in the Niagara Region is a two-tiered approach; Niagara Region has jurisdiction over the drinking water supply for homes and businesses throughout the Region and is responsible for treatment, storage, pumping, and trunk watermains. The City of Welland is responsible for the local distribution system.

Currently, the area surrounding the proposed development is pipe fed from the Welland Water Treatment Plant (WTP) to the Shoalt's Drive Reservoir and surrounding area. During periods where the WTP is offline, the area is predominately supplied by gravity from the Shoalt's Reservoir. The Welland system also has an elevated storage tank (Bemis) located in the southern portion of the distribution system.

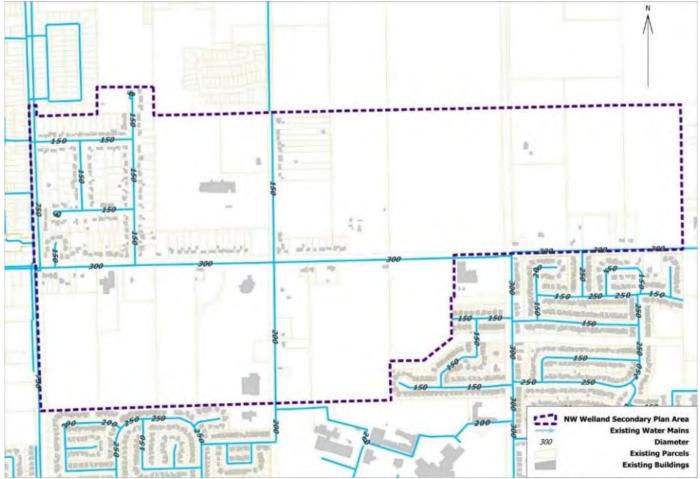


Figure 3-1: Existing Watermains Configuration in Study Area

The existing system configuration within the study area, including existing pipe diameters, is shown in

Figure 3-1. Within this area there is a small existing development east of Line Avenue and north of Quaker Road. This area, which was built in 2002, consists of 150mm PVC watermain connecting to both the 750mm CPP on Line Avenue to the west and the 300mm CI on Quaker Road to the south. In addition, there is a 150mm existing main on Rice Road (north of Quaker Road) which appears to serve few properties. There are also existing properties along Quaker Road, which are serviced off the 300mm main.

3.1 Design Criteria

The design criteria used for the analysis of the water distribution system includes the following:

- Target normal operating pressures:
 - Preferred system pressure between 350 kPa to 550 kPa (50 to 80 psi)
 - Minimum system pressure to be greater than 275 kPa (40 psi)
 - Maximum system pressure to be less than 700 kPa (100 psi)
- Fire flow requirements during MDD with 140 kPa (20 psi) residual system pressure:

- Parks: 67 L/s
- Low Density Residential (Single Family Residential): 67 L/s
- Medium Density Residential (Townhomes): 133 L/s
- Multi-Use: 133 L/s
- Per capita demand: 240 L/cap-day (Based on City design criteria)
- Peaking factors as per the City of Welland Model, as follows:
 - Maximum Day Demand peaking factor: 1.5
 - Peak Hour Demand peaking factor: 1.87 (2.81 x Average Day Demand)
- ADD and MDD demand patterns as per City of Welland Model
- C-Factor for new pipes: 135 (Based on the City design standard)

3.1.1 Water Demands

Table 3-1 summarizes the new demands assigned within the model for the NWSP area. These demands were calculated based on the newly proposed populations/units previously identified in Table 1-1 and design criteria noted in Section 3.1.

Junction ID	ADD (L/s)	MDD (L/s)	PHD (L/s)
814	0.89	1.33	2.49
951	3.89	5.83	10.93
1700	0.75	1.12	2.10
3952	1.76		4.94
8338	1.50	2.25	4.22
8622	3.41	5.12	9.59
8623	2.07	3.11	5.83
J-FUT-47	2.80	4.20	7.87
J_NWSP_4	1.26	1.89	3.55
J_NWSP_6	1.50	2.25	4.22
J_NWSP_8	2.07	3.11	5.83
J_NWSP_9	2.07	3.11	5.83
J_NWSP_10	3.12	4.68	8.77
J_NWSP_15	1.84	2.76	5.16
J_NWSP_20	3.13	4.70	8.81
J-FUT-49	1.77	2.65	4.97

Table 3-1: New NWSP Demands

Junction ID	ADD (L/s)	MDD (L/s)	PHD (L/s)
Total Demand	33.84	50.77	95.11

3.2 Model Updates and Existing System Conditions

An InfoWater Model (WELLAND_WATER_2023, dated October 23, 2023) provided by the City was used for the analysis. The City's model includes both existing and future Average Day Demand (ADD) and Maximum Day Demand (MDD) extended period simulation scenarios. Model data sets suggest that the existing demand scenarios in the model were last reviewed and updated in 2022. The earlier study completed for this development reviewed and commented on the Niagara Region & City of Welland InfoWater models for their future development growth, providing an insight into the future development areas of the region. It has been assumed that this information still applies despite the time passed since that report.

During the development of this study, City noted that there were two errors in the existing model scenarios that should be rectified and therefore, the analysis was updated with the following changes/corrections.

- The size of the watermain, dead end on Montogomery Road where hydrant was connected, was changed from 50mm to 150mm pipe.
- The connection to the intersection of the Regional trunk main at Line Avenue and Summerlea Avenue was opened in the model.
- Recent discussions with the City indicated that the watermain along Quaker Road from Clare Avenue to Rice Road is currently being replaced with a new 300mm watermain and therefore, this portion of pipe was upsized and a C-factor of 135 was assigned in the model to reflect the upgrade.
- The connection (IW pipe ID 2377) between the 750mm Region trunk main on Clare Avenue N and the 300mm watermain on Quaker Road was opened in the model.

Other than the above noted model updates, no quality control checks were conducted on the City's model; it was assumed that the model is sufficiently calibrated for the purpose of this analysis and is indicative of the current system.

Figures for this section can be found in Appendix A. Table 3-2 shows the existing and current future pumping schemes from the City's model (on/off settings) at the WTP for both ADD and MDD scenarios. No changes were made to these settings for the development analysis.

Pump	Existing ADD	Existing MDD	Future ADD	Future MDD
Low Flow Pump #1	On at 0:00 Off at 6:00	Off at 0:00	Off at 0:00 On at 11:00	Off at 0:00 On at 20:00 Off at 22:00
Low Flow Pump #2	Off at 0:00	Off at 0:00	Off at 0:00 On at 20:00	Off at 0:00

Table 3-2: Existing and Future WTP Pump Settings – City's InfoWater Model

Pump	Existing ADD	Existing MDD	Future ADD	Future MDD
High Flow Pump #1	Off at 0:00 On at 13:00	On at 0:00 Off at 7:00	On at 0:00	On at 0:00 Off at 2:00 On at 5:00
High Flow Pump #2	Off at 0:00	Off at 0:00 On at 12:00	On at 0:00 Off at 3:00 On at 6:00 Off at 20:00	On at 0:00 Off at 2:00 On at 5:00

3.2.1 Current Hydraulic Conditions

A hydraulic analysis of the existing system was completed to provide a baseline level of service to compare to the future development scenarios.

Figures A-1 and A-2 show the minimum pressure during existing ADD and MDD in the study limits and surrounding area. At certain locations within the study area, pressures are lower than the required minimum pressure of 275 kPa (40 psi). These low-pressure nodes are in proximity to the Shoalt's reservoir and occur during peak periods; simulation time 11am to 12 noon for ADD and 10am to 11am for MDD. The observed minimum pressures in this portion of the study area for ADD and MDD are 239 kPa and 234 kPa respectively and are thought to be due to high ground elevations (maximum of 193m) and fluctuations of the Shoalt's Drive Reservoir head (between 217.5m and 219.0m). As to be expected during higher demands, more low-pressure nodes were observed in the surrounding study area during MDD scenario than ADD. There were also few low-pressure nodes observed in the other future growth areas of the system.

Figure A-3 shows the available fire flow during MDD at a residual pressure of 140 kPa (20 psi). Certain portions of the study area, specifically watermains along the Rice Road and Topham Boulevard have available fire flows less than 67 L/s (the City standard for single family residential). However, the new 300mm watermain upgrade along Quaker Road (from Clare Avenue to Rice Road) improves fire flows along Quaker Road, Montgomery Road and in Summerlea Avenue. The dead ends of the watermains in this portion of the area still indicated low fire flows (< 67 L/s).

The low availability of fire flows is due to both the high ground elevation and the size of the watermains supplying these hydrants.

3.2.2 Future Conditions without NWSP Development

In the existing model from the City, it was observed that the future model scenario included NWSP infrastructure and demands based on the previous study. A total of 48.7 L/s for future ADD and 73.1 L/s for future MDD was allocated in the NWSP region at the model junctions summarized below in Table 3-3.

Junction ID	Future ADD (L/s)	Future MDD (L/s)
3952	1.00	1.07
567	3.15	4.72
812	2.52	3.77
815	3.86	5.79
818	4.01	6.02
8622	1.18	1.77
8623	5.35	8.03
J-FUT-47	10.10	15.16
J-FUT-48	2.14	3.21
J-FUT-49	5.58	8.37
J-FUT-50	6.08	9.12
J-FUT-51	4.03	6.05
Total Demand	49.00	73.08

Table 3-3: Identified Previous NWSP Demands from the City's Model

To prevent "doubling up" on NWSP demands, the previously proposed infrastructure for NWSP has been removed from the future analysis.

Figures A-4 and A-5 show the minimum pressure during future ADD and MDD, without the NWSP development. As these figures show, a significant improvement in pressures was noted in the surrounding study area when compared to the existing scenarios, with only a small number of low-pressure nodes noted. This is due to the change in the pumping procedure at the WTP for the future scenario.

Figures 3-2 and 3-3 below show the hydraulic grade (HG) for Shoalt's and Bemis tanks for the existing and future MDD Scenarios. The pumping operating procedure at the WTP for the existing scenario shuts down the pumps midmorning, coinciding with periods of higher system demand. During this mid-morning WTP shutdown, both the Shoalt's Drive Reservoir and the Bemis Elevated Tank levels are drawn down; this draw down is sharp and reaches its lowest hydraulic grade level (HG) around noon. However, with the current future pumping scheme at WTP, the HG at Shoalt's and Bemis shows a sustained hydraulic head after 6 am showing improved pressures in the surrounding study area.

The future pumping schemes in the model for ADD and MDD scenarios showed improved pressures surrounding the study area which appeared to resolve most of the low-pressure nodes that were highlighted in existing scenarios. A few low-pressure nodes (250 kPa to 261kPa) still persisted surrounding the study area particularly nodes close to the Shoalt's reservoir.

An attempt was made to assess the future system by changing the current future pumping scheme for MDD scenario by altering the pumping hours at pump H-1 (On at 0:00 and Off at 2:00) which showed improved pressures in the reservoir area but not completely eliminated. As modification of pumping schemes is outside of the scope of this analysis, this would need to be confirmed by the City when adjusting the overall system configuration and settings.

Figure A-6 shows the available fire flow during future MDD prior to the proposed development. Parts of the surrounding study area on the south and east sides showed sufficient fire flows as required for multi-family residential housing (133 L/s) however, the nodes on the Rice Road watermain have less than the design standard of 133 L/s. Most of the Shoalt's reservoir area showed adequate fire flows with the new 300mm watermain upgrade in Quaker Road and by opening the 750mm Region trunk main interconnection in Clare Avenue N with the exception of the dead-end locations.

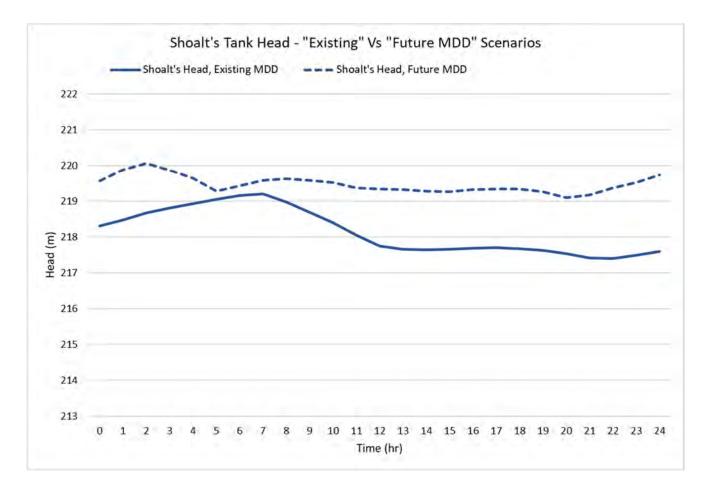


Figure 3-2: Shoalt's Tank Head – Existing and Future MDD Scenarios (without NWSP)

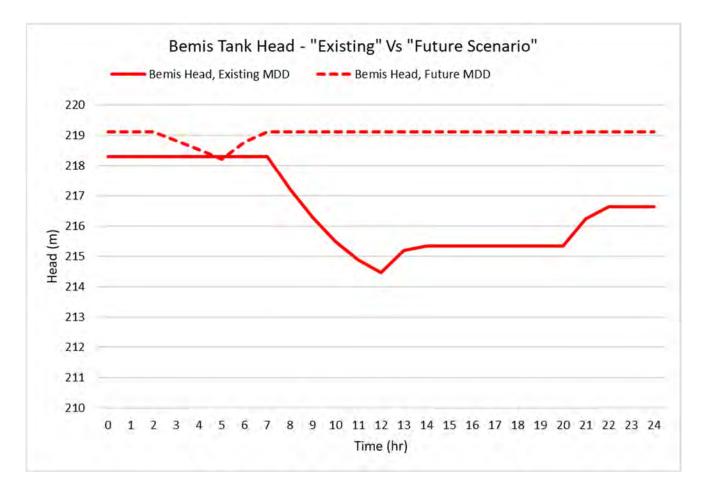


Figure 3-3: Bemis Tank Head – Existing and Future MDD Scenarios (without NWSP)

3.3 Proposed System Requirements

Several pipes and junctions were added to the City of Welland InfoWater model to represent future servicing of the NWSP area. The proposed pipe routing is laid based on the new NWSP site layout as shown in Figure 1-2 in Section 1.0 of this report. As the existing 300mm main on Quaker Road acts as a main supply line for this study area, the proposed mains for NWSP were mainly branched and looped out from this main to service the proposed development. Note that only significant pipes that will connect the NWSP site were included in the model. There will be additional future piping required along local roads upon finalization of the site layout.

Junction elevations for the newly added nodes in the study area were assigned based on the City of Welland 1 m contours. Pipe sizing for the major loops shown in Figure 3-4 was established as part of the hydraulic analysis to achieve the required fire flow of 133 L/s as needed for the medium density residential. New piping is shown in bold red; existing piping in blue.

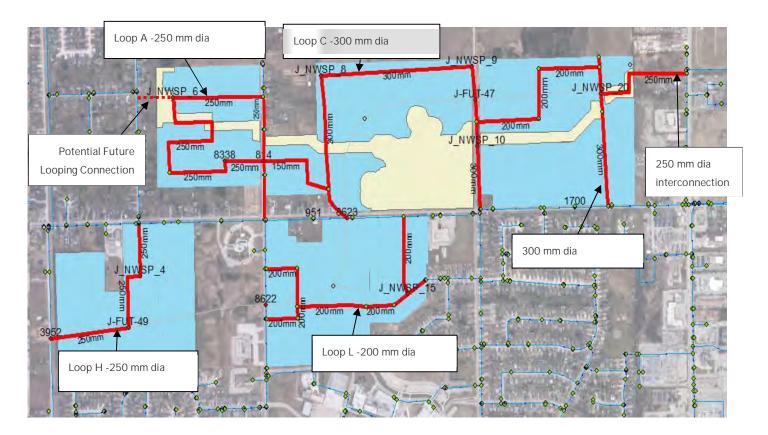


Figure 3-4: Proposed Infrastructure for NWSP Development

3.3.1 Hydraulic Analysis

The development demands for the proposed NWSP development were added to the Futures ADD and MDD scenarios in the model. The hydraulic analysis then was carried out with NWSP future demands to identify the impact of this proposed development on the future system and to confirm the pipe sizing and servicing requirements to support the future NWSP development.

Figures A-7 and A-8 show the minimum available pressures during ADD and MDD EPS, and Figure A-9 shows the available fire flows, with the NWSP area serviced with the proposed watermain sizes identified.

As these figures show, the addition of NWSP area to the future system does not significantly impact the surrounding system pressures, instead the proposed servicing has shown improved pressures over Future ADD and MDD when no NWSP development was added. As with the other modelled scenarios, there are existing low-pressure nodes near Shoalt's Drive Reservoir area, however no exacerbation of low pressures was noted when the NWSP development was added.

Figure A-9 shows most of the NWSP study area meets fire flow requirements of 133 L/s that is required for medium density housing with the following pipe servicing requirements.

The major watermain loops (Loop A, C, H and L) that are proposed to service the future NWSP development are shown in Figure 3-4 above. The pipe routing and sizing was identified based on the current site layout provided by the

developers and to achieve the design fire flow of 133 L/s throughout the study area. Should a change in the NWSP site layout occur in the future, a review of the analysis may be required to re-confirm the pipe sizes and servicing options. Furthermore, additional modelling may be required in the future to assess the extent of the overall system that is required to be constructed to facilitate each development block on a project-by-project basis.

To supply the required fire flow (133 L/s) to the northwest portion of the NWSP, specifically, the development that is planned west of Rice Road, an upgrade of Rice Road watermain and as well as the new water mains installed in this area should be a minimum of 250mm as shown as Loop A. With this upgrade, the fire flows in the area were improved and vary from 138 L/s to 213 L/s. It is also noted that a potential future looping connection between the northwest portion of the NWSP and the existing watermain on Montgomery Road can be considered based on final development details and servicing requirements within the area.

A new 300mm watermain loop, Loop C will be required to supply the C-block of the NWSP planned development. In addition, a new interconnection with 250mm watermain connecting the NWSP development to the watermain in Niagara Street on the eastern side is also made to improve the fire flows in the area.

Two major watermain loops with 200mm and 250mm, Loop L and Loop H respectively will be required for the southern portion of the NWSP, to provide the required fire flow of 133 L/s in this area. Without the Loop L, the development blocks K and M were not able to achieve the design fire flows of 133 L/s.

Overall, the proposed NWSP development shows improved operating pressures except in the low-pressure areas previously identified. Improved fire flows were also noted around the NWSP study area with the proposed pipe servicing, both within and outside the development boundaries.

3.3.2 Storage Requirements Review

A review of the City of Welland's overall storage capacity and existing and future storage requirements was conducted to determine the impact of the NWSP area on future storage needs. As per the MECP Design Guidelines for Drinking Water Systems, storage requirements for a water distribution system are as follows:

- Equalization Storage (A) = 25% of Maximum Day Demand
- Fire Storage (B) = 378 L/s for 6 hours (Based on MECP Equivalent Population Fire Flow Requirement)
- Emergency Storage (C) = 25% of A +B

Table 3-4 summarizes the total available storage identified in the Region Master Plan (as used in the previous report) and the calculated existing and future storage needs for the system based on the City of Welland model demands. As shown, there is sufficient storage in the Welland system to allow for the addition of the NWSP area. The total additional storage required for the addition of the NWSP area is 1.4 ML.

Description	Storage (ML)
Total Available Storage	37.0
Existing Required Storage	19.7
Future Required Storage without NWSP (a)	26.5

Table 3-4: Available and Required Water Storage

Description	Storage (ML)
Future Required Storage with NWSP (b)	27.9
Required Additional Storage for NWSP (b-a)	1.4

4 SANITARY

Sanitary servicing in Niagara Region is based on a two-tiered approach. The Region is responsible for the wastewater treatment plants, trunk sewers, pumping stations and forcemains. The City of Welland is responsible for the local gravity sewer system.

The sanitary sewage from the NWSP area will ultimately be treated at the Welland Wastewater Treatment Plant (WWTP). This WWTP services the City of Welland, Town of Pelham, and the Port Robinson area of the City of Thorold.

The existing sanitary services in the NWSP area includes a regional main down Rice Road, local main in the Montgomery subdivision, and local and regional (trunk) sanitary sewer along Quaker Road. Primary sanitary sewage flows south down Rice Road, and then east down Quaker Road to Towpath Road. Sanitary sewage then flows northeast along Towpath Road to Towpath Sewage Pumping Station (SPS). Towpath SPS receives gravity flow from the regional trunk sanitary sewer along Quaker Road and flows from Hurricane Road SPS (Rice Road). Sewage from Towpath SPS is pumped through a forcemain across the Welland River to a gravity system, which ultimately flows to the Welland WWTP. A schematic of the existing sanitary servicing within the NWSP study area is provided in Figure 4-1.

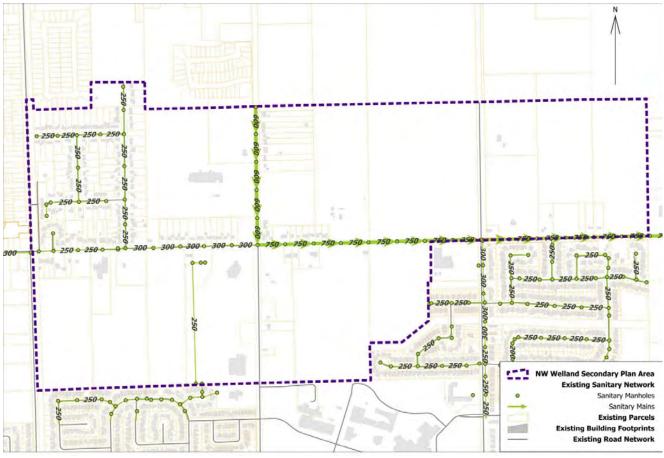


Figure 4-1: Schematic of Existing Sanitary System in NWSP Study Area

4.1 Design Criteria

Existing and future peak flows conveyed by the trunk sewer on Quaker Road to the Towpath SPS were assumed to be equivalent to the flows represented in the City's all-pipe InfoSWMM model.

Additional flows contributed to the Quaker Road trunk sewer, and ultimately the Towpath SPS, by the NWSP area were calculated using the following design criteria:

- Extraneous flows = 0.286 L/s/ha
- Roughness coefficient = 0.013
- Residential per capita flow rate (for sewage generation) = 275 L/cap/day
- Peaking factor = Calculated based on Harmon formula with values between 2.0 and 4.0

4.2 Existing System Capacity

4.2.1 Trunk Sewer

The available capacity of the existing trunk sewer along Quaker Road from Rice Road to the Towpath SPS was reviewed using the City's all pipe InfoSWMM model.

Currently Line Avenue is the break point in the collection system, with areas west of Line Avenue flowing west and then south, contributing to the Welland WWTP drainage area. However, the Region Master Servicing Plan Update (MSPU) identified a new 600mm diameter connection (WW-SS-002) along Quaker Road from Line Avenue to Rice Road, which would redirect approximately 130L/s of flows from Pelham (north-west of Line Avenue) to the Quaker Road trunk sewer, and ultimately the Towpath SPS. Given this change in flows through the Quaker Road trunk sewer, the available capacity of this sewer was reviewed with this new connection. This completed available capacity assessment, based on the InfoSWMM model outputs, is attached in Appendix B. In general, the Quaker Road trunk sewer has significant available capacity – with future available capacity ranging from 100L/s to 3,194L/s with the new Line Avenue connection.

4.2.2 Towpath SPS and Forcemain

The Region MSPU identified that Towpath SPS has existing and future deficiencies based on existing and design peak wet weather flows. As such, the Region MSPU identified a capital project to upgrade the Towpath SPS during the timeframe of 2022 – 2026 from 118L/s to 600L/s (WW-SPS-037).

The Region MSPU also indicates that the existing Towpath SPS forcemain has current capacity; however, will have a projected capacity deficit for 2051 growth. There is already a constructed 600mm diameter forcemain that can be commissioned in line with Towpath upgrades, as identified in the Region MSPU capital projects during the timeframe of 2032-2036 (WW-FM-022).

4.2.3 Welland WWTP

The Region MSPU identified that the existing Welland WWTP has surplus capacity available to treat existing and future flows at the plant, with the plant reaching 80% capacity around the 2041 time horizon.

4.3 Proposed System Requirements

4.3.1 NWSP Sanitary Drainage Areas and Proposed Collection System

As requested, two sanitary servicing options were prepared and reviewed for feasibility for the NWSP area, including: 1) development blocks on the east and west side of First Avenue are connected to a new city trunk located on First Avenue and 2) development blocks on the east and west side of First Avenue are connected through the development blocks to a new city trunk located on Quaker Road.

Figure 4-2 and Figure 4-3 (also provided in Appendix B as Figure B-1 and B-2, respectively) show the approximate location of future city trunk sanitary gravity sewers within the NWSP area and the location where the city trunks will connect to the existing Region trunk sewer on Quaker Road for each servicing option. Figure 4-2 and Figure 4-3 also show identifying numbers for the individual NWSP drainage areas, which are referenced in the sewer design sheets provided in Appendix B.

The design sheets for the proposed sanitary sewers have been prepared with the new Line Avenue connection included. Note that the inverts and pipe lengths assigned to the existing trunk sewer in the proposed design sheets are from the City's InfoSWMM model. Existing peak flows into the trunk sewer, input at existing manhole locations in the design sheets, are also as per the City's InfoSWMM model. All inverts and pipe lengths of the proposed city trunk sewers have been assigned based on preliminary modeling and the existing ground contours of the area. Note that, it is assumed that any other sanitary sewer required on future local roads servicing the NWSP area, will be 200 mm diameter.

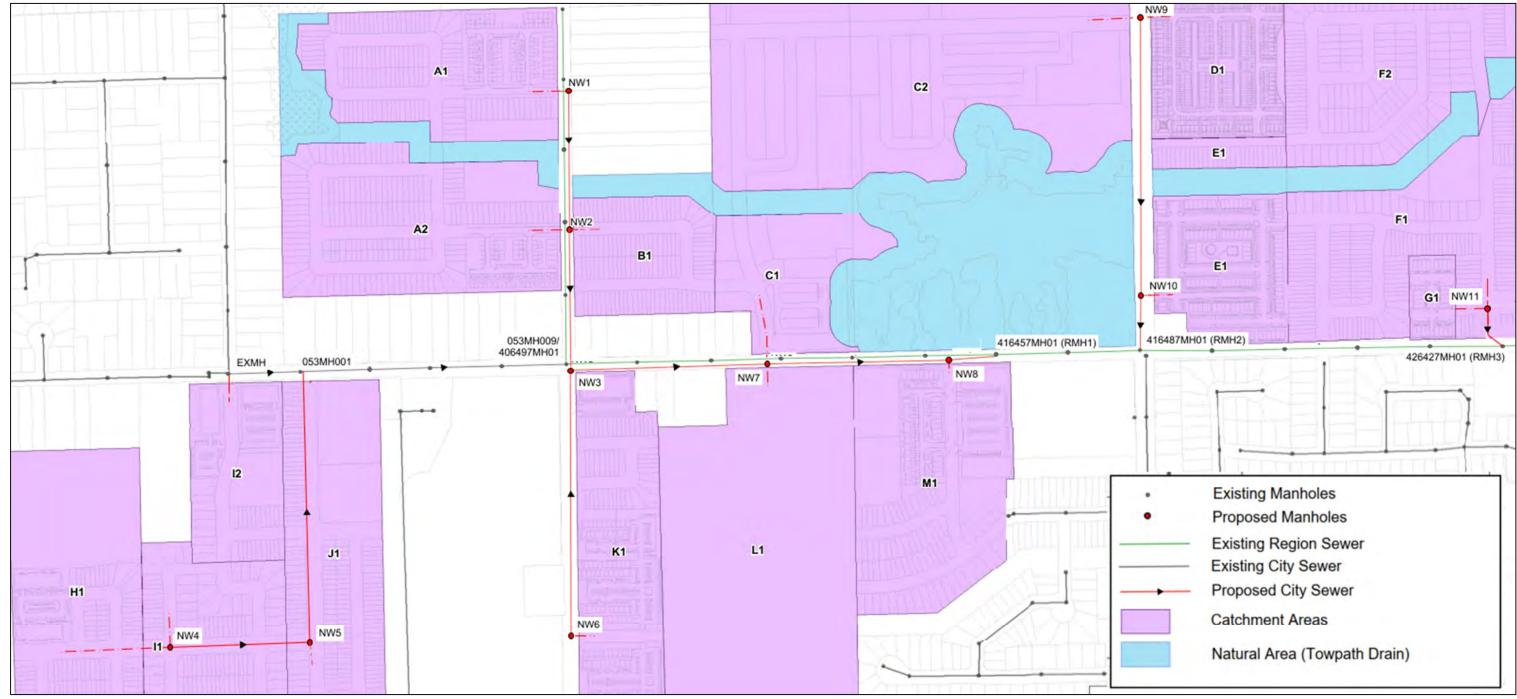


Figure 4-2: Proposed Sanitary System and Drainage Areas – Option 1

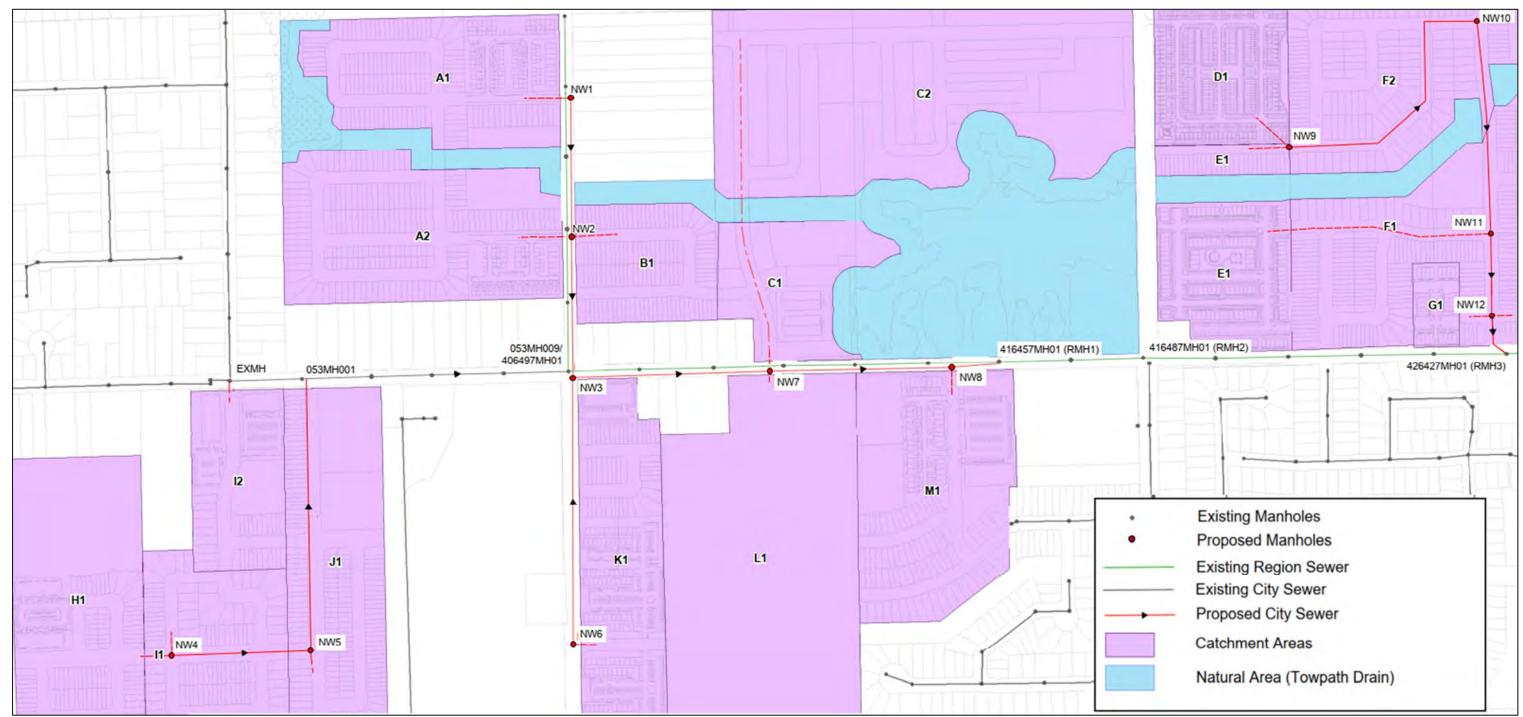


Figure 4-3: Proposed Sanitary System and Drainage Areas – Option 2

For servicing Option 2, the proposed trunk sewer within the quadrant east of First Avenue and north of Quaker Road (from NW10 to NW11) must cross the proposed Towpath Drain. For this preliminary assessment, using the existing ground contours and referencing the Towpath Drain Re-Alignment drawing package (Upper Canada Consultants, 2022) it appears that the proposed trunk sewer will be in direct conflict with the proposed box culvert and new creek bottom, making this servicing option not achievable. Further review and confirmation, based on proposed development details, will be required to determine viability of this servicing option moving forward.

As shown in the appended design sheets, the NWSP drainage area contributes overall an additional 143.3L/s of peak flow to the Quaker Road trunk sewer. Based on the capacity review of the existing trunk sewer on Quaker Road (provided in Appendix B), there are two (2) pipe segments that have an available capacity below 143L/s. The first pipe segment (19001376) is located between Rice Road and RMH1 (as shown on Figures 4-2 and 4-3 above). Since this segment will only receive an additional 27L/s sanitary flow from the NWSP area, this segment is not a concern. The second pipe segment (19001405) is located further downstream on Towpath Road between Grisdale Road and the Towpath Road SPS. Model analysis indicates this segment has 100L/s of available capacity with the Line Avenue trunk sewer connection. Further review and confirmation of available capacity within this segment should be completed prior to full build out of the NWSP area.

Although the phasing of future development within the NWSP area is not currently known, the proposed layout of this area and the associated sanitary design is such that the individual quadrants (defined as: areas west of Rice Road and north of Quaker Road (catchment area A); areas west of Rice Road and south of Quaker Road (catchment areas H, I, J); areas east of Rice Road and south of Quaker Road (catchment areas B, C1); areas east of First Avenue and north of Quaker Road (catchment areas D, E, F, G); and areas west of First Avenue (catchment area C2)) can mostly be developed independently of each other. Several exceptions to this include:

- the proposed city trunk sewer on Quaker Road (from NW3 to RMH1) must be constructed prior to development of catchment area A, catchment area B and catchment area K occurring;
- a portion of the proposed city trunk sewer on Quaker Road (from NW7 to RMH1) must be constructed prior to any development occurring within catchment areas C1 (and C2 for servicing Option 2), L, and M.
- for servicing Option 1, the proposed city trunk sewer on First Avenue (from NW9 to RMH2) must be constructed prior to development within catchment areas C2, D, and E.

The remainder of the city trunk sewers within each development quadrant should be constructed as development occurs in that quadrant starting from the downstream end.

Alternatively, to eliminate duplication of trunk infrastructure along Quaker Road and Rice Road, additional connections can be considered directly to the regional trunk main in order to eliminate the need for a 'local' trunk system. This approach would also eliminate most of the phasing exceptions noted above, as the local trunk would not need to be constructed.

4.3.2 Towpath SPS and Forcemain

The Welland NWSP area will contribute an additional 143.3L/s of peak flow to the Towpath SPS. As previously noted, the Region MSPU identified a planned upgrade to this SPS. The SPS upgrades will be required to address existing and future capacity and will be required to be completed before significant development can occur within the NWSP area.

The Towpath SPS forcemain has sufficient existing and future capacity to accommodate flows from the Welland NWSP area, provided the constructed 600mm diameter forcemain is commissioned prior to 2051 flows and build-out.

4.3.3 Welland WWTP and Downstream System

As previously noted, the Welland WWTP currently has a capacity surplus, and the NWSP area can be added. The Region MSPU did indicate the plant will reach 80% capacity around 2041. The post-2051 flows are expected to exceed the plant capacity; however, the plant can accommodate flows to 2051.

Additionally, the trunk sewer that the Towpath SPS forcemain discharges to has available capacity between the discharge point and the WWTP to accept an increase in flow. The design of the future Towpath SPS upgrade should confirm the capacity of the downstream trunk sewer when determining SPS outflow rates.

5 STORM

The existing NWSP area topography is quite flat and drains in a west to east direction. The land use is mainly pasture/ agricultural land interspersed with country residential homes. The plan area is significantly developed all around the boundary as well as within the plan area itself. The west side of the study area is already developed with country residential homes. There are two (2) major drainage channels that flow through the site – Towpath Drain within the northern portion of the development area and a tributary to Welland Recreational Canal within the southern portion of the development area. These two (2) channels are identified by the Niagara Peninsula Conservation Authority (NPCA) as requiring approval for any development draining to the channels. The existing stormwater drainage paths are shown in Figure 5-1.

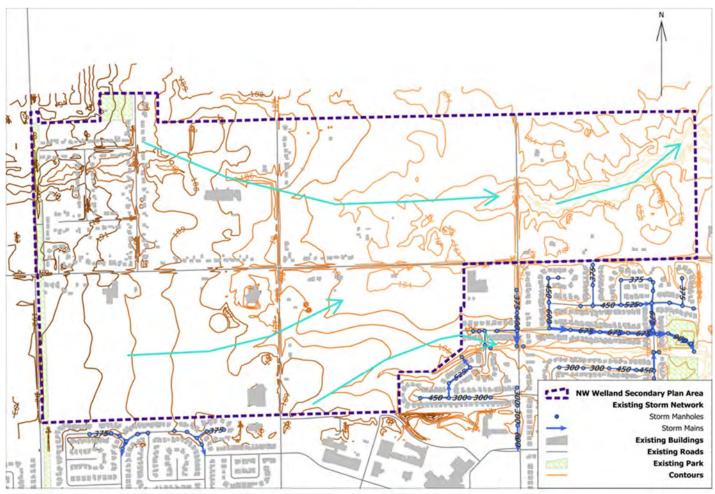


Figure 5-1: Schematic of Existing Stormwater Drainage Path

5.1 Design Criteria

The overall stormwater management plan for the NWSP area was initially developed by Aquafor Beech (2020) and updated and refined by Upper Canada Consultants (2022). The focus of this report is the identification of gravity sewer servicing requirements. The following design criteria were used in identifying these servicing requirements:

- Pipes were sized using the rational method with the City of Welland's 5-Year IDF curve values (a = 830, b = 0.777, c = 7.3)
- Friction factor = 0.013
- Run-off coefficients (as per City of Welland's Design Standards) of:
 - o Low Density Residential (i.e.: Single Family) = 0.40
 - o Medium Density Residential (i.e.: Semi-Detached) = 0.50
 - High Density Residential (i.e.: Townhouses) = 0.60

5.2 Existing System Capacity

Since the proposed servicing, which is the focus of this report, will not leverage any existing gravity storm sewers in the area, no review of existing system capacity was conducted.

5.3 Proposed System Requirements

5.3.1 Proposed Stormwater Management Pond Locations

The stormwater management plan developed by Upper Canada Consultants identified approximate locations for eight (8) storm ponds, which will outlet to the Towpath Drain (channel north of Quaker Road), while one (1) storm pond will outlet to the tributary to Welland Recreational Canal (channel south of Quaker Road). The intent of the stormwater management plan is that all runoff from the proposed NWSP area will be directed to these storm pond locations through new gravity sewers installed on existing and future roads.

The approximate location of these proposed storm ponds is shown on the Ultimate Stormwater Management Plan figure from the Upper Canada Consultants Stormwater Management Implementation Plan (October 2022), which is included in Appendix C for reference. These pond locations were used to identify approximate outlet locations for the gravity sewers that will be required to service the NWSP area.

5.3.2 Proposed Gravity Sewers

Figure 5-2 (also provided in Appendix C as Figure C-2) shows the approximate location of future trunk storm gravity sewer outlets to the proposed storm ponds within the NWSP area. Figure 5-2 also shows identifying numbers for the individual NWSP drainage areas, which are referenced in the sewer design sheet found in Appendix C. Note, the design sheet was used primarily to identify outlet pipe sizing. Pipe sizes/lengths for the remainder of the future system were also approximated for preliminary costing (see Section 6), with a conservative assumption of a minimum pipe size of 450mm.

Based on the results of the completed sewer design sheet found in Appendix C, Table 5-1 shows the identified required outlet sizes for each approximate pond location.



Figure 5-2: Proposed Storm System and Drainage Areas

Outlet #	Size (mm)
SWM1	900
SWM3	1050
SWM5	1350
SWM7	1350
SWM9	1200

Table 5-1: Required Outlet Size

Note that pipe slopes identified in the design sheet were assigned based on the existing ground contours for the area and the required outlet elevations, with the intent of ensuring suitable cover over all proposed pipes.

6 PRELIMINARY COSTING

Preliminary costing for the conceptual water, sanitary, and stormwater servicing is provided in Table 6-1. Note – neither road works, utilities (including hydro, gas and communications servicing), nor restoration cost (asphalt) for works proposed on existing roads (Rice Road, Quaker Road, and First Avenue) are included in this estimate. A more detailed breakdown of these preliminary cost estimates can be found in Appendix D.

Item	Scope of Work	Cost
Water Distribution System	Watermain (150mm to 300mm) including services, valves, and hydrants	\$26,366,775
Sanitary Collection Servicing		\$36,657,195
Storm Collection Servicing	Storm Sewer (450mm to 1350mm), including structures	\$19,136,475
Sub-total	Water/Sanitary/Storm	\$82,160,445
Engineering	10% of Capital	\$8,216,200
Contingency	15% of Capital	\$12,324,200
TOTAL		\$102,700,845

Table 6-1: Preliminary Cost Estimate for Municipal Servicing

7 CONCLUSIONS

The conclusions from the water, sanitary, and storm servicing capacity assessments are as follows:

Water:

- Proposed pipe servicing for the NWSP development is sized based on the design fire flow criteria of 133 L/s which are provided in Section 3. These include:
 - To supply fire flows for the northwest portion of NWSP development, the existing Rice Road watermain and the new infrastructure west of Rice Road (Loop A), should be a minimum of 250mm in diameter.
 - To supply water and adequate fire flows to the south-west portion of the development, a new 250mm diameter interconnection (Loop-H) is required to connect the existing 750mm regional trunk main on Clare Avenue to the new 300mm main on Quaker Road.
 - Loop C (300mm dia) for block C of NWSP and Loop L (200mm dia) for blocks K, L and M are required to provide the adequate fire flows.
 - A new 250mm watermain interconnection connecting the NWSP development to the Niagara Street Watermain on the east side will also be required to support the required fire flows.
- The addition of the NWSP development to the City's system does not negatively impact the surrounding system, and instead should improve pressures and fire flows in the area.
- The existing system has sufficient storage to support the future NWSP development.
- The proposed development does not negatively impact the existing low-pressure areas identified near Shoalt's Reservoir.

Sanitary:

- The existing trunk along Quaker Road, which conveys flows to the Towpath SPS, has sufficient capacity to accept the additional 143.3 L/s peak flow generated by the NWSP area, with the exception of pipe segment 19001405 on Towpath Road between Grisdale Road and the Towpath Road SPS. Model results indicate this segment has only 100L/s of available capacity.
- The Towpath SPS was identified in the Region MSPU as requiring an upgrade due to both growth north of the study area and the redirection of a portion of the flows from Pelham (north-west of Line Avenue) to the Towpath SPS through the Quaker Road trunk sewer. The timing of the Towpath SPS upgrade is 2022-2026 and will be required to be completed before significant development can occur within the NWSP area.
- The Towpath SPS forcemain has sufficient existing capacity; however, will have a projected capacity deficit for 2051 growth. There is already a constructed 600mm diameter forcemain that will require commissioning in line with Towpath SPS upgrades during the timeframe of 2032-2036 (WW-FM-022).
- The trunk sewer that the Towpath SPS forcemain discharges to has available capacity between the discharge point and the WWTP to accept an increase in flow.
- The WWTP has sufficient capacity to allow for the addition of the NWSP area.
- Future sanitary sewer sizing will range from 200 mm diameter to 450 mm diameter. Sizing to be confirmed during design.
- The phasing of future development within the NWSP area is not currently known; however, the proposed layout of this area is such that the individual quadrants (defined as: areas west of Rice Road and north of Quaker Road; areas west of Rice Road and south of Quaker Road; areas east of Rice Road and south of Quaker Road; areas east of Rice Road and north of Quaker Road; areas east of Rice Road and Road

Quaker Road; and areas west of First Avenue) can mostly be developed independently of each other, with exceptions noted below.

- The proposed city trunk sewer on Quaker Road (from NW3 to RMH1) must be constructed prior to development west of Rice Road, north of Quaker Road, and lands fronting the east side of Rice Road both north and south of Quaker Road.
- A portion of the proposed city trunk sewer on Quaker Road (from NW7 to RMH1) must be constructed prior to any development occurring east of Rice Road and west of First Avenue.
- For servicing Option 1, the proposed city trunk sewer on First Avenue (from NW9 to RMH2) must be constructed prior to development occurring immediately east and west of First Avenue.
- Alternatively, to eliminate duplication of trunk infrastructure along Quaker Road and Rice Road, additional connections can be considered directly to the regional trunk main in order to eliminate the need for a 'local' trunk system and most of the phasing exceptions noted above.

Storm:

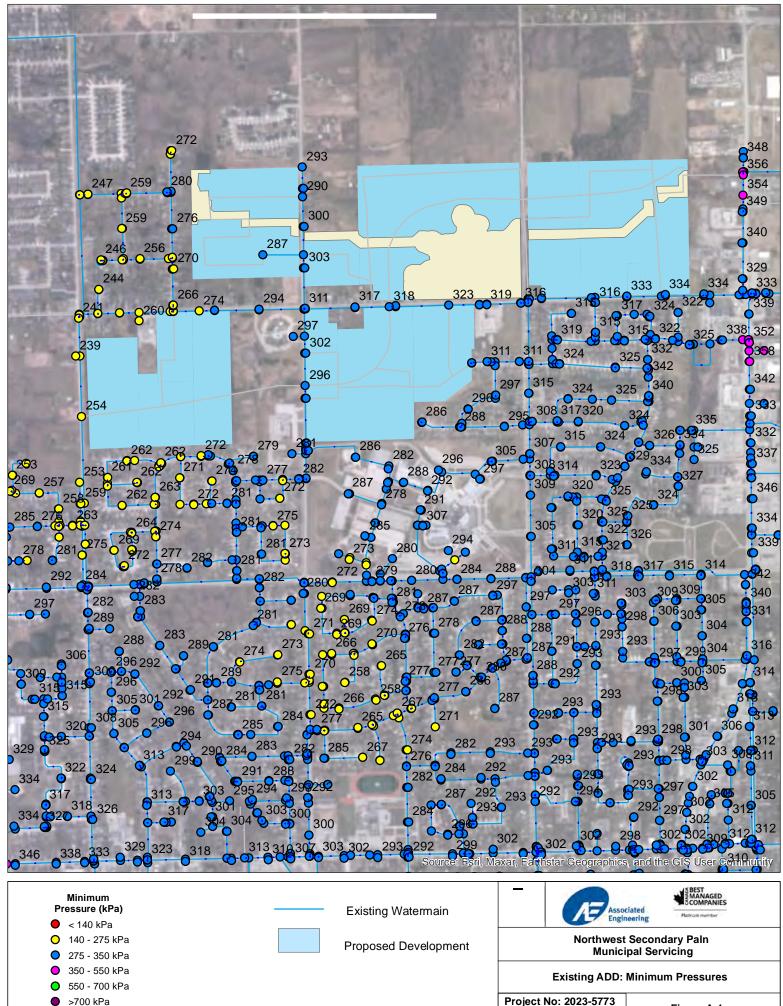
• The stormwater management plan developed by Upper Canada Consultants identified approximate locations for nine (9) new storm water ponds to service the NWSP area. Gravity sewers along the existing and future roads will direct runoff to these pond locations. Outlet sizing for the ponds will range from approximately 750 mm diameter to 1350 mm diameter. Sizing to be confirmed during design.

Respectfully Submitted by,

Andrea LaPlante, P.Eng. Project Manager

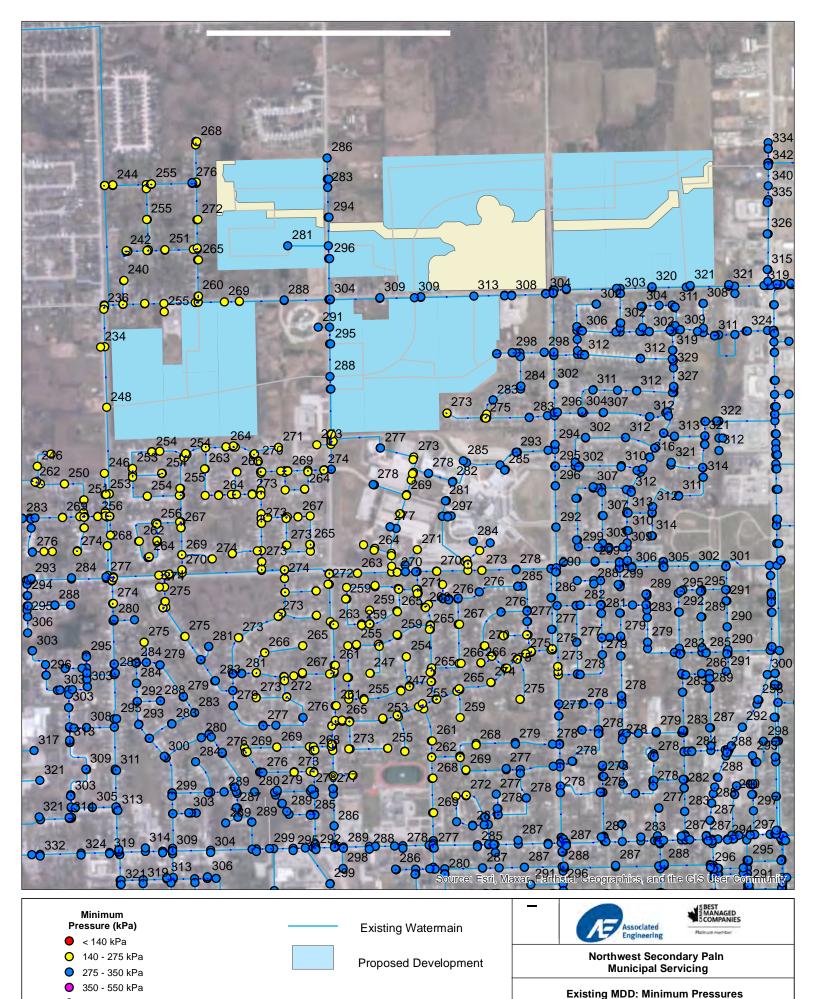


APPENDIX A - WATER



Project No: 2023-5773 Date: March 2024

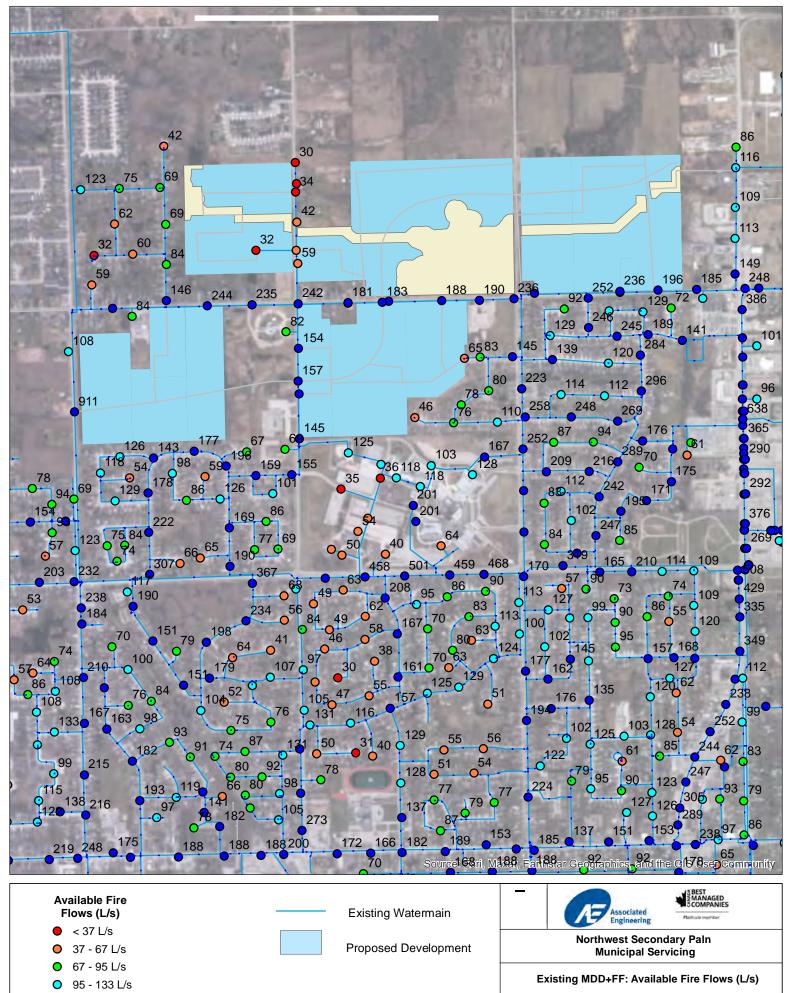
Figure A-1



550 - 700 kPa >700 kPa Existing MDD: Minimum Press

Project No: 2023-5773 Date: March 2024

Figure A-2

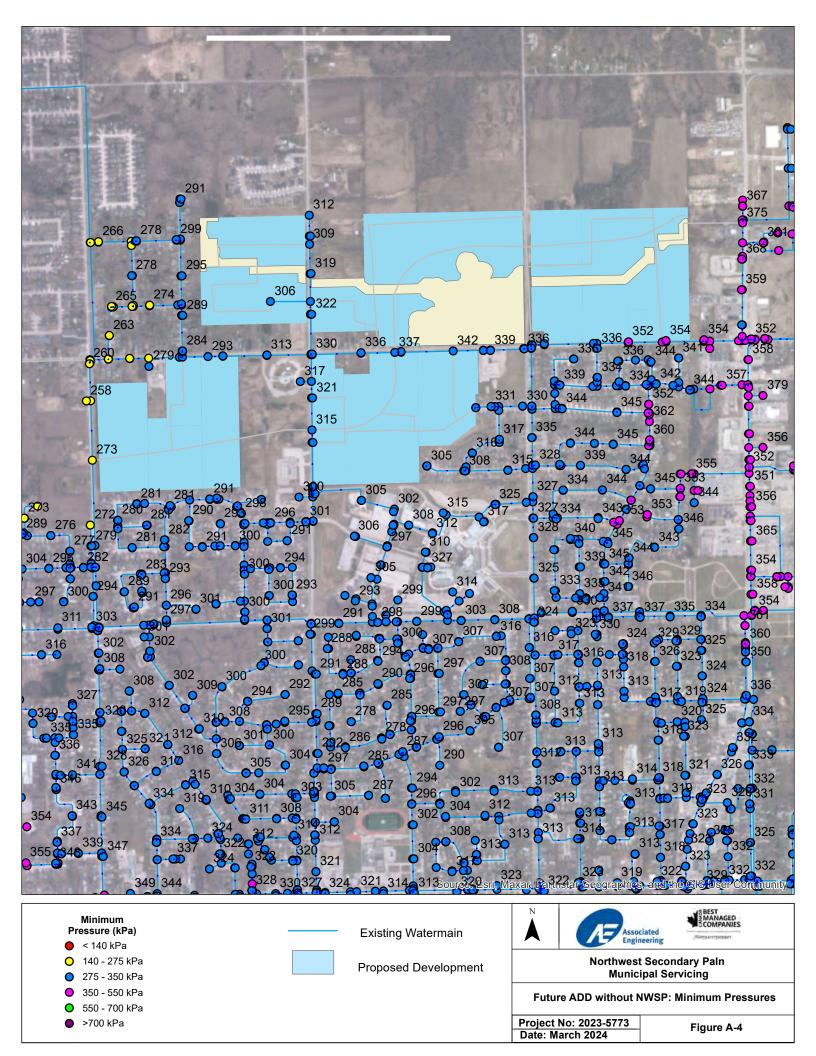


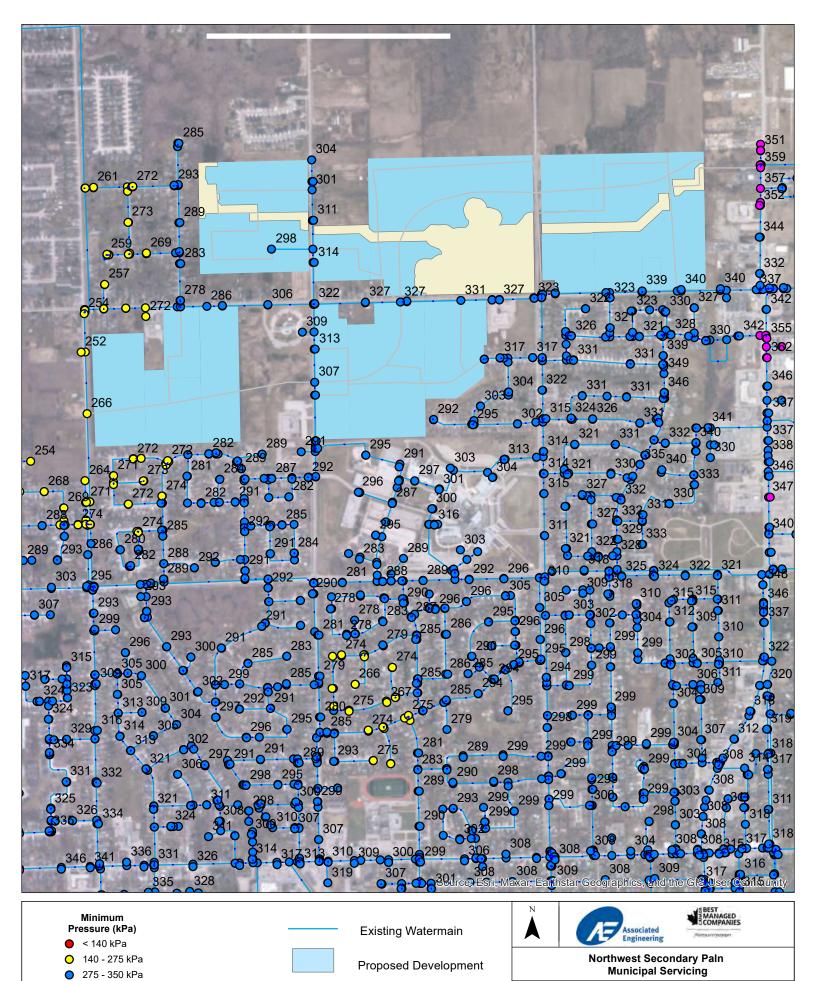
0	> 133 l/s	
<u> </u>	2 100 %0	

Figure A-3

Project No: 2023-5773

Date: March 2024





0	350 - 550 kPa
0	550 - 700 kPa

- >700 kPa
- >700 kPa

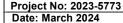
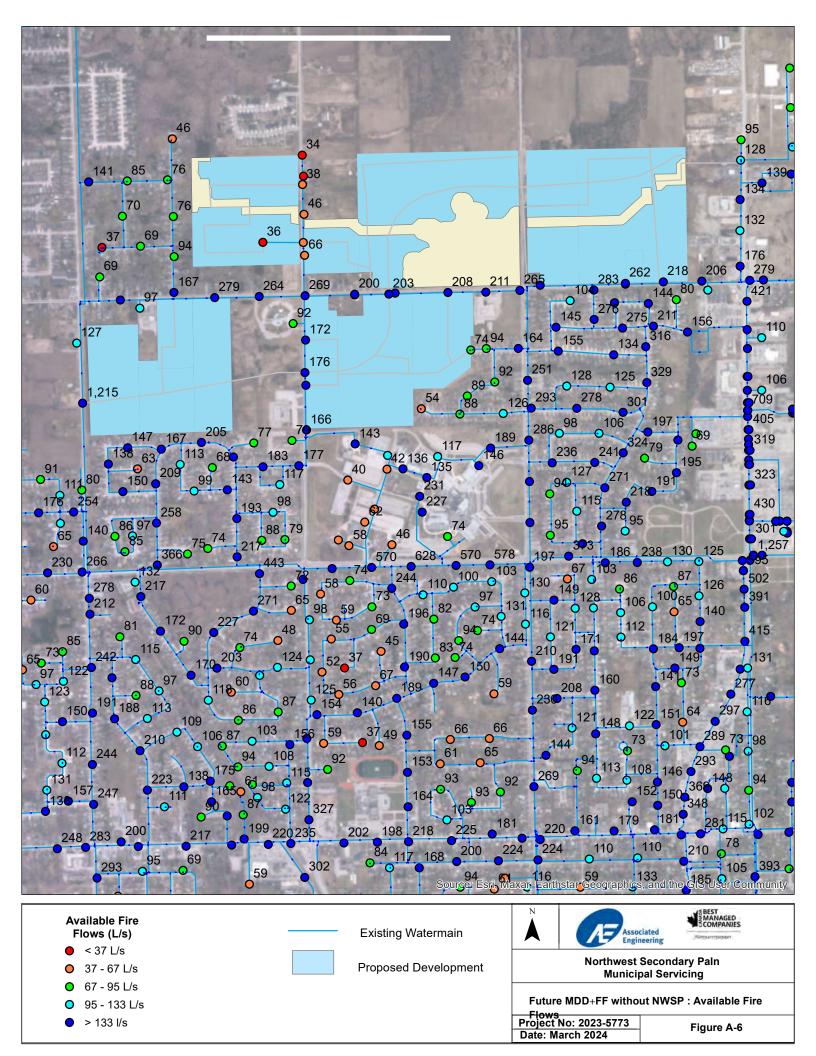
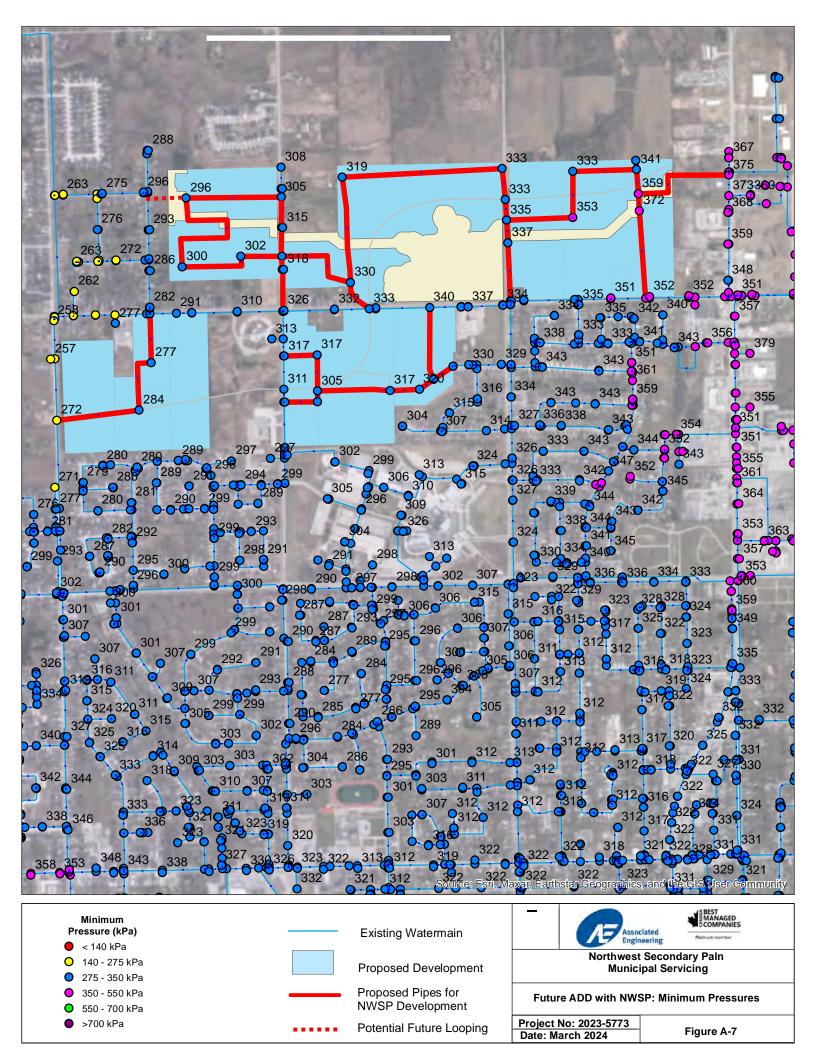
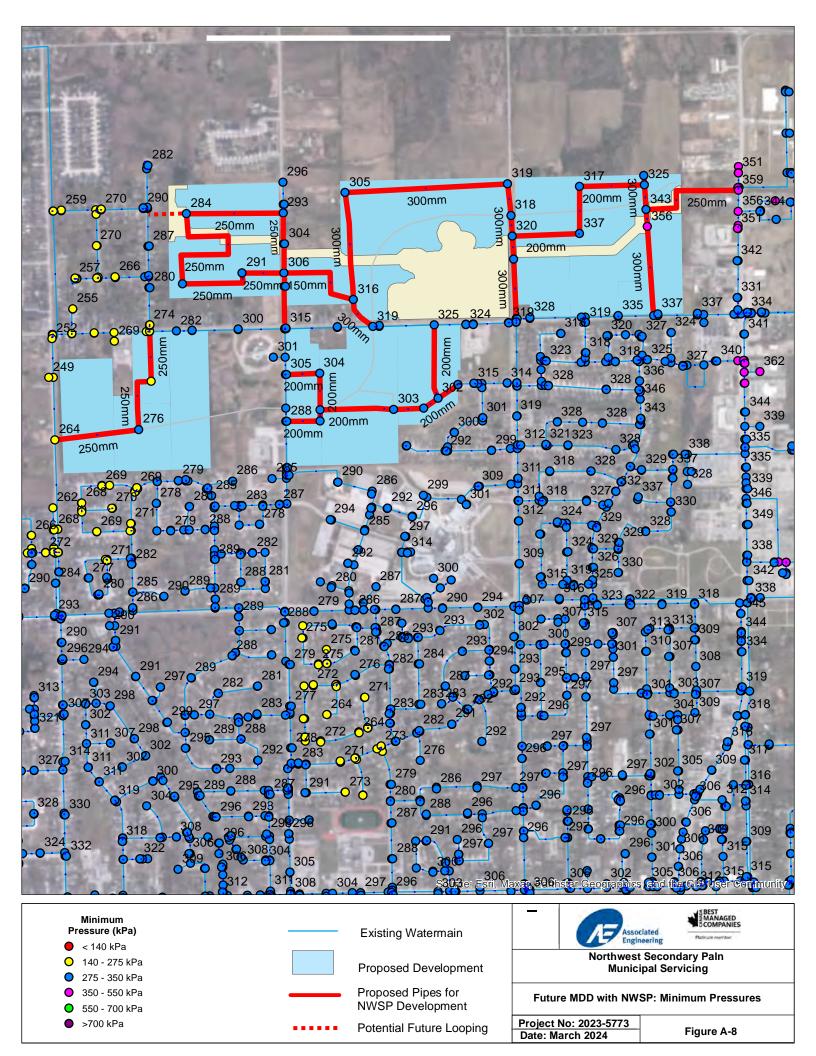


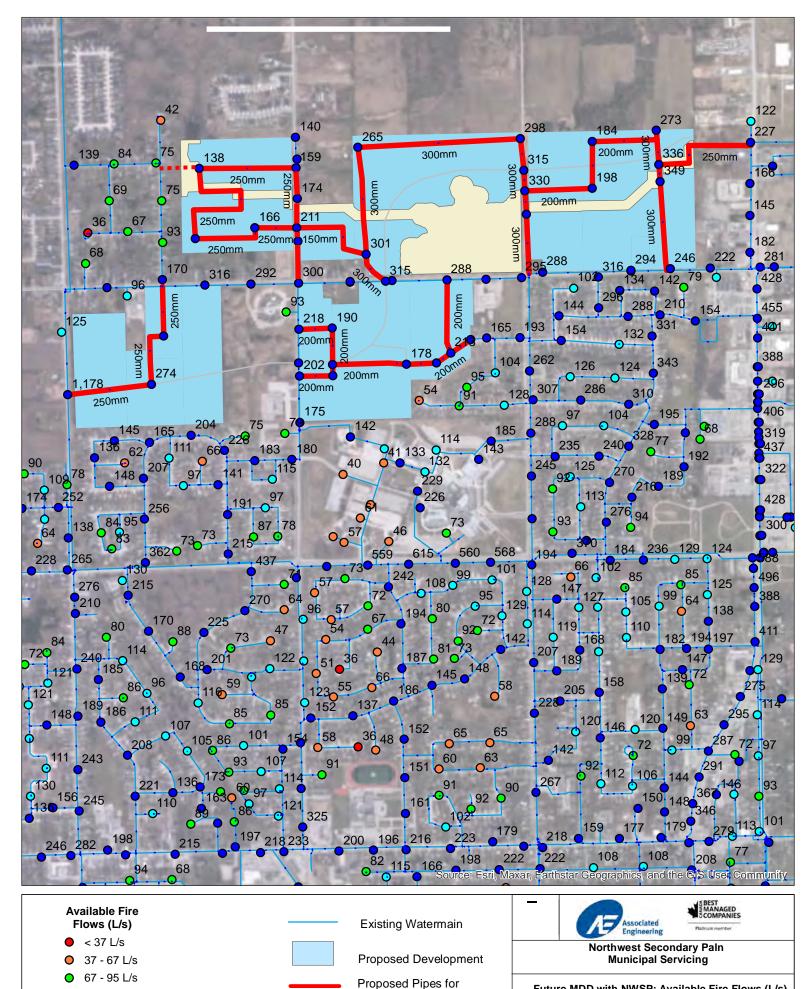
Figure A-5

Future MDD without NWSP: Minimum Pressures









NWSP Development

Potential Future Looping

0	95 - 133 L/s
0	> 133 l/s



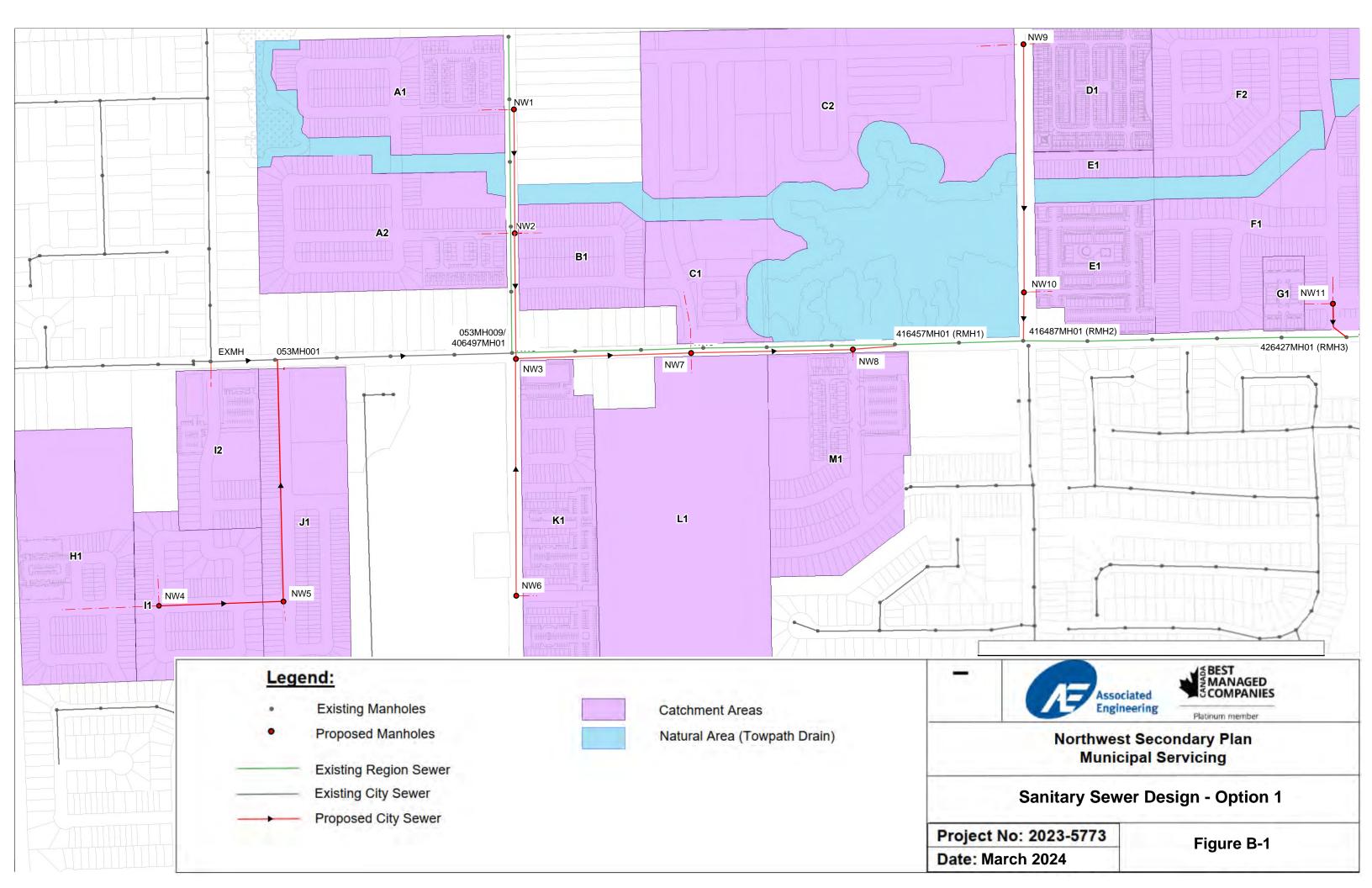
Project No: 2023-5773 Date: March 2024

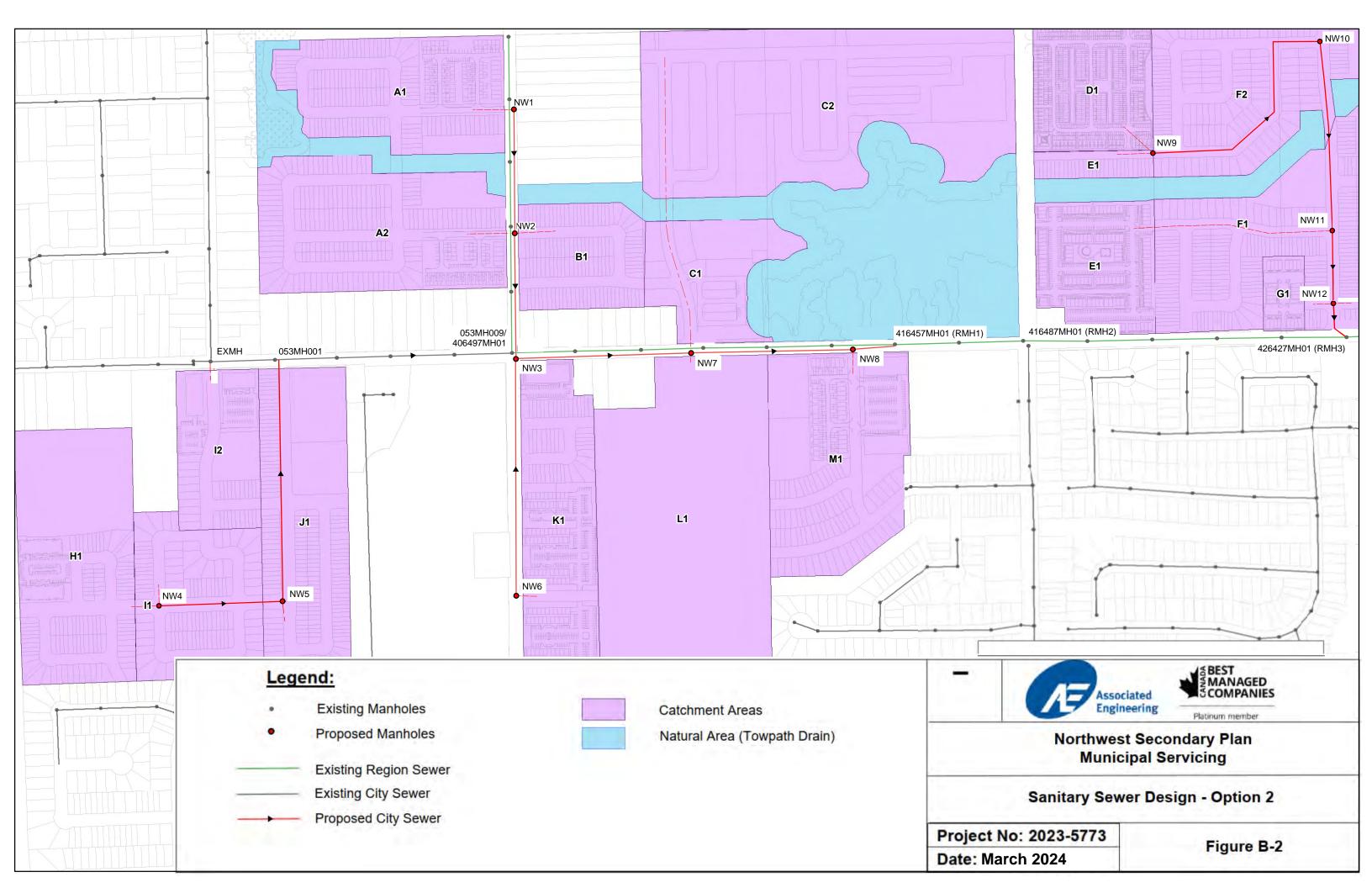
Figure A-9

APPENDIX B - SANITARY

Northwest Secondary Plan Municipal Servicing 2041 Quaker Road to Towpath SPS Trunk Sewer Available Capacity

	Full Flow Capacity	2041 without Line		2041 with Line Avenue Connection					
Pipe Segment ID	(L/s)	Peak Flow 2041 (L/s)	Available Capacity	Peak Flow 2041 (L/s)	Available Capacity				
	(1/3)		(L/s)		(L/s)				
19001374	608	146	462	276	332				
19001375	547	146	401	276	271				
19001376	383	147	236	277	106				
19001377	495	147	348	277	218				
19001378	446	147	299	277	169				
19001366	282	125	157	124	158				
19001367	327	126	201	125	202				
19001365	313	124	189	124	189				
19001364	370	124	246	123	247				
19001363	353	123	230	122	231				
19001379	639	147	492	277	362				
19001380	623	147	476	277	346				
19001381	540	148	392	278	262				
19001382	729	148	581	278	451				
19001383	452	148	304	278	174				
19001384	720	149	571	279	441				
19001385	747	149	598	279	468				
19001386	638	149	489	279	359				
19001387	588	149	439	279	309				
19001388	638	150	488	280	358				
19001389	816	150	666	280	536				
19001390	671	170	501	300	371				
19001391	731	170	561	300	431				
19001392	718	170	548	300	418				
19001393	731	170	561	300	431				
19001394	717	170	547	300	417				
19001395	714	170	544	300	414				
19001396	733	170	563	300	433				
19001397	844	170	674	300	544				
19001398	708	170	538	300	408				
19001399	740	170	570	300	400				
19001400	718	170	548	300	418				
19001400	718	170	548	300	418				
19001401	918	170	748	300	618				
19001402	917	170	740	300	617				
19001403	907	170	737	300	607				
19001404	401	170	230	300	100				
19001406	923	171	752	301	622				
19001400	1143	177	966	307	836				
19001407	914	177	737	307	607				
19001408	914	177	737	307	607				
19001409	914 912	177	737	307	605				
19001410									
	914	177	737	307	607				
19001412	1125	220	905 669	350	775				
19001413				350	539				
19001519	3470	220	3250	350	3120				
19001520	3544	220	3324	350	3194				





SANITARY SEWER DESIGN SHEET

Design Option - 1

Project: Welland Northwest Secondary Plan Location:

 Roughness Coefficient (n) =
 0.013

 Residential Per Capita Flow Rate =
 0.00318287

 Infiltration Rate =
 0.286

 U/s/ha

	LOCATION										NWSP POPULA	ATION AND FLOW [DATA			EX TRU	INK FLOW	TOTAL (NWSP + EX)						SEWER	DESIGN					1
DESCRIPTION	DRAINAGE AREA	MA	NHOLE	INVERT	IS LEI	NGTH	AREA	POP	CUM	ULATIVE	AVG. DAILY FLOW	PEAKING FACTOR	PEAK FLOW (NO INFIL.)	INFILT. FLOW	PEAK FLOW	ADDITIONAL	CUMULATIVE	TOTAL PEAK FLOW	PIPE SIZE	ACTUAL		DESIGN SLOPE	Act. Dia.	PIPE AREA		FULL FLOW	FULL FLOW	PERCENT	CAPACITY	ACTUAL
									AREA	POP.		(PF = 1+14/(4+P^1/2))			(W/ INFIL.)	PEAK FLOW				SLOPE	CRITICAL SLOPE					VELOCITY	CAPACITY	FULL	CHECK	VELOCITY
				U/S	D/S					Served						(FROM MODEL	.) (FROM MODEL)											1		1
STREET	D	FROM	TO	0/3		m	(ha)	(ppl)	(ha)	(ppl)	(I/s)	(dmnl)	(L/s)	(L/s)	(L/s)	(L/s)		(L/s)	(mm)	(%)	(%)	(%)	(mm)	(m ²)	(m)	(m/s)	(L/s)	(%)		(m/s)
SIREET	LD LD	TROM	10				(11d)	(PP)	(iia)	(pp)	(#3)	(dilili)	(03)	(03)	(03)	(03)		(0.8)	(mm)	(/0)	(78)	(76)	(1111)	()	(11)	(1100)	(23)	(78)		(11/3)
Rice Road (N of Quaker)	A1	NW1	NW2	182.30 1	81.02	200	6.0	532	6.0	532	1.69	3.96	6.71	1.72	8.43	0.0	0.0	8.4	200	0.64	1.54	0.64	203.2	0.032	0.051	0.84	27.4	30.8	ОК	0.65
Rice Road (N of Quaker)	A2, B1	NW2	NW3	181.02 1			10.6	868	16.6	1400	4.46	3.70	16.49	4.76	21.25	0.0	0.0	21.2	250	0.47	1.43	0.47	254.0	0.051	0.064	0.84	42.5	50.0	OK	0.74
			1																				1	1 1.00			1			
Kaywood Crt.			1	188.89 1	88.47	65	0.5	15	0.5	15	0.05	4.00	0.19	0.14	0.33	0.0	0.0	0.3	200	0.65	1.54	0.65	203.2	0.032	0.051	0.85	27.6	1.2	OK	0.20
Quaker Road (School/Daycare)							1.6	500	1.6	500	0.36	3.97	1.41	0.47	1.88	0.0	0.0	1.9			1				1					1
																					1				1					1
Montgomery (end to Summerlea)				186.53 1	86.10	179	3.0	25	3.0	25	0.08	4.00	0.32	0.86	1.18	0.0	0.0	1.2	250	0.24	1.43	0.24	254.0	0.051	0.064	0.60	30.4	3.9	OK	0.24
																														1
Topham/Crerar/Summerlea				188.66 1	86.12	420	10.9	148	10.9	148	0.47	4.00	1.88	3.12	5.00	0.0	0.0	5.0	250	0.60	1.43	0.60	254.0	0.051	0.064	0.95	48.1	10.4	OK	0.53
Montgomery (Summerlea to Quaker)			EXMH	186.08 1	85.03 4	423	5.7	78	19.6	250	0.80	4.00	3.18	5.61	8.79	0.0	0.0	8.8	250	0.25	1.43	0.25	254.0	0.051	0.064	0.61	31.0	28.3	OK	0.46
														L														ļ		ļ
Quaker Road (Line to Kaywood)			1	188.89 1		53	0.7	13	0.7	13	0.04	4.00	0.16	0.20	0.36	0.0	0.0	0.4	200	0.89	1.54	0.89	203.2	0.032	0.051	1.00	32.3	1.1	OK	0.21
Quaker Road (Kaywood to Montgomery)			EXMH	188.41 1	84.55	270	3.4	38	4.6	565	2.15	3.95	8.50	1.32	9.82	0.0	0.0	9.8	250	1.43	1.43	1.43	254.0	0.051	0.064	1.46	74.2	13.2	OK	0.88
												ļ																+		+
Quaker Road (W of Rice)	12	EXMH	053MH001	184.52 1	83.93	104	3.4	330	27.6	1145	4.00	3.76	15.05	7.90	22.95	0.0	0.0	22.9	300	0.57	1.34	0.57	304.8	0.073	0.076	1.04	76.2	30.1	OK	0.80
																														+
NWSP (W of Rice, S of Quaker)	H1, I1	NW4	NW5	186.40 1		210	13.8	938	13.8	938	2.99	3.82	11.40	3.94	15.34	0.0	0.0	15.3	200	0.48	1.54	0.48	203.2	0.032	0.051	0.73	23.7	64.7	OK	0.69
NWSP (W of Rice, S of Quaker)	J1	NW5	053MH001	185.40 1	83.90	389	7.0	454	20.8	1392	4.43	3.70	16.41	5.96	22.36	0.0	0.0	22.4	250	0.39	1.43	0.39	254.0	0.051	0.064	0.76	38.7	57.7	OK	0.70
Quaker Road (W of Rice)		053MH001	053MH009 / 406497MH01	183.88 1	04.04	205	0.5	33	54.0	0570	0.54	0.50	29.87	14.86	44.72	0.0	0.0	44.7	200	0.58	1.34	0.58	201.0	0.073	0.076	4.05	76.8			0.07
Quaker Road (W of Rice)		053MH001	053MH009 / 406497MH01	183.88 1	81.64	385	3.5	33	51.9	2570	8.54	3.50	29.87	14.86	44.72	0.0	0.0	44./	300	0.58	1.34	0.58	304.8	0.073	0.076	1.05	/6.8	58.2	OK	0.97
Rice Road (S of Quaker)	K1	NW6	NW3	184.50 1	90.10	207	5.7	1229	57	1229	3.91	3.74	14.63	1.64	16.27	0.0	0.0	16.3	200	1.14	1.54	1.14	203.2	0.032	0.051	1.13	36.5	44.5	OK	0.96
Rice Road (S of Quaker)	KI	INVIO	11113	164.50 1	00.10	307	5.7	1229	5.7	1229	3.91	3.74	14.03	1.04	10.27	0.0	0.0	10.3	200	1.14	1.34	1.14	203.2	0.032	0.031	1.13	30.5	44.5	UK	0.90
Quaker Road (Rice to W of First)		NW3	NW7	180.10 1	79 24	287			22.4	2629	8.37	3.49	29.21	6.40	35.60	0.0	0.0	35.6	300	0.30	1.34	0.30	304.8	0.073	0.076	0.76	55.3	64.4	OK	0.71
Quaker Road (Rice to W of First)	C1, L1	NW7	NW8	179.24 1		261	16.6	1842	39.0	4471	14.23	3.29	46.81	11.15	57.96	0.0	0.0	58.0	375	0.20	1.25	0.20	381.0	0.114	0.095	0.72	81.8	70.9	OK	0.69
Quaker Road (Rice to W of First)	M1	NW8	416457MH01 (RMH1)	178.72 1		69	7.1	661	46.0	5132	16.33	3.23	52.83	13.17	66.00	0.0	0.0	66.0	450	0.20	1.17	0.20	457.2	0.164	0.114	0.81	133.0	49.6	OK	0.71
			1						1											1				1		1	1			
Flows from Hurricane SPS/Rice Road (North)	-	-	053MH009 / 406497MH01	-	-	-	-	-	-	-	-	-	-	-	-	97.7	97.7	97.7	-	· ·	-		-	-	-	-	-	-	-	
																												1		
Flows from West of Quaker and Rice (from Line Ave)	-	-	053MH009 / 406497MH01	-	-	-	•	-	-	-	-	-	-	-	-	79.1	79.1	79.1	-	-	-		-	-	-	-	-	-	-	-
																														1
Quaker Road (Region Trunk E of Rice)	-	053MH009 / 406497MH01	416457MH01 (RMH1)	179.94 1	78.58	618	-	-	51.9	2570	8.54	3.50	29.87	14.86	44.72	0.0	176.8	221.5	750	0.22	0.99	0.22	762.0	0.456	0.191	1.19	544.8	40.7	OK	1.00
																											<u></u>			
Quaker Road (W of First to First)	-	416457MH01 (RMH1)	416487MH01 (RMH2)	178.58 1	78.25	207	-	-	98.0	7702	24.87	3.07	76.26	28.02	104.29	0.0	176.8	281.1	750	0.16	0.99	0.16	762.0	0.456	0.191	1.02	464.6	60.5	OK	0.95
																														ł
First Ave (N of Quaker)	C2, D1, F2	NW9	NW10	179.40 1		393	26.1	3223	26.1	3223	10.26	3.42	35.04	7.47	42.51	0.0	0.0	42.5	375	0.25	1.25	0.25	381.0	0.114	0.095	0.80	91.5	46.5	OK	0.69
First Ave (N of Quaker)	E1	NW10	416487MH01 (RMH2)	178.41 1	78.25	80	4.8	1123	30.9	4346	13.83	3.30	45.66	8.83	54.49	0.0	0.0	54.5	375	0.20	1.25	0.20	381.0	0.114	0.095	0.72	81.8	66.6	OK	0.68
Quaker Road (First to W of Niagara)	-	416487MH01 (RMH2)	426427MH01 (RMH3)	178.25 1	//.0/	521	•		128.9	12048	38.70	2.87	111.23	36.86	148.09	3.0	179.8	327.9	750	0.23	0.99	0.23	762.0	0.456	0.191	1.22	557.0	58.9	OK	1.13
NWSP (N of Quaker, E of First)	F1, G1	NW11	426427MH01 (RMH3)	177.29 1	77.07	50	40.0	000	10.9	980	3.12	3.81	11.87	3.13	15.00	0.0	0.0	15.0	200	0.44	1.54	0.44	203.2	0.000	0.051	0.70	22.7	66.1	01/	0.67
INVISE (IN OF QUARET, E OF FIRST)	F1, G1	11/1/11	42042/WH01 (RMH3)	1//.29 1	11.07	50	10.9	980	10.9	980	3.12	3.81	11.8/	3.13	15.00	0.0	0.0	15.0	200	0.44	1.54	0.44	203.2	0.032	0.051	0.70	22.1	00.1	OK	0.67
Quaker Road (W of Niagara to Towpath)		426427MH01 (RMH3)	436437MH03	177.07 1	71 78 1	1320			139.8	13028	41.82	2.84	118.77	39.99	158.76	28.8	208.6	367.4	750	0.40	0.99	0.40	762.0	0.456	0.191	1.61	734.5	50.0	ОК	1.42
Towpath (to SPS)	-	436540MH01	446525MH01	171.05 1					139.8	13028	41.82	2.84	118.77	39.99	158.76	98.1	306.7	465.5	900	0.40	0.93	0.40	914.4	0.450	0.191	1.01	755.4	61.6	OK	1.42
	-	400040101101	11002000101	111.00	00.70				100.0	13020	41.02	2.04	110.77	33.33	130.70	30.1	500.7	700.0	300	0.10	0.35	0.10	1 314.4	1 0.007	0.223	1.15	133.4	01.0	<u>U</u>	1.07
		1	1		3						1		1			1				1	1	1	1	1	1	1	1			

Notes: 1. Residential design flows as per UCC 2. Slopes approximate; calculated based on length 3. Infiltration rate is 0.286 as per Region Master Plan Update 2021 4. Peak Factors for NWSP Flows as per Harmon's Formula 5. Population for NWSP as per UCC 6. All other peak flows as per All Pipe Model 7. Assume population density for existing residential single family home is 2.5p/household 8. School and daycare flows as per Building Code Table 8.2.1.3.B

	N
Æ	Associated Engineering

SANITARY SEWER DESIGN SHEET Design Option - 2

Project: Welland Northwest Secondary Plan Location:

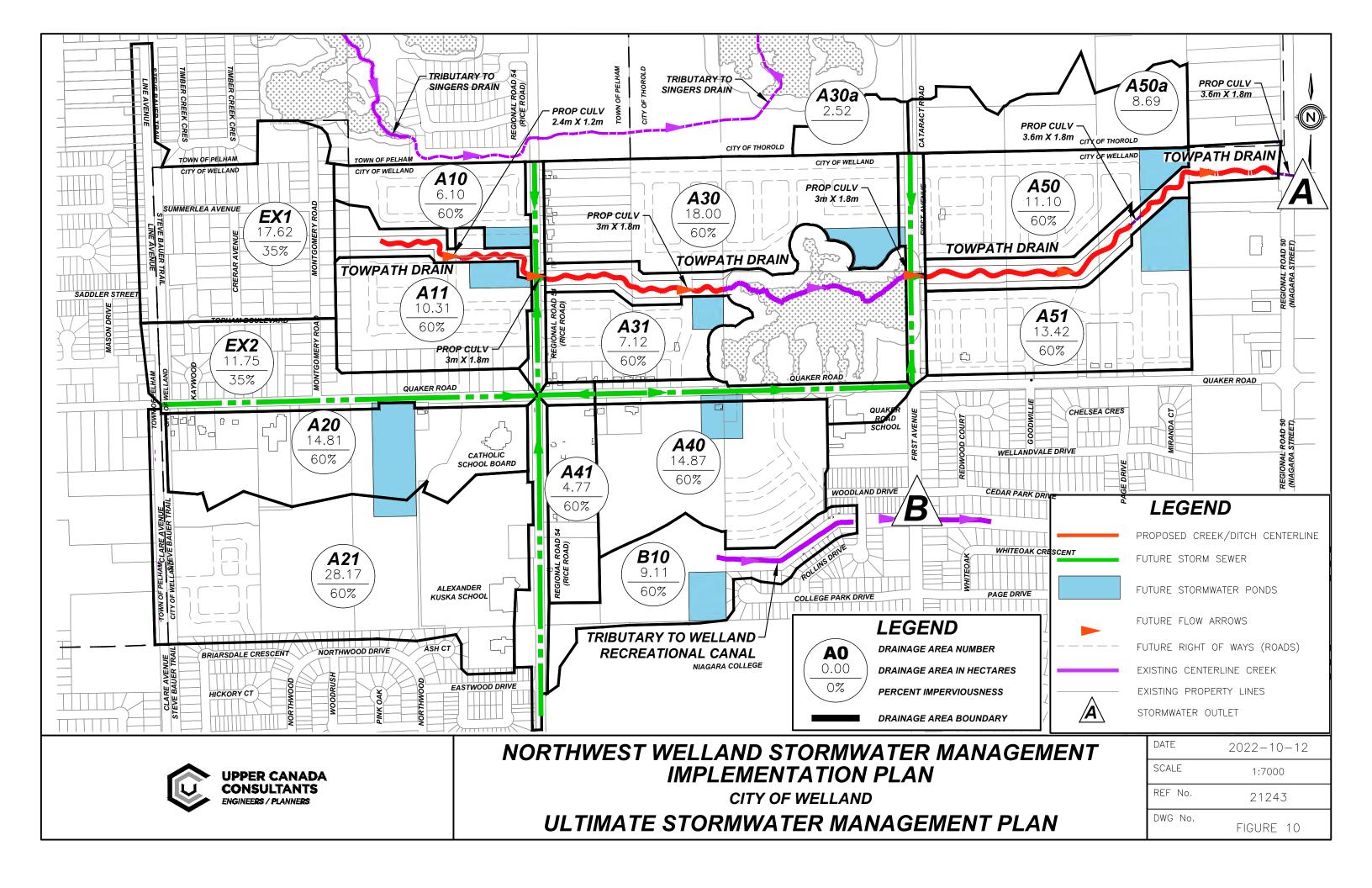
Roughness Coefficient (n) = 0.013 Residential Per Capita Flow Rate = 0.00318287 L/cap/s (275 L/cap/day) Infiltration Rate 0.286 L/s/ha

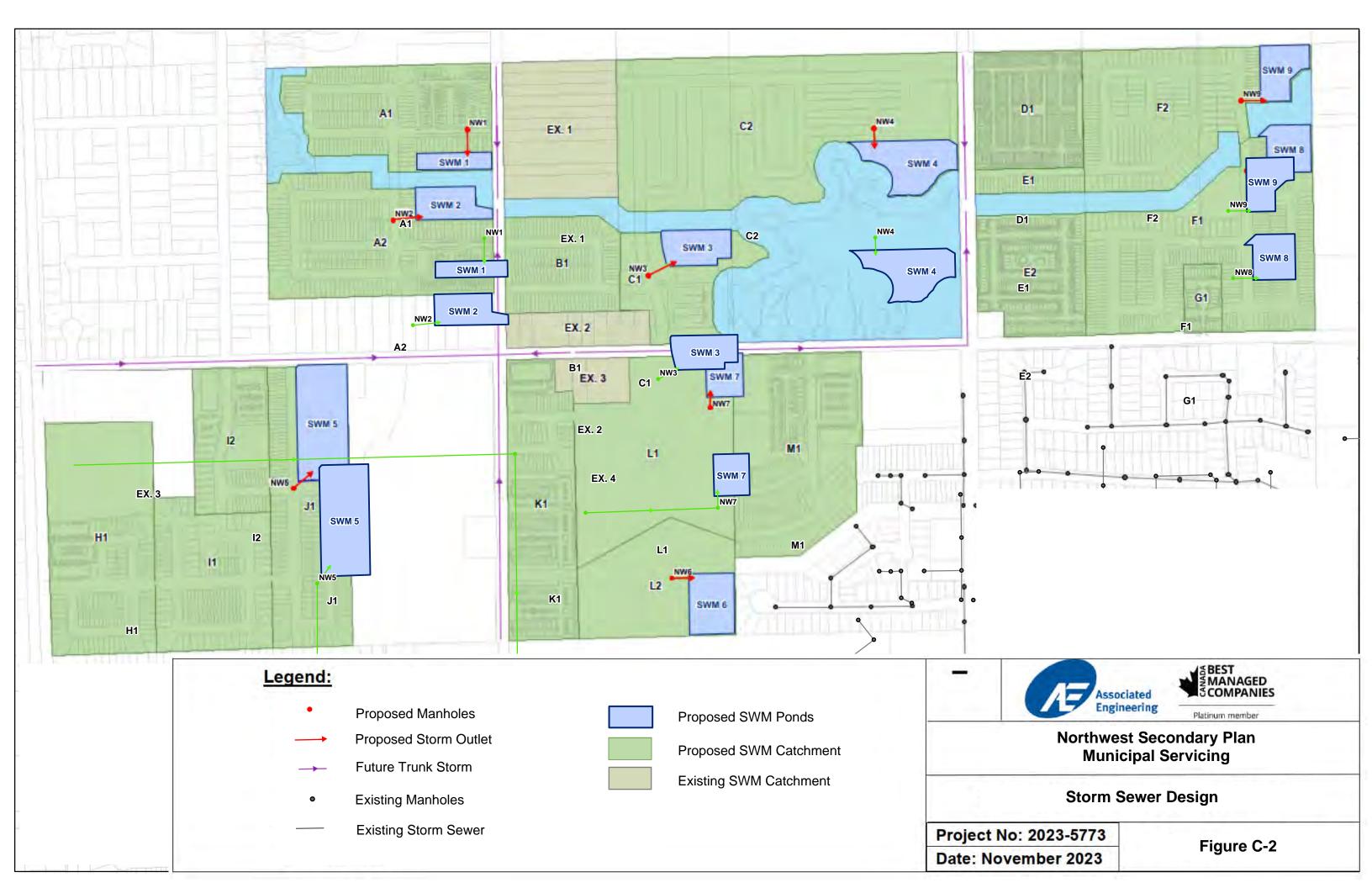
	LOCATION										NWSP POPULA	TION AND FLOW	ATA			EX TRU	INK FLOW	TOTAL (NWSP + EX)	1					SEWER	DESIGN					
DESCRIPTION	DRAINAGE AREA	A MA	NHOLE	INV	ERTS	LENGTH	AREA	POP	CUM	1ULATIVE	AVG. DAILY FLOW	PEAKING FACTOR	PEAK FLOW (NO INFIL.)	INFILT. FLOW	PEAK FLOW	ADDITIONAL	CUMULATIVE	TOTAL PEAK FLOW	PIPE SIZE	ACTUAL		DESIGN SLOPE	Act. Dia.	PIPE AREA				PERCENT	CAPACITY	ACTUAL
		1				LENGTH			AREA	POP.		(PF = 1+14/(4+PM/2))			(W/ INFIL.)	PEAK FLOW	PEAK FLOW			SLOPE	CRITICAL SLOPE					VELOCITY	CAPACITY	FULL	CHECK	VELOCITY
					-					Served						(FROM MODEL	.) (FROM MODEL))									1	1		
				U/S	D/S																						-			-
STREET	ID	FROM	TO			m	(ha)	(ppl)	(ha)	(ppl)	(l/s)	(dmnl)	(L/s)	(L/s)	(L/s)	(L/s)		(L/s)	(mm)	(%)	(%)	(%)	(mm)	(m ²)	(m)	(m/s)	(L/s)	(%)		(m/s)
B			1940	400.00	404.00						4.00	0.00	0.74	4 70	0.40										0.054					
Rice Road (N of Quaker) Rice Road (N of Quaker)	A1 A2, B1	NW1 NW2	NW2 NW3		181.02		6.0	532	6.0	532 1400	1.69 4.46	3.96	6.71 16.49	1.72	8.43 21.24	0.0	0.0	8.4 21.2	200 250	0.64	1.54	0.64	203.2	0.032	0.051	0.84	27.4	30.8	OK	0.65
Rice Road (N of Quaker)	A2, D1	INVV2	INVVO	101.02	100.10	197	10.6	000	10.0	1400	4.40	3.70	10.49	4.70	21.24	0.0	0.0	21.2	250	0.47	1.43	0.47	254.0	0.051	0.064	0.64	42.5	50.0	ОК	0.74
Kaywood Crt.				400.00	188.47	05	0.5	15	0.5	15	0.05	4.00	0.19	0.14	0.33	0.0	0.0	0.3	200	0.65	1.54	0.65	203.2	0.032	0.051	0.85	27.6	1.2	ОК	0.20
Kaywood Cit.				100.09	100.47	05	0.5	15	0.5	15	0.05	4.00	0.19	0.14	0.33	0.0	0.0	0.5	200	0.05	1.34	0.05	203.2	0.032	0.051	0.65	27.0	1.2	UK	0.20
Quaker Road (School/Davcare)				-	+		1.6	500	1.6	500	0.36	3.97	1.41	0.47	1.88	0.0	0.0	1.9					+	+		+	+			
ddaker Hoad (Ochool/Daycare)				-			1.0		1.0	300	0.50	5.51	1.41	0.47	1.00	0.0	0.0	1.9					1			1	+			
Montgomery (end to Summerlea)				186 53	186.10	179	3.0	25	3.0	25	0.08	4.00	0.32	0.86	1.18	0.0	0.0	1.2	250	0.24	1.43	0.24	254.0	0.051	0.064	0.60	30.4	3.9	ОК	0.24
intering and to commonour		1		100.00	100.10	1	0.0		0.0		0.00	1.00	0.02	0.00		0.0	0.0	1		0.24		1	1 201.0	1 0.001	0.007	1				
Topham/Crerar/Summerlea				188.66	186.12	420	10.9	148	10.9	148	0.47	4.00	1.88	3.12	5.00	0.0	0.0	5.0	250	0.60	1.43	0.60	254.0	0.051	0.064	0.95	48.1	10.4	ОК	0.53
Montgomery (Summerlea to Quaker)			EXMH		185.03		5.7	78	19.6	250	0.80	4.00	3.18	5.61	8.79	0.0	0.0	8.8	250	0.25	1.43	0.25	254.0	0.051	0.064	0.61	31.0	28.3	OK	0.46
						1											-					1	1				1			
Quaker Road (Line to Kaywood)				188.89	188.42	53	0.7	13	0.7	13	0.04	4.00	0.16	0.20	0.36	0.0	0.0	0.4	200	0.89	1.54	0.89	203.2	0.032	0.051	1.00	32.3	1.1	OK	0.21
Quaker Road (Kaywood to Montgomery)			EXMH	188.41	184.55	270	3.4	38	4.6	565	2.15	3.95	8.50	1.32	9.82	0.0	0.0	9.8	250	1.43	1.43	1.43	254.0	0.051	0.064	1.46	74.2	13.2	OK	0.88
Quaker Road (W of Rice)	12	EXMH	053MH001	184.52	183.93	104	3.4	330	27.6	1145	4.00	3.76	15.05	7.90	22.95	0.0	0.0	22.9	300	0.57	1.34	0.57	304.8	0.073	0.076	1.04	76.2	30.1	OK	0.80
						1																1	1	1	1	1		1		
NWSP (W of Rice, S of Quaker)	H1, I1	NW4	NW5		185.40		13.8	938	13.8	938	2.99	3.82	11.40	3.95	15.35	0.0	0.0	15.3	200	0.48	1.54	0.48	203.2	0.032	0.051	0.73	23.7	64.7	OK	0.69
NWSP (W of Rice, S of Quaker)	J1	NW5	053MH001	185.40	183.90	389	7.0	454	20.8	1392	4.43	3.70	16.41	5.96	22.37	0.0	0.0	22.4	250	0.39	1.43	0.39	254.0	0.051	0.064	0.76	38.7	57.7	OK	0.70
						<u></u>																					·'	Į		
Quaker Road (W of Rice)	-	053MH001	053MH009 / 406497MH01	183.88	181.64	385	3.5	33	52.0	2571	8.54	3.50	29.87	14.86	44.73	0.0	0.0	44.7	300	0.58	1.34	0.58	304.8	0.073	0.076	1.05	76.8	58.2	ОК	0.97
Bis Bask(O.(O. star)	К1	hilling		10150	100.10	007				4000		0.74	11.00		40.07			40.0							0.054	1.10			011	
Rice Road (S of Quaker)	<u>K1</u>	NW6	NW3	184.50	180.10	387	5.7	1229	5.7	1229	3.91	3.74	14.63	1.64	16.27	0.0	0.0	16.3	200	1.14	1.54	1.14	203.2	0.032	0.051	1.13	36.5	44.5	ОК	0.96
Overlage Based (Biege to W of First)		NW3	NW7	400.40	470.04	207			22.4	2629	8.37	3.49	29.21	6.39	35.60	0.0	0.0	35.6	300	0.30	1.34	0.30	304.8	0.073	0.076	0.76	55.3	64.4	ОК	0.71
Quaker Road (Rice to W of First) Quaker Road (Rice to W of First)	C1, C2, L1	NW7	NW8		179.24		31.2	3640	53.5	6269	19.95	3.49	62.90	15.31	78.21	0.0	0.0	78.2	450	0.30	1.17	0.30	457.2	0.164	0.078	0.70	133.0	58.8	OK	0.75
Quaker Road (Rice to W of First)	M1	NW8	416457MH01 (RMH1)		178.58		7.1	661	60.6	6930	22.06	3.13	68.61	17.32	85.94	0.0	0.0	85.9	450	0.20	1.17	0.20	457.2	0.164	0.114	0.81	133.0	64.6	OK	0.75
				110.72	110.00	}			00.0	0000	222.00	0.11	00.01	11.02	00.01	0.0	0.0			0.20	1	0.20	1 107.2	1 0.101		1 0.01		0.0		
Flows from Hurricane SPS/Rice Road (North)	-		053MH009 / 406497MH01		÷			· .			· .	-			-	97.7	97.7	97.7	-		-		-				-			
																01.1	01.1	0					1	1		1	-		1	
Flows from West of Quaker and Rice (from Line Ave)	-	-	053MH009 / 406497MH01	-	-	-	-	-	-	-	-	-		-	-	79.1	79.1	79.1	-	-	-	1	-	-	-	-	-	-	-	
					1	1		1														1	1	1	1	1	1			
Quaker Road (Region Trunk E of Rice)	-	053MH009 / 406497MH01	416457MH01 (RMH1)	179.94	178.58	618	-	-	52.0	2571	8.54	3.50	29.87	14.86	44.73	0.0	176.8	221.5	750	0.22	0.99	0.22	762.0	0.456	0.191	1.19	544.8	40.7	OK	1.00
																						1					,	1		
Quaker Road (W of First to W of Niagara)	-	416457MH01 (RMH1)	426427MH01 (RMH3)	178.58	177.07	728		-	112.5	9500	30.59	2.98	91.07	32.18	123.26	3.0	179.8	303.1	750	0.21	0.99	0.21	762.0	0.456	0.191	1.17	532.2	56.9	OK	1.07
																											'	1		
NWSP (N of Quaker, E of First)	D1, E1	NW9	NW10		178.32		4.9	1089	4.9	1089	3.47	3.78	13.09	1.40	14.49	0.0	0.0	14.5	200	0.41	1.54	0.41	203.2	0.032	0.051	0.68	21.9	66.1	OK	0.64
NWSP (N of Quaker, E of First)	F2	NW10	NW11		177.40		7.4	417	12.3	1506	4.79	3.68	17.64	3.53	21.17	0.0	0.0	21.2	250	0.30	1.43	0.30	254.0	0.051	0.064	0.67	34.0	62.3	ОК	0.63
NWSP (N of Quaker, E of First)	E2, F1	NW11	NW12		177.17		14.2	1753	26.5	3259	10.37	3.41	35.39	7.58	42.97	0.0	0.0	43.0	375	0.20	1.25	0.20	381.0	0.114	0.095	0.72	81.8	52.5	ОК	0.64
NWSP (N of Quaker, E of First)	G1	NW12	426427MH01 (RMH3)	177.17	177.07	50	0.8	269	27.3	3528	11.23	3.38	37.97	7.81	45.78	0.0	0.0	45.8	375	0.20	1.25	0.20	381.0	0.114	0.095	0.72	81.8	56.0	OK	0.65
		100 107 M 101 (D	100107141105	477.67	171 77	1000			100.0	10000	11.00	0.01	440.77		450.75			0.07.4	750					-		-	+			
Quaker Road (W of Niagara to Towpath)		426427MH01 (RMH3)	436437MH03		171.78				139.8	13029	41.82	2.84	118.77	39.99	158.77	28.8	208.6	367.4	750	0.40	0.99	0.40	762.0	0.456		1.61	734.5	50.0	OK	1.42
Towpath (to SPS)	-	436540MH01	446525MH01	171.05	169.40	1002	•		139.8	13029	41.82	2.84	118.77	39.99	158.77	98.1	306.7	465.5	900	0.16	0.93	0.16	914.4	0.657	0.229	1.15	755.4	61.6	ОК	1.07
																					+		+	+		+	+	1		
		1	1			5			1		1				1	1	1				1	1	1	1	1	1	/	L	1	

Notes: 1. Residential design flows as per UCC 2. Slopes approximate; calculated based on length 3. Infiltration rate is 0.286 as per Region Master Plan Update 2021 4. Peak Factors for NWSP Flows as per Harmon's Formula 5. Population for NWSP fas per UCC 6. All other peak flows as per All Pipe Model 7. Assume population density for existing residential single family home is 2.5p/household 8. School and daycare flows as per Building Code Table 8.2.1.3.B



APPENDIX C - STORM





						S	TORM	SEWER	DESIGN	N SHEE	ĒT				Æ	Associate Engineeri		PERSPECTIVE. DCUS.
Q=2.78AiR	Storm Event =	5.00	Years															
A = Area (ha)	а	b	с				N		Seconda									
R = Runoff Coefficient	830	0.777	7.3					Municip	oal Servic	ing							JOB No.:	2023-5773
T _c = Time of Concentration	n =	0.013																
i = Avg Rainfall Intensity (mm	n/hr) = a / (T _c +c) ^b																	
DE	VELOPMENT DAT	ΓA				DES	IGN DATA							PIPE DATA	١			
AREA	FROM	TO	AREA	RUNOFF	A * R	ACCUM	TIME OF	INTENSITY	PEAK	PIPE	SLOPE	CRITICAL	DESIGN	LENGTH	FLOW	VEL	TRAVEL	%
NO			(ha)	COEFF.		A * R	CONC.	i	FLOW	DIA		SLOPE	SLOPE		FULL	FULL	TIME	FULL
				R			(min)	(mm/hr)	(l/s)	(mm)	(%)	(%)	(%)	(m)	(l/s)	(m/s)	(min)	
Pond 1																		
A1	NW1	SWM 1	5.70	0.53	3.006	3.006	12.00	83.21	695.399	900	0.20	0.93	0.20	40	809.60	1.27	0.52	85.89
Pond 2	AUA/O	014/140	7.00	0.50	0.775	0.775	10.00	00.04	070.007	000	0.00	0.00	0.00	40	004 55	4.50	0.40	00.07
A2	NW2	SWM2	7.33	0.52	3.775	3.775	12.00	83.21	873.297	900	0.30	0.93	0.30	40	991.55	1.56	0.43	88.07
Pond 3	_																	
B1, Ex.2, C1	NW3	SWM3	8.50	0.49	4,193	4.193	12.00	83.21	969.880	1050	0.30	0.89	0.30	40	1495.68	1.73	0.39	64.85
51, 242, 01		0	0.00	0.10			12.00	00.21		1000	0.00	0.00	0.00				0.00	0 1100
Pond 4																		
Ex. 1, C2	NW4	SWM4	18.00	0.50	9.034	9.034	15.00	74.38	1867.971	1200	0.30	0.85	0.30	40	2135.42	1.89	0.35	87.48
Pond 5																		
H1, I1, I2, J1	NW5	SWM5	21.77	0.51	11.131	11.131	15.00	74.38	2301.570	1350	0.30	0.81	0.30	40	2923.42	2.04	0.33	78.73
Pond 6																		
L2	NW6	SWM6	3.88	0.50	1.940	1.940	12.00	83.21	448.794	750	0.30	0.99	0.30	40	609.77	1.38	0.48	73.60
																	L/	
Pond 7	5 N A / -	014147		0.50	10.011	10.011	15.00	74.00		4050	0.00							05.47
K1, Ex.3, L1, M1	NW7	SWM7	22.90	0.53	12.041	12.041	15.00	74.38	2489.732	1350	0.30	0.81	0.30	40	2923.42	2.04	0.33	85.17
Pond 8	_																	
E2, F1, G1	NW8	SWM8	14.31	0.53	7.634	7.634	15.00	74.38	1578.491	1200	0.30	0.85	0.30	116	2135.42	1.89	1.02	73.92
		0		0.00		1.007				.200	0.00	0.00	0.00					. 0.02
Pond 9																		
D1, E1, F2	NW9	SWM9	13.14	0.53	6.975	6.975	15.00	74.38	1442.229	1200	0.30	0.85	0.30	116	2135.42	1.89	1.02	67.54

STORM SEWER DESIGN SHEET

APPENDIX D - COST ESTIMATE DETAIL

Northwest Welland Secondary Plan Municipal Servicing

Preliminary Cost Estimate

Watermain				
Item	Quantity	Unit	Unit Price	Cost
150mm PVC DR18 Watermain	8420	m	\$455	\$3,831,100
150mm Gate Valve & Box	92	each	\$3,250	\$299,000
200 mm PVC DR18 Watermain	1645	m	\$520	\$855,400
200mm Gate Valve & Box	20	each	\$4,225	\$84,500
250 mm PVC DR18 Watermain	2480	m	\$620	\$1,537,600
250mm Gate Valve & Box	24	each	\$5,200	\$124,800
300mm PVC DR18 Watermain	1985	m	\$845	\$1,677,325
300mm Gate Valve & Box	22	each	\$7,150	\$157,300
Water Services	4350	each	\$2,600	\$11,310,000
Hydrants	97	each	\$9,750	\$945,750
Connect to Existing	13	each	\$6,500	\$84,500
Granular A	87500	t	\$35	\$3,062,500
Other General Construction	1	LS	\$2,397,000	\$2,397,000
Subtotal				\$26,366,775
Contingency (15% of subtotal)				\$3,955,100
Engineering (10% of subtotal)				\$2,636,700
Total				\$32,958,575
Rounded Total				\$33,000,000

Sanitary Sewer				
Item	Quantity	Unit	Unit Price	Cost
200mm PVC DR35	13,620	m	\$490	\$6,673,800
250mm PVC DR35	586	m	\$585	\$342,810
375mm PVC DR35	734	m	\$975	\$715,650
450mm PVC DR35	69	m	\$1,175	\$81,075
Maintenance Hole Structure	134	each	\$13,000	\$1,742,000
Sanitary Laterals	4,350	each	\$3,900	\$16,965,000
Connect to Existing Trunk	3	each	\$6,500	\$19,500
Granular A	176,700	t	\$35	\$6,184,500
Flush & CCTV (end of construction)	15,009	m	\$20	\$300,180
Flush & CCTV (end of maintenance)	15,009	m	\$20	\$300,180
Other General Construction	1	LS	\$3,332,500	\$3,332,500
Subtotal				\$36,657,195
Contingency (15% of subtotal)				\$5,498,600
Engineering (10% of subtotal)				\$3,665,800
Total				\$45,821,595
Rounded Total				\$45,900,000

Northwest Welland Secondary Plan Municipal Servicing

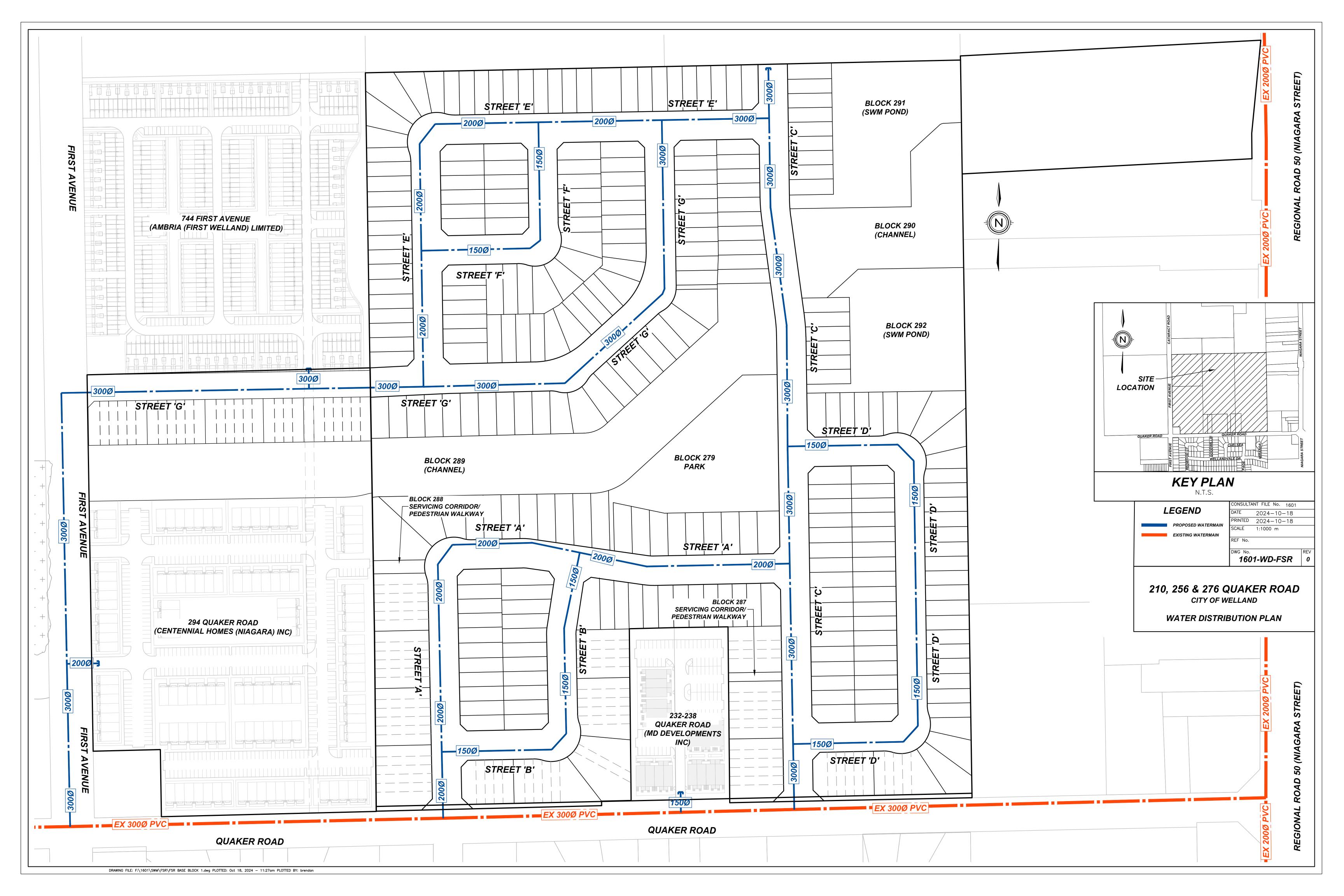
Preliminary Cost Estimate

Storm Sewer						
450mm PVC DR35 Ultra Rib	2204	m	\$455	\$1,002,820		
525mm PVC DR35 Ultra Rib	2515	m	\$520	\$1,307,800		
600mm CONC	2661	m	\$585	\$1,556,685		
675mm CONC	81	m	\$815	\$66,015		
750mm CONC	902	m	\$1,025	\$924,550		
825mm CONC	554	m	\$1,175	\$650,950		
900mm CONC	1015	m	\$1,380	\$1,400,700		
1050mm CONC	941	m	\$1,775	\$1,670,275		
1200mm CONC	332	m	\$2,190	\$727,080		
1350mm CONC	80	m	\$2,795	\$223,600		
1200mm Diameter MH	68	each	\$13,000	\$884,000		
1500mm Diameter CBMH	13	each	\$18,200	\$236,600		
1800mm Diameter CBMH	18	each	\$20,800	\$374,400		
2400mm Diameter CBMH	2	each	\$24,700	\$49,400		
Catchbasin	380	each	\$4,175	\$1,586,500		
Catchbasin leads	1900	m	\$490	\$931,000		
Granular A	95800	t	\$35	\$3,353,000		
Flush & CCTV (end of construction)	11285	m	\$20	\$225,700		
Flush & CCTV (end of maintenance)	11285	m	\$20	\$225,700		
Other General Construction	1	LS	\$1,739,700	\$1,739,700		
Subtotal	\$19,136,475					
Contingency (15% of subtotal)	\$2,870,500					
Engineering (10% of subtotal)	\$1,913,700					
Total	\$23,920,675					
Rounded Total	\$24,000,000					



APPENDIX B

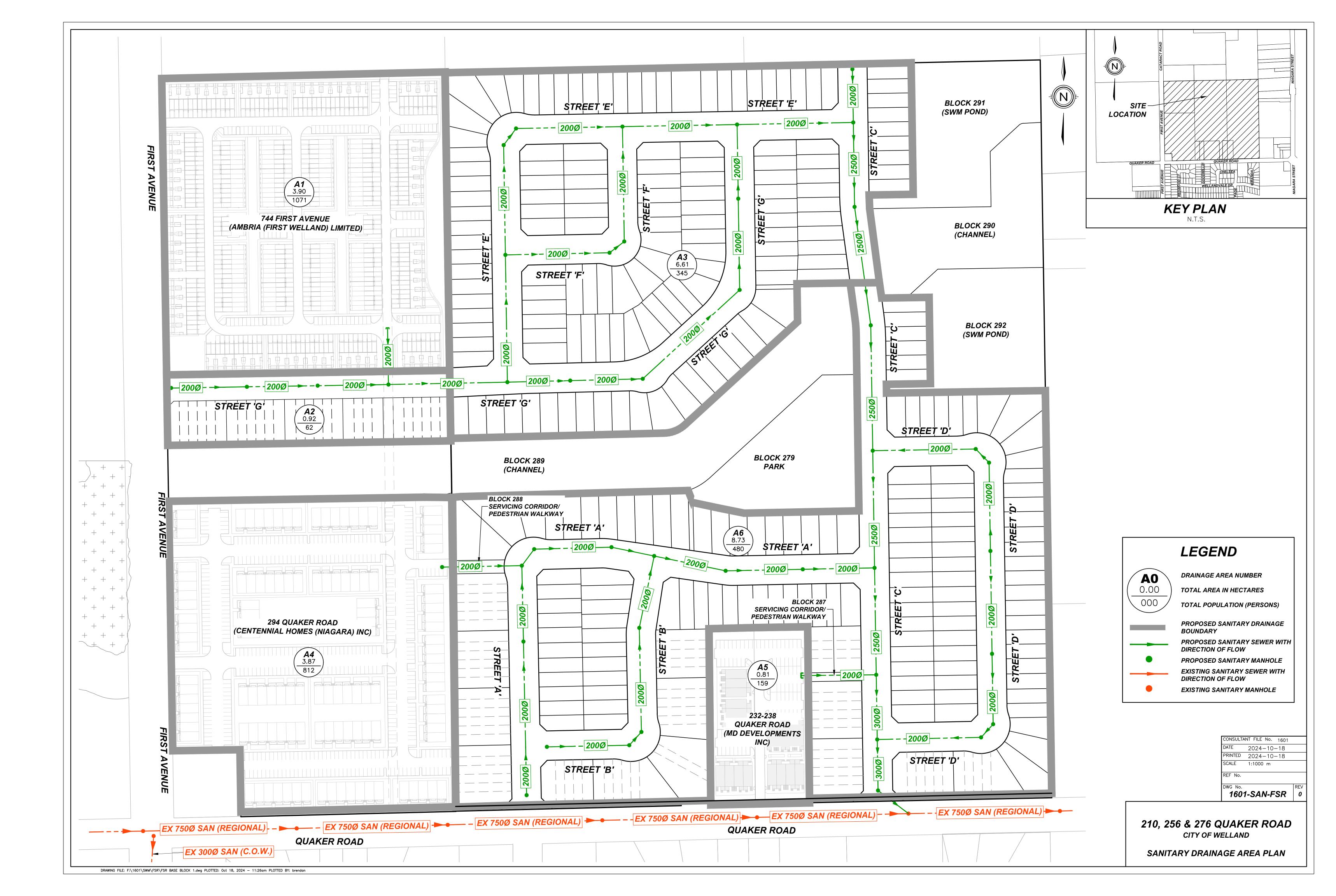
Water Distribution Plan (DWG#: 1601-WD-FSR)





APPENDIX C

Sanitary Drainage Area Plan (DWG#: 1601-SAN-FSR) Sanitary Sewer Calculation Sheet

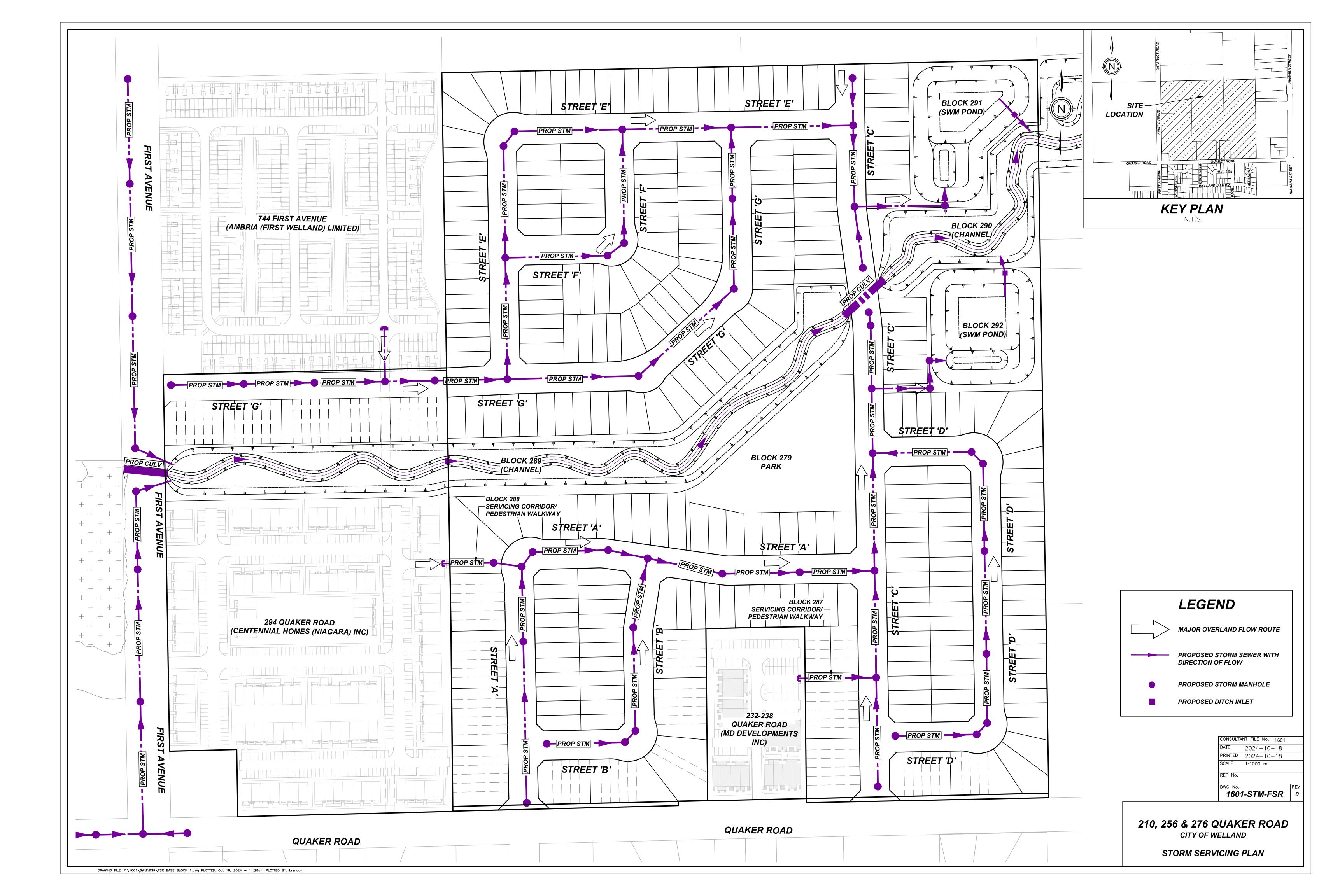


UPPER CANADA CONSULTANT	ГS													
30 HANNOVER DRIVE, UNIT 3														
ST.CATHARINES, ON, L2W 1A3														
DESIGN FLOWS							SEWER DESIGN							
RESIDENTIAL:	255 LITRES/PERSON/DAY (AVERAGE DAILY FLOW)				LOW)	x								
INFILTRATION RATE:	0.286 LITRES/HECTARE					PIPE SIZES: 1.016 IMPERIAL EQUIVALENT FACTOR								
POPULATION DENSITY:	2.5	PERSONS / U	NIT (SINGLE FA	AMILY DWELLI	NG	PERCENT FULL: TOTAL PEAK FLOW / CAPACIT					ГY			
	2.2	PERSONS / U	NIT (TOWNHO	USE DWELLING	(1									
MUNICIPALITY:	CITY OF W	VELLAND												
PROJECT :	210, 256 &	276 QUAKER	ROAD	SANI	TARY SE	WERD	ESIGNSHE	ЕЕТ						
PROJECT NO:	1601													
LOCATION	AREA					ACCUMULATED PEAK FLOW			DESIGN FLOW					
				Total	Peaking		Infiltration	Total	Pipe	Pipe	Full Flow	Full Flow		
Description	Increment	Accumulated	Population	Population	Factor	Flow	Flow	Peak Flow	Diameter	Slope	Velocity	Capacity	Percer	
	(hectares)	(hectares)	Increment	Served (P)	(PF)	(L/s)	L/s	(L/s)	(mm)	(%)	(m/s)	(L/s)	Full	
			Area A1 Popula	ation per 744 Firs	st Avenue Fu	nctional S	ervicing Report	(1,071 persons)						
A1 - 744 First Avenue	3.90	3.90	1071	1071	3.78	11.95	1.12	13.07	200	0.40	0.7	21.64	60.4%	
A2 - 294 Quaker Road	0.92	0.92	62	62	4.29	0.79	0.26	1.05	200	0.40	0.7	21.64	4.8%	
A3 - 210, 256 & 276 Quaker Road	6.61	11.43	345	1478	3.68	16.07	3.27	19.34	250	0.28	0.6	32.83	58.9%	
A4 - 294 Quaker Road	3.87	3.87	812	812	3.86	9.24	1.11	10.35	200	0.40	0.7	21.64	47.89	
A5 - 232 - 238 Quaker Road	0.81	0.81	159	159	4.18	1.96	0.23	2.19	200	0.40	0.7	21.64	10.19	
A6 - 210, 256 & 276 Quaker Road	8.73	24.84	480	2929	3.45	29.83	7.10	36.94	300	0.22	0.6	47.32	78.1	
Quaker Road (Ex. 750mm dia.)		24.84	··	2929	3.45	29.83	7.10	36.94	750	0.23	1.2	556.99	6.69	



APPENDIX D

Storm Servicing Plan (DWG#: 1601-STM-FSR)





APPENDIX E

210, 256 & 276 Quaker Road Stormwater Management Plan (UCC, October 2024)

STORMWATER MANAGEMENT PLAN

210, 256 & 276 QUAKER ROAD

CITY OF WELLAND

Prepared For:

Ashton Homes (Western) Limited 17 Rancine Road Etobicoke, ON M9W 2Z4

Prepared by:

Upper Canada Consultants 3-30 Hannover Drive St. Catharines, Ontario L2W 1A3

October 2024

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- Appendix A Existing Conditions MIDUSS Output File
- Appendix B Stormwater Management Facility Calculations (P30)
- Appendix C Stormwater Management Facility Calculations (P31)
- Appendix D Future Conditions MIDUSS Output File

REFERENCES

- 1. Stormwater Management Planning and Design Manual Ontario Ministry of Environment (March 2003)
- 2. Soils of the Regional Municipality of Niagara Soil Survey Report No. 60 of the Ontario Institute of Pedology. (1989)
- 3. Northwest Welland Stormwater Management Implementation Plan Upper Canada Consultants (October 2022)

STORMWATER MANAGEMENT PLAN

210, 256 & 276 Quaker Road

CITY OF WELLAND

1.0 INTRODUCTION

1.1 Study Area

Upper Canada Consultants (UCC) has been retained by landowner of the 210, 256, & 276 Quaker Road properties to prepare a stormwater management plan to address the stormwater management needs for the proposed subdivision development located within the aforementioned properties.

The proposed subdivision is located in the north-eastern portion of the Northwest Welland Secondary Plan (NWWSP) area in the City of Welland, north of Quaker Road, west of Niagara Street, east of First Avenue, and south of the municipal boundary with the City of Thorold.

UCC has previously prepared a Stormwater Management Implementation Plan for the entirety of the NWWSP Area. This Plan identified the preferred locations of future stormwater management (SWM) Facilities within the developable areas in the Secondary Plan in support of the realignment of the Towpath Drain, which flows through the proposed subdivision lands, and identified the existing stormwater flows through each segment of the existing watercourse.

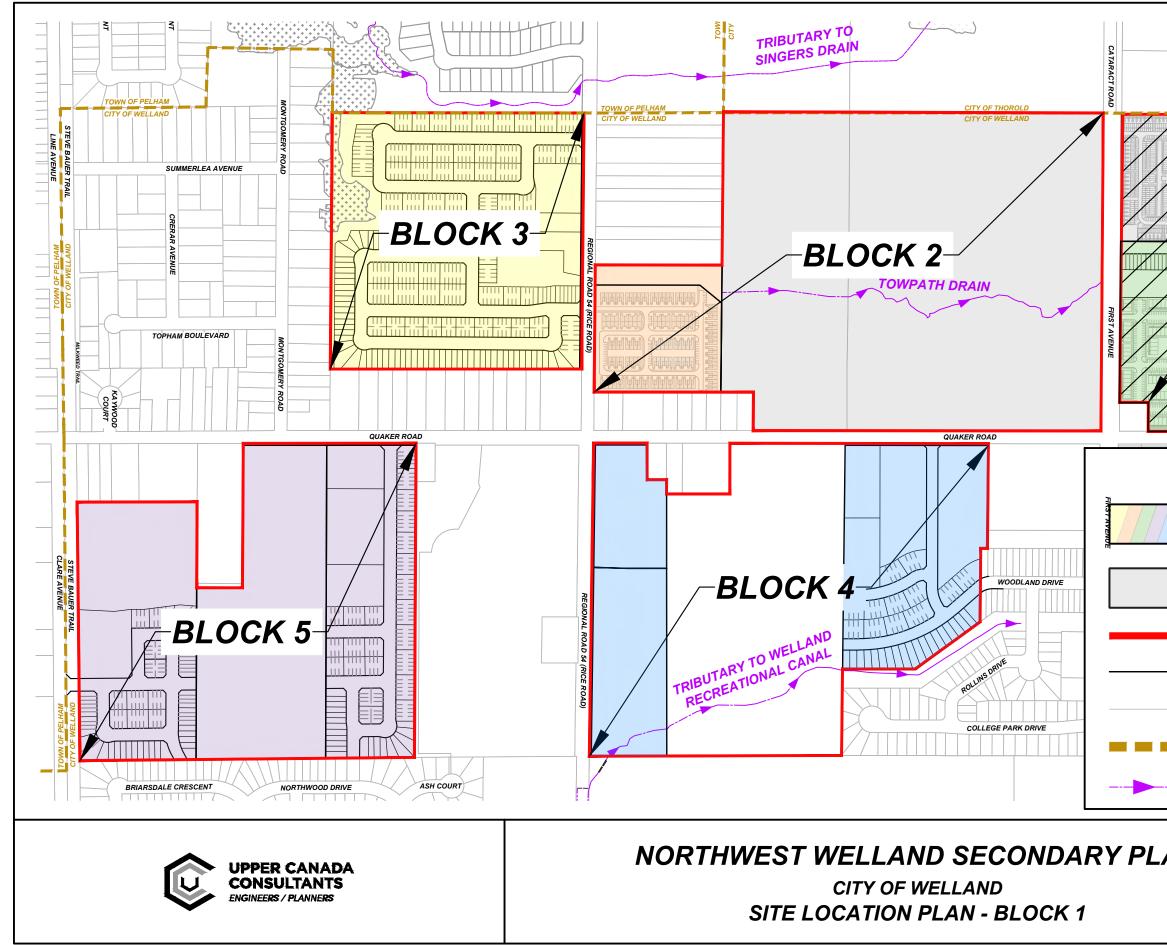
It was identified in the Implementation Plan that two SWM Facilities are to be constructed in the eastern limit of the proposed subdivision lands to provide stormwater management quality and quantity controls the entire 'Block' of development area, bound by Quaker Road on the south, First Avenue on the west, to the eastern limit of 210 Quaker Road, and south of the municipal boundary with the City of Thorold as shown in Figure 1 as Block 1. Therefore, this Block (Block 1) will hereafter be referred to as 'subject lands' in this report.

The subject lands are approximately 28.99 hectares and will consist of a mix of subdivision and condominium developments, comprising of an overall mix of residential single detached, street townhouse, stacked townhouse, and apartment dwellings. The subject lands will be developed to include associated asphalt roadways, concrete curb, catch basins, storm sewers, sanitary sewers, and watermain.

1.2 Objectives

The objectives of this study are as follows:

- 1. Establish specific criteria for the management of stormwater from this site.
- 2. Determine the impact of development on the stormwater peak flow & volume of stormwater from the drainage area.
- 3. Investigate alternatives for controlling the quality of stormwater discharging from the site.
- 4. Establish the property requirements to construct stormwater management facilities for the Draft Plan of Subdivision.



BLOCK 1-						
PARTICIPATING PROPERTIES FOR WHICH UCC BARTICIPATING PROPERTIES FOR WHICH UCC IS NOT PROVIDING ENGINEERING SERVICES						
PARTICIPATING DEVELOPMENT "BLOCK" LIMITS − PROPOSED: DEVELOPMENT BOUNDARY EXISTING PROPERTY BOUNDARY PAGE DRIVE MUNICIPAL BOUNDARY						
MACO EXEMPTING DITCH/WATERCOURSE WOOD ROAD						
AN DATE 2024-07-16 SCALE 1:6000 m REF No.						
REF NO.						

1.3 Existing & Proposed Conditions

a) **Existing Conditions**

The topography of the subject lands is relatively flat with a general slope towards the Towpath Drain, which flows through the middle of the site from west to east direction. The Towpath Drain conveys stormwater flows through the City of Welland and the City of Thorold, prior to ultimately outletting into the Welland Canal, with multiple crossings at Municipal and Regional roads, and Highway 406.

Existing stormwater flows and the delineation of existing stormwater drainage areas for the Towpath Drain were assessed as part of the Implementation Plan to the culvert crossing at Regional Road 50 (Niagara Street) and will be the basis for future peak flow targets for all stormwater management facilities constructed within the Secondary Plan Area.

As part of the realignment of the Towpath Drain, twin 2.4 x 1.8m concrete box culverts will be constructed crossing Regional Road 50 (Niagara Street), a 1.8 x 1.2m concrete box culvert will be constructed crossing Regional Road 54 (Rice Road), and the existing 1800mm diameter culvert crossing First Avenue will remain. Upgrades to the First Avenue Culvert will be subject to a future NPCA Work Permit.

b) Proposed Conditions

The subject lands are approximately 28.99 hectares and will consist of a mix of subdivision and condominium developments, comprising of an overall mix of residential single detached, street townhouse, stacked townhouse, and apartment dwellings.

The subject lands will include associated asphalt roadways, concrete curb, catch basins, storm sewers, sanitary sewers, and watermain.

It is proposed to convey all future Stormwater flows from the subject lands to the Towpath Drain as identified in the Implementation Plan.

UCC has been retained as the engineering consultant for the majority of the developing landowners in the NWWSP, as shown in Figure 1. For the purpose of maintaining consistency between the various Draft Plan of Subdivision submissions within the Secondary Plan Area, the "Proposed Conditions" stormwater modelling will include the future SWM Facilities designed for each respective Block in the NWWSP.

For lands where Planning Act Applications are not expected to be submitted in the near future as of the writing of this stormwater management plan, where UCC has not been retained as the engineering consultant, or a stormwater management alternative has not yet been selected, future stormwater flows have been allocated to the Towpath Drain at the existing levels identified in the Implementation Plan.

The existing conditions MIDUSS modelling output file provided in the Implementation Plan has been included in Appendix A for reference.

2.0 STORMWATER MANAGEMENT CRITERIA

New developments are required to provide stormwater management in accordance with provincial and municipal policies including:

- Stormwater Quality Guidelines for New Development (MECP/MNRF, May 1991)
- Stormwater Management Planning and Design Manual (MECP, March 2003)

Based on the comments and outstanding policies from the City of Welland, Regional Municipality of Niagara, Niagara Peninsula Conservation Authority (NPCA), and the Ministry of the Environment, Conservation and Parks (MECP), the following site-specific considerations were identified:

- Per City of Welland requirements, stormwater **quality** improvements must be provided to a minimum of Enhanced Protection (80% TSS Removal).
- Per the Northwest Welland Stormwater Management Implementation Plan prepared by Upper Canada Consultants, future stormwater management facilities within the Secondary Plan Area will be required to provide **quantity** controls up to and including the 100 year design storm event before outletting to the Towapth Drain.
- **Erosion control** to be provided in accordance with MECP guidelines. The guidelines require an extended detention volume to be detained for 24 hours.

Based on above policies and site specific considerations, the following stormwater management criteria have been established for this site:

- Stormwater **quality** controls are to be provided for the more frequent storm events to provide Enhanced Protection (80% TSS Removal), prior to discharging to the receiving watercourse (Towpath Drain).
- To maintain existing water surface elevations in the Towpath Drain, stormwater **quantity controls** will be provided up to and including the 100 year design storm event.
- **Erosion protection** will be provided in accordance with MECP guidelines. The quidelines require an extended detention volume to be detained for 24 hours.

3.0 STORMWATER ANALYSIS

Stormwater for the existing and proposed conditions was estimated using the MIDUSS computer modelling program. This program was selected because it is applicable to both urban and rural drainage areas like the study area. It is relatively easy to use and modify for the future drainage conditions and control facilities. It readily allows for design storm hyetographs for the various return periods being investigated.

3.1 Design Storms

Design storm hyetographs for the storm system design uses a Chicago distribution based on the City of Welland Intensity-Duration-Frequency (IDF) curves. Hyetographs for the 25mm, 2, 5, 10, 25 and 100 year events were developed using a 4 hour Chicago distribution. The 25mm design storm event parameters were derived using the IDF curve and a 4-hour Chicago distribution. Table 1 summarizes the rainfall data applied in the stormwater modelling.

Table 1. Rainfall Data							
Design Storm (Return Period)	Chicago	Duration (minutes)					
(Iteluin Ferrou)	а	b	с	(IIIIIutes)			
25mm	512	6.0	0.800	240			
2 Year	755	8.0	0.789	240			
5 Year	830	7.3	0.777	240			
10 Year	860	6.5	0.763	240			
25 Year	900	5.2	0.745	240			
100 Year	1020	4.7	0.731	240			

3.2 Existing Conditions

Existing conditions within the Towpath Drain were assessed as part of the Implementation Plan to determine the existing the peak flows within the watercourse at existing and future roadway crossings. The existing catchment areas as provided in Figure 2 of the Implementation Plan have been included as Figure 2 in this stormwater management plan for reference.

For consistency between the stormwater management plans submitted by UCC in the NWWSP, Outlets A through D have been identified at specific locations along the Towpath Drain to demonstrate that the existing flows identified in the Implementation Plan are maintained at all locations within the watercourse under future conditions. The locations of Outlets A through D can be found on Figure 3 and the summary of the existing flows at each Outlet have been summarized in Table 2 below.

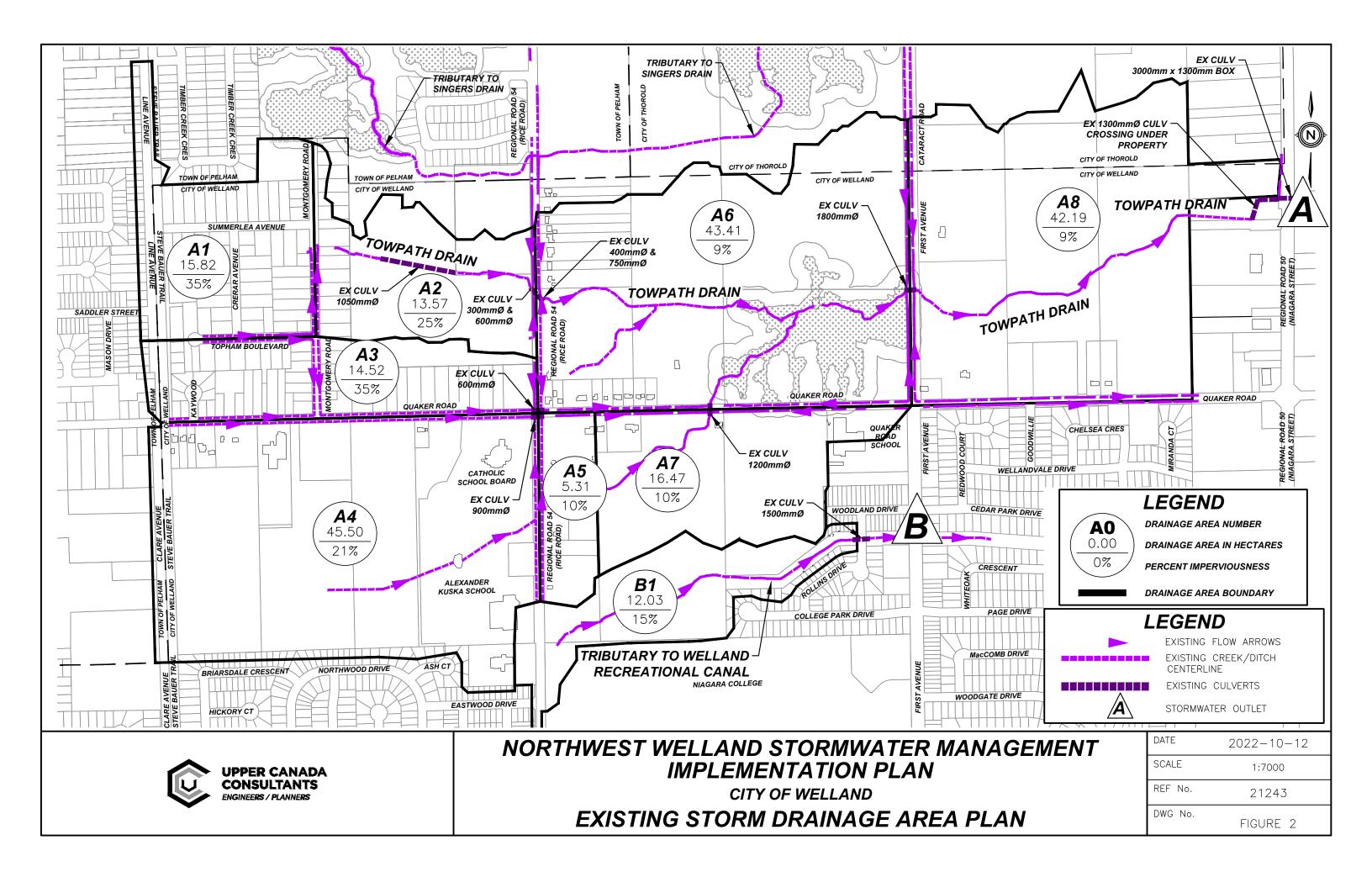


Table 2. Existing Peak Stormwater Flows – Towpath Drain							
T		Р	eak Flow (m ³ /	s)			
Location	2 Year	5 Year	10 Year	25 Year	100 Year		
Outlet A1	1.317	1.589	1.800	2.099	2.558		
Outlet A2	3.301	4.194	4.777	5.619	6.987		
Outlet B (*)	3.425	4.367	4.977	5.863	7.305		
Outlet C	4.035	5.176	5.914	7.005	8.781		
Outlet D	4.509	5.835	6.678	7.938	9.995		

Note (*) : Outlet B was not specified as a location where peak flows were evaluated within the Implementation Plan.

Therefore, the change in existing peak flow across the 803m width of Drainage Area A6 (between Rice Road and First Avenue) was prorated to the location of Outlet B (at 205m east of Rice Road) for the peak flow at Outlet B for each design storm event.

3.3 Proposed Conditions

For the purpose of maintaining consistency between the various Draft Plan of Subdivision submissions within the NWWSP Area, the "Proposed Conditions" stormwater modelling will include the future SWM Facilities designed for each respective Block in the NWWSP.

For lands where Planning Act Applications are not expected to be submitted in the near future, as of the writing of this stormwater management plan, or where UCC has not been retained as the engineering consultant, future stormwater flows have been allocated to the Towpath Drain at the existing levels identified in the Implementation Plan.

The future stormwater drainage areas for the NWWSP Area are shown in Figure 3, and a schematic of the future hydrologic modelling is provided as Figure 4.

As shown in Figure 3, there is an existing drainage area (A30) which is entirely within the City of Thorold and conveys existing stormwater flows through the subject lands to the Towpath Drain. For the purposes of this SWM Plan, this area will be included within the proposed SWM Facility at existing conditions. Should a Planning Act Application be submitted within this area, a separate SWM Facility on the adjacent property is to be constructed with a new outlet to the Towpath Drain.

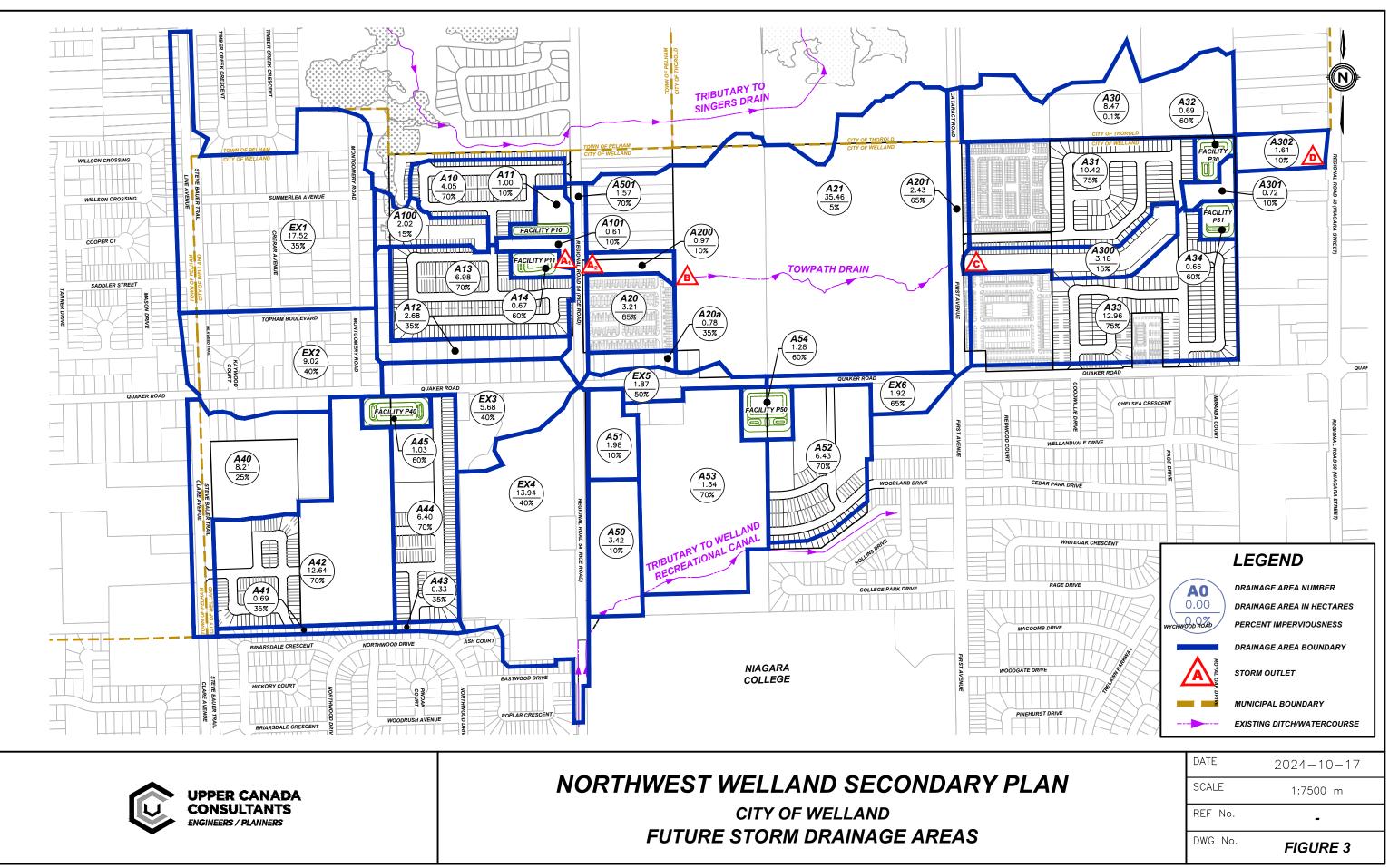
Table 3 below provides a summary of the catchment areas shown in Figure 3 and associated hydrological parameters used for the MIDUSS software model.

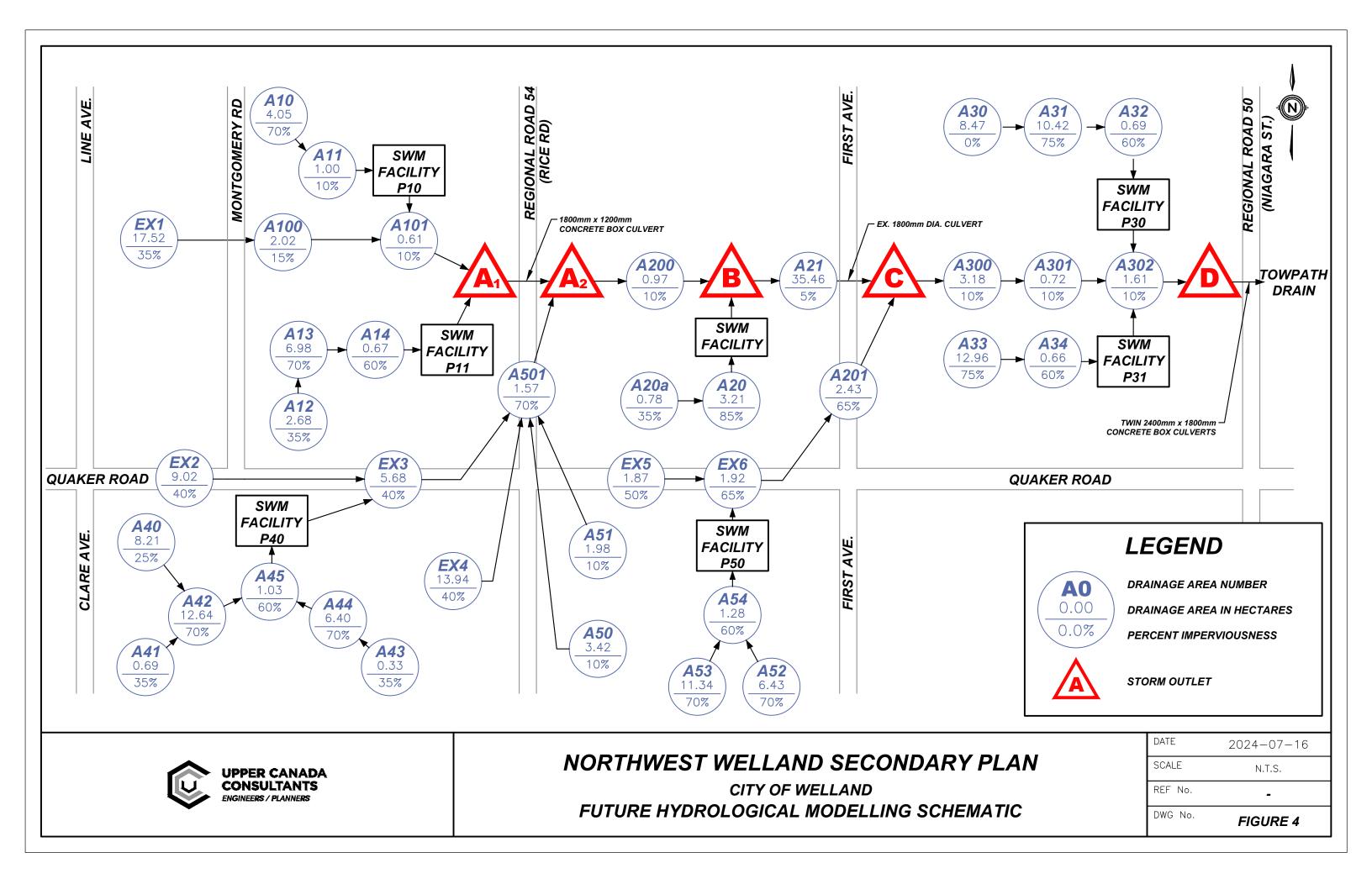
The future conditions MIDUSS modelling output file has been enclosed in Appendix D for reference.

Table 3. Hydrologic Parameters for Future Conditions								
Area	Area	Length	Slope	Manni	ng – "n"	Soil	SCS	Percent
No.	(ha)	(m)	(%)	Perv.	Imperv.	Туре	CN	Impervious
EX1	17.52	343	1.0	0.25	0.015	CD	74	35%
A100	2.02	116	0.4	0.25	0.015	CD	74	15%
A10	4.05	164	1.0	0.25	0.015	CD	74	70%
A11	1.00	82	1.0	0.25	0.015	CD	74	10%
A101	0.61	64	1.0	0.25	0.015	CD	74	10%
A12	2.68	134	1.0	0.25	0.015	CD	74	35%
A13	6.98	216	1.0	0.25	0.015	CD	74	70%
A14	0.67	67	1.0	0.25	0.015	CD	74	60%
A40	8.21	234	1.0	0.25	0.015	CD	74	25%
A41	0.69	68	1.0	0.25	0.015	CD	74	35%
A42	12.64	290	1.0	0.25	0.015	CD	74	70%
A43	0.33	47	1.0	0.25	0.015	CD	74	35%
A44	6.40	207	1.0	0.25	0.015	CD	74	70%
A45	1.03	83	1.0	0.25	0.015	CD	74	60%
EX2	9.02	245	1.0	0.25	0.015	CD	74	40%
EX3	5.68	195	1.0	0.25	0.015	CD	74	40%
EX4	13.94	305	1.0	0.25	0.015	CD	74	40%
A50	3.42	151	1.0	0.25	0.015	CD	74	10%
A51	1.98	115	1.0	0.25	0.015	CD	74	10%
A501	1.57	102	1.0	0.25	0.015	CD	74	70%
A20a	0.78	72	1.0	0.25	0.015	CD	74	35%
A20	3.21	146	1.0	0.25	0.015	CD	74	85%
A200	0.97	80	1.0	0.25	0.015	CD	74	10%
A21	35.46	487	0.2	0.25	0.015	CD	74	5%
A52	6.43	207	1.0	0.25	0.015	CD	74	70%
A53	11.34	275	1.0	0.25	0.015	CD	74	70%
A54	1.28	92	1.0	0.25	0.015	CD	74	60%
EX5	1.87	112	1.0	0.25	0.015	CD	74	50%
EX6	1.92	113	0.2	0.25	0.015	CD	74	65%

Stormwater Management Plan 210, 256 & 276 Quaker Road, City of Welland

	204.87 Total Area (ha)							
A302	1.61	104	0.2	0.25	0.015	CD	74	10%
A34	0.66	66	1.0	0.25	0.015	CD	74	60%
A33	12.99	294	1.0	0.25	0.015	CD	74	75%
A32	0.69	68	1.0	0.25	0.015	CD	74	60%
A31	10.42	264	1.0	0.25	0.015	CD	74	75%
A30	8.47	238	0.2	0.25	0.015	CD	74	0.1%
A301	0.72	69	0.2	0.25	0.015	CD	74	10%
A300	3.18	146	0.2	0.25	0.015	CD	74	15%
A201	2.43	127	1.0	0.25	0.015	CD	74	65%





4.0 STORMWATER MANAGEMENT ALTERNATIVES

4.1 Screening of Stormwater Management Alternatives

A variety of stormwater management alternatives are available to control the quantity and quality of stormwater, most of which are described in the Stormwater Management Planning and Design Manual (MECP, March 2003). Alternatives for the proposed and ultimate developments were considered in the following broad categories: lot level, vegetative, infiltration, and end-of-pipe controls. General comments on each category are provided below. Individual alternatives for the proposed development are listed in Table 4 with comments on their effectiveness and applicability to the proposed outlet.

a) Lot Level Controls

Lot level controls are not generally suitable as the primary control facility for quality control. They are generally used to enhance stormwater quality in conjunction with other types of control facilities.

b) <u>Vegetative Alternatives</u>

Vegetative stormwater management practices are not generally suitable as the primary control facility for quality control. They are generally used to enhance stormwater quality in conjunction with other types of control facilities.

c) <u>Infiltration Alternatives</u>

Where soils are suitable, infiltration techniques can be very effective in providing quantity and quality control. However, the very small amount of surface area on this site dedicated to permeable surfaces such as greenspace and landscaping make this an impractical option. Therefore, infiltration techniques will not be considered for this development.

d) End-of-Pipe Alternatives

Surface storage techniques can be very effective in providing quality and quantity control. Wet facilities are effective practices for stormwater erosion, quality and quantity control for large drainage areas (>5 ha).

	Table 4. Evaluation of Stormwater Management Practices							
210, 256 & 276			or Implementation agement Practices					
Quaker Road	Topography Flat	Soils Variable	Bedrock Shallow	Groundwater At Considerable	Area ± 28.99ha		Recommend Implementation	
Site Conditions	±1%	±15 mm/hr		Depth		(10 high)	Yes / No	Comments
Lot Level Controls								
Lot Grading	<5%	nlc	nlc	nlc	nlc	2	Yes	Quality/quantity benefits
Roof Leaders to Surface	nlc	nlc	nlc	nlc	nlc	2	Yes	Quality/quantity benefits
Roof Ldrs.to Soakaway Pits	nlc	loam, infiltr. > 15 mm/hr	>1m Below Bottom	>1m Below Bottom	< 0.5 ha	6	Yes	Quality/quantity benefits
Sump Pump Fdtn. Drains	nlc	nlc	nlc	nlc	nlc	2	No	Unsuitable site conditions
Vegetative								
Grassed Swales	< 5 %	nlc	nlc	nlc	nlc	7	Yes	Quality/quantity benefits
Filter Strips(Veg. Buffer)	< 10 %	nlc	nlc	>.5m Below Bottom	< 2 ha	5	No	Unsuitable site conditions
Infiltration								
Infiltration Basins	nlc	loam, infiltr. > 15 mm/hr			< 5 ha	2	No	Unsuitable site conditions
Infiltration Trench	nlc				< 2 ha	4	No	Unsuitable site conditions
Rear Yard Infiltration	< 2.0 %	loam, infiltr. > 15 mm/hr		>1m Below Bottom	< 0.5 ha	7	No	Unsuitable site conditions
Perforated Pipes	nlc	,		>1m Below Bottom	nlc	4	No	Unsuitable site conditions
Pervious Catch basins	nlc	loam, infiltr. > 15 mm/hr		>1m Below Bottom	nlc	3	No	Unsuitable site conditions
Sand Filters	nlc	nlc	nlc	>.5m Below Bottom	< 5 ha	5	No	High maintenance/poor aesthetics
Surface Storage								
Dry Ponds	nlc	nlc	nlc	nlc	> 5 ha	7	No	No quality control
Wet Ponds	nlc	nlc	nlc	nlc	> 5 ha	9	Yes	Very effective quality/quantity control
Wetlands	nlc	nlc	nlc	nlc	> 5 ha	6	No	Very effective quality control
Other								
Oil/Grit Separator	nlc	nlc	nlc	nlc	<2 ha	3	No	Limited benefit/area too large

Reference: Stormwater Management Practices Planning and Design Manual - 2003 nlc - No Limiting Criteria

4.2 Selection of Stormwater Management Alternatives

Stormwater management alternatives were screened based on technical effectiveness, physical suitability for this site, and their ability to meet the stormwater management criteria established for proposed and future development areas. The following stormwater management alternatives are recommended for implementation on the proposed development:

- Lot grading to be kept as flat as practical in order to slow down stormwater and encourage infiltration.
- **Roof leaders to be discharged to the ground surface** in order to slow down stormwater and encourage infiltration.
- **Grassed swales** to be used to collect rear lot drainage. Grassed swales tend to filter sediments and slow down the rate of stormwater.
- Two **wet pond facilities** on either side of the Towpath Drain are to be constructed to provide stormwater quality and quantity controls.

5.0 STORMWATER MANAGEMENT PLAN

A MIDUSS model was created to assess existing and future flows generated by the proposed subdivision. The stormwater management facility was sized according to MECP Guidelines (MECP, March 2003) as follows:

5.1 Northern Stormwater Management Facility 'P30'

5.1.1 Stormwater Quality Control

The stormwater drainage outlet for the proposed Wet Pond 'P30' is the Towpath Drain, where *Enhanced* protection will be provided. Based on Table 3.2 of SWMP & Design Manual, the Enhanced water quality storage requirement for wet pond facilities in a development with 75% impervious area is approximately 233 m³/ha. The wet pond facility will provide stormwater quality controls for a drainage area of approximately 10.42 hectares (Area 31) as shown in Table 5.

Table 5. SWM Facility 'P30' - Stormwater Quality Volume Calculations							
Total Water Quality Volume = 10.42 ha x 233 m ³ /ha = $2,428$ m ³	Reference: Table 3.2, SWMP & Design Manual (MECP 2003)						
Permanent Pool Volume= 10.42 ha x 193 m³/ha= $2,011$ m³	Extended Detention Volume = $10.42 \text{ ha x } 40 \text{ m}^3/\text{ha}$ = 417 m^3						

5.1.2 Erosion Control

Using the MIDUSS hydrological model, the stormwater volume from the 25mm - 4 hour design storm event for the overall 19.58 hectare drainage area (Areas A30. A31, and A32) to the proposed facility is $1,924 \text{ m}^3$.

The following table shows the stormwater storage volumes required using both the water quality and erosion control guidelines.

Table 6. SWM Facility 'P30' – Stormwater Quality Volume Requirements					
A. Permanent Pool Volume	2,011 m ³				
B. Extended Detention Volume	417 m ³				
C. Stormwater Volume from 25mm – 4-hour rainfall event	1,924 m ³				
D. Minimum Extended Detention Volume (greater of B & C)	1,924 m ³				
Total Quality and Extended Detention Volume (A + D)	3,935 m ³				

5.1.3 Stormwater Management Facility 'P30' Configuration

As shown in Figure 5, it is proposed to construct a three-stage control outlet for the proposed stormwater management facility. The first stage of control consists of a reverse slope pipe acting as a tubular control orifice to detain the extended detention volume and release it slowly over an extended period of time. The second stage of control consists of a ditch inlet catch basin and outlet pipe which provides an outlet for flows exceeding the extended detention volume. The third stage consists of an emergency spillway to provide an outlet for greater storm events.

The proposed bottom elevation of the facility is 177.20 m, and the permanent pool water level is proposed at 178.80 m, for a permanent water depth of 1.6 metre. The configuration of the facility provides 2,221 m³ of permanent pool volume, which is more than the required 2,011 m³. The proposed top of pond is at an elevation of 180.80 m which provides a total active volume of 8,137 m³ with 5:1 side slopes.

Based on the configuration of the proposed facility, it was determined that a 135 mm diameter (5 inch) quality orifice at an invert of 178.80 m can provide 29 hours of extended detention for the 25mm design storm event, which has a corresponding water surface elevation of 179.28m within the proposed facility.

The proposed ditch inlet catchbasin will be constructed with the rim at an elevation of 180.10 m which will provide an extended detention volume of 4,649 m³, which is greater than the minimum volume of 1,924 m³ specified in Table 6.

The outflow pipe from the stormwater management facility is to be 450mm in diameter and will convey the stormwater flows from the ditch inlet to the proposed headwall structure outletting to Towpath Drain. A stage-storage-discharge relationship was determined for the facility and is included in Appendix B for reference purposes.

Major overland flows within the northern portion of the subject lands directed to the proposed wetpond facility, and then to the Towpath Drain.

A sediment forebay has been sized for this facility to minimize the transport of heavy sediment throughout the facility and to localize maintenance activities. Calculations for the forebay sizing follow MECP Guidelines and is shown in Table 7.

Table 7. Stormwater Management Facility 'P30' Forebay Sizing								
a) Forebay Settling Leng	th (MOE	SWM	IP&D, Eq	uation 4.5	5)			
			r =	3.5	:1	(Length:Width Ratio)		
Settling Length = $\sqrt{\left(\frac{1}{2}\right)^2}$	$\frac{r \times Q}{V}$		$Q_p =$	0.025	m ³ /s	(25mm Storm Pond Discharge)		
	v_s /			0.0003	m/s	(Settling Velocity)		
Settling Length =	Settling Length = 17.08 m							
b) Dispersion Length (MOE SWMP&D, Equation 4.6)								
	0 ~ 0		Q =	1.401	m ³ /s	(5 Yr Stm Sew Design Inflow)		
$Dispersion \ Length =$	$\frac{0 \times Q}{D \times V_c}$		D =	1.50	m	(Depth of Perm. Pool in the Forebay)		
	2		$V_{\rm f}$ =	0.5	m/s	(Desired Velocity)		
Dispersion Length =	14.94	m						
c) Minimum Forebay De	ep Zone	Botton	n Width (MOE SW	MP&D)	, Equation 4.7)		
$Width = rac{Min.Foreb}{8}$	ay Leng	th						
8				17.08	m	(minimum required length)		
Width =	2.13	m	(minimun	n required	d width)			
d) Average Velocity of F	Flow							
			Q =	0.760	m ³ /s	(25mm Storm Design Inflow)		
	0		A =	15.75	m^2	(Cross Sectional Area)		
Average Velocity =	$\frac{c}{A}$		D =	1.50	m	(Depth of Forebay)		
			$\mathbf{W} =$	6.00	m	(Proposed Bottom Width)		
			SS =	3	:1	(Side Slopes - Minimum)		
Average Velocity =	0.05	m/s						
Is this Acceptable?	Yes		(Maximu	m velocit	y of flow	w = 0.15 m/s		
e) Cleanout Frequency								
Is this Acceptable?	Yes		L =	21.0		(Proposed Bottom Length)		
			ASL =	3.13	m ³ /ha	(Annual Sediment Loading)		
			A =	10.42	ha	(Drainage Area)		
			FRC =	80	%	(Facility Removal Efficiency)		
			FV =	432.0	m ³	(Forebay Volume)		
Cleanout Frequency = 10.6 Years								
Is this Acceptable? Yes (10 Year Minimum Cleanout Frequency)								

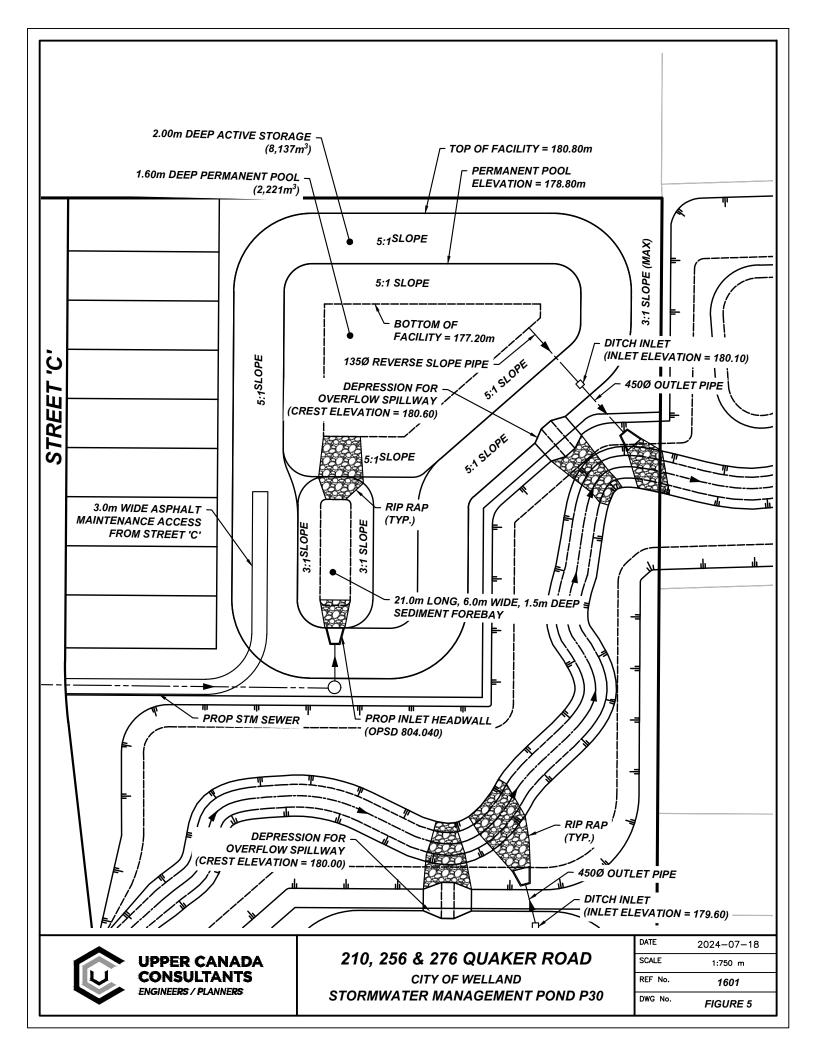


Table 8 summarizes the peak inflows and outflows for the stormwater management facility along with corresponding pond elevations. Based on the MIDUSS model, the maximum wet pond elevation is 180.38 m, and an active storage volume is 5,999 m³ for the 100-year design storm event.

Table 8.	Table 8. Stormwater Management Wet Pond Facility 'P30' Characteristics					
Design	Peak Flo	ws (L/s)	Maximum Elevation (m)	Maximum		
Storm	Inflow	Outflow		Storage (m3)		
25mm	760	25	179.28	1,460		
2 Year	1,210	34	179.64	2,856		
5 Year	1,401	38	179.85	3,675		
10 Year	1,576	42	180.03	4,365		
25 Year	1,840	114	180.19	5,104		
100 Year	2,246	250	180.38	5,999		

Table 9. SWM Facility 'P30' – MECP Quality Requirements Comparison					
SWM Facility Characteristic	MECP Requirement	Provided by SWM Facility			
Permanent Pool Volume (m ³) - <i>minimum</i>	2,011 (min)	2,221			
Extended Detention Volume (m ³) – <i>minimum</i>	1,924 (min)	4,649			
Total Quality + Detention Storage (m ³) – <i>minimum</i>	3,935 min)	6,870			
Drawdown Time (hr) – minimum	24 (min)	29			
Forebay Length (m) – minimum	17.08 (min)	21.00			
Forebay Width (m) – minimum	2.13 (min)	6.00			
Average Forebay Velocity (m/s) – maximum	0.15 (max)	0.05			
Cleanout Frequency (years) - minimum	10 (min)	11			

As shown in Table 9, the proposed stormwater management facility configuration satisfies the quality control requirements for the associated drainage area.

5.2 Southern Stormwater Management Facility 'P31'

5.2.1 Stormwater Quality Control

The stormwater drainage outlet for the proposed Wet Pond 'P31' is the Towpath Drain, where *Enhanced* protection will be provided. Based on Table 3.2 of SWMP & Design Manual, the Enhanced water quality storage requirement for wet pond facilities in a development with 75% impervious area is approximately 233 m³/ha. The wet pond facility will provide stormwater quality controls for a drainage area of approximately 12.96 hectares (Area A33) as shown in Table 10.

Table 10. SWM Facility 'P31' - Stormwater Quality Volume Calculations				
Total Water Quality Volume= 12.96 ha x 233 m³/ha= $3,020$ m³	Reference: Table 3.2, SWMP & Design Manual (MECP 2003)			
Permanent Pool Volume= 12.96 ha x 193 m ³ /ha= $2,501$ m ³	Extended Detention Volume = 12.96 ha x 40 m ³ /ha = 518m ³			

5.1.2 Erosion Control

Using the MIDUSS hydrological model, the stormwater volume from the 25mm - 4 hour design storm event for the overall 13.62 hectare area (Areas A33 and A34) is 2,114 m³.

The following table shows the stormwater storage volumes required using both the water quality and erosion control guidelines.

Table 11. SWM Facility 'P31' – Stormwater Quality Volume Requirements			
A. Permanent Pool Volume (m ³)	2,501 m ³		
B. Extended Detention Volume (m ³)	518 m ³		
C. Stormwater Volume from 25mm – 4-hour rainfall event	2,114 m ³		
D. Minimum Extended Detention Volume (greater of B & C)	2,114 m ³		
Total Quality and Extended Detention Volume (A + D)	4,615 m ³		

5.1.3 Stormwater Management Facility 'P31' Configuration

As shown in Figure 6, it is proposed to construct a three-stage control outlet for the proposed stormwater management facility. The first stage of control consists of a reverse slope pipe acting as a tubular control orifice to detain the extended detention volume and release it slowly over an extended period of time. The second stage of control consists of a ditch inlet catch basin and outlet pipe which provides an outlet for flows exceeding the extended detention volume. The third stage will consist of an emergency spillway to provide an outlet for greater storm events.

The proposed bottom elevation of the facility is 176.50 m, and the permanent pool water level is proposed at 178.30 m, for a permanent water depth of 1.80 metres. The configuration of the facility provides $2,733 \text{ m}^3$ of permanent pool volume, which is more than the required $2,501 \text{ m}^3$. The proposed top of pond is at an elevation of 180.30 m which provides a total active volume of $8,059 \text{ m}^3$ with 5:1 side slopes.

Based on the configuration of the proposed facility, it was determined that a 150 mm diameter quality orifice at an invert of 178.30 m can provide 26 hours of extended detention for the 25mm design storm event, which has a corresponding water surface elevation of 178.84m within the proposed facility.

The proposed ditch inlet catchbasin will be constructed with the rim at an elevation of 179.60 m which will provide an extended detention volume of 4,692 m³, which is greater than the minimum volume of 2,114 m³ specified in Table 11.

The outflow pipe from the stormwater management facility is to be 450mm in diameter and will convey the stormwater flows from the ditch inlet to the proposed headwall structure outletting to Towpath Drain. A stage-storage-discharge relationship was determined for the facility and is included in Appendix C for reference purposes.

Major overland flows within the southern portion of the subject lands directed to the proposed wetpond facility, and then to the Towpath Drain.

A sediment forebay was included in this stormwater management facility to minimize the transport of heavy sediment from the storm sewer outlet throughout the facility and to localize maintenance activities. Calculations for the forebay sizing follow MECP Guidelines and is shown in Table 12.

Table	Table 12. Stormwater Management Facility 'P31' Forebay Sizing					
a) Forebay Settling Leng	th (MOE	SWM	1P&D, Eq	uation 4.5	5)	
		r =	8.0	:1	(Length:Width Ratio)	
Settling Length = $\sqrt{\left(\frac{1}{2}\right)^2}$	$\frac{r \times Q}{V}$		$Q_p =$	0.032	m ³ /s	(25mm Storm Pond Discharge)
	v_s /		$V_s =$	0.0003	m/s	(Settling Velocity)
Settling Length =	29.30	m				
b) Dispersion Length (M	OE SWN	ИР&D	, Equatior	n 4.6)		
	0 v 0		Q =	1.765	m ³ /s	(5 Yr Stm Sew Design Inflow)
$Dispersion \ Length =$	$\frac{0 \times Q}{D \times V_c}$		D =	1.50	m	(Depth of Perm. Pool in the Forebay)
	$D \land I_f$		$V_{\rm f}$ =	0.5	m/s	(Desired Velocity)
Dispersion Length =	18.83	m				
c) Minimum Forebay De	ep Zone	Bottor	n Width (MOE SW	MP&D)	, Equation 4.7)
$Width = rac{Min.Foreb}{8}$	ay Leng	th				
8				29.30	m	(minimum required length)
Width =	3.66	m	(minimun	n required	d width)	
d) Average Velocity of F	low					
			Q =	0.922	m ³ /s	(25mm Storm Design Inflow)
	0		A =	12.90	m^2	(Cross Sectional Area)
Average Velocity =	$\frac{\mathbf{x}}{A}$		D =	1.50	m	(Depth of Forebay)
			$\mathbf{W} =$	4.10	m	(Proposed Bottom Width)
			SS =	3	:1	(Side Slopes - Minimum)
Average Velocity =	0.07	m/s				
Is this Acceptable?	Yes		(Maximu	m velocit	y of flow	w = 0.15 m/s
e) Cleanout Frequency						
Is this Acceptable?	Yes		L =		m	(Proposed Bottom Length)
			ASL =	3.13	m ³ /ha	(Annual Sediment Loading)
			A =	12.96	ha	(Drainage Area)
	FRC = 80 % (Facility Removal Efficiency)					
			FV =	514.1	m^3	(Forebay Volume)
Cleanout Frequency =	10.1	Year				
Is this Acceptable? Yes (10 Year Minimum Cleanout Frequency)						

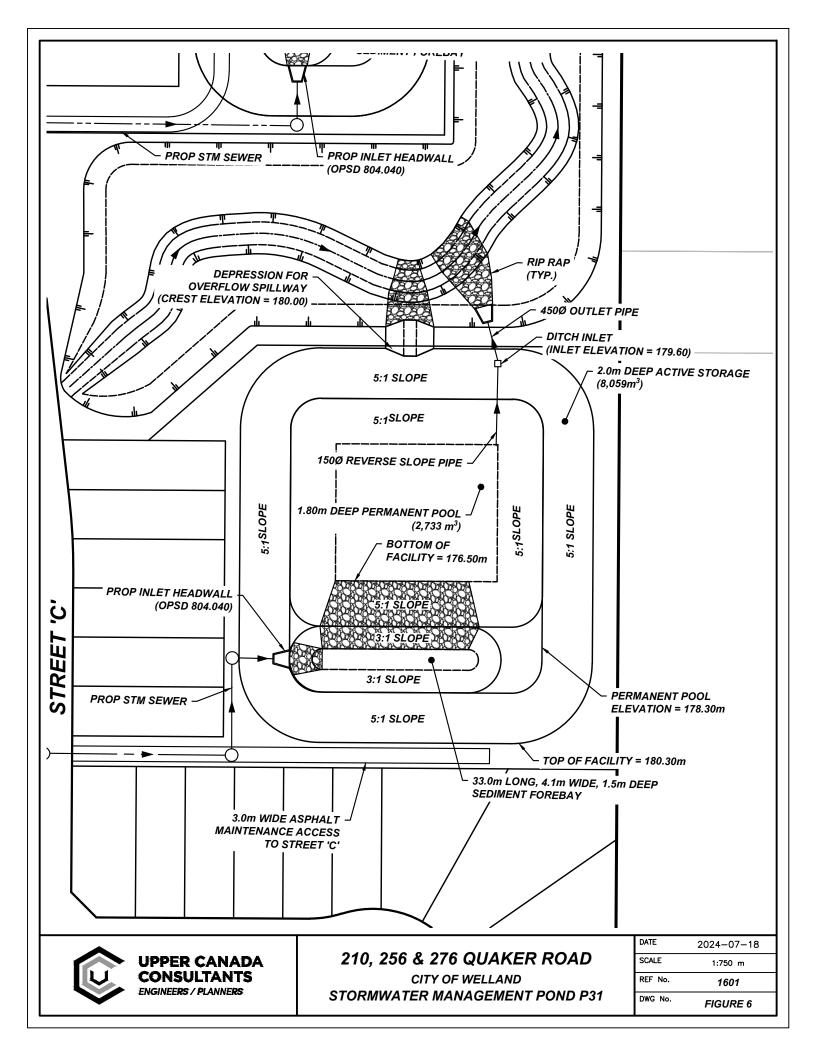


Table 13 summarizes the peak inflows and outflows for the stormwater management facility along with corresponding pond elevations. Based on the MIDUSS model, Table 13 shows the maximum wet pond elevation of 179.88 m, and an active storage volume of $5,982 \text{ m}^3$ for the 100-year design storm event.

Table 13. Stormwater Management Wet Pond Facility 'P31' Characteristics					
Design Storm	Peak Flo	ws (L/s)	Maximum Elevation (m)	Maximum	
	Future Inflow	Future Outflow		Storage (m3)	
25mm	922	32	178.84	1,746	
2 Year	1,478	43	179.20	3,116	
5 Year	1,765	48	179.39	3,856	
10 Year	1,983	52	179.54	4,465	
25 Year	2,245	107	179.71	5,183	
100 Year	2,731	221	179.88	5,982	

Table 14. SWM Facility 'P31' – MECP Quality Requirements Comparison					
SWM Facility Characteristic	MECP Requirement	Provided by SWM Facility			
Permanent Pool Volume (m ³) - <i>minimum</i>	2,497 (min)	2,733			
Extended Detention Volume (m ³) – minimum	2,114 (min)	4,692			
Total Quality + Detention Storage (m ³) – <i>minimum</i>	4,615 (min)	7,425			
Drawdown Time (hr) – minimum	24 (min)	26			
Forebay Length (m) – minimum	29.30 (min)	33			
Forebay Width (m) – minimum	3.66 (min)	4.10			
Average Forebay Velocity (m/s) – maximum	0.15 (max)	0.07			
Cleanout Frequency (years) - minimum	10 (min)	10			

As shown in Table 14, the proposed stormwater management facility configuration satisfies the quality control requirements for the associated drainage area.

5.3 Overall Stormwater Management Plan

As previously discussed, UCC has prepared a comprehensive Future conditions MIDUSS model to include all of the proposed stormwater management facilities to be constructed within the properties for which UCC is providing engineering services. The facilities included in the model are SWM Facilities P10 through P50, as shown in Figures 3 and 4.

Within properties where there are no Planning Act Applications forthcoming at the time of writing this report, that UCC is not providing engineering services, or a stormwater management alternative has not been selected, existing conditions were assumed in accordance with the Implementation Plan (see Figure 2).

As part of the Planning Act Applications on the properties where UCC is providing engineering services, separate Stormwater Management Reports will be submitted to outline the detailed calculations for each proposed facility. For the purposes of this Stormwater Management Plan, Tables 15 through 21 have been including providing the summary of the characteristics of each SWMF designed by UCC in the NWWSP Area.

5.3.1 Block 2

As shown in Figure 1, Block 2 consists of a property where UCC is providing the engineering services (450 Rice Road) and the remaining property where UCC is not providing engineering services.

The 450 Rice Road will provide only stormwater management quality controls (Facility P20) which will be via an Oil/Grit Separator as the tributary drainage area (Areas A20 and A20a) is below 5.0 hectares. A separate SWM Plan will be submitted outlining the detailed calculations for this Block.

The adjacent lands where UCC is not providing engineering services have been assumed at existing conditions for the purposes of identifying future stormwater flows within the realigned watercourse. A separate SWM Plan will be submitted by the owner's engineering consultant addressing the future stormwater management within this property.

5.3.2 Block 3

As shown in Figure 1, Block 3 consists of lands owned by a single owner for which UCC is providing engineering services and will include two stormwater management facilities (P10 and P11). Facility P10 will be comprised of a dry pond and Oil/Grit Separator as the tributary drainage area to the Oil/Grit Separator (Areas A10) is below 5.0 hectares, and Facility P11 will be comprised of a single wet pond providing quality and quantity controls for areas A12, A13, and A14. A separate SWM Plan will be submitted outlining the detailed calculations for this Block.

Table 15, 16, and 17 below summarize the design characteristics for Facilites P10 and P11.

Table 15. Stormwater Management Dry Pond Facility 'P10' Characteristics					
Design	Peak Flo	ows (L/s)	Maximum Elevation (m)	Maximum Storage (m3)	
Storm	Future Inflow	Future Outflow			
25mm	273	23	185.94	390	
2 Year	422	25	186.13	803	
5 Year	497	26	186.26	1,035	
10 Year	1,229	26	186.30	1,229	
25 Year	0.644	27	186.41	1,531	
100 Year	0.783	105	186.51	1,804	

Table 16. Stormwater Management Wet Pond Facility 'P11' Characteristics					
Design	Peak Flo	ows (L/s)	Maximum Elevation (m)	Maximum Storage (m3)	
Storm	Future Inflow	Future Outflow			
25mm	584	14	185.31	1,163	
2 Year	889	18	185.63	2,132	
5 Year	1,052	20	185.81	2,641	
10 Year	1,177	22	185.95	3,066	
25 Year	1,367	48	186.14	3,650	
100 Year	1,659	143	186.28	4,180	

Table 17. SWM Facility 'P11' – MECP Quality Requirements Comparison					
SWM Facility Characteristic	MECP Requirement	Provided by SWM Facility			
Permanent Pool Volume (m ³) - <i>minimum</i>	1,565 (min)	1,616			
Extended Detention Volume (m ³) – minimum	1,350 (min)	3,519			
Total Quality + Detention Storage (m ³) – <i>minimum</i>	2,915 (min)	5,135			
Drawdown Time (hr) – minimum	24 (min)	40			
Forebay Length (m) – minimum	19.80 (min)	21.00			
Forebay Width (m) – minimum	2.41 (min)	2.50			
Average Forebay Velocity (m/s) – maximum	0.15 (max)	0.06			
Cleanout Frequency (years) - minimum	10 (min)	11			

As shown in the above tables, Facilities P10 and P11 have adequate capacity to provide stormwater management quantity and quality controls in accordance with MECP requirements and the requirements of the Implementation Plan.

5.3.3 Block 4

As shown in Figure 1, Block 4 consists of multiple properties owned by a single owner for which UCC is providing engineering services separated by a property for which there is not expected to be a future Planning Act Application submitted in the near future.

The area fronting on Rice Road will be consolidated into multiple properties that will be subject to separate applications for Site Plan Approval. The stormwater management facility characteristics for quantity control (storage) within these areas are not presently known and have therefore been included at existing conditions. Stormwater management quality controls will also be provided in accordance with the Implementation Plan.

For the area fronting onto Quaker Road, it is proposed to constuct a single communal wet pond SWM Facility (P50) to provide quality and quantity controls for Areas A52, A53, and A54 prior to discharging to the Towpath Drain.

Additionally, there is an existing catchment area within these lands that drain to the existing unnamed tributary to the Welland Recreational Canal that was constructed as part of the College Park Subdivision.

For the purposes of this Stormwater Management Plan, it was assumed that the majority of this area will convey future stormwater flows to the Towpath Drain. However, a separate SWM Plan will be submitted outlining the detailed calculations for this Block to ensure that future stormwater flows to each watercourse are controlled to existing levels.

Table 18. Stormwater Management Wet Pond Facility 'P50' Characteristics					
Design	Peak Flo	ws (L/s)	Maximum Elevation (m)	Maximum Storage (m3)	
Storm	Future Inflow	Future Outflow			
25mm	1,227	9	182.40	2,607	
2 Year	1,923	17	182.70	4,589	
5 Year	2,285	20	182.85	5,617	
10 Year	2,514	21	182.96	6,474	
25 Year	2,924	23	183.13	7,762	
100 Year	3,539	132	183.33	9,342	

Table 20 and 21 below summarize the design characteristics for Facility P50.

Table 19. SWM Facility 'P50' – MECP Quality Requirements Comparison				
SWM Facility Characteristic	MECP Requirement	Provided by SWM Facility		
Permanent Pool Volume (m ³) - <i>minimum</i>	3,287 (min)	5,743		
Extended Detention Volume (m ³) – minimum	2,782 (min)	7,895		
Total Quality + Detention Storage (m ³) – <i>minimum</i>	6,072 (min)	13,638		
Drawdown Time (hr) – minimum	24 (min)	99		
West Forebay				
Forebay Length (m) – minimum	12.42 (min)	18.50		
Forebay Width (m) – minimum	1.55 (min)	3.80		
Average Forebay Velocity (m/s) – maximum	0.15 (max)	0.04		
Cleanout Frequency (years) - minimum	10 (min)	11		
East Forebay	1			
Forebay Length (m) – minimum	6.98 (min)	18.50		
Forebay Width (m) – minimum	0.87 (min)	3.80		
Average Forebay Velocity (m/s) – maximum	0.15 (max)	0.03		
Cleanout Frequency (years) - minimum	10 (min)	20		

As shown in the above tables, Facility P50 has adequate capacity to provide stormwater management quantity and quality controls in accordance with MECP requirements and the requirements of the Implementation Plan.

5.3.4 Block 5

As shown in Figure 1, Block 5 consists of lands owned by multiple owners for which UCC is providing engineering services and will include a single communal wet pond SWM Facility (P40) providing quality and quantity controls for the Areas A40 to A45. A separate SWM Plan will be submitted outlining the detailed calculations for this Block.

Table 20. Stormwater Management Wet Pond Facility 'P40' Characteristics					
Design	Peak Flows (L/s)		Maximum	Maximum	
Storm	Future Inflow	Future Outflow	Elevation (m)	Storage (m3)	
25mm	1,513	41	186.59	3,005	
2 Year	2,374	64	187.04	5,502	
5 Year	2,832	72	187.27	6,887	
10 Year	3,124	129	187.42	7,854	
25 Year	3,648	198	187.60	9,121	
100 Year	4,453	430	187.86	10,981	

Table 18 and 19 below summarize the design characteristics for Facility P40.

Table 21. SWM Facility 'P40' – MECP Quality Requirements Comparison				
SWM Facility Characteristic	MECP Requirement	Provided by SWM Facility		
Permanent Pool Volume (m ³) - <i>minimum</i>	4,297 (min)	4,612		
Extended Detention Volume (m ³) – minimum	3,593 (min)	7,091		
Total Quality + Detention Storage (m ³) – <i>minimum</i>	7,890 (min)	11,703		
Drawdown Time (hr) – minimum	24 (min)	30		
West Forebay				
Forebay Length (m) – minimum	23.34 (min)	25.00		
Forebay Width (m) – minimum	2.92 (min)	5.20		
Average Forebay Velocity (m/s) – maximum	0.15 (max)	0.07		
Cleanout Frequency (years) - minimum	10 (min)	10		
East Forebay				
Forebay Length (m) – minimum	14.14 (min)	25.00		
Forebay Width (m) – <i>minimum</i>	1.77 (min)	5.00		
Average Forebay Velocity (m/s) – maximum	0.15 (max)	0.05		
Cleanout Frequency (years) - minimum	10 (min)	10		

As shown in the above tables, Facility P40 has adequate capacity to provide stormwater management quantity and quality controls in accordance with MECP requirements and the requirements of the Implementation Plan.

5.3.5 Existing and Future Peak Flow Comparison

As summarized in Table 22 below, the proposed SWM Facilities (P10 through P50) can provide adequate stormwater quantity controls to control future flows to the existing levels identified in the Implementation Plan at each identified outlet along the Towpath Drain during each storm event.

Table 22. Imp		Peak Flow (m ³ /s)	
Design Storm	Existing	Future with SWM	Change
Ups	stream of Rice Ro	ad Culvert Crossing – Outl	et A1
2 Year	1.317	0.983	-25.4%
5 Year	1.589	1.185	-25.4%
10 Year	1.800	1.344	-25.3%
25 Year	2.099	1.583	-24.6%
100 Year	2.558	1.908	-25.4%
Dow	nstream of Rice R	oad Culvert Crossing – Ou	tlet A2
2 Year	3.301	2.916	-11.7%
5 Year	4.194	3.502	-16.5%
10 Year	4.777	3.959	-17.1%
25 Year	5.619	4.621	-17.8%
100 Year	6.987	5.662	-19.0%
Tov	vpath Drain Upstı	ream of Existing PSW – Ou	tlet B
2 Year	3.425	3.353	-2.1%
5 Year	4.367	4.015	-8.1%
10 Year	4.977	4.532	-8.9%
25 Year	5.863	5.284	-9.9%
100 Year	7.305	6.464	-11.5%
Down	stream of First A	venue Culvert Crossing – O	Outlet C
2 Year	4.035	4.031	-0.1%
5 Year	5.176	4.834	-6.6%
10 Year	5.914	5.467	-7.6%
25 Year	7.005	6.402	-8.6%
100 Year	8.781	7.881	-10.2%
Upst	ream of Niagara S	Street Culvert Crossing – O	utlet D
2 Year	4.509	4.177	-7.4%
5 Year	5.835	5.016	-14.0%
10 Year	6.678	5.677	-15.0%
25 Year	7.938	6.649	-16.2%
100 Year	9.995	8.188	-18.1%

6.0 SEDIMENT AND EROSION CONTROL

Sediment controls are required during construction. The proposed extended detention facility can be used for this purpose. Therefore, the proposed constructed wet pond facility should be constructed prior to the facility for sediment control during construction.

The following additional erosion and sediment controls will also be implemented during construction:

- Install silt control fencing along the limits of construction where overland flows will flow beyond the limits of the development or into downstream watercourse.
- Re-vegetate disturbed areas as soon as possible after grading works have been completed.
- Lot grading and siltation controls plans will be provided with sediment and erosion control measures to the appropriate agencies for approval during the final design stage.
- The Stormwater management facility be cleaned after construction prior to assumption by municipality.

7.0 STORMWATER MANAGEMENT FACILITY MAINTENANCE

Maintenance is a necessary and important aspect of urban stormwater quality and quantity measures such as constructed wetlands. Many pollutants (i.e. nutrients, metals, bacteria, etc.) bind to sediment and therefore removal of sediment on a scheduled basis is required.

The wet pond for this development is subject to frequent wetting and deposition of sediments as a result of frequent low intensity storm event. The purpose of the wet pond is to improve post development sediment and contaminant loadings by detaining the 'first flush' flow for a 24 hour period. For the initial operation period of the stormwater management facility, the required frequency of maintenance is not definitively known and many of the maintenance tasks will be performed on an 'as required' basis. For example, during the home construction phase of the development there will be a greater potential for increased maintenance frequency, which depends on the effectiveness of sediment and erosion control techniques employed.

Inspections of the wet pond will indicate whether or not maintenance is required. Inspections should be made after every significant storm during the first two years of operation or until all development is completed to ensure the wet pond is functioning properly. This may translate into an average of six inspections per year. Once all building activity is finalized, inspections shall be performed annually. The following points should be addressed during inspections of the facility.

- a) Standing water above the inlet storm sewer invert a day or more after a storm may indicate a blockage in the reverse slope pipe or orifice. The blockage may be caused by trash or sediment and a visual inspection would be required to determine the cause.
- b) The vegetation around the wet pond should be inspected to ensure its function and aesthetics. Visual inspections will indicate whether replacement of plantings are required. A decline in vegetation habitat may indicate that other aspects of the constructed wet pond are operating improperly, such as the detention times may be inadequate or excessive.
- c) The accumulation of sediment and debris at the wet pond inlet sediment forebay or around the high water line of the wet pond should be inspected. This will indicate the need for sediment removal or debris clean up.
- d) The wet pond has been created by excavating a detention area. The integrity of the embankments should be periodically checked to ensure that it remains watertight and the side slopes have not sloughed.

Grass cutting is a maintenance activity that is done solely for aesthetic purposes. It is recommended that grass cutting be eliminated. It should be noted that municipal by-laws may require regular grass maintenance for weed control.

Trash removal is an integral part of maintenance and an annual clean-up, usually in the spring, is a minimum requirement. After this, trash removal is performed as required basis on observation of trash build-up during inspections.

To ensure long term effectiveness, the sediment that accumulates in the forebay area should be removed periodically to ensure that sediment in not deposited throughout the facility. For sediment removal operations, typical grading/excavating equipment should be used to remove sediment from the inlet forebay and detention areas. Care should be taken to ensure that limited damage occurs to existing vegetation and habitat.

Generally, the sediment which is removed from the detention pond will not be contaminated to the point that it would be classified as hazardous waste. However, the sediment should be tested to determine the disposal options.

8.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of this study, the following conclusions are offered:

- Infiltration techniques are not suitable for this site as the primary control facility due to the low soil infiltration rates.
- Two proposed stormwater management wet pond facilities will provide stormwater quality, quantity and erosion controls to the proposed development.
- Multiple stormwater management facilities external to the subject lands will provide stormwater quality, quantity and erosion controls for the respective catchment areas, to be addressed in separate SWM Reports as part of forthcoming Planning Act Applications.
- Various lot level vegetative stormwater management practices can be implemented to enhance stormwater quality.
- This report was prepared in accordance with the provincial guidelines contained in "Stormwater Management Planning and Design Manual, March 2003".

The above conclusions lead to the following recommendations:

- That the stormwater management criteria established in this report be accepted.
- That two stormwater management wet pond facilities be constructed to provide stormwater quality protection to MECP *Enhanced* Protection levels and quantity controls as outlined in this report.
- That the external SWM Facilities be constructed to the criteria established in the separately submitted SWM Reports.
- That additional lot level controls and vegetative stormwater management practices as described previously in this report be implemented.
- That sediment and erosion controls during construction as described in this report be implemented.

Respectfully Submitted, B. J. KAPTEYN B. J. KAPTEYN 100509155 B. J. KAPTEYN 100509155 B. J. KAPTEYN 100509155 B. J. KAPTEYN 100509155

APPENDICES

APPENDIX A Existing Conditions MIDUSS Output File

Output File (4.7) EX.OUT opened 2024-04-03 15:59 Units used are defined by G = 9.810 24 144 10.000 are MAXDT MAXHYD & DTMIN values Licensee: UPPER CANADA CONSULTANTS 35 COMMENT COMMENT l line(s) of comment STORMWATER MANAGEMENT PLAN 4 QUAKER ROAD CITY OF WELLAND EXISTING CONDITIONS 35 COMMENT 3 line(s) of comment ***** 25mm STORM EVENT STORM 2 1=Chicago;2=Huff;3=User;4=Cdnlhr;5=Historic 512.000 Coefficient a Constant b (min) Exponent c Fraction to peak r 6.000 .800 450 Duration 240 min 25.035 mm Total depth 240 000 IMPERVIOUS Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1 .015 Manning "n" SCS Curve No or C 98.000 .100 Ia/S Coefficient Initial Abstraction 35 COMMENT ********* 4 CATCHMENT 1 000 TD No 99999 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious 15.820 325.000 1.000 35.000 325.000 Length (IMPERV) sengut (IMPERV) % Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C SCS Curve No or C .000 . 250 74.000 Ia/S Coefficient Initial Abstraction .100 8.924 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
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 C perv/imperv/total
 .461 ADD RUNOFF .461 15 1.269 .000 .000 c.m/s CATCHMENT 4.000 ID No. 99999 45 500 Area in hectares 4 45.500 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 43.300 551.000 1.000 21.000 551.000 .000 . 250 Manning "n" SCS Curve No or C Ia/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .611 1.269 .000 .000 c.m/s .098 .804 .247 C perv/imperv/total INNOFP Manning "n" 74.000 8.924 ADD RUNOFF .611 1.879 .000 .000 c.m/s COMMENT 15 35 3 line(s) of comment AREA SOUTH OF QUAKER

4 CATCHMENT ID No. 99999 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious 5.000 5.310 188.000 1.000 10.000 Per cent impervious Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning *n* SCS Curve No or C Y=C0 Confectories 188.000 .000 .250 74.000 SCS Curve No or C Ia/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .051 1.879 .000 .000 c.m/s .098 .806 .169 C perv/imperv/total MORP .100 8.924 15 ADD RUNOFF .051 1.930 .000 .000 c.m/s 4 SCS Curve No or C Ia/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .255 1.930 .000 .000 c.m/s .098 .803 .162 C perv/imperv/total COMMENT 35 3 line(s) of comment TOTAL FLOW AT FIRST AVENUE 15 ADD RUNOFF .255 2.185 .000 .000 c.m/s ROUTE 9 Conduit Length .000 N. Z' J F JO O No Conduit Length No Conduit defined Zero lag Beta weighting factor .000 Beta weighting facto: .000 Routing timestep 0 No. of sub-reaches .255 2.185 2.1 COMBINE 2.185 .000 c.m/s COMBINE .- 2.100 .000 c.m/s 1 Junction Node No. .255 2.185 2.185 2.185 c.m/s START 17 14 1=Zero; 2=Define COMMENT 3 line(s) of comment 35 AREA SOUTH OF QUAKER 4 CATCHMENT CATCHM 7.000 16.470 331.000 1.000 10.000 ID No. 99999 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CM/C: 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C Ia/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 49 000 2: 185 c.m/c 331.000 .000 .250 .250 74.000 .100 8.924 1 .149 .149 .000 2.185 2.185 c.m/s .098 .805 .169 C perv/imperv/total 15 ADD RUNOFF .149 ROUTE .149 2.185 2.185 c.m/s 9 Conduit Length .000 No Conduit defined .000 .000 Zero lag Beta weighting factor 2.185 c.m/s 17 Junction Node No. 1 .149 .149 .149 .149 .149 .147 CONFLUENCE 1 JUNCE 1 JUNCE 149 2.334 .149 CATCHMENT 8.000 ID No. 99999 42.190 Area in hectares Tength (PERV) metres 2.334 c.m/s 18 .000 c.m/s 4 530.000 Length (PERV) metres Gradient (%) Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1.000 9.000 530.000 1 .250 Manning "n" SCS Curve No or C Ia/S Coefficient 74.000 .100 Ia/S Coefficient 8.924 Initial Abstraction 10 Option 1=Triang1r; 2=Rectang1r; 3=SWM HYD; 4=Lin. Reserv .250 2.334 .149 .000 c.m/s .098 .803 .162 C perv/imperv/total COMMENT 35 3 line(s) of comment TOTAL FLOW AT NIAGARA STREET ADD RUNOFF 250 2.584 .149 HYDROGRAPH DISPLAY 5 is # of Hyeto/Hydrograph chosen Volume = .1074966E+05 c.m STRAT 1 l=Zero; 2=Define 15 .149 .000 c.m/s 27 14

35 COMMENT line(s) of comment 2-YEAR STORM EVENT 2 STORM 1=Chicago;2=Huff;3=User;4=Cdnlhr;5=Historic l=Chicago;2=Huff;3=User;4: Coefficient a Constant b (min) Exponent c Fraction to peak r Duration 240 min 38.971 mm Total depth 755.000 8.000 450 240.000 3 IMPERVIOUS JS Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C IA/S Coefficient Initial Abstraction .015 98.000 .100 .518 35 COMMENT line(s) of comment 3 AREA NORTH OF QUAKER 4 CATCHMENT ID No. 99999 Area in hectares 1.000 15.820 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 325.000 1.000 35.000 325.000 .000 1 .250 Manning "n" Manning "n" SCS Curve No or C Ia/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .813 .000 .149 .000 c.m/s .194 .859 .427 C perv/imperv/total Work 74.000 8.924 15 ADD RUNOFF .813 .149 .000 c.m/s .813 4 CATCHMENT ID No. 99999 Area in hectares Length (PERV) metres 2.000 13.570 301.000 1.000 Gradient (%) Per cent Impervious Length (IMPERV) 25.000 Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CD/C? 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C To (C or effective) 301 000 .000 .250 74.000 .:uv Ia/S Coefficient 8:924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .504 .813 .149 .000 c.m/s .194 .862 .361 C perv/imperv/total COMMENT 3 line(c) (35 COMMENT 3 line(s) of comment **************************** FLOW AT RICE ROAD ADD RUNOFF .504 1.317 .149 .000 c.m/s CATCHMENT 3.000 ID No. 99999 15 3.000 14.520 Area in hectares 14.520 311.000 1.000 35.000 311.000 .000 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1 .250 Manning "n" SCS Curve No or C 74.000 SCS Curve No or C Ia/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .749 1.317 .149 .000 c.m/s .194 .861 .428 C perv/imperv/total MMPP 100 8 924 15 ADD RUNOFF 2.066 .149 .000 c.m/s .749 .749 2.000 ... CATCHMENT 4.000 ID No. 99999 45.500 Area in hectares 51.000 Length (PERV) metres 1.000 Gradient (%) 21.000 Per cent Impervious 51.000 Length (IMPERV) 200 % Tem with Zero Opth 4 4.000 45.500 551.000 551.000 Length (IMVERV) %Imp.with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C 000 . 250 74.000 .100 8.924 Ia/S Coefficient Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1.153 2.066 .149 .000 c.m/s .194 .868 .336 C perv/imperv/total .194 .868 ADD RUNOFF 1.153 3.219 COMMENT 15 .000 c.m/s .149 35 3 line(s) of comment AREA SOUTH OF QUAKER

4 CATCHMENT CATCHM 5.000 5.310 188.000 1.000 10.000 ID No. 99999 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C Ta(S Confficient) 188.000 .000 .250 74.000 .100 8.924 Ia/S Coefficient .100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .082 3.219 .149 .000 c.m/s .194 .863 .261 C perv/imperv/total ADD RUNOFF .082 3.301 .149 .000 c.m/s CUCTUMENT 15 ADD RUWVe: .082 3.5v1 CATCHMENT 6.000 ID No. 99999 43.410 Area in hectares 538.000 Length (PERV) metres 1.000 Gradient (%) 9.000 Per cent Impervious 538.000 Length (IMPERV) .000 %Imp.with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat ^~^ Manning ~** ~ No or C 4 6.000 43.410 538.000 1.000 9.000 538.000 .000 Option 1=SCS CM/Cf 2=Horton; 3=Green-Ampt; 4=Repeat Manning "" SCS Curve No or C Ia/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 95, 2, 201 .250 74.000 .100 8.924 35 TOTAL FLOW AT FIRST AVENUE 15 ADD RUNOFF .485 3.786 .149 .000 c.m/s ROUTE 9 Conduit Length .000 No Conduit Length No Conduit defined Zero lag Beta weighting factor .000 .000 Routing timestep No. of sub-reaches 85 3.786 3. .000 .485 COMBINE 3.786 .000 c.m/s COMBINE ... J.rov .000 c.m/s 1 Junction Node No. .485 3.786 3.786 3.786 c.m/s START 17 14 1=Zero; 2=Define 1 l=Zero; 2=Define COMMENT 3 line(s) of comment *********** 35 AREA SOUTH OF QUAKER 4 CATCHMENT 7.000 16.470 331.000 ID No. 99999 Area in hectares Length (PERV) metres Gradient (%) 1.000 Per cent Impervious Per cent Impervious Length (IMPERV) & %Imp. with Zero Dpth Option 1=SCS CN/C: 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C Ia/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 49 000 3 796 c m/c 331.000 .000 .250 74.000 .100 1 .249 .249 .000 3.786 3.786 c.m/s .194 .858 .261 C perv/imperv/total 15 ADD RUNOFF FF 249. ROUTE .249 3.786 3.786 c.m/s 9 Conduit Length .000 No Conduit defined .000 .000 Zero lag Beta weighting factor 3.786 c.m/s 17 Junction Node No. 1 nuction Node No. .249 .249 .249 .249 .249 CONFLUENCE 1 Junction Node No. .249 4.035 .249 CATCHMENT 8.000 ID No. 99999 42.190 Area in hectares Vencth (PERV) metres 4.035 c.m/s 18 .000 c.m/s 4 530.000 Length (PERV) metres Gradient (%) Per cent Impervious Length (IMPERV) %Imp, with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Mongoury 1 = prof. 1.000 9.000 530.000 1 .250 SCS Curve No or C Ia/S Coefficient 74.000 .100 Ia/S Coefficient 8.924 Initial Abstraction 10 Option 1=Triang1r; 2=Rectang1r; 3=SWM HYD; 4=Lin. Reserv .474 4.035 .249 .000 c.m/s .194 .867 .255 C perv/imperv/total COMMENT 35 3 line(s) of comment TOTAL FLOW AT NIAGARA STREET ADD RUNOFF .474 4.509 HYDROGRAPH DISPLAY 15 .249 .000 c.m/s ribKUGRAPH DISPLAY 5 is # of Hyeto/Hydrograph chosen Volume = .2362202E+05 c.m STRAT 1 1=Zero; 2=Define 27

35 COMMENT line(s) of comment 5-YEAR STORM EVENT 2 STORM 1=Chicago;2=Huff;3=User;4=Cdnlhr;5=Historic l=Chicago;2=Huff;3=User;4: Coefficient a Constant b (min) Exponent c Fraction to peak r Duration 240 min 45.874 mm Total depth 830.000 7.300 .777 .450 240.000 з 1 .015 98.000 .100 35 COMMENT line(s) of comment 3 AREA NORTH OF QUAKER 4 CATCHMENT ID No. 99999 Area in hectares 1.000 15.820 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 325.000 1.000 35.000 325.000 .000 1 .250 Manning "n" Manning "n" SCS Curve No or C Ia/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .980 .000 .249 .000 c.m/s .235 .880 .461 C perv/imperv/total WNPP 74.000 8.924 15 ADD RUNOFF .980 .249 .000 c.m/s .980 4 CATCHMENT ID No. 99999 Area in hectares Length (PERV) metres 2.000 13.570 301.000 1.000 Gradient (%) Per cent Impervious Length (IMPERV) 25.000 Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CD/C? 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C To (C or effective) 301 000 .000 .250 74.000 .:uv Ia/S Coefficient 8:924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .608 .980 .249 .000 c.m/s .236 .883 .398 C perv/imperv/total COMMENT 3 line(=) 5 35 COMMENT 3 line(s) of comment **************************** FLOW AT RICE ROAD ADD RUNOFF .608 1.589 .249 .000 c.m/s CATCHMENT 3.000 ID No. 99999 15 3.000 14.520 Area in hectares 14.520 311.000 1.000 35.000 311.000 .000 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1 .250 Manning "n" SCS Curve No or C 74.000 SCS Curve No or C Ia/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .902 1.589 .249 .000 c.m/s .236 .882 .462 C perv/imperv/total 100 8 924 15 ADD RUNOFF .902 2.491 .249 .000 c.m/s 4 4.000 45.500 551.000 551.000 Length (IMVERV) %Imp.with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C . 250 74.000 .100 8.924 Ia/S Coefficient Initial Abstraction
 1
 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv

 1.602
 2.491
 .249
 .000 c.m/s

 .236
 .885
 .372
 C perv/imperv/total
 .236 .885 ADD RUNOFF 1.602 4.093 COMMENT 15 .000 c.m/s .249 35 3 line(s) of comment AREA SOUTH OF QUAKER

4 CATCHMENT CATCHM 5.000 5.310 188.000 1.000 10.000 ID No. 99999 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C Ta(S Confficient) 188.000 .000 .250 74.000 .100 8.924 Ia/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .101 4.093 .249 .000 c.m/s .236 .875 .300 C perv/imperv/total .236 .875 .300 C perv/imperv/local ADD RUNOFF .101 4.194 .249 .000 c.m/s CATCHMENT 6.000 ID No. 99999 43.410 Area in hectares 538.000 Length (PERV) metres 1.000 Gradient (%) 9.000 Per cent Impervious 538.000 Length (IMPERV) .000 & Imp. with Zero Dpth 1 O Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning *n* 15 4 6.000 43.410 538.000 1.000 9.000 538.000 .000 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .676 4.194 .249 .000 c.m/s .236 .885 .294 C perv/imperv/total COMMENT 35 TOTAL FLOW AT FIRST AVENUE 15 ADD RUNOFF .676 4.870 .249 ROUTE .000 c.m/s 9 Conduit Length .000 No Conduit Length No Conduit defined Zero lag Beta weighting factor .000 .000 Routing timestep No. of sub-reaches 76 4.870 4. .000 COMBINE 1 4.870 .000 c.m/s 17 14 1=Zero; 2=Define 1 l=Zero; 2=Define COMMENT 3 line(s) of comment *********** 35 AREA SOUTH OF QUAKER 4 CATCHMENT 7.000 ID No. 99999 16.470 331.000 Area in hectares Length (PERV) metres Gradient (%) 1.000 Per cent Impervious Per cent Impervious Length (IMPERV) & %Imp. with Zero Dpth Option 1=SCS CN/C: 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C Ia/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 06 000 4 870 c m/c 331.000 .000 .250 74.000 .100 1 . 306 .306 .000 4.870 4.870 c.m/s .236 .880 .300 C perv/imperv/total 15 ADD RUNOFF .306 ROUTE .306 4.870 4.870 c.m/s 9 Conduit Length .000 No Conduit defined .000 .000 Zero lag Beta weighting factor 4.870 c.m/s 17 Junction Node No. 1 .306 .306 .306
 .306
 .300

 CONFLUENCE
 JUNCTION Node No.

 .306
 5.176
 .306

 CATCHMENT No.
 99999

 42.190
 Area in hectares

 Yength (PERV) metres
 5.176 c.m/s 18 .000 c.m/s 4 530.000 Length (PERV) metres Gradient (%) Per cent Impervious Length (IMPERV) %Imp, with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Mongoury 1 = prof. 1.000 9.000 530.000 1 .250 SCS Curve No or C Ia/S Coefficient 74.000 .100 Ia/S Coefficient 8.924 Initial Abstraction 10 Option 1=Triang1r; 2=Rectang1r; 3=SWM HYD; 4=Lin. Reserv .659 5.176 .306 .000 c.m/s .236 .885 .294 C perv/imperv/total COMMENT 35 3 line(s) of comment TOTAL FLOW AT NIAGARA STREET ADD RUNOFF .659 5.835 HYDROGRAPH DISPLAY 15 .306 .000 c.m/s HYDROGRAPH DISPLAY 5 is # of Hyeto/Hydrograph chosen Volume = .3122033E+05 c.m STRAT 1 1=Zero; 2=Define 27

35 COMMENT line(s) of comment 10-YEAR STORM EVENT 2 STORM 1=Chicago;2=Huff;3=User;4=Cdnlhr;5=Historic l=Chicago;2=Huff;3=User;4: Coefficient a Constant b (min) Exponent c Fraction to peak r Duration 240 min 51.471 mm Total depth 860.000 6.500 450 240.000 з IMPERVIOUS JS Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C IA/S Coefficient Initial Abstraction .015 98.000 .100 .518 COMMENT 35 line(s) of comment 3 AREA NORTH OF QUAKER 4 CATCHMENT ID No. 99999 Area in hectares 1.000 15.820 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 325.000 1.000 35.000 325.000 .000 1 .250 Manning "n" 0 Manning "n" SCS Curve No or C 1 Ia/S Coefficient 4 Initial Abstraction 1 Option 1=Triang1r; 2=Rectang1r; 3=SWM HYD; 4=Lin. Reserv 1.110 .000 .306 .000 c.m/s .267 .894 .486 C perv/imperv/total pumore 74.000 100 8.924 1 ADD RUNOFF 15 JNOFF 1.110 1.110 .306 .000 c.m/s CATCHMENT 4 ID No. 99999 Area in hectares Length (PERV) metres 2.000 13.570 301.000 Length (PERV) metres Gradient (%) Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C Lo(6 Coefficient 1.000 25.000 301 000 .000 .250 74.000 .uu Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .690 1.110 .306 .000 c.m/s .267 .896 .424 C perv/imperv/total COMMENT 35 COMMENT 3 line(s) of comment ********************************** FLOW AT RICE ROAD ADD RUNOFF .690 1.800 .306 .000 c.m/s CATCHMENT 3.000 ID No. 99999 14.520 Area in bectares 15 14.520 311.000 Area in hectares Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth 311.000 1.000 35.000 311.000 .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1 .250 Manning "n"
 Manning "n"

 00
 SCS Curve No or C

 01
 Ia/S Coefficient

 124
 Initial Abstraction

 1
 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv

 1.020
 1.800
 .306
 .000 c.m/s

 .267
 .896
 .487
 C perv/imperv/total

 DRNOFF
 .
 .
 .
 .
 74.000 .100 8.924 ADD RUNOFF 15 1.020 2.820 .306 .000 c.m/s
 1.020
 2.820
 ...

 CATCHMENT
 4.000
 ID No. 99999

 45.500
 Area in hectares

 51.000
 Length (PERV) metres

 1.000
 Gradient (%)

 21.000
 Per cent Impervious

 551.000
 Length (IMPERV)

 2000
 %Imp with Zero Opth
 4 4.000 45.500 551.000 551.000 Length (IMPERV) %Imp.with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C 000 . 250 74.000 o.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1.840 2.820 .306 .000 c.m/s .267 .896 .399 C perv/imperv/total ADD RUNOFF 1.840 4.660 .306 .000 c.m/s COMMENT 3 line(c) -f 15 35 3 line(s) of comment AREA SOUTH OF QUAKER

4 CATCHMENT ID No. 99999 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious 5.000 5.310 188.000 1.000 10.000 Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C Ta(S Confficient) 188.000 .000 .250 74.000 .100 8.924 Ia/S Coefficient Ia/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .117 4.660 .306 .000 c.m/s .267 4.883 .328 C perv/imperv/total wyper .267 .883 .328 C perv/imperv/total ADD RUNOFF .117 4.777 .306 .000 c.m/s CATCHMENT 6.000 ID No. 99999 43.410 Area in hectares 538.000 Length (PERV) metres 1.000 Gradient (%) 9.000 Per cent Impervious 538.000 Length (IMPERV) .000 % Imp. with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning *n* 15 4 6.000 43.410 538.000 1.000 9.000 538.000 .000 Option 1=SCS CM/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C Ia/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .784 4.777 .306 .000 c.m/s .267 .896 .323 C perv/imperv/total F .250 74.000 .100 8.924 1 .784 COMMENT 35 3 line(s) of comment TOTAL FLOW AT FIRST AVENUE ADD RUNOFF .784 5.561 .306 .000 c.m/s ROUTE 15 9 Conduit Length .000 No Conduit Length No Conduit defined Zero lag Beta weighting factor .000 . Beta weighting facto .000 Routing timestep 0 No. of sub-reaches .784 5.561 5. COMBINE 5.561 .000 c.m/s 17 14 1=Zero; 2=Define 1 l=Zero; 2=Define COMMENT 3 line(s) of comment *********** 35 AREA SOUTH OF QUAKER 4 CATCHMENT CATCHM 7.000 16.470 331.000 1.000 10.000 ID No. 99999 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious Per cent Impervious Length (IMPERV) & %Imp. with Zero Dpth Option 1=SCS CN/C: 2=Horton; 3=Green-Ampt; 4=Repeat Manning "* SCS Curve No or C Ia/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 52 000 5 5 561 c m/c 331.000 .000 .250 .250 74.000 .100 8.924 1 .353 .000 5.561 5.561 c.m/s .267 .894 .329 C perv/imperv/total . 353 15 ADD RUNOFF .353 ROUTE .353 5.561 5.561 c.m/s 9 Conduit Length .000 No Conduit defined .000 .000 Zero lag Beta weighting factor 5.561 c.m/s 17 OMBINE Junction Node No. .353 .353 .353 1 5.914 c.m/s 18 .000 c.m/s 4 Area in hectares Length (PERV) metres 530.000 Length (PERV) metres Gradient (%) Per cent Impervious Length (IMPERV) %Imp, with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Mongoury 1 = prof. 1.000 9.000 530.000 1 .250 SCS Curve No or C Ia/S Coefficient 74.000 .100 Ia/S Coefficient Initial Abstraction Option 1=Triang1r; 2=Rectang1r; 3=SWM HYD; 4=Lin. Reserv .764 5.914 .353 .000 c.m/s .267 .896 .323 C perv/imperv/total 8.924 COMMENT 35 3 line(s) of comment TOTAL FLOW AT NIAGARA STREET ADD RUNOFF .764 6.678 HYDROGRAPH DISPLAY 15 .353 .000 c.m/s HYDROGRAPH DISPLAY 5 is # of Hyeto/Hydrograph chosen Volume = .3783245E+05 c.m STRAT 1 1=Zero; 2=Define 27

35 COMMENT line(s) of comment 25-YEAR STORM EVENT 2 STORM 1=Chicago;2=Huff;3=User;4=Cdnlhr;5=Historic l=Chicago;2=Huff;3=User;4: Coefficient a Constant b (min) Exponent c Fraction to peak r Duration 240 min 59.713 mm Total depth 900.000 5.200 450 240.000 з IMPERVIOUS JS Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C IA/S Coefficient Initial Abstraction .015 98.000 .100 .518 35 COMMENT line(s) of comment 3 AREA NORTH OF QUAKER 4 CATCHMENT ID No. 99999 Area in hectares 1.000 15.820 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 325.000 1.000 35.000 325.000 .000 1 .250 Manning "n" Manning 'n' SCS Curve No or C Ia/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 74.000 8.924 1
 0
 Option 1=Trlangir, z=ketcangir, z=ketcang ADD RUNOFF 15 JNOFF 1.306 1.306 .353 .000 c.m/s CATCHMENT 4 ID No. 99999 Area in hectares Length (PERV) metres 2.000 13.570 301.000 Length (PERV) metres Gradient (\$) Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C Lo(6 Coefficient 1.000 25.000 301 000 .000 .250 74.000 .:uv Ia/S Coefficient 8.924 Initial Abstraction 1 Option l=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .793 1.306 .353 .000 c.m/s .308 .910 .459 C perv/imperv/total COMMENT 3 line(c) C 35 FLOW AT RICE ROAD ADD RUNOFF .793 2.099 .353 .000 c.m/s CATCHMENT 3.000 ID No. 99999 14.520 Area in bectares 15 14.520 311.000 Area in hectares Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth 311.000 1.000 35.000 311.000 .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1 .250 Manning "n" Manning "n" SCS Curve No or C Ia/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1.164 2.099 .353 .000 c.m/s .308 .910 .519 C perv/imperv/total UNOFF 74.000 .100 8.924 ADD RUNOFF 15 1.164 3.263 .353 .000 c.m/s
 1.164
 ...

 CATCHMENT
 4.000
 ID No. 99999

 45.500
 Area in hectares

 551.000
 Length (PERV) metres

 1.000
 Gradient (%)

 21.000
 Per cent Impervious

 551.000
 Length (IMPERV)

 %Tmp. with Zero Dpth
 4 4.000 45.500 551.000 551.000 Length (IMVERV) %Imp.with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C . 250 15 35 3 line(s) of comment AREA SOUTH OF QUAKER

4 CATCHMENT CATCHM 5.000 5.310 188.000 1.000 10.000 ID No. 99999 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C Ta(S Confficient) 188.000 .000 .250 74.000 .100 8.924 Ia/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .146 5.473 .353 .000 c.m/s .308 .892 .367 C perv/imperv/total .146 ADD RUNOFF .146 5.619 .353 .000 c.m/s CATCHMENT 6.000 ID No. 99999 43.410 Area in hectares i38.000 Length (PERV) metres 1.000 Gradient (%) 9.000 Per cent Impervious 538.000 Length (IMPERV) .000 % Imp. with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning *n* 15 4 6.000 43.410 538.000 1.000 9.000 538.000 .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
 .250 Manning "n"
 74.000 SCS Curve No or C
 .100 Ia/S Coefficient
 8.924 Initial Abstraction
 1 Option 1=TriangIr; 2=RectangIr; 3=SWM HYD; 4=Lin. Reserv
 .957 5.619 .353 .000 c.m/s
 .308 .906 .362 C perv/imperv/total
 COMMENT
 COMMENT 35 3 line(s) of comment TOTAL FLOW AT FIRST AVENUE ADD RUNOFF .957 6.576 .353 .000 c.m/s ROUTE 15 9 Conduit Length .000 No Conduit Length No Conduit defined Zero lag Beta weighting factor .000 .000 Routing timestep No. of sub-reaches 57 6.576 6 .000 0 .957 COMBINE 6.576 .000 c.m/s 17 14 1=Zero; 2=Define 1 l=Zero; 2=Define COMMENT 3 line(s) of comment *********** 35 AREA SOUTH OF QUAKER 4 CATCHMENT CATCHM 7.000 16.470 331.000 1.000 10.000 ID No. 99999 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious Per cent Impervious Length (IMPERV) & %Imp. with Zero Dpth Option 1=SCS CN/C: 2=Horton; 3=Green-Ampt; 4=Repeat Manning "* SCS Curve No or C Ia/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 20 000 6 576 6 576 c.m/c 331.000 .000 .250 .250 74.000 .100 8.924 1 .429 .000 6.576 6.576 c.m/s .308 .909 .369 C perv/imperv/total . 429 15 ADD RUNOFF .429 ROUTE .429 6.576 6 576 c m/s 9 Conduit Length .000 No Conduit defined .000 .000 Zero lag Beta weighting factorBeta weighting factor .000 Routing timestep 0 No. of sub-reaches .429 .429 .429 COMBINE 6.576 c.m/s 17 Junction Node No. 1 .429 .429 .429 ENCE .429 .227 CONFLUENCE 1 Junction Node No. .429 7.005 .429 CATCHMENT 8.000 ID No. 99999 7.005 c.m/s 18 .000 c.m/s 4 Area in hectares Length (PERV) metres 530.000 Length (PERV) metres Gradient (%) Per cent Impervious Length (IMPERV) %Imp, with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Mongoury 1 = prof. 1.000 9.000 530.000 1 .250 SCS Curve No or C Ia/S Coefficient 74.000 .100 Ia/S Coefficient 8.924 Initial Abstraction 10 Option 1=Triang1r; 2=Rectang1r; 3=SWM HYD; 4=Lin. Reserv .933 7.005 .429 .000 c.m/s .308 .906 .362 C perv/imperv/total COMMENT 35 3 line(s) of comment TOTAL FLOW AT NIAGARA STREET ADD RUNOFF .933 7.938 .429 HYDROGRAPH DISPLAY 5 is # of Hyeto/Hydrograph chosen Volume = .4820893E+05 c.m START 1 l=Zero; 2=Define 15 .429 .000 c.m/s 27

35 COMMENT line(s) of comment 100-YEAR STORM EVENT 2 STORM 1=Chicago;2=Huff;3=User;4=Cdnlhr;5=Historic l=Chicago;2=Huff;3=User;4: Coefficient a Constant b (min) Exponent c Fraction to peak r Duration 240 min 73.203 mm Total depth 1020.000 4.700 450 240.000 з IMPERVIOUS JS Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C IA/S Coefficient Initial Abstraction 1 .015 98.000 .100 .518 35 COMMENT line(s) of comment 3 AREA NORTH OF QUAKER 4 CATCHMENT ID No. 99999 Area in hectares 1.000 15.820 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 325.000 1.000 35.000 325.000 .000 1 .250 Manning "n" 0 Manning "n" 0 SCS Curve No or C 0 Ia/S Coefficient 4 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1.566 .000 .429 .000 c.m/s .366 .924 .562 C perv/imperv/total RNOFF 74.000 8.924 1 ADD RUNOFF 15 JNOFF 1.566 1.566 .429 .000 c.m/s CATCHMENT 4 ID No. 99999 Area in hectares Length (PERV) metres 2.000 13.570 301.000 Length (PERV) metres Gradient (\$) Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C Lo(6 Coefficient 1.000 25.000 301 000 .000 .250 74.000 .uu Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .992 1.566 .429 .000 c.m/s .367 .923 .506 C perv/imperv/total COMMENT 35 COMMENT 3 line(s) of comment ********************************** FLOW AT RICE ROAD ADD RUNOFF .992 2.558 .429 .000 c.m/s CATCHMENT 3.000 ID No. 99999 14.520 Area in bectares 15 14.520 311.000 Area in hectares Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth 311.000 1.000 35.000 311.000 .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1 .250 Manning "n" 0 Manning "n" 0 SCS Curve No or C 0 Ia/S Coefficient 4 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1.440 2.558 .429 .000 c.m/s .367 .923 .562 C perv/imperv/total RNOOF 74.000 .100 8.924 1 ADD RUNOFF 15 UNOFF 1.440 3.998 .429 .000 c.m/s 1.440 3.998 .429 .000 c.m/s CATCHMENT 4.000 ID No. 99999 45.500 Area in hectares 51.000 Gradient (%) 21.000 Per cent Impervious 51.000 Length (IMPERV) .000 %Imp. with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 4 4.000 45.500 551.000 21.000 551.000 .100 8.924 Ia/S Coefficient
 8.924
 Initial Abstraction

 1
 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv

 2.790
 3.998
 .429
 .000 c.m/s

 .368
 .916
 .483
 C perv/imperv/total

 ADD RUNOFF
 2.790
 6.789
 .429
 .000 c.m/s

 COMMENT
 .000 c.m/s
 .000 c.m/s
 .000 c.m/s
 15 35 3 line(s) of comment AREA SOUTH OF QUAKER

4 CATCHMENT CATCHM 5.000 5.310 188.000 1.000 10.000 ID No. 99999 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C Ta(S Confficient) 188.000 .000 .250 74.000 .100 8.924 Ia/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .199 6.789 .429 .000 c.m/s .367 .904 .421 C perv/imperv/total .199 15 4 6.000 43.410 538.000 1.000 9.000 538.000 .000 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=TriangIr; 2=RectangIr; 3=SWM HYD; 4=Lin. Reserv 1.246 6.987 .429 .000 c.m/s .368 .915 .417 C perv/imperv/total COMMENT 3 line(c) =f 35 3 line(s) of comment TOTAL FLOW AT FIRST AVENUE 15 ADD RUNOFF 1.246 8.233 .429 .000 c.m/s 9 ROUTE Conduit Length No Conduit defined Zero lag Beta weighting factor Routing timestep .000 Routing timestep No. of sub-reaches 46 8.233 8. .000 0 1.246 , 8 233 000 cm/s
 1.246
 8.233
 8.233
 .000 C.m/s

 COMBINE
 Junction Node No.
 1.246
 8.233
 8.233
 c.m/s

 START
 8.233
 8.233
 c.m/s
 s.233
 1.000 C.m/s
 17 14 START 1 1=Zero; 2=Define COMMENT 35 line(s) of comment AREA SOUTH OF QUAKER CATCHMENT 4 ID No. 99999 Area in hectares Length (PERV) metres Gradient (%) 7.000 16.470 331.000 1.000 10.000 Per cent Impervious Per cent Impervious Length (IMPERV) & %Imp. with Zero Dpth Option 1=SCS CN/C: 2=Horton; 3=Green-Ampt; 4=Repeat Manning "* SCS Curve No or C Ia/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 48 000 & 233 & 233 c.m/c 331.000 .000 .250 .250 74.000 .100 8.924 1 . 548 .548 .000 8.233 8.233 c.m/s .368 .925 .423 C perv/imperv/total L. C perv/imper .548 .548 8.233 8.233 c.m/s ROUTE 15 9 Conduit Length .000 No Conduit defined .000 .000 Zero lag Beta weighting factor 8.233 c.m/s 17 Junction Node No. 1 1000 Node No. .548 .548 .548 CONFLUENCE J JUNCE 548 8.781 .548 CATCHMENT 8.000 ID No. 99999 42.190 Area in hectares Length (PERV) metres 8.781 c.m/s 18 .000 c.m/s 4 530.000 Length (PERV) metres Gradient (%) Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Monnog "n" 1.000 9.000 530.000 .000 1 .250 SCS Curve No or C 74.000 .100 8.924 74.000 .100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1.214 8.781 .548 .000 c.m/s .368 .916 .417 C perv/imperv/total COMMENT 35 3 line(s) of comment TOTAL FLOW AT NIAGARA STREET ADD RUNOFF 1.214 9.995 15 .548 .000 c.m/s HYDROGRAPH DISPLAY 27 HYDROGRAPH DISPLAY 5 is # of Hyeto/Hydrograph chosen Volume = .6645652E+05 c.m STRRT 1 1=Zero; 2=Define

APPENDIX B Stormwater Management Facility Calculations (P30)

	nes, ON, L2V		8. 276 0114		TTV OF WET	LAND							
PROJECT			& 216 QUA	KER ROAD, C	IT I OF WEL	LAND							
PROJECT	NU.:	1601		DDODOG									
									NS (POND F	,			1.01
Quality Req	-	10.10			y Orifice		Dutlet Wein		Overflow	- •		tflow Pipe Or	
0	e Area (ha) =			Diameter (m) =		Perimeter Le	0		Length $(m) =$		I	Diameter (m) =	
	ed (m3/ha) =				= 0.63	Inlet Eleva	ation $(m) =$	180.10	Slopes $(X:1) =$				= 0.65
	ol (m3/ha) =			Invert (m) =	= 178.80				Invert (m) =	180.60		Invert (m) =	
	l Vol (m3) =											Obvert (m) =	
	ive Vol (m3)					Drawdown T			· · ·		Тор	o of Pipe (m) =	= 179.35
	E Volume =	,		Water S	Surface Elevation								
Water I	Level Elev. =	178.80	m			tion 4.11 Draw							
					-	tion 4.11 Draw							
					MOI	E Equation 4.1	1 Drawdow	n Time (h) =	= 29				
				Average						Max			
	Increment		Surface	Surface	Increment	Permanent	Active	Quality	Ditch	Pipe	Overflow	Total	Average
Elevation	Depth	Depth	Area	Area	Volume	Volume	Volume	Orifice	Inlet	Orifice	Spillway	Outflow	Discharg
	(m)	(m)	(m2)	(m2)	(m3)	(m3)	(m3)	(m3/s)	(m3/s)	(m3/s)	(m3/s)	(m3/s)	(m3/s)
177.20		-1.60	812			0							
5:1 SLOPE	0.60			1,015	609								
177.80		-1.00	1,218			609							
5:1 SLOPE	0.50			1,410	705								
178.30		-0.50	1,602			1,314							
5:1 SLOPE	0.50			1,814	907								
178.80		0.00	2,026			2,221							
5:1 SLOPE													
178.80		0.00	2,741				0	0.000	0.000	0.000	0.000	0.000	
5:1 SLOPE	0.50			3,039	1,520								0.023
179.30		0.50	3,338				1,520	0.026	0.000	0.205	0.000	0.026	
5:1 SLOPE	0.80			3,912	3,130								0.161
180.10		1.30	4,486				4,649	0.044	0.000	0.458	0.000	0.044	
5:1 SLOPE	0.50			4,840	2,420								0.554
180.60		1.80	5,194				7,069	0.052	0.362	0.561	0.000	0.414	
5:1 SLOPE	0.20			5,341	1,068								0.809
180.80		2.00	5,488				8,137	0.055	0.599	0.597	0.607	1.204	

Notes 1. Quality Orifice flow is the orifice controlling for the 24 hour detention period and uses an orifice formula.

2. Pipe Orifice flow is calcuated using an orifice formula on the pipe from the ditch inlet to the outlet and uses the total head on the orifice.

3. Overflow Weir flow is calculated using a trapezondial weir to convey outflow for less frequent storms through the embankment with an emergency spillway.

4. Total Outflow is calculated by adding the Overflow Spillway with the lowest of Quality Orifice plus Ditch Inlet or Max Pipe Orifice.

APPENDIX C Stormwater Management Facility Calculations (P31)

	ada Consulta	nts											
8-30 Hanno													
	nes, ON, L2V												
PROJECT		,	& 276 QU A	AKER ROAD, O	CITY OF WEL	LAND							
PROJECT	NO.:	1601											
				PROPOS	SED SOUTH	WET PON	D CALC	ULATIO	NS (POND P	P31)			
Quality Req	quirements			Qualit	y Orifice	(Outlet Weir	•	Overflow	Spillway	Ou	tflow Pipe Or	rifice
Drainage	e Area (ha) =	12.96		Diameter (m) =	0.150	Perimeter Le	ength $(m) =$	0.60	Length (m) =	2.50	Ι	Diameter (m) =	= 0.450
Enhance	ed (m3/ha) =	233		Cd =	0.63	Inlet Eleva	ation (m) =	179.60	Slopes (X:1) =	10.00		Cd =	= 0.65
Perm Po	ool (m3/ha) =	193		Invert (m) =	178.30				Invert (m) =	180.00		Invert (m) =	= 178.30
Perm Poo	ol Vol (m3) =	2,501										Obvert (m) =	= 178.75
Acti	ive Vol (m3)	518			Pond	Drawdown T	ime Calcula	ation (MOE	E, 2003)		Тој	p of Pipe (m) =	= 178.85
25mm MO	DE Volume =	2,114		Water	Surface Elevation	on during 25mr	n Design St	orm Event =	= 178.84				
Water I	Level Elev. =	178.30	m		MOE Equa	tion 4.11 Draw	down Coeff	ficient 'C2' =	= 1,193				
					MOE Equa	tion 4.11 Draw	down Coeff	ficient 'C3' =					
					MO	E Equation 4.1	1 Drawdow	n Time (h) =	= 26				
				Average						Max			
	Increment		Surface	Surface	Increment	Permanent	Active	Quality	Ditch	Pipe	Overflow	Total	Average
Elevation	Depth	Depth	Area	Area	Volume	Volume	Volume	Orifice	Inlet	Orifice	Spillway	Outflow	Discharge
	(m)	(m)	(m2)	(m2)	(m3)	(m3)	(m3)	(m3/s)	(m3/s)	(m3/s)	(m3/s)	(m3/s)	(m3/s)
176.50		-1.80	872			0							
5:1 SLOPE	0.80			1,141	913								
177.30		-1.00	1,409			913							
5:1 SLOPE	1.00			1,821	1,821								
178.30		0.00	2,232			2,733							
178.30		0.00	2,888				0	0.000	0.000	0.000	0.000	0.000	
5:1 SLOPE	0.60		_,	3,212	1,927								0.060
178.90		0.60	3,536	-,	-,		1,927	0.035	0.000	0.251	0.000	0.035	
5:1 SLOPE	0.70		- ,	3,950	2,765		· · ·						0.080
179.60		1.30	4,363	- ,	· · · -		4,692	0.054	0.000	0.458	0.000	0.054	
5:1 SLOPE	0.20		,	4,488	898		,						0.175
179.80		1.50	4,614	<i>,</i>			5,590	0.058	0.092	0.502	0.000	0.150	-
5:1 SLOPE	0.20		*	4,742	948		*						0.798
180.00		1.70	4,870	*			6,538	0.062	0.259	0.542	0.000	0.321	
100.00				5.0.00	1 501								1.121
5:1 SLOPE	0.30			5,069	1,521								1.121

Notes 1. Quality Orifice flow is the orifice controlling for the 24 hour detention period and uses an orifice formula.

2. Pipe Orifice flow is calcuated using an orifice formula on the pipe from the ditch inlet to the outlet and uses the total head on the orifice.

3. Overflow Weir flow is calculated using a trapezondial weir to convey outflow for less frequent storms through the embankment with an emergency spillway.

4. Total Outflow is calculated by adding the Overflow Spillway with the lowest of Quality Orifice plus Ditch Inlet or Max Pipe Orifice.

APPENDIX D Future Conditions MIDUSS Output File

Development Conditions with SWM Output File (4.7) 25MM.OUT opened 2024-10-16 18:02 Units used are defined by G = 9.810 24 144 10.000 are MAXDT MAXHYD & DTMIN values License: UPPER CANADA CONSULTANTS 35 COMMENT l line(s) of comment STORMWATER MANAGEMENT PLAN OUAKER ROAD CITY OF WELLAND FUTURE CONDITIONS 35 COMMENT 3 line(s) of comment 25mm STORM EVENT 2 STORM 1=Chicago;2=Huff;3=User;4=Cdnlhr;5=Historic 512.000 Coefficient a Constant b (min) Exponent c 6.000 .800 Fraction to peak r .450 Duration ó 240 min 25.035 mm Total depth 240.000 IMPERVIOUS 3 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C 1 .015 98.000 Ia/S Coefficient Initial Abstraction .100 .518 35 COMMENT 3 line(s) of comment PROP DEVELOPMENT NORTH OF SEGMENT 1 - POND P10 CATCHMENT 10.000 ID No.ó 99999 4.050 Area in hectares Length (PERV) metres 1.000 Gradient (%) Per cent Impervious 164.000 Length (IMPERV) %Imp. with Zero Dpth .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" SCS Curve No or C Ia/S Coefficient 74.000 .100 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .264 .000 .000 .000 c.m/s .806 .594 C perv/imperv/total .098 ADD RUNOFF 15 .264 .000 .000 c.m/s .264 CATCHMENT 4 ID No.ó 99999 11.000 Area in hectares Length (PERV) metres Gradient (%) 1,000 82.000 1.000 10.000 Per cent Impervious Length (IMPERV) 82.000 %Imp. with Zero Dpth .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" 1 .250 74.000 SCS Curve No or C .100 Ia/S Coefficient Initial Abstraction 8.924 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .264 .000 c.m/s C perv/imperv/total .009 .000 .098 .168 15 ADD RUNOFF .009 .273 .000 .000 c.m/s POND 10 POND 6 Depth - Discharge - Volume sets 184.800 .000 185.750 .0210 186.000 186.250 .0230 503.0 1091.0 186.500 .0280 1765.0 186.500 .0280 1765.0 186.700 1.244 2370.0 Peak Outflow .023 c.m/s Maximum Depth 185.944 metres Maximum Storage .390. c.m .009 .273 .023 .000 c.m/s 14 COMMENT 35 3 CATCHMENT 12,000 ID No.ó 99999 2.680 134.000 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious Length (IMPERV) 1.000 35.000 134.000 %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 .250 Manning "n" SCS Curve No or C Ia/S Coefficient 74.000 .100 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 8 .000 .023 .000 c.m/s 8 .801 .344 C perv/imperv/total .088 . 098 ADD RUNOFF 15

```
.088
                                 .088
                                               .023
                                                             .000 c.m/s
 4
         CATCHMENT
                      TD No. 6 99999
       13.000
         6.980
                      Area in hectares
       216.000
                      Length (PERV) metres
                      Gradient (%)
Per cent Impervious
         1.000
       70.000
      216.000
                      Length (IMPERV)
                      %Imp. with Zero Dpth
Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
          .000
           .250
                      Manning "n"
                      SCS Curve No or C
Ia/S Coefficient
       74.000
           .100
         8,924
                      Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv

1. .088 .023 .000 c.m/s
                                          .023 .000 c.m/s
.592 C perv/imperv/total
                  .461
                  .098
                                .804
        ADD RUNOFF
.461
15
                                .549
                                              .023
                                                             .000 c.m/s
         CATCHMENT
 4
                      ID No.ó 99999
        14.000
          .670
                      Area in hectares
                      Length (PERV) metres
Gradient (%)
        67.000
         1.000
                      Per cent Impervious
Length (IMPERV)
%Imp. with Zero Dpth
        60.000
        67.000
          .000
                      Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
Manning "n"
SCS Curve No or C
              1
           .250
        74.000
           .100
                      Ia/S Coefficient
                      Initial Abstraction
Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
         8.924
             1
                  .036
                           .549
                                        .023
.518
                                                      .000 c.m/s
C perv/imperv/total
                  .098
15
         ADD RUNOFF
         .036 .584
HYDROGRAPH DISPLAY
                                            .023
                                                             .000 c.m/s
27
         Volume = .1350286E+04 c.m
        5
10
         POND
        5 Depth - Discharge - Volume sets
                      .000
.0140
         184.800
185.300
                                         .0
1142.0
                          .0240
.287
1.922
         186.100
                                          3519.0
         186.500
                                          4978.0
         186.800
                                         6222.0

        186.800
        1.922
        5222.0

        Peak Outflow
        =
        .014 c.m/s

        Maximum Depth
        =
        185.307 metres

         Maximum Storage = 1163. c.m
.036 .584 .01
                 .036
                                               .014
                                                             .000 c.m/s
14
         START
       1
               1=Zero; 2=Define
         COMMENT
35
         line(s) of comment
        3
         PROP DEVELOPMENT SOUTH OF QUAKER RD & WEST OF RICE RD. - PON
 4
         CATCHMENT
                      ID No.ó 99999
        40.000
         8.210
                      Area in hectares
                      Length (PERV) metres
Gradient (%)
       234.000
         1.000
        25.000
                      Per cent Impervious
Length (IMPERV)
       234.000
                      %Imp. with Zero Dpth
          .000
                      Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
Manning "n"
              1
           .250
        74.000
                      SCS Curve No or C
                      La/S Coefficient
Initial Abstraction
Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
           .100
         8.924
             1
                              .000
                                          .014
.274
                                                      .000 c.m/s
C perv/imperv/total
                  .193
                               .800
                  .098
15
         ADD RUNOFF
                 .193
                                .193
                                               .014
                                                             .000 c.m/s
 9
         ROUTE
                      Conduit Length
          .000
           .000
                      No Conduit defined
                      Zero lag
Beta weighting factor
Routing timestep
           .000
           .000
           .000
         Nc
.193
COMBINE
              0
                      No. of sub-reaches
                                .193
                                              .193
                                                             .000 c.m/s
17
               Junction Node No.
       2
                               .193
                                               .193
                 .193
                                                             .193 c.m/s
         START
14
               1=Zero; 2=Define
        1
         CATCHMENT

'1 000 ID No.6 99999

'5 hecta
 4
        41.000
                      Area in hectares
Length (PERV) metres
        68.000
         1.000
                      Gradient (%)
        35.000
                      Per cent Impervious
Length (IMPERV)
                      Sumpow (ANFREV)
%Imp. with Zero Dpth
Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
Manning "n"
          .000
           1
.250
                      SCS Curve No or C
        74.000
           .100
                      Ia/S Coefficient
         8.924
                      Initial Abstraction
                   Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.022 .000 .193 .193 c.m/s
.098 .798 .343 C perv/imperv/total
                  .098
15
         ADD RUNOFF
                  .022
                                .022
                                              .193
                                                             .193 c.m/s
 4
         CATCHMENT
                      ID No.ó 99999
        42,000
```

	12.640 290.000		n hectare		
	1.000	Gradie	(PERV) m nt (%)	letres	
	70.000 290.000		nt Imperv (IMPERV)		
	.000		with Zero		
	1	Option	1=SCS CN		on; 3=Green-Ampt; 4=Repeat
	.250 74.000	Manning SCS Cu	g "n" rve No or	c	
	.100	Ia/S C	oefficien	t	
	8.924 1		1 Abstrac		anglr; 3=SWM HYD; 4=Lin. Reserv
	-	.809	.022		.193 c.m/s
15	ADD RUNG	.098	.800	.590	C perv/imperv/total
15		.809	.831	.193	.193 c.m/s
9	ROUTE	Constantin	t Length		
	.000		t Length duit defi	ned	
	.000	Zero la	ag		
	.000		eighting g timeste		
	0	No. of	sub-reac	hes	
17	COMBINE	.809	.831	.831	.193 c.m/s
17		nction No	de No.		
14	START	.809	.831	.831	1.024 c.m/s
14		Zero; 2=De	efine		
4	CATCHMEN				
	43.000 .330	ID No.	ö 999999 n hectare	s	
	47.000		(PERV) m		
	1.000	Gradie			
	35.000 47.000		nt Imperv (IMPERV)		
	.000		with Zero		
	1				on; 3=Green-Ampt; 4=Repeat
	.250	Manning		-	
	74.000 .100		rve No or oefficien		
	8.924	Initia	l Abstrac	tion	
	1				anglr; 3=SWM HYD; 4=Lin. Reserv
		.011	.000 .798	.831 .343	1.024 c.m/s C perv/imperv/total
15	ADD RUNG	OFF			
4	CATCHME	.011	.011	.831	1.024 c.m/s
4	44.000		ó 99999		
	6.400	Area in	n hectare		
	207.000		(PERV) m	etres	
	1.000 70.000	Gradie Per ce	nt Imperv	rious	
	207.000		(IMPERV)		
	.000		with Zero		and a first a branch
	.250	Manning		I/C; Z=Horto	on; 3=Green-Ampt; 4=Repeat
	74.000	SCS Cu	rve No or		
	.100		oefficien		
	8.924 1		l Abstrac 1=Triang		anglr; 3=SWM HYD; 4=Lin. Reserv
		.424	.011	.831	1.024 c.m/s
15	ADD RUNG	.098)FF	.805	.593	C perv/imperv/total
		.424	.433	.831	1.024 c.m/s
9	ROUTE	a			
	.000		t Length duit defi	ned	
	.000	Zero la	ag		
	.000		eighting	factor	
	.000	No. of	g timeste sub-reac	p hes	
		.424	.433	.433	1.024 c.m/s
17	COMBINE 2 Jui	nction No	de No		
			.433	.433	1.457 c.m/s
14	START	7 ama - 0 -			
18	1 1=2 CONFLUE	Zero; 2=De NCE	erine		
	2 Ju	nction No			
A	CATCUME	. 424		.433	.000 c.m/s
4	CATCHMEN 45.000	ID No.	ó 99999		
	1.030	Area in	n hectare	s	
	83.000	Length	(PERV) m	etres	
	1.000	Gradie:	nt (%) nt Tmperv	ious	
	83.000	Length	(IMPERV)	2005	
	45.000 1.030 83.000 1.000 60.000 83.000 .000	%Imp. v	with Zero	Dpth	
	1 .250	Mannin	I=SCS CN g "n"	I/C; 2=Horto	on; 3=Green-Ampt; 4=Repeat
	74.000	SCS Cu	rve No or	c	on; 3=Green-Ampt; 4=Repeat
	.100	Ia/S C	oefficien	ıt	
	8.924 1	Option	ADSTRAC 1=Triand	lr; 2=Rec+:	anglr; 3=SWM HYD; 4=Lin. Reserv
		.056	1.457	.433	.000 c.m/s
15		.098	.791	.514	C perv/imperv/total
15	ADD RUNG		1.513	.433	.000 c.m/s
27	HYDROGRA	APH DISPL	AY		
				raph chosen	a
10	Volume POND	= .3593	299E+04 c	• m	
	6 Depth ·	- Dischar	ge - Volu	me sets	
	186.000	-	000	.0	
	186.800 187.300			4048.0 7091.0	
	187.500	•:	170	8424.0	
	187.800		257 1		

 188.000
 .880
 12094.0

 Peak Outflow
 .041 c.m/s

 Maximum Depth
 186.594 metres

 Maximum Storage
 3005. c.m

 .056
 1.513
 .041
 .000 c.m/s 14 START COMMENT 35 3 line(s) of comment
*********** 3 PROP DEVELOPMENT SOUTH OF QUAKER, EAST OF RICE - POND P50 ********* 4 CATCHMENT 52,000 ID No.ó 99999 6.430 207.000 Area in hectares Length (PERV) metres 1.000 Gradient (%) Per cent Impervious 70.000 207.000 Length (IMPERV) %Imp.with Zero Dpth
Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 .250 Manning "n" SCS Curve No or C Ia/S Coefficient 74.000 .100 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .000 .041 .000 c.m/s C perv/imperv/total .426 .098 .805 .593 15 ADD RUNOFF .426 .426 .041 .000 c.m/s 9 ROUTE Conduit Length No Conduit defined .000 .000 .000 Zero lag Lero lag Beta weighting factor Routing timestep .000 .000 No. of sub-reaches .426 .426 0 .426 .426 .000 c.m/s 17 COMBINE Junction Node No. .426 .426 2 .426 .426 c.m/s 14 START 1 1=Zero; 2=Define CATCHMENT 4 ID No.ó 99999 Area in hectares Length (PERV) metres 53.000 11.340 275.000 1.000 Gradient (%) Per cent Impervious 275.000 Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 .250 Manning "n" SCS Curve No or C Ia/S Coefficient 74.000 .100 Ditial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 8.924 1 .731 .426 c.m/s C perv/imperv/total .000 .798 .426 .098 15 ADD RUNOFF .731 .731 .426 .426 c.m/s 9 ROUTE Conduit Length .000 No Conduit defined Zero lag Beta weighting factor . 000 .000 .000 .000 Routing timestep No. of sub-reaches 0 .731 .731 .731 .426 c.m/s COMBINE 17 Junction Node No. .731 .731 2 .731 1.157 c.m/s 18 CONFLUENCE Junction Node No. .731 1.157 2 .731 .000 c.m/s CATCHMENT 54.000 ID No.6 99999 4 54.000 1.280 Area in hectares 92.000 Length (PERV) metres 1.000 Gradient (%) Per cent Impervious Length (IMPERV) 60.000 92.000 %Imp. with Zero Dpth .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" 1 .250 SCS Curve No or C 74.000 .100 Ia/S Coefficient Initial Abstraction
 Option
 1=Trianglr;
 2=Rectanglr;
 3=SWM HYD;
 4=Lin. Reserv

 70
 1.157
 .731
 .000 c.m/s

 98
 .786
 .511
 C perv/imperv/total
 1 .070 .098 ADD RUNOFF .070 1.2 HYDROGRAPH DISPLAY 15 1.227 .731 .000 c.m/s 27 is # of Hyeto/Hydrograph chosen
Volume = .2781534E+04 c.m 5 10 POND 6 Depth - Discharge - Volume sets 182.000 .000 .0 .000 .0190 .0 5251.0 182.800 183.150 183.500 .0190 .0230 .238 .396 1.028 7895.0 183.800 13425.0 184.000 15337.0
 Peak Outflow
 =
 .009 c.m/s

 Maximum Depth
 182.397 metres

 Maximum Storage
 2607. c.m

 .070
 1.227
 .009
 .000 c.m/s GTADT 14

35	1 1=Ze	ro; 2=Def	ine			
	COMMENT	10, 2-201	1110			
	3 line	(s) of co	mment			
			ORTH OF SE	CMENT 3	- POND P30	
	********			01121(1 5	1010 100	
4	CATCHMENT					
	30.000 8.470	ID No.ŏ Area in				
			PERV) metr	es		
	.200	Gradient				
	.100 238.000	Length (Imperviou IMPERV)	s		
	.000		th Zero Dp	th		
	1	Option 1 Manning		2=Horto	n; 3=Green-Ampt; 4=Repeat	
	.250 74.000		e Noor C			
	.100	Ia/S Coe	fficient			
	8.924 1		Abstractic		nglr; 3=SWM HYD; 4=Lin. Reserv	
	-		.000	.009	.000 c.m/s	
			.803	.099	C perv/imperv/total	
15	ADD RUNOF	F 07	.007	.009	.000 c.m/s	
4	CATCHMENT			.005		
	31.000	ID No.ó				
	10.420 264.000	Area in	hectares PERV) metr			
	1.000	Gradient		65		
	75.000		Imperviou	s		
	264.000 .000	Length (IMPERV) th Zero Dp	th		
	1				n; 3=Green-Ampt; 4=Repeat	
		Manning				
	74.000	Ia/S Coe	e No or C			
	8.924		Abstractic	n		
	1				nglr; 3=SWM HYD; 4=Lin. Reserv	
			.007 .798	.009 .623	.000 c.m/s C perv/imperv/total	
15	ADD RUNOF			1025	e port, import, coodr	
	.7		.724	.009	.000 c.m/s	
27	HYDROGRAP 5 is #		/Hydrograp	h chosen		
	Volume =	.183482	7E+04 c.m			
4	CATCHMENT					
	32.000	ID No.ó Area in				
	68.000	Length (PERV) metr	es		
		Gradient		_		
		Length (Imperviou IMPERV)	s		
	.000	%Imp. wi	th Zero Dp			
	1 .250			2=Horto	n; 3=Green-Ampt; 4=Repeat	
	.250	Manning SCS Curv	"n" 'e No or C			
	.100	Ia/S Coe	fficient			
	8.924 1		Abstractio		nglas 2-dent HVDs 4-tin Decem	
	.0		.724	.009	nglr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s	
	.0	98	.798	.518	C perv/imperv/total	
15	ADD RUNOF	F				
27			760	009	000 c m/s	
		- 37 H DISPLAY	.760	.009	.000 c.m/s	
	5 is#	37 H DISPLAY of Hyeto	/Hydrograp			
10	5 is # Volume =	37 H DISPLAY of Hyeto	/Hydrograp			
10	5 is # Volume = POND	37 H DISPLAY of Hyeto .192428	/Hydrograp 9E+04 c.m	h chosen		
10	5 is # Volume = POND 5 Depth - 1 178.800	37 H DISPLAY of Hyeto .192428 Discharge .00	/Hydrograp 9E+04 c.m - Volume 0	h chosen sets .0		
10	5 is # Volume = POND 5 Depth - 1 178.800 179.300	37 H DISPLAY of Hyeto .192428 Discharge .00 .026	/Hydrograp 9E+04 c.m - Volume 0 152	h chosen sets .0 0.0		
10	5 is # Volume = POND 5 Depth - 1 178.800	37 H DISPLAY of Hyeto .192428 Discharge .00	/Hydrograp 9E+04 c.m - Volume 0 152 0 464	h chosen sets .0 0.0 9.0		
10	5 is # Volume = POND 5 Depth - 178.800 179.300 180.100 180.600 180.800	37 H DISPLAY of Hyetc .192428 Discharge .000 .026 .044 .41 1.20	/Hydrograp 9E+04 c.m 0 152 0 152 0 464 4 706 4 813	h chosen sets .0 0.0 9.0 9.0 7.0		
10	5 is # Volume = POND 5 Depth - 178.800 179.300 180.100 180.600 180.800 Peak Outf	37 H DISPLAY of Hyeto .192428 Discharge .000 .026 .044 .41 1.20 low =	/Hydrograp 9E+04 c.m a - Volume 0 152 0 464 4 706 4 813 .025	h chosen .0 0.0 9.0 9.0 7.0 c.m/s		
10	5 is # Volume = POND 5 Depth - 178.800 179.300 180.100 180.600 180.800 Peak Outf Maximum D	37 H DISPLAY of Hyeto .192428 Discharge .000 .026 .044 .41 1.20 low = epth =	/Hydrograp 9E+04 c.m 0 152 0 152 0 464 4 706 4 813	h chosen .0 0.0 9.0 9.0 7.0 c.m/s metres		
	5 is # Volume = POND 5 Depth - 178.800 179.300 180.100 180.600 180.800 Peak Outf Maximum D Maximum S	37 H DISPLAY of Hyeto .192428 Discharge .000 .026 .044 .41 1.20 low = epth = torage =	/Hydrograp 9E+04 c.m - Volume 0 152 0 464 4 706 4 813 .025 179.280	h chosen .0 0.0 9.0 9.0 7.0 c.m/s metres		
10	5 is # Volume = POND 5 Depth - 178.800 179.300 180.100 180.600 180.800 Peak Outf Maximum D Maximum S 	37 H DISPLAY of Hyeto .192428 Discharge .000 .026 .044 .41 1.20 low = epth = torage = 37	/Hydrograp 9E+04 c.m 0 152 0 464 4 706 4 813 .025 179.280 1460. .760	h chosen sets .0 0.0 9.0 9.0 7.0 c.m/s metres c.m		
	5 is # Volume = POND 5 Depth - 178.800 179.300 180.100 180.600 180.800 Peak Outf Maximum D Maximum S	37 H DISPLAY of Hyeto .192428 Discharge .000 .026 .044 .41 1.20 low = epth = torage = 37	/Hydrograp 9E+04 c.m 0 152 0 464 4 706 4 813 .025 179.280 1460. .760	h chosen sets .0 0.0 9.0 9.0 7.0 c.m/s metres c.m		
14	5 is # Volume = POND 5 Depth - 1 178.800 179.300 180.100 180.600 Peak Outf Maximum D Maximum S .00 START 1 1=Ze COMMENT 3 line	37 H DISPLAY of Hyetc. .192428 Discharge .00 .026 .044 .41 1.20 low = epth = torage = 37 ro; 2=Def (s) of co	/Hydrograp 9E+04 c.m 0 152 0 464 4 706 4 813 .025 179.280 1460. .760 ine	h chosen sets .0 0.0 9.0 9.0 7.0 c.m/s metres c.m		
14	5 is # Volume = POND 5 Depth - 1 178.800 179.300 180.600 180.600 180.600 180.600 180.600 180.800 0 sTART 0 sTART 1 1=2c COMMENT 3 line	37 H DISPLAY of Hyetc .192428 Discharge .00 .0262 .044 .41 1.20 low = epth = torage = 37 ro; 2=Deff (s) of co	/Hydrograp 9E+04 c.m 0 152 0 464 4 706 4 813 .025 179.280 1460. .760 ine	h chosen .0 0.0 9.0 7.0 c.m/s metres c.m .025	.000 c.m/s	
14	5 is # Volume = POND 5 Depth - 1 178.800 179.300 180.600 180.600 180.600 180.600 180.600 180.800 0 sTART 0 sTART 1 1=2c COMMENT 3 line	37 H DISPLAY of Hyetc .192428 Discharge .00 .026 .044 .11 1.20 low = epth = torage = 37 ro; 2=Def (s) of co ** LOPMENT S	/Hydrograp 9E+04 c.m 0 152 0 464 4 706 4 813 .025 179.280 1460. .760 ine	h chosen .0 0.0 9.0 7.0 c.m/s metres c.m .025		
14	5 is # Volume = POND 5 Depth - 1 178.800 179.300 180.600 180.600 180.600 Peak Outf Maximum D Maximum S .0 START 1 1=Ze COMMENT 3 line ********* CATCHMENT	37 H DISPLAY of Hyetc .192428 Discharge .00 .026 .044 .41 1.20 low = epth = torage = 37 ro; 2=Def (s) of co ** LOPMENT S	/Hydrograp 9E+04 c.m 0 152 0 464 4 706 4 813 .025 179.280 1460. .760 ine mment OUTH OF SE	h chosen .0 0.0 9.0 7.0 c.m/s metres c.m .025	.000 c.m/s	
14 35	5 is # Volume = POND 5 Depth - 1 178.800 179.300 180.600 180.600 Peak Outf Maximum D Maximum S .0 START 1 1=Ze COMMENT 3 line ********* ROP DEVE ********* CATCHMENT 33.000	37 H DISPLAY of Hyetc .192428 Discharge .00 .0252 .044 .41 1.20 low = epth = torage = 37 ro; 2=Deff (s) of cc ** LOPMENT S ** ID No.6	/Hydrograp 9E+04 c.m 0 152 0 464 4 706 4 813 .025 179.280 1460. .760 ine mment OUTH OF SE 99999	h chosen .0 0.0 9.0 7.0 c.m/s metres c.m .025	.000 c.m/s	
14 35	5 is # Volume = POND 5 Depth - 1 178.800 179.300 180.600 180.600 180.600 180.600 180.600 180.600 START 0 START 1 1=22 COMMENT 3 line ******** CATCHMENT 33.000 12.960	<pre>37 H DISPLAY Of Hyetc .192428 Discharge .00 .026 .044 .41 1.20 low = torage = 37 ro; 2=Def (s) of co ** LOPMENT S ** ID No.6 Area in</pre>	/Hydrograp 9E+04 c.m 0 152 0 464 4 706 4 813 .025 179.280 1460. .760 ine mment OUTH OF SE 99999	h chosen sets .0 9.0 9.0 9.0 c.m/s metres c.m .025 GMENT 3	.000 c.m/s	
14 35	5 is # Volume = POND 5 Depth - 1 178.800 179.300 180.600 180.600 180.600 180.600 180.600 180.600 180.800 START 1 1=2e COMMENT 3 line ********* PROP DEVE ********* CATCHMENT 33.000 12.960 294.000 1.000	37 H DISPLAY of Hyetc .192428 Discharge .00 .0226 .044 .41 1.20 low = epth = torage = 37 ro; 2=Def (s) of co ** LOPMENT S ** ID No.6 Area in Length (Gradient		h chosen sets .0 9.0 9.0 7.0 c.m/s metres c.m .025 GMENT 3 es	.000 c.m/s	
14 35	5 is # Volume = POND 5 Depth - 1 178.800 179.300 180.600 180.600 Peak Outf Maximum D Maximum D Maximum S .0 START 1 1=Ze COMMENT 3 line ******** CATCHMENT 33.000 12.960 294.000 1.000 75.000	37 H DISPLAY of Hyetc .192428 Discharge .00 .026 .044 .41 1.20 low = epth = torage = 37 ro; 2=Def (s) of co ** LOPMENT S ** ID No.6 Area in Length (Gradient Per cent	<pre>//Hydrograp 9E+04 c.m 0 152 0 464 4 706 4 813 .025 179.280 1460. .760 ine mment OUTH OF SE 99999 hectares PERV) metr (%) Imperviou</pre>	h chosen sets .0 9.0 9.0 7.0 c.m/s metres c.m .025 GMENT 3 es	.000 c.m/s	
14 35	5 is # Volume = POND 5 Depth - 1 178.800 179.300 180.600 180.600 Peak Outf Maximum D Maximum D Maximum S .0 START 1 1=Ze COMMENT 3 line ******** CATCHMENT 33.000 12.960 294.000 1.000 75.000	<pre>37 H DISPLAY Of Hyero Of Hyeto .192428 Discharge .00 .026 .044 .41 1.20 low = epth = torage = 37 ro; 2=Deff (s) of co ** LOPMENT S ** ID No.6 Area in Length (Gradient Per cent Length (Simp. w Simp. w Simp. (S) </pre>	<pre>//Hydrograp 9E+04 c.m 0 152 0 464 4 706 4 813 .025 179.280 1460. .760 ine mment OUTH OF SE 99999 hectares PERV) metr (%) Imperviou IMPERV) th Zero Dp</pre>	h chosen sets .0 9.0 9.0 7.0 c.m/s metres c.m .025 GMENT 3 es s th	.000 c.m/s - POND F31	
14 35	5 is # Volume = POND 5 Depth - 1 178.800 179.300 180.600 180.600 180.800 Peak Outf Maximum D Maximum D Maximum D START 1 1=Ze COMMENT 3 line ********* CATCHMENT 33.000 12.960 294.000 1.000 75.000 294.000 1	<pre>37 H DISPLAY of Hyeta Of Hyeta .00 .026 .044 .41 1.20 low = torage = 37 ro; 2=Deff (s) of co ** LOPMENT S ** ID No.6 Area in Area in Length (Gradient Length (Simp, wi Option 1</pre>	<pre>//Hydrograp 9E+04 c.m 0 152 0 464 4 706 4 813 .025 179.280 1460. .760 ine mment OUTH OF SE 99999 hectares PERV) metr (%) IMPERV) metr (%)</pre>	h chosen sets .0 9.0 9.0 7.0 c.m/s metres c.m .025 GMENT 3 es s th	.000 c.m/s	
14 35	5 is # Volume = POND 5 Depth - 1 178.800 179.300 180.600 180.600 180.600 180.600 180.600 180.600 Peak Outf Maximum 5 .0 START 1 1=2e COMMENT 3 line ********* CATCHMENT 3.000 12.960 294.000 1.000 75.000 294.000 1.250	<pre>37 H DISPLAY of Hyetc .192428 Discharge .00 .0226 .044 .41 1.20 low = epth = torage = 37 ro; 2=Deff (s) of cc ** ID No.66 Area in Length (Gradient) Cordent for cent Length (%Imp.wi Option 1 Manning</pre>	<pre>//Hydrograp 9E+04 c.m 0 152 0 464 4 706 4 813 .025 179.280 1460. .760 ine mment OUTH OF SE 99999 hectares PERV) metr (%) Imperviou th Zero Dp =SCS CN/C; "n"</pre>	h chosen sets .0 9.0 9.0 7.0 c.m/s metres c.m .025 GMENT 3 es s th	.000 c.m/s - POND F31	
14 35	5 is # Volume = POND 5 Depth - 1 178.800 179.300 180.600 180.600 180.800 Peak Outf Maximum D Maximum D Maximum D START 1 1=Ze COMMENT 3 line ********* CATCHMENT 33.000 12.960 294.000 1.000 75.000 294.000 1	<pre>37 H DISPLAY of Hyetc .192428 Discharge .00 .0226 .044 .41 1.20 low = epth = torage = 37 ro; 2=Deff (s) of cc ** ID No.66 Area in Length (Gradient) Cordent for cent Length (%Imp.wi Option 1 Manning</pre>	<pre>//Hydrograp 9E+04 c.m 0 152 0 464 4 706 4 706 4 706 179.280 1460. .760 ine mment OUTH OF SE 99999 hectares PERV) metr (%) imperviou IMPERV) th Zero Dp =SCS CN/C; "n" e No or C</pre>	h chosen sets .0 9.0 9.0 7.0 c.m/s metres c.m .025 GMENT 3 es s th	.000 c.m/s - POND F31	
14 35	5 is # Volume = POND 5 Depth - 1 178.800 179.300 180.600 180.600 180.600 180.600 180.600 180.600 180.600 180.600 maximum 5 .0 START 1 1=2e COMMENT 3 line ******** CATCEMENT 33.000 12.960 294.000 1.000 75.000 294.000 1.250 74.000 1.000	<pre>37 H DISPLAY of Hyetc .192428 Discharge .00 .026 .044 .41 1.20 low = epth = torage = 37 ro; 2=Deff (s) of co ** LOPMENT S ** ID No.6 Area in Length (Gradient Per cent Per cent Per cent Condent Per cent Condent Condent Cardient Cardeet Cardi</pre>	<pre>//Hydrograp 9E+04 c.m 0 152 0 464 4 706 4 813 .025 179.280 1460. .760 ine mment OUTH OF SE 99999 hectares PERV) metr (%) Imperviou IMPERV) th Zero Dp =SCS CN/C; "n" e No or C fficient Abstractic</pre>	h chosen sets .0 9.0 9.0 7.0 c.m/s metres c.m .025 GMENT 3 es s th 2=Horto n	.000 c.m/s - POND P31 n; 3=Green-Ampt; 4=Repeat	
14 35	5 is # Volume = POND 5 Depth - 1 178.800 179.300 180.600 180.600 Peak Outf Maximum D Maximum D M	37 H DISPLAY of Hyetc. .192428 Discharge .00 .026 .044 .41 1.20 low = epth = torage = 37 ro; 2=Deff (s) of co ** LOPMENT S ** ID No.6 Area in Length (Gradient Per cent Length (%Imp. wi Option 1 Manning SCS Curv IA/S Coe Initial Option 1	<pre>//Hydrograp 9E+04 c.m 0 152 0 464 4 706 4 813 .025 179.280 1460. .760 ine mment OUTH OF SE 99999 hectares PERV) metr (%) IMPERV0 th Zero Dp =SCS CN/C; "n" e No or C fficient Abstractio ITrianglr;</pre>	h chosen .0 .0 9.0 9.0 7.0 c.m/s metres .025 GMENT 3 es s th 2=Horto n 2=Recta	.000 c.m/s - POND F31 n; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reserv	
14 35	5 is # Volume = POND 5 Depth - 1 178.800 179.300 180.600 180.600 180.600 180.600 180.800 Peak Outf Maximum 5 .0 START 1 1=2e COMMENT 3 line ********* CATCHMENT 3.000 12.960 294.000 1.000 75.000 294.000 1.250 74.000 .000 1.250 74.000 .000 8.924 1 .8	37 H DISPLAY of Hyetc. .192428 Discharge .00 .0252 .044 .41 1.20 low = epth = torage = 37 ro; 2=Deff (s) of co ** ID No.6 Area in Length (Gradient Fer cent Length (% Imp. wi Option 1 Manning SCS Curv Ia/S Coe Initial Option 1 87	<pre>//Hydrograp 9E+04 c.m 0 152 0 464 4 706 4 813 .025 179.280 1460. .760 ine mment OUTH OF SE 99999 hectares PERV) metr (%) IMPERV0 th Zero Dp =SCS CN/C; "n" e No or C fficient Abstractio ITrianglr;</pre>	h chosen sets .0 9.0 9.0 7.0 c.m/s metres c.m .025 GMENT 3 es s th 2=Horto n	.000 c.m/s - POND P31 n; 3=Green-Ampt; 4=Repeat	
14 35	5 is # Volume = POND 5 Depth - 1 178.800 179.300 180.600 180.600 Peak Outf Maximum D Maximum D Maximum D Maximum C START 1 1=Ze COMMENT 3 line ********* CATCHMENT 33.000 12.960 294.000 10.000 11 .250 74.000 .100 8.924 1 .800 .000 .000 .000 .000 .000 .000 .0	<pre>37 47 47 47 47 47 47 47 47 47 47 47 47 47</pre>	<pre>//Hydrograp 9E+04 c.m 0 152 0 464 4 706 4 813 .025 179.280 1460. .760 ine mment OUTH OF SE 99999 hectares PERV) metr (%) IMPERV) th Zero Dp =SCS CN/C; "n" e No or C fficient Abstractic =Trianglr; .000 .801</pre>	h chosen .0 .0 .0 .0 .0 .0 .0 .0 .0 .0	.000 c.m/s - POND P31 n; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total	
14 35 4	5 is # Volume = POND 5 Depth - 1 178.800 179.300 180.600 180.600 180.600 180.600 180.600 180.600 180.600 reak Outf Maximum D Maximum S .0 START 1 1=2¢ COMMENT 3 line ********* COMMENT 3 line ********* COMMENT 3 line ********* CATCHMENT 3.000 12.960 294.000 1.000 75.000 294.000 1.250 74.000 .100 8.924 1 8.8 .0 ADD RUNNF .8	<pre>37 H DISPLAY of Hyetc .192428 Discharge .00 .026 .044 .41 1.20 low = epth = torage = 37 ro; 2=Deff (s) of co ** LOPMENT S ** ID No.6 Area in Length (Gradient Per cent Per cent Centert Per cent Compth (Gradient Compth (Gradeet C</pre>	<pre>//Hydrograp 9E+04 c.m 0 152 0 464 4 706 4 813 .025 179.280 1460. .760 ine mment OUTH OF SE 99999 hectares PERV) metr (%) Imperviou th Zero Dp =SCS CN/C; "n" e No or C fficient Abstractic =Trianglr; .000 .8801</pre>	h chosen .0 0.0 9.0 9.0 7.0 c.m/s metres c.m .025 GMENT 3 es s th 2=Horto n 2=Recta .025	.000 c.m/s - POND P31 n; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s	
14 35 4	5 is # Volume = POND 5 Depth - 1 178.800 179.300 180.600 180.600 Peak Outf Maximum D Maximum D Maximum D Maximum C START 1 1=Ze COMMENT 3 line ********* CATCHMENT 33.000 12.960 294.000 10.000 11 .250 74.000 .100 8.924 1 .800 .000 .000 .000 .000 .000 .000 .0	<pre>37 47 47 47 47 47 47 47 47 47 47 47 47 47</pre>	/Hydrograp 9E+04 c.m 0 152 0 464 4 706 4 813 .025 179.280 1460. .760 ine mment OUTH OF SE 99999 hectares PERV) metr (%) IMPERV0 th Zero Dp ERV) metr (%) IMPERV0 th Zero Or fficient Abstractic = Trianglr; .000 .887	h chosen .0 .0 .0 .0 .0 .0 .0 .0 .0 .0	.000 c.m/s - POND F31 n; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s	
14 35 4 15 27	5 is # Volume = POND 5 Depth - 1 178.800 179.300 180.600 180.600 180.600 180.600 180.600 180.600 180.600 180.800 Peak Outf Maximum D Maximum D Max	<pre>37 H DISPLAY of Hyetc .192428 Discharge .00 .026 .044 .41 1.20 epth = etorage = 37 ro; 2=Deff (s) of co ** LOPMENT S ** ID No.6 Area in Length (Gradient Fer cent Length (Gradient Fer cent Longth (Gradient Coption 1 Manning SCS Curv Ia/S Coe Initial Option 1 87 98 F 87 H DISPLAX of Hyetc .202878</pre>	/Hydrograp 9E+04 c.m 0 152 0 464 4 706 4 813 .025 179.280 1460. .760 ine mment OUTH OF SE 99999 hectares PERV) metr (%) IMPERV0 th Zero Dp ERV) metr (%) IMPERV0 th Zero Or fficient Abstractic = Trianglr; .000 .887	h chosen .0 .0 .0 .0 .0 .0 .0 .0 .0 .0	.000 c.m/s - POND F31 n; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s	
14 35 4	5 is # Volume = POND 5 Depth - 1 178.800 179.300 180.600 180.600 180.600 Peak Outf Maximum D Maximum D Maximum D Maximum D START 1 1=Ze COMMENT 3 line ********* CATCHMENT 33.000 12.960 294.000 1.000 75.000 294.000 1.000 74.000 1.000 8.924 1 .8 0 ADD RUNOF .8 HTDROGRAP 5 is # Volume = CATCHMENT	<pre>37 47 47 47 47 47 47 47 47 47 47 47 47 47</pre>	<pre>//Hydrograp 9E+04 c.m 0 152 0 464 4 706 4 813 .025 179.280 1460. .760 ine mment OUTH OF SE 99999 hectares PERV) metr (%) Imperviou IMPERV) th Zero Dp eSCS CN/C; "n" e No or C fficient Abstractic =Trianglr; .000 .881 .887 //Hydrograp 0E+04 c.m</pre>	h chosen .0 .0 .0 .0 .0 .0 .0 .0 .0 .0	.000 c.m/s - POND F31 n; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s	
14 35 4 15 27	5 is # Volume = POND 5 Depth - 1 178.800 179.300 180.600 180.600 180.600 Peak Outf Maximum D Maximum D Maximum D Maximum D COMMENT 3 lime ******** CATCHMENT 3 lime ********* CATCHMENT 33.000 12.960 294.000 10.000 75.000 294.000 10.000 75.000 294.000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.00000 10.0000 10.00000 10.00000000	<pre>37 H DISPLAY of Hyetc .00 .0262 Discharge .00 .026 .044 .41 1.20 low = torage = 37 ro; 2=Deff (s) of co ** LOPMENT S ** ID No.6 Area in Length (%Imp. wi Option 1 Manning SCS Curv Ia/S Coe Initial Option 1 87 87 H DISPLAY of Hyetc .202878 ID No.6 Area in </pre>	<pre>//Hydrograp 9E+04 c.m 0 152 0 464 4 706 4 813 .025 179.280 1460. .760 ine mment OUTH OF SE 99999 hectares PERV) metr (%) IMPERV0 th Zero Dp FERV) metr (%) IMPERV0 th Zero Dr =SCS CN/C; "n" e No or C fficient Abstractic =Trianglr; .000 .887 //Hydrograp 0E+04 c.m 99999</pre>	h chosen sets .0 9.0 9.0 7.0 c.m/s metres c.m .025 GMENT 3 es s th 2=Horto n 2=Recta .025 .625 .625 .025 h chosen	.000 c.m/s - POND F31 n; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s	
14 35 4 15 27	5 is # Volume = POND 5 Depth - 1 178.800 179.300 180.600 180.600 180.600 Peak Outf Maximum D Maximum S 0 START 1 1=22 COMMENT 3 line ******** COMMENT 3 line ********* CATCHMENT 33.000 12.960 294.000 1.000 75.000 294.000 1.250 74.000 1.250 74.000 .100 8.84 0.00 ADD RUNOF .8 HTDROGRAP. .8 HTDROGRAP. .8 HTDROGRAP. .8	<pre>37 H DISPLAY of Hyetc .00 .0262 Discharge .00 .026 .044 .41 1.20 low = torage = 37 ro; 2=Deff (s) of co ** LOPMENT S ** ID No.6 Area in Length (%Imp. wi Option 1 Manning SCS Curv Ia/S Coe Initial Option 1 87 87 H DISPLAY of Hyetc .202878 ID No.6 Area in </pre>	<pre>//Hydrograp 9E+04 c.m 0 152 0 464 4 706 4 813 .025 179.280 1460. .760 ine mment OUTH OF SE 99999 hectares PERV) metr (%) Imperviou th Zero Dp =SCS CN/C; "n" e No or C fficient Abstractio =Trianglr; .000 .881 .887 /Hydrograp 0E+04 c.m 99999</pre>	h chosen sets .0 9.0 9.0 7.0 c.m/s metres c.m .025 GMENT 3 es s th 2=Horto n 2=Recta .025 .625 .625 .025 h chosen	.000 c.m/s - POND F31 n; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s	

	1.000	Gradient (%)					
	60.000	Per cent I	mperviou	IS				
	66.000	Length (IM	PERV)					
	.000	%Imp. with	Zero Dr	th				
	1	Option 1=S	CS CN/C;	2=Horton	n; 3=Gree	en-Ampt;	4=Repea	t
	.250	Manning "n						
	74.000	SCS Curve	No or C					
	.100	Ia/S Coeff	icient					
	8.924	Initial Ab	stractic	n				
	1	Option 1=T	rianglr;	2=Rectar	nglr; 3=8	SWM HYD;	4=Lin.	Reserv
	.0	.8	87	.025	.000	c.m/s		
	.0	.7 98	98	.518	C perv	/imperv/t	otal	
15	ADD RUNOF	F						
	.0	.9	22	.025	.000	c.m/s		
27	HYDROGRAF	PH DISPLAY						
	5 is#	f of Hyeto/H	ydrograp	h chosen				
	Volume =	.2114417E	+04 c.m					
10	POND							
		Discharge -	Volume					
	178.300	.000		.0				
	178.900	.0350	192	7.0				
	179.600	.0540	469	2.0				
	179.800	.150	559	0.0				
	180.000	.321	653	8.0				
	180.300			9.0				
	Peak Outf	low =	.032	c.m/s				
		Pepth =						
		Storage =		c.m				
	.0	.9	22	.032	.000	c.m/s		
14	START							

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1 1=Zero; 2=Define
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35 COMMENT 2-YEAR STORM EVENT STORM 2 1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic 755.000 Coefficient a Constant b (min) Exponent c 8.000 Fraction to peak r Duration ó 240 min 38.971 mm Total depth .450 240.000 3 IMPERVIOUS Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" 1 .015 SCS Curve No or C Ia/S Coefficient Initial Abstraction 98.000 .100 .518 35 COMMENT 3 line(s) of comment EXISTING RES. WEST OF SEGMENT 1 4 CATCHMENT 1.000 TD No. 6 99999 17.520 Area in hectares Length (PERV) metres Gradient (%) 343.000 1.000 Per cent Impervious 35.000 343.000 Length (IMPERV) Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 250 Manning "n" SCS Curve No or C Ia/S Coefficient 74.000 .100 8.924 Ditial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .896 .194 ADD RUNOFF .896 COMMENT .896 .000 .000 .000 c.m/s .857 .426 C perv/imperv/total 15 . 896 .000 .000 c.m/s 35 REALIGNED CHANNEL - SEGMENT 1 ****** CATCHMENT 4 100.000 ID No.ó 99999 Area in hectares Length (PERV) metres 2.020 116.000 .400 Gradient (%) 15.000 Per cent Impervious Length (IMPERV) 116.000 %Imp. with Zero Dpth .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" 1 .250 SCS Curve No or C 74.000 .100 Ia/S Coefficient 8.924 Initial Abstraction
 Option
 1=Trianglr;
 2=Rectanglr;
 3=SWM HYD;
 4=Lin. Reserv

 46
 .896
 .000
 .000 c.m/s

 94
 .862
 .294
 C perv/imperv/total
 1 .046 .194 COMMENT 35 3 line(s) of comment FLOW AT FUT ROADWAY CULVERT - SEGMENT 1 ADD RUNOFF 15 .046 .941 .000 .000 c.m/s ROUTE Conduit Length .000 .000 No Conduit defined .000 Zero lag Beta weighting factor .000 Routing timestep No. of sub-reaches .000 0 .046 .941 . 941 .000 c.m/s COMBINE 17 Junction Node No. 1 .046 .046 .941 . 941 .941 c.m/s 14 1=Zero; 2=Define 1 35 COMMENT line(s) of comment PROP DEVELOPMENT NORTH OF SEGMENT 1 - POND P10 CATCHMENT 4 10.000 4.050 ID No.ó 99999 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious 164.000 1.000 70.000 164.000 Length (IMPERV) %Imp. with Zero Dpth .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1 . 250 Manning "n" 74.000 SCS Curve No or C .100 Ta/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 8.924 1 .000 .941 .941 c.m/s .857 .658 C perv/imperv/total .406 .194 15 ADD RUNOFF CATCHMENT L1.000 ID No.6 99999 Area in hectar .406 .406 .941 .941 c.m/s 11.000 Area in hectares

82.000 Length (PERV) metres 1.000 Gradient (%) Per cent Impervious 82.000 Length (IMPERV) %Imp. with Zero Dpth .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" 1 .250 74.000 SCS Curve No or C Ia/S Coefficient Initial Abstraction .100 8.924 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .941 .261 .015 .406 .941 c.m/s C perv/imperv/total .194 15 ADD RUNOFF .015 .422 .941 .941 c.m/s POND 10
 POND

 6 Depth - Discharge - Volume sets

 184.800
 .000

 185.750
 .0210
 .0230 186.000 503.0 186.250 1091.0 186.500 .0280 1765.0 186.700 1.244 2370.0 Peak Outflow Peak Outflow = .025 c.m/s Maximum Depth = 186.128 metres Maximum Storage = 803. c.m .025 c.m/s ______ = 803. c.m .422 .015 COMBINE .025 .941 c.m/s 17 Junction Node No. 1 .015 START .422 .025 .963 c.m/s 14 1=Zero; 2=Define L 1=Zero CONFLUENCE 18 1 Junction Node No. .015 .963 COMMENT .025 .000 c.m/s 35 3 line(s) of comment REALIGNED CHANNEL - SEGMENT 1 **** CATCHMENT 4 101.000 TD No. 6 99999 .610 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious 1.000 10.000 Length (IMPERV) 64.000 %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 .250 Manning "n" SCS Curve No or C Ia/S Coefficient 74.000 .100 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 8.924 .010 .025 .000 c.m/s C perv/imperv/total .963 .194 ADD RUNOFF .855 15 .010 .972 .025 .000 c.m/s 9 ROUTE Conduit Length .000 .000 No Conduit defined .000 Zero lag Beta weighting factor .000 .000 Routing timestep No. of sub-reaches 0 .010 .972 .972 .000 c.m/s 17 COMBINE Junction Node No. .010 .972 1 .972 .972 c.m/s 14 START 1=Zero; 2=Define COMMENT 35 3 line(s) of comment PROP DEVELOPMENT SOUTH OF SEGMENT 1 - POND P11 4 CATCHMENT 12.000 TD No. 6 99999 2.680 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious 1.000 35.000 134.000 Length (IMPERV) .000 %Imp. with Zero Dpth
Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C Ia/S Coefficient .100 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 4 .000 .972 .972 c.m/s .134 .972 .972 c.m/s .424 C perv/imperv/total .194 ADD RUNOFF .850 15 .972 .134 .134 .972 c.m/s 4 CATCHMENT ID No.ó 99999 13.000 6.980 Area in hectares 216.000 1.000 Length (PERV) metres Gradient (%) 70.000 Per cent Impervious Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 216.000 .000 .250 Manning "n" SCS Curve No or C 74.000 .100 Ia/S Coefficient 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 704 .134 .972 .972 c.m/s

	.194	.867	.665	C perv/imperv/total	
15	ADD RUNOFF .704	.838	.972	.972 c.m/s	
4	CATCHMENT				
		.ó 99999 in hectares			
	67.000 Lengt	h (PERV) me			
		ent (%) ent Impervi	0115		
	67.000 Lengt	h (IMPERV)			
		with Zero n 1=SCS CN/		n; 3=Green-Ampt; 4=Repeat	
	.250 Manni	ng "n"			
		urve No or Coefficient			
		al Abstract		nglr; 3=SWM HYD; 4=Lin. Rese	ru
	.060	.838	.972	.972 c.m/s	- •
15	.194 ADD RUNOFF	.856	.592	C perv/imperv/total	
27	.060 HYDROGRAPH DISP	.889	.972	.972 c.m/s	
21	5 is # of Hy		aph choser	L	
10	Volume = .240 POND	6793E+04 c.	m		
10	5 Depth - Discha		ne sets		
		.000 0140 1	.0 .142.0		
	186.100 .	0240 3	519.0		
			978.0		
	Peak Outflow Maximum Depth		8 c.m/s		
	Maximum Storage		. c.m		
35	.060 COMMENT	.889	.018	.972 c.m/s	
55	3 line(s) of				
	**************************************		T - OUTLET	A1	

17	COMBINE 1 Junction N	iode No.			
14	.060 START	.889	.018	.983 c.m/s	
	1 1=Zero; 2=	Define			
35	COMMENT 3 line(s) of	comment			
	**********	******			
	PROP DEVELOPMEN		QUAKER RD	& WEST OF RICE RD PON	
4	CATCHMENT	á 00000			
	40.000 ID No 8.210 Area	in hectares			
		h (PERV) me .ent (%)	tres		
	25.000 Per c	ent Impervi	ous		
		h (IMPERV) with Zero	Dpth		
	1 Optic	n 1=SCS CN/		on; 3=Green-Ampt; 4=Repeat	
		ng "n" Curve No or	с		
		Coefficient al Abstract			
	1 Optic	n 1=Triangl	r; 2=Recta	nglr; 3=SWM HYD; 4=Lin. Rese	rv
	.194	.000	.018 .363	.983 c.m/s C perv/imperv/total	
15	ADD RUNOFF .300	.300	.018	.983 c.m/s	
9	ROUTE			1909 CTM, D	
		it Length nduit defin	led		
	.000 Zero .000 Beta	lag weighting f	a a tran		
	.000 Routi	ng timestep	b		
	0 No.c .300	of sub-reach .300	.300	.983 c.m/s	
17	COMBINE	- 4- w-			
	2 Junction N .300	.300	.300	.300 c.m/s	
14	START 1 1=Zero; 2=	Define			
4	CATCHMENT				
		.ó 99999 in hectares			
		h (PERV) me .ent (%)	etres		
	35.000 Per c	ent Impervi	.ous		
		h (IMPERV) with Zero	Dpth		
	1 Optic			on; 3=Green-Ampt; 4=Repeat	
	74.000 SCS C	urve No or			
		Coefficient al Abstract			
	1 Optic	n 1=Triangl	r; 2=Recta	nglr; 3=SWM HYD; 4=Lin. Rese	rv
	.036 .194	.000 .857	.300	.300 c.m/s C perv/imperv/total	
15	ADD RUNOFF .036	.036	.300	.300 c.m/s	
4	CATCHMENT				
		.ó 999999 in hectares			
	290.000 Lengt	h (PERV) me			
	70.000 Per c	ent (%) ent Impervi	ous		
	290.000 Lengt	h (IMPERV) with Zero			
	1 Optic	on 1=SCS CN/		on; 3=Green-Ampt; 4=Repeat	
	.250 Manni	ng "n"			

		Curve No or			
		Coefficient ial Abstract			
	1 Optio	on 1=Triang]	lr; 2=Recta	anglr; 3=SWM HYD; 4=Lin. Re	eserv
	1.302	.036 .863	.300	.300 c.m/s C perv/imperv/total	
15	ADD RUNOFF		.002	C perv/ imperv/ cocar	
9	1.302 ROUTE	1.333	.300	.300 c.m/s	
,		uit Length			
		onduit defir	ned		
		weighting f	actor		
	.000 Rout:	ing timester	>		
	0 No. 0 1.302	of sub-reach 1.333	1.333	.300 c.m/s	
17	COMBINE				
	2 Junction 1 1.302	Node No. 1.333	1.333	1.633 c.m/s	
14	START		1.000	1.000 0111,0	
4	<pre>1 1=Zero; 2: CATCHMENT</pre>	=Define			
•	43.000 ID No	o.ó 99999			
		in hectares th (PERV) me			
		ient (%)	scres		
		cent Impervi	lous		
		th (IMPERV) . with Zero	Dpth		
		on 1=SCS CN/ ing "n"	C; 2=Hort	on; 3=Green-Ampt; 4=Repeat	
		ing "n" Curve No or	с		
	.100 Ia/S	Coefficient	:		
		ial Abstract on 1=Triang		anglr; 3=SWM HYD; 4=Lin. Re	serv
	.018	.000	1.333	1.633 c.m/s	
15	.194 ADD RUNOFF	.858	.426	C perv/imperv/total	
15	.018	.018	1.333	1.633 c.m/s	
4	CATCHMENT 44.000 ID No	a á 99999			
		in hectares	3		
		th (PERV) me	etres		
		ient (%) cent Impervi	lous		
		th (IMPERV)			
		 with Zero on 1=SCS CN/ 		on; 3=Green-Ampt; 4=Repeat	
	.250 Mann:	ing "n"			
		Curve No or Coefficient			
	8.924 Init:	ial Abstract	ion		
	1 Optio .646	on 1=Triang] .018	1.333 lr; 2=Recta	anglr; 3=SWM HYD; 4=Lin. Re 1.633 c.m/s	serv
	.194	.866	.665	C perv/imperv/total	
15	ADD RUNOFF .646	.660	1.333	1.633 c.m/s	
9	ROUTE		1.000	1.000 0111,0	
		uit Length onduit defir	hed		
	.000 Zero		164		
		weighting f ing timester			
	0 No. (of sub-reach	nes		
17	.646 COMBINE	.660	.660	1.633 c.m/s	
17	2 Junction I	Node No.			
14	.646 START	.660	.660	2.293 c.m/s	
14	1 1=Zero; 2:	=Define			
18	CONFLUENCE 2 Junction 1	Nodo No			
		2.293	.660	.000 c.m/s	
4	CATCHMENT	o.ó 99999			
		in hectares	3		
		th (PERV) me	etres		
		ient (%) cent Impervi	ous		
	83.000 Lengt	th (IMPERV)			
		. with Zero		on; 3=Green-Ampt; 4=Repeat	
	.250 Mann:	ing "n"		,	
		Curve No or Coefficient			
		ial Abstract			
	1 Optio .088	on 1=Triang] 2.293	lr; 2=Recta .660	anglr; 3=SWM HYD; 4=Lin. Re .000 c.m/s	serv
	.194	.857	.592	C perv/imperv/total	
15	ADD RUNOFF .088	2.374	.660		
27	HYDROGRAPH DIS		.000	.000 c.m/s	
	5 is # of H	yeto/Hydrogi		ı	
10	Volume = .64 POND	03003E+U4 C.	. 111		
	6 Depth - Discha				
		.000 .0550 4	.0 1048.0		
	187.300	.0730 7	7091.0		
	187.500 187.800		3424.0)552.0		
	188.000	.880 12	2094.0		
	Peak Outflow Maximum Depth	= .06	54 c.m/s 39 metres		
	Maximum Storage	e = 5502	2. c.m		
17	.088 COMBINE	2.374	.064	.000 c.m/s	
±/	2 Junction 1				
	.088	2.374	.064	.064 c.m/s	
					D.

14 START 1=Zero; 2=Define 1 COMMENT 35 3 line(s) of comment EXISTING AREA ON QUAKER RD, WEST OF RICE RD CATCHMENT 4 TD No. 6 99999 2.000 9.020 Area in hectares 245.000 Length (PERV) metres 1.000 Gradient (%) Per cent Impervious 245.000 Length (IMPERV) Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 .250 Manning "n" SCS Curve No or C 74.000 Ia/S Coefficient .100 Initial Abstraction 8.924 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .064 c.m/s C perv/imperv/total .520 .000 .064 .464 .194 15 ADD RUNOFF . 520 .520 .064 .064 c.m/s 9 Conduit Length .000 . 000 No Conduit defined Zero lag Beta weighting factor .000 .000 Routing timestep No. of sub-reaches .000 0 .520 . 520 .064 c.m/s .520 17 COMBINE Junction Node No. 2 .520 .520 . 520 .548 c.m/s START 14 1=Zero; 2=Define 18 CONFLUENCE Junction Node No. .548 .520 .000 c.m/s .520 COMMENT 35 3 line(s) of comment EXISTING AREA ON QUAKER RD, WEST OF RICE RD CATCHMENT 4 3.000 5.680 TD No. 6 99999 Area in hectares 195.000 Length (PERV) metres Gradient (%) Per cent Impervious 1.000 40.000 195.000 Length (IMPERV) Length (IMPERV)
%Imp. with Zero Dpth
Option 1=SCS CM/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 Manning "n" SCS Curve No or C 250 74.000 Ia/S Coefficient .100 Initial Abstraction 8.924 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .548 .330 .520 .462 .000 c.m/s C perv/imperv/total .194 .865 ADD RUNOFF 15 . 878 . 330 . 520 .000 c.m/s ROUTE 9 Conduit Length .000 .000 No Conduit defined Zero lag Beta weighting factor .000 .000 Routing timestep No. of sub-reaches .000 0 . 878 .330 .000 c.m/s .878 17 COMBINE Junction Node No. 2 .330 .878 .878 .878 c.m/s 14 START 1=Zero; 2=Define 35 COMMENT PROP DEVELOPMENT SOUTH OF QUAKER RD, EAST OF RICE RD CATCHMENT 4 50.000 ID No.ó 99999 Area in hectares Length (PERV) metres 3.420 151.000 1.000 Gradient (%) Per cent Impervious 151.000 Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 . 250 Manning "n" SCS Curve No or C Ia/S Coefficient 74.000 .100 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .053 .000 .878 .878 c.m/s .854 .260 C perv/imperv/total 194 ADD RUNOFF 15 .878 .878 c.m/s .053 .053 CATCHMENT 4 ID No.ó 99999 51.000 1.980 115.000 Area in hectares Length (PERV) metres Gradient (%) 1.000 10.000 Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth 115.000 .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1

.250 Manning "n" 74.000 SCS Curve No or C .100 Ta/S Coefficient Ditial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 8.924 1 .053 .878 .878 c.m/s C perv/imperv/total . 031 .850 .194 15 ADD RUNOFF .031 .084 .878 .878 c.m/s 9 ROUTE .000 Conduit Length No Conduit defined Zero lag Beta weighting factor 000 .000 .000 .000 Routing timestep No. of sub-reaches 0 .031 .084 .084 .878 c.m/s COMBINE 17 Junction Node No. 2 .031 .084 .084 .962 c.m/s START 14 1=Zero; 2=Define 1 35 COMMENT 3 line(s) of comment EXISTING AREA WEST OF RICE RD AND SOUTH OF QUAKER ROAD 4 CATCHMENT ID No.6 99999 4.000 13.940 Area in hectares Length (PERV) metres Gradient (%) 305.000 1.000 Per cent Impervious 305.000 Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Ditial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .000 .962 c.m/s C perv/imperv/total . 822 .084 .194 .461 15 ADD RUNOFF .822 .822 .084 .962 c.m/s 9 ROUTE Conduit Length .000 .000 No Conduit defined Zero lag Beta weighting factor .000 Routing timestep No. of sub-reaches .000 0 .822 .822 .822 .962 c.m/s COMBINE 17 Junction Node No. 2 .822 START .822 822 1.784 c.m/s 14 1=Zero; 2=Define 1 CONFLUENCE 18 Junction Node No. 2 .822 1.784 .822 .000 c.m/s 35 COMMENT 3 line(s) of comment RICE ROAD FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUNDA 4 CATCHMENT ID No.ó 99999 501.000 1.570 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious 102.000 1.000 102.000 Length (IMPERV) %Imp. with Zero Dpth .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1 .250 Manning "n" SCS Curve No or C 74.000 .100 Ta/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 8.924 1 1.784 .822 .000 c.m/s C perv/imperv/total .149 .194 ADD RUNOFF 15 .149 1.933 .822 .000 c.m/s ROUTE Conduit Length .000 .000 No Conduit defined Zero lag .000 Beta weighting factor Routing timestep No. of sub-reaches .000 0 1.933 .149 1.933 .000 c.m/s 35 COMMENT 3 line(s) of comment FLOW D/S OF RICE RD CULVERT - OUTLET A2 17 COMBINE Junction Node No. 1 ction، 149. START 1.933 2.916 c.m/s 1.933 14 1=Zero; 2=Define 1 COMMENT 35 line(s) of comment PROP DEVELOPMENT SOUTH OF QUAKER RD - QUALLITY CONTROL ONLY 4 CATCHMENT ID No.ó 99999 20.100

		in hectares h (PERV) metı			
		ent (%)	65		
		ent Imperviou	15		
		h (IMPERV)			
		with Zero Dr		- 3-Croon-Ampt. 4-Popost	
	.250 Mannin		; Z=HOILOI	n; 3=Green-Ampt; 4=Repeat	
		urve No or C			
		Coefficient			
		al Abstractio			
	1 Option .040		; 2=Rectar 1.933	nglr; 3=SWM HYD; 4=Lin. Reser 2.916 c.m/s	v
	.194	.857	.426	C perv/imperv/total	
15	ADD RUNOFF				
	.040	.040	1.933	2.916 c.m/s	
4	CATCHMENT 20.000 ID No	.ó 99999			
		in hectares			
		h (PERV) metr	res		
		ent (%)			
		ent Imperviou	15		
		h (IMPERV) with Zero Dr	oth		
				n; 3=Green-Ampt; 4=Repeat	
	.250 Mannis				
		urve No or C			
		Coefficient			
		al Abstractio		nglr; 3=SWM HYD; 4=Lin. Reser	
	.386			2.916 c.m/s	•
	.194	.854	.755	C perv/imperv/total	
15	ADD RUNOFF	400	1 000		
9	.386 ROUTE	.422	1.933	2.916 c.m/s	
9		it Length			
		nduit defined	1		
	.000 Zero	lag			
		weighting fac	ctor		
		ng timestep f sub-reaches	-		
	.386	.422	.422	2.916 c.m/s	
17	COMBINE				
	1 Junction No				
14	.386 START	.422	.422	3.338 c.m/s	
14	1 1=Zero; 2=1	Define			
18	CONFLUENCE				
	1 Junction No				
35	.386	3.338	.422	.000 c.m/s	
35	COMMENT 3 line(s) of	comment			

	REALIGNED CHANN	EL - SEGMENT	2		
	********	* *			
4	CATCHMENT				
		6 00000			
	200.000 ID No				
	200.000 ID No .970 Area	.ó 99999 in hectares h (PERV) metr	res		
	200.000 ID No .970 Area 80.416 Length 1.000 Gradie	in hectares h (PERV) metr ent (%)			
	200.000 ID No .970 Area 80.416 Length 1.000 Gradie 10.000 Per con	in hectares h (PERV) metr ent (%) ent Imperviou			
	200.000 ID No .970 Area : 80.416 Lengtl 1.000 Fer c. 80.416 Lengtl	in hectares h (PERV) metr ent (%) ent Imperviou h (IMPERV)	15		
	200.000 ID No .970 Area 80.416 Lengtl 10.000 Per co 80.416 Lengtl .000 %Imp.	in hectares h (PERV) metr ent (%) ent Imperviou h (IMPERV) with Zero Dy	ıs oth	1; 3=Green-Ampt; 4=Repeat	
	200.000 ID No .970 Area: 80.416 Lengtl 1.000 Gradi 10.000 Per c 80.416 Lengtl .000 %Imp. 1 Optic	in hectares h (PERV) metr ent (%) ent Imperviou h (IMPERV) with Zero Dy	ıs oth	n; 3=Green-Ampt; 4=Repeat	
	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradia 0.000 Per c 80.416 Lengtl .000 %Imp. 1 Option .250 Mannin 74.000 SCSC	in hectares h (PERV) metrent (%) ent Imperviou h (IMPERV) with Zero Dr n 1=SCS CN/C; ng "n" urve No or C	ıs oth	1; 3=Green-Ampt; 4=Repeat	
	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 10.000 Per c 80.416 Lengtl .000 %Imp. 1 Optio .250 Manni 74.000 SCS C .100 Ia/SG	in hectares h (PERV) metrent ent (%) ent Imperviou h (IMPERV) with Zero Dr n 1=SCS CN/C; ng "n" urve No or C Coefficient	us oth ; 2=Horton	n; 3=Green-Ampt; 4=Repeat	
	200.000 ID No .970 Area: 80.416 Lengt 1.000 Gradi 10.000 Per c: 80.416 Lengt .000 %Imp. 1 Option .250 Manni 74.000 SCS C .100 Ia/SC	in hectares h (PERV) metr ent (%) ent Imperviou h (IMPERV) with Zero Dp n 1=SCS CN/C; ng "n" urve No or C Coefficient al Abstractic	ns oth ; 2=Horton on		v
	200.000 ID No .970 Area : 80.416 Lengt 1.000 Gradi 10.000 Per c: 80.416 Lengt .000 %Imp. .1 Option .250 Mannin 74.000 SCS C .100 Ia/Sa 8.924 Initia 1 Option .015	in hectares h (PERV) metr ent (%) ent Imperviou h (IMPERV) with Zero Dp n 1=SCS CN/C; ng "n" urve No or C Coefficient al Abstractic n 1=Trianglr; 3.338	on 2=Rectar .422	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s	v
	200.000 ID No .970 Area: 80.416 Lengt 1.000 Gradi 10.000 Per c: 80.416 Lengt .000 %Imp. 1 Optio: .250 Manni 74.000 SCS C .100 Ia/S3 8.924 Initi: 1 Optio: .015 .194	in hectares h (PERV) metrent ent (%) ent Imperviou h (IMPERV) with Zero Dy n 1=SCS CN/C ng "n" urve No or C Coefficient al Abstractic n 1=Trianglr;	on 2=Rectar .422	nglr; 3=SWM HYD; 4=Lin. Reser	v
35	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 10.000 Per c .80.416 Lengtl .000 % Imp. 1 Option .250 Manni 74.000 SCS C .100 Ia/SG 8.924 Initi 1 Option .015 .194 COMMENT	<pre>in hectares h (PERV) met h (PERV) met nt (%) ent Imperviou h (IMPERV) with Zero Dp n 1=SCS CN/C; ng "n" urve No or C Coefficient al Abstractic 1=Trianglr; 3.338 .858</pre>	on 2=Rectar .422	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s	v
35	200.000 ID No .970 Area: 80.416 Lengt 1.000 Gradi 10.000 Per c: 80.416 Lengt .000 %Imp. 1 Optio: .250 Manni 74.000 SCS C .100 Ia/S3 8.924 Initi: 1 Optio: .015 .194	in hectares h (PERV) meth ent (%) ent Imperviou with Zero Dr h 1=SCS CN/C, g "n" urve No or C Coefficient al Abstractic h 1=Trianglr; 3.338 .858 comment	on 2=Rectar .422	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s	v
35	200.000 ID No .970 Area 80.416 Lengt 1.000 Gradi 10.000 Per c 80.416 Lengt .000 %Imp. .000 %Imp. .000 %Imp. .001 0.000 .250 Mannin 74.000 SCS C .100 IA/SG 8.924 Initia 1 Option .015 .194 COMMENT 3 line(s) of	<pre>in hectares h (PERV) met h (PERV) met nnt (%) ent (mpervion h (IMPERV) with Zero Dp n 1=SCS CN/C; ng "n" urve No or C Coefficient al Abstractia n 1=Trianglr; 3.338 .858 comment **</pre>	18 9th ; 2=Horton 9 ; 2=Rectan .422 .261	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s	v
	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 10.000 Per c. 80.416 Lengtl .000 % Imp. 1 Optio .250 Manni 74.000 SCS CC .100 Ia/S 8.924 Initia 1 Optio .115 .194 COMMENT 3 line(s) of ARE 	in hectares h (PERV) meth ent (%) ent Imperviou with Zero Dg h 1=SCS CN/C; og "n" urve No or C Coefficient al Abstraction h 1=Trianglr; 3.338 .858 comment ** A A20 - OUTLH	18 9th ; 2=Horton 9 ; 2=Rectan .422 .261	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s	v
35	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 10.000 Per c .80.416 Lengtl .000 % Imp. 1 Optio .250 Manni 74.000 SCS C .100 Ia/SC 8.924 Initi 1 Optio .015 .194 COMMENT 3 line(s) of ************************************	<pre>in hectares in hectares h (%) h (PERV) meth h (PERV) h (IMPERV) with Zero Pg n 1=SCS CN/Cg ng "n" urve No or C Coefficient al Abstractia h=Trianglr; 3.338 .858 comment ** A A20 - OUTLH **</pre>	us pth ; 2=Hortor on ; 2=Rectar .422 .261 3T B	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total	v
	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 10.000 Per c. 80.416 Lengtl .000 %Imp. 1 Optio .250 Manni 74.000 SCS CC .100 Ia/S 8.924 Initia 1 Optio .115 .194 COMMENT 3 line(s) of ARE 	in hectares h (PERV) meth ent (%) ent Imperviou with Zero Dg h 1=SCS CN/C; og "n" urve No or C Coefficient al Abstraction h 1=Trianglr; 3.338 .858 comment ** A A20 - OUTLH	us pth ; 2=Hortor on ; 2=Rectar .422 .261 3T B	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s	v
15	200.000 ID No .970 Area 80.416 Lengt 1.000 Gradi 10.000 Per c. 80.416 Lengt .000 % Imp. 1 Option .250 Manni 74.000 SCS C .100 Ia/50 .194 COMMENT 3 line(s) of ************************************	<pre>in hectares h (PERV) metr ent (%) ent Impervion h (IMPERV) with Zero Dp n 1=SCS CR/C; g "n" urve No or C Coefficient al Abstractic n 1=Trianglr; 3.338 comment ** 3.353</pre>	us pth ; 2=Hortor on ; 2=Rectar .422 .261 3T B	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total	v
15	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 10.000 Per c. 80.416 Lengtl .000 %Imp. 1 Option .250 Manni 74.000 SCS CC .100 Ia/50 8.924 Initia 1 Option .015 .194 COMMENT 3 line(s) of ************************************	<pre>in hectares h (PERV) meth ent (%) ent (%) ent (%) with Zero Dp h 1=SCS CN/C; g "n" urve No or C Coefficient al Abstractic al Abstractic a</pre>	15 pth ; 2=Hortor .422 .261 ET B .422	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total .000 c.m/s	v
15	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 10.000 Per c 80.416 Lengtl .000 % Imp. 1 Optio .250 Manni 74.000 SCS C .100 Ia/SC 8.924 Initi 1 Optio .015 .194 COMMENT 3 line(s) of ************************************	<pre>in hectares h (PERV) meth ent (%) ent Imperviou with Zero Pg h 1=SCS CN/Cj ng "n" urve No or C Coefficient al Abstractic h 1=Trianglr; 3.338 .858 comment ** 3.353 comment Evelopment Development</pre>	15 pth ; 2=Hortor .422 .261 ET B .422	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total	v
15 35	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 10.000 Per c .80.416 Lengtl .000 % Imp. 1 Option .250 Manni 74.000 SCS C .100 Ia/56 8.924 Initi. 1 Option .015 .194 COMMENT 3 line(s) of ************************************	<pre>in hectares h (PERV) meth ent (%) ent Imperviou with Zero Pg h 1=SCS CN/Cj ng "n" urve No or C Coefficient al Abstractic h 1=Trianglr; 3.338 .858 comment ** 3.353 comment Evelopment Development</pre>	15 pth ; 2=Hortor .422 .261 ET B .422	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total .000 c.m/s	v
15	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 10.000 Per c 80.416 Lengtl .000 % Imp. 1 Optio .250 Manni 74.000 SCS C .100 Ia/SC 8.924 Initi 1 Optio .015 .194 COMMENT 3 line(s) of ************************************	<pre>in hectares h (PERV) meth ent (%) ent (%) ent (%) with Zero Dp h 1=SCS CN/C, g "n" urve No or C Coefficient al Abstractic al Abstractic a</pre>	15 pth ; 2=Hortor .422 .261 ET B .422	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total .000 c.m/s	v
15 35	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 10.000 Per c. 80.416 Lengtl .000 %Imp. 1 Optio .250 Manni 74.000 SCS CC .100 Ia/50 8.924 Initi. 1 Optio .015 .194 COMMENT 3 line(s) of ************************************	<pre>in hectares h (PERV) meth ent (%) ent (%) ent (%) with Zero Dr n 1=SCS CN/C; ng "n" urve No or C Coefficient al Abstractic n 1=Trianglr; 3.338 comment ** 3.353 comment ** 3.353 comment ** ** DEVELOPMENT ** .6 99999</pre>	15 pth ; 2=Hortor .422 .261 ST B .422 LANDS BY	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total .000 c.m/s	v
15 35	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 1.000 Per c. 80.416 Lengtl .000 % Imp. 1 Optio .250 Manni 74.000 SCS CC .100 Ia/SC 8.924 Initi 1 Optio .015 .194 COMMENT 3 line(s) of ************************************	<pre>in hectares in hectares ent (%) ent Imperviou with Zero Pg in 1=SCS CN/Cg ing "n" urve No or C Coefficient al Abstractic in 1=TriangIr; 3.338 .858 comment ** 3.353 comment ** 3.353 comment ** ** 6 99999 in hectares h (PERV) metri</pre>	15 pth ; 2=Hortor .422 .261 ST B .422 LANDS BY	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total .000 c.m/s	v
15 35	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 10.000 Per c .80.416 Lengtl .000 Wimp. 1 Option .250 Manni 74.000 SCS C .100 Ia/SG 8.924 Initi. 1 Option .015 .194 COMMENT 3 line(s) of ************************************	<pre>in hectares in hectares ent (%) ent Imperviou with Zero Dy n 1=SCS CN/C; g "n" urve No or C Coefficient al Abstractic n 1=Trianglr; 3.338 .858 comment ** A A20 - OUTLI ** 3.353 comment ** beveLoPMENT ** .6 99999 in hectares n (PERV) metr ent (%)</pre>	15 pth ; 2=Hortor .422 .261 ST B .422 LANDS BY	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total .000 c.m/s	v
15 35	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 1.000 Per c. 80.416 Lengtl .000 %Imp. 1.001 .250 Manni 74.000 SCS CC .100 Ia/s 8.924 Initia 1.00 tia/s .015 .194 COMMENT 3 line(s) of ************************************	<pre>in hectares h (PERV) meth ent (%) ent (%) with Zero Dp n 1=SCS CN/C; g "n" urve No or C Coefficient 1 Abstractic 1 Abstractic 1 Abstractic n 1=Trianglr; 3.338 comment ** 3.353 comment ** 3.353 comment ** ** 3.353 comment ** ** 6 99999 in hectares h (PERV) meth ent (%) ent [mervious]</pre>	15 pth ; 2=Hortor .422 .261 ST B .422 LANDS BY	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total .000 c.m/s	•
15 35	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 1.000 Per cr 80.416 Lengtl 1.000 Per cr 80.416 Lengtl 1.001 Control 250 Manni 74.000 SCS CC 1.00 Ia/50 8.924 Initia 1.001 Control .194 COMMENT 3 line(s) of ************************************	<pre>in hectares h (PERV) meth ent (%) ent (%) ent (myERV) with Zero Dr n 1=SCS CN/C; g "n" urve No or C Coefficient al Abstractic al Abstract</pre>	ns pth 2=Hortor .422 .261 ST B .422 LANDS BY res ls pth	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV	••
15 35	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 1.000 Per c. 80.416 Lengtl .000 % Imp. 1 Option .250 Manni 74.000 SCS CC .100 Ia/S .100 Ia/S .100 Ia/S .100 Ia/S .100 Ia/S .100 Ia/S .100 Ia/S .100 Ia/S .100 Ia/S .100 Ia/S .015 .015 .015 .015 COMMENT 3 line(s) of ************************************	<pre>in hectares in hectares ent (%) ent Imperviou with Zero Dp in 1=SCS CN/C; gg "n" urve No or C Coefficient al Abstractic in 1=Triang1r; 3.338 .858 comment ** a A20 - OUTLI ** 3.353 comment ** a A20 - OUTLI ** a A20 - OUTLI ** A20 - OUTLI ** A20 - OUTLI ** A</pre>	ns pth 2=Hortor .422 .261 ST B .422 LANDS BY res ls pth	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total .000 c.m/s	v
15 35	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 10.000 Per cr 80.416 Lengtl .000 % Imp. 1 Option .250 Manni 74.000 SCS C .100 Ia/SC 8.924 Initi 1 Option .015 .194 COMMENT 3 line(s) of ************************************	<pre>in hectares h (PERV) meth ent (%) ent Imperviou (IMPERV) with Zero Dy n 1=SCS CN/C, ag "n" Urve No or C Coefficient al Abstractic al Abst</pre>	ns pth 2=Hortor .422 .261 ST B .422 LANDS BY res ls pth	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV	v
15 35	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 1.000 Per c. 80.416 Lengtl .000 %Imp. 1.001 .250 Manni 74.000 SCS CC .100 Ia/sd 8.924 Initia 1.00 Ia/sd 8.924 Initia 1.00 Ia/sd 8.924 Initia 1.00 Ia/sd .015 .194 COMMENT 3 line(s) of ************************************	<pre>in hectares h (PERV) meth ent (%) ent (%) with Zero Dp n 1=SCS CM/C, g "n" urve No or C Coefficient al Abstractic n 1=Trianglr; 3.338 comment ** 3.353 comment ** 3.353 comment ** ** 6 99999 in hectares h (PERV) meth ent (%) ent Imperviou h (IMPERV) with Zero Dp n 1=SCS CM/C; g "n" urve No or C</pre>	ns pth 2=Hortor .422 .261 ST B .422 LANDS BY res ls pth	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV	••
15 35	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 1.000 Per c 80.416 Lengtl .000 % Imp. 1 Option .250 Manni 74.000 SCS C .100 Ia/SC 8.924 Initi 1 Option .015 .194 COMMENT 3 line(s) of ************************************	<pre>in hectares h (PERV) meth ent (%) ent Imperviou (IMPERV) with Zero Dy n 1=SCS CN/C, ag "n" Urve No or C Coefficient al Abstractic al Abst</pre>	15 pth ; 2=Hortor on ; 2=Rectar .422 .261 ET B .422 LANDS BY ress 15 pth ; 2=Hortor	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV	~
15 35	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 1.000 Per c. 80.416 Lengtl .000 % Imp. 1 Option .250 Manni 74.000 SCS CC .100 Ia/S 8.924 Initia 1 Option .015 .194 COMMENT 3 line(s) of ************************************	<pre>in hectares in hectares ent (%) ent Imperviou with Zero Pg in 1=SCS CN/Cj ng "n" urve No or C Coefficient al Abstractic in 1=rriang1r; 3.338 .858 comment ** a A20 - OUTLI ** 3.353 comment ** a A20 - OUTLI ** a A20 - OUTLI</pre>	<pre>is pth pth plane pth plane prove prove pth plane pt</pre>	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV 1; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reser	
15 35	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 10.000 Per c 80.416 Lengtl .000 % Imp. 1 Option .250 Manni 74.000 SCS C .100 Ia/SC 8.924 Initi 1 Option .015 .0194 COMMENT 3 line(s) of ************************************	in hectares in hectares h (PERV) meth ent (%) ent Imperviou with Zero Dg n 1=SCS CN/Cj a 1=SCS CN/Cj coefficient al Abstraction a 1=Trianglr; 3.338 comment *** 3.353 comment *** 3.353 comment *** 6 99999 in hectares h (PERV) meth ent (%) ent Imperviou functionent *** 6 99999 in hectares h (PERV) meth ent (%) ent Imperviou n 1=SCS CN/Cj g "n" urve No or C Coefficient al Abstraction 1=Trianglr; 3.353	15 pth pth 2=Hortor .422 .261 ET B .422 .422 LANDS BY res 15 pth ; 2=Hortor ph ; 2=Hortor	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV n; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s	
15 35 4	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 1.000 Gradi 1.000 Per c. 80.416 Lengtl .000 %Imp. 1.001 .250 Manni 74.000 SCS CC .100 Ia/s 8.924 Initi. 1.00 Ja/s 8.924 Initi. 1.00 Ja/s .015 .194 COMMENT 3 line(s) of ************************************	<pre>in hectares in hectares ent (%) ent Imperviou with Zero Pg in 1=SCS CN/Cj ng "n" urve No or C Coefficient al Abstractic in 1=rriang1r; 3.338 .858 comment ** a A20 - OUTLI ** 3.353 comment ** a A20 - OUTLI ** a A20 - OUTLI</pre>	15 pth pth 2=Hortor .422 .261 ET B .422 .422 LANDS BY res 15 pth ; 2=Hortor ph ; 2=Hortor	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV 1; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reser	
15 35	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 10.000 Per c 80.416 Lengtl .000 % Imp. 1 Option .250 Manni 74.000 SCS C .100 Ia/SC 8.924 Initi 1 Option .015 .0194 COMMENT 3 line(s) of ************************************	in hectares in hectares h (PERV) meth ent (%) ent Imperviou with Zero Dg n 1=SCS CN/Cj a 1=SCS CN/Cj coefficient al Abstraction a 1=Trianglr; 3.338 comment *** 3.353 comment *** 3.353 comment *** 6 99999 in hectares h (PERV) meth ent (%) ent Imperviou functionent *** 6 99999 in hectares h (PERV) meth ent (%) ent Imperviou n 1=SCS CN/Cj g "n" urve No or C Coefficient al Abstraction 1=Trianglr; 3.353	15 pth pth 2=Hortor .422 .261 ET B .422 .422 LANDS BY res 15 pth ; 2=Hortor ph ; 2=Hortor	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV n; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s	
15 35 4	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 1.000 Per c. 80.416 Lengtl .000 % Imp. 1 Option .250 Manni 74.000 SCS CC .100 Ia/S 8.924 Initi 1 Option .015 .194 COMMENT 3 line(s) of ************************************	<pre>in hectares in hectares ent (%) ent Imperviou with Zero Dg in 1=SCS CN/C; gg "n" urve No or C Coefficient al Abstractic in 1=Trianglr; 3.338 .858 comment ** 3.353 comment ** A A20 - OUTLI ** 3.353 comment ** A A20 - OUTLI ** 6 99999 in hectares h (PERV) metr ent Imperviou h (IMPERV) metr ent Imperviou h (IMPERV) metr ent Imperviou h (IMPERV) metr ent Imperviou h 1=Trianglr; 3.353 .867 3.489</pre>	15 pth ; 2=Hortor .422 .261 T B .422 LANDS BY res th ; 2=Hortor pth ; 2=Rectar .422 .228	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV n; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total	
15 35 4	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 10.000 Per c 80.416 Lengtl .000 % Imp. 1 Option .250 Manni 74.000 SCS C .100 Ia/S 8.924 Initi 1 Option .015 .194 COMMENT 3 line(s) of ************************************	in hectares in hectares h (PERV) meth ent (%) ent Imperviou (IMPERV) with Zero Dg n 1=SCS CN/C; Coefficient al Abstraction al Abstraction al Abstraction al Abstraction al Abstraction al Abstraction al Abstraction ent (MPERV) meth ent (%) ent (IMPERV) with Zero Dg n 1=SCS CN/C; g "n" Live No or C Coefficient al Abstraction n 1=Trianglr; 3.353 .867 3.489 it Length	<pre>15 25 25 25 25 25 25 25 25 25 25 25 25 25</pre>	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV n; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total	
15 35 4	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 1.000 Per c. 80.416 Lengtl .000 %Imp. 1.00100 Per c. 80.416 Lengtl .000 %Imp. 1.00100 .250 Manni 74.000 SCS CC .100 Ia/s 8.924 Initia 1.00115 .194 COMMENT 3 line(s) of ************************************	<pre>in hectares h (PERV) meth ent (%) ent (%) ent (%) with Zero Dr a 1=SCS CN/C; g "n" urve No or C Coefficient al Abstractic al Abstractic better al Abstractic al Abstr</pre>	<pre>15 25 25 25 25 25 25 25 25 25 25 25 25 25</pre>	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV n; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total	
15 35 4	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 1.000 Per c. 80.416 Lengtl .000 % Imp. 1 Option .250 Manni 74.000 SCS CC .100 Ia/SC .100 Ia/SC .100 Ia/SC .100 Ia/SC .015 .194 COMMENT 3 line(s) of ************************************	<pre>in hectares h (PERV) meth ent (%) ent (%) ent (%) with Zero Dr a 1=SCS CN/C; g "n" urve No or C Coefficient al Abstractic al Abstractic better al Abstractic al Abstr</pre>	<pre>15 pth pth pth pth pth pth pth pth pth pth</pre>	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV n; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total	
15 35 4	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 1.000 Per c. 80.416 Lengtl .0000 Per c. 80.416 Lengtl .000 Per c. 80.416 Lengtl .000 Per c. 8.924 Initi. 1 Option .100 I3/50 8.924 Initi. 1 Option .194 COMMENT 3 line(s) of ************************************	<pre>in hectares in hectares ent (%) ent Imperviou with Zero Dp n 1=SCS CN/C; g "n" urve No or C Coefficient al Abstraction n 1=Triang1r; 3.338 .858 comment ************************************</pre>	<pre>15 pth pth pth pth pth pth pth pth pth pth</pre>	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV n; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total	
15 35 4	200.000 ID No .970 Area 80.416 Lengtl 1.000 Gradi 1.000 Per c. 80.416 Lengtl .000 Vimp. 1 Option .250 Manni 74.000 SCS CC .100 Ia/s 8.924 Initi 1 Option .015 .194 COMMENT 3 line(s) of ************************************	<pre>in hectares h (PERV) meth ent (%) ent Imperviou (IMPERV) with Zero Dg h 1=SCS CN/C; Coefficient al Abstractic coefficient al Abstractic n 1=Triang1r; 3.338 .858 comment ** A A20 - OUTLI ** 3.353 comment ** A A20 - OUTLI ** 3.353 comment ** A A20 - OUTLI ** 3.353 comment ** A A20 - OUTLI ** 3.353 comment ** ** A A20 - OUTLI ** 3.353 comment ** ** A A20 - OUTLI ** 3.353 comment ** ** A A20 - OUTLI ** 3.353 comment ** ** ** ** ** ** ** ** ** ** ** ** **</pre>	15 pth pth 2=Hortor 122 .261 3T B .422 .422 .422 LANDS BY res 15 pth ; 2=Hortor .422 .228 .422 .422 .228 .422 .422 .228 .422 .422 .228 .422 .422 .228 .422	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV n; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s C perv/imperv/total	

25		
35		(s) of comment

	*******	*************
17	COMBINE 1 Junc	tion Node No.
	.1	81 3.489 3.489 3.489 c.m/s
14	START 1 1=Ze	ro; 2=Define
35	COMMENT	

	PROP DEVE	LOPMENT SOUTH OF QUAKER, EAST OF RICE - POND P50
4	CATCHMENT	
	6.430	ID No.ó 99999 Area in hectares
	207.000 1.000	Length (PERV) metres Gradient (%)
	70.000	Per cent Impervious
	207.000	Length (IMPERV) %Imp. with Zero Dpth
	1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
		Manning "n" SCS Curve No or C
		Ia/S Coefficient Initial Abstraction
	1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
		49 .000 3.489 3.489 c.m/s 94 .866 .665 C perv/imperv/total
15	ADD RUNOF	F 49 .649 3.489 3.489 c.m/s
9	ROUTE	
	.000	Conduit Length No Conduit defined
	.000	Zero lag
		Beta weighting factor Routing timestep
	0	No. of sub-reaches 49 .649 .649 3.489 c.m/s
17	COMBINE	
		tion Node No. 49 .649 .649 .649 c.m/s
14	START	ro; 2=Define
4	CATCHMENT	
	53.000 11.340	ID No.ó 99999 Area in hectares
	275.000	Length (PERV) metres
		Gradient (%) Per cent Impervious
		Length (IMPERV) %Imp. with Zero Dpth
	1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
	.250 74.000	Manning "n" SCS Curve No or C
	.100 8.924	Ia/S Coefficient Initial Abstraction
	1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
	1.1	.000 .649 .649 c.m/s .865 .664 C perv/imperv/total
15	ADD RUNOF 1.1	F
9	ROUTE	71 1.171 .649 .649 c.m/s
	.000	Conduit Length No Conduit defined
	.000	Zero lag
	.000	Beta weighting factor Routing timestep No. of sub-reaches
	0	No. of sub-reaches 71 1.171 1.171 .649 c.m/s
17	COMBINE	
	1.1	
18	CONFLUENC 2 Junc	E tion Node No.
	1.1	71 1.820 1.171 .000 c.m/s
4	CATCHMENT 54.000	ID No.6 99999
		Area in hectares Length (PERV) metres
	1.000	Gradient (%)
	60.000 92.000	Per cent Impervious Length (IMPERV)
	.000	%Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
	.250	Manning "n"
	74.000 .100	SCS Curve No or C Ia/S Coefficient
	8.924 1	Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
	.1	07 1.820 1.171 .000 c.m/s
15	.1 ADD RUNOF	94 .857 .592 C perv/imperv/total F
		07 1.923 1.171 .000 c.m/s
27		H DISPLAY of Hyeto/Hydrograph chosen
10	Volume = POND	.4892284E+04 c.m
	6 Depth -	Discharge - Volume sets
	182.000 182.800	.000 .0 .0190 5251.0
	183.150 183.500	.0230 7895.0 .238 10751.0
	183.800	.396 13425.0
	184.000 Peak Outf	
	Maximum D	epth = 182.699 metres
		D

			4589.		
17	COMBINE	.107	1.923	.017	.000 c.m/s
		nction Nod .107	e No. 1.923	.017	.017 c.m/s
14	START 1 1=	Zero; 2=De	fine		
35	COMMENT				
		ne(s) of c ********			
4	EXISTIN ******* CATCHME	********	QUAKER RD, ******	EAST OF R	ICE RD
-	5.000		99999		
	1.870 112.000		hectares (PERV) metr		
	1.000	Gradien	t (%)		
	50.000 112.000	Per cen Length	t Imperviou	s	
	.000	%Imp. w	ith Zero Dp		
	1 .250	Option Manning		2=Horton	; 3=Green-Ampt; 4=Repeat
	74.000		ve No or C		
	.100 8.924		efficient Abstractic	-	
	1		1=Trianglr;		glr; 3=SWM HYD; 4=Lin. Reserv
		.130 .194	.000 .851	.017	.017 c.m/s C perv/imperv/total
15	ADD RUN	OFF			
9	ROUTE	.130	.130	.017	.017 c.m/s
	.000	Conduit			
	.000	No Cond Zero la	uit defined g		
	.000	Beta we	ighting fac	tor	
	.000		timestep sub-reaches		
		.130	.130	.130	.017 c.m/s
17	COMBINE 2 Ju	nction Nod	e No.		
18	CONFLUE	.130	.130	.130	.136 c.m/s
10		nction Nod	e No.		
35	COMMENT	.130	.136	.130	.000 c.m/s
55	3 li:	ne(s) of c			
		************* 3 AREA ON (QUAKER RD,	EAST OF R	ICE RD
	******	********			
4	CATCHME 6.000		99999		
	1.920	Area in	hectares		
	113.000 .200	Length Gradien	(PERV) metr t (%)	es	
	65.000	Per cen	t Imperviou	s	
	113.000 .000	Length %Imp.w	(IMPERV) ith Zero Dp	th	
	1 .250	Option Manning		2=Horton	; 3=Green-Ampt; 4=Repeat
	74.000		ve No or C		
	.100 8.924		efficient Abstractic	n	
	1				glr; 3=SWM HYD; 4=Lin. Reserv
		.185 .194	.136 .867	.130 .631	.000 c.m/s C perv/imperv/total
15	ADD RUN	OFF .185	.321	.130	.000 c.m/s
35	COMMENT				
	3 li: ******	ne(s) of c ****	omment		
	FIRST A		AKER RD TO	CITY OF W	ELLAND MUNICIPAL BOUNDA
4	CATCHME	лт			
	201.000 2.430	ID No.ó	99999 hectares		
	127.000	Length	(PERV) metr	es	
	1.000 65.000	Gradien	t (%) t Imperviou	-	
	127.000	Length	(IMPERV) ith Zero Dp		
	.000 1			th	
		Option			: 3=Green-Ampt: 4=Repeat
	.250	Manning	"n"		; 3=Green-Ampt; 4=Repeat
	.250 74.000	Manning SCS Cur	"n" ve No or C		; 3=Green-Ampt; 4=Repeat
	.250 74.000 .100 8.924	Manning SCS Cur Ia/S Co Initial	"n" ve No or C efficient Abstractio	2=Horton	
	.250 74.000 .100 8.924 1	Manning SCS Cur Ia/S Co Initial	"n" ve No or C efficient Abstractio	2=Horton	; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s
15	.250 74.000 .100 8.924 1	Manning SCS Cur Ia/S Co Initial Option .221 .194	"n" ve No or C efficient Abstractio 1=Trianglr;	2=Horton n 2=Rectan .130	glr; 3=SWM HYD; 4=Lin. Reserv
15	.250 74.000 .100 8.924 1 ADD RUN	Manning SCS Cur Ia/S Co Initial Option .221 .194	"n" ve No or C efficient Abstractio 1=Trianglr; .321	2=Horton n 2=Rectan .130	glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s
15 9	.250 74.000 .100 8.924 1 ADD RUN ROUTE	Manning SCS Cur Ia/S Co Initial Option .221 .194 DFF .221	"n" ve No or C efficient Abstractio 1=Trianglr; .321 .848 .542	2=Horton n 2=Rectan .130 .619	glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total
	.250 74.000 .100 8.924 1 ADD RUN ROUTE .000 .000	Manning SCS Cur Ia/S Co Initial Option .221 .194 .221 Conduit No Condi	"n" ve No or C efficient Abstractio 1=Trianglr; .321 .848 .542 Length uit defined	2=Horton n 2=Rectan .130 .619 .130	glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total
	.250 74.000 .100 8.924 1 ADD RUN ROUTE .000	Manning SCS Cur Ia/S Co Initial Option .221 .194 .221 Conduit No Cond Zero la	"n" ve No or C efficient Abstractic 1=Trianglr; .321 .848 .542 Length uit defined g	2=Horton n 2=Rectan .130 .619 .130	glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total
	.250 74.000 .100 8.924 1 ADD RUN ROUTE .000 .000 .000 .000 .000	Manning SCS Cur Ia/S Co Initial Option 2 .221 .194 .221 Conduit No Cond Zero la Beta we Routing	"n" ve No or C efficient Abstractio 1=Trianglr; .321 .848 .542 Length uit defined g ighting fac timestep	2=Horton 2=Rectan .130 .619 .130	glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total
	.250 74.000 .100 8.924 1 ADD RUN ROUTE .000 .000 .000 .000 .000 .000 0	Manning SCS Cur Ia/S Co Initial Option : .221 .194 .221 Conduit No Cond Zero la Beta we Routing No. of	"n" ve No or C efficient Abstractio 1=Triang1r; .321 .348 .542 Length uit defined g ighting fac timestep sub-reaches	2=Horton 2=Rectan .130 .619 .130	glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total
	.250 74.000 .100 8.924 1 ADD RUM ROUTE .000 .000 .000 .000 .000 .000 .000 .0	Manning SCS Cur Ia/S Co Initial Option .221 .194 OFF .221 Conduit No Cond Zero la Beta we Routing No. of 2.	"n" ve No or C efficient Abstractico l=Trianglr; .321 .848 .542 Length uit defined g ighting fac timestep sub-reaches .542	2=Horton 2=Rectan .130 .619 .130	glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s
9	.250 74.000 .100 8.924 1 ADD RUN ROUTE .000 .000 .000 .000 .000 .000 .000 .0	Manning SCS Cur Ia/S Co Initial Option 221 Conduit No Cond Zero la Beta we Routing No. of 221 notion Nod. 221	"n" ve No or C efficient Abstractico l=Trianglr; .321 .848 .542 Length uit defined g ighting fac timestep sub-reaches .542	2=Horton 2=Rectan .130 .619 .130 tor .542	glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s
9	.250 74.000 .100 8.924 1 ADD RUN ROUTE .000 .000 .000 .000 .000 .000 .000 .0	Manning SCS Cur Ia/S Co Initial Option 2221 .221 Conduit No Cond Zero la Beta we Routing No. of .221 notion Nod .221	"n" ve No or C efficient Abstractic 1=Trianglr; .321 .848 .542 Length uit defined g ighting fac timestep sub-reaches .542 e No. .542	2=Horton 2=Rectan .130 .619 .130 tor .542	<pre>glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s .000 c.m/s</pre>
9	.250 74.000 .100 8.924 1 ADD RUM ROUTE .000 .000 .000 .000 0 COMBINE 1 JU COMMENT 3 Li:	Manning SCS Cur Ia/S Co Initial Option : .221 Conduit No Condi Zero la Beta we Routing No. of : .221 nction Nod .221 ne(s) of c	"n" ve No or C efficient Abstractio L=Trianglr; .321 .848 .542 Length uit defined g ighting fac timestep sub-reaches .542 e No. .542 omment	2=Horton 2=Rectan .130 .130 .130 .130 .542	<pre>glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s .000 c.m/s 4.031 c.m/s</pre>
9	.250 74.000 .100 8.924 1 ADD RUN ROUTE .000 .000 .000 .000 .000 .000 .000 .0	Manning SCS Cur Ia/S Co Initial Option : .221 Conduit No Condi Zero la Beta we Routing No. of : .221 nction Nod .221 ne(s) of c	"n" ve No or C efficient Abstractic 1=rrianglr; .321 .848 .542 Length uit defined g ighting fac timestep sub-reaches .542 e No. .542 omment ******	2=Horton 2=Rectan .130 .130 .130 .130 .542	<pre>glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s .000 c.m/s 4.031 c.m/s</pre>
9	.250 74.000 .100 8.924 1 ADD RUM ROUTE .000 .000 .000 .000 .000 .000 .000 .0	Manning SCS Cur Ia/S Co Initial Option 2 .221 Conduit No Condi Zero la Beta we Routing No. of 1 .221 netion Nod .221 ne(s) of c	"n" ve No or C efficient Abstractic 1=Trianglr; .321 .848 .542 Length uit defined g ighting fac timestep sub-reaches .542 e No. .542 omment *******	2=Horton 2=Rectan .130 .130 .130 .130 .542	<pre>glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s .000 c.m/s 4.031 c.m/s</pre>
9 17 35	.250 74.000 .100 8.924 1 ADD RUN ROUTE .000 .000 .000 .000 .000 0 COMBINE 1 Ju COMMENT 3 11: ******* FLOW D/ *******	Manning SCS Cur Ia/S Co Initial Option : .221 .221 Conduit No Cond Zero la Beta we Routing No. of : .221 metion Nod .221 mets) of c	"n" ve No or C efficient Abstractic 1=Trianglr; .321 .848 .542 Length uit defined g ighting fac timestep sub-reaches .542 e No. .542 omment *******	2=Horton 2=Rectan .130 .130 .130 .130 .542	<pre>glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s .000 c.m/s 4.031 c.m/s T C</pre>

COMMENT 35 3 line(s) of comment REALIGNED CHANNEL - SEGMENT 3 4 CATCHMENT 300.000 ID No.ó 99999 3.180 Area in hectares 146.000 .200 15.000 Length (PERV) metres Gradient (%) Per cent Impervious 146.000 Length (IMPERV) %Imp. with Zero Dpth Option 15CS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C 1 .250 74.000 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .100 8.924 1 .542 .000 c.m/s C perv/imperv/total .071 4.031 .859 .194 15 ADD RUNOFF .071 4.102 .542 .000 c.m/s CATCHMENT 4 TD No. 6 99999 301.000 .720 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious . 200 10.000 Length (IMPERV) 69.000 Sump. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" .000 1 SCS Curve No or C Ia/S Coefficient Initial Abstraction 74.000 .100 8.924 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 11 4.102 .542 .000 c.m/s .000 c.m/s C perv/imperv/total .011 .542 .194 .855 15 ADD RUNOFF 4.113 .542 .000 c.m/s 9 ROUTE .000 Conduit Length .000 No Conduit defined Zero lag Beta weighting factor . 000 .000 .000 Routing timestep No. of sub-reaches .011 4.113 0 4.113 .000 c.m/s COMBINE 17 Junction Node No. .011 4.113 1 4.113 4.113 c.m/s 14 START 1=Zero; 2=Define COMMENT 35 3 line(s) of comment
********** PROP DEVELOPMENT NORTH OF SEGMENT 3 - POND P30 ***** CATCHMENT 4 30.000 ID No.ó 99999 Area in hectares Length (PERV) metres 8.470 238.000 .200 Gradient (%) Per cent Impervious .100 238.000 Length (IMPERV) .000 %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" SCS Curve No or C Ia/S Coefficient Initial Abstraction 74.000 .100 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5. .000 4.113 4.113 c.m/s 4. .195 C perv/imperv/total 1 .035 .194 ADD RUNOFF .035 15 .035 4.113 4.113 c.m/s 4 CATCHMENT ID No.ó 99999 31.000 10.420 Area in hectares Length (PERV) metres Gradient (%) 264.000 1.000 75.000 Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth 264.000 .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1 . 250 Manning "n" SCS Curve No or C 74.000 .100 Ia/S Coefficient 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 1.154 .194 ADD RUNOFF .035 4.113 4.113 c.m/s C perv/imperv/total 15 1.154 4.113 c.m/s 1.158 4.113 1.154 1.158 4.113 HYDROGRAPH DISPLAY 5 is # of Hyetc/Hydrograph chosen Volume = .3477034E+04 c.m CATCHMENT 27 5 4 TD No. 6 99999 32.000 .690 Area in hectares Length (PERV) metres 1.000 Gradient (%) Per cent Impervious 68.000 Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 .250 Manning "n" 74.000 SCS Curve No or C

.100 Ia/S Coefficient 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 61 1.158 4.113 4.113 c.m/s 94 .857 .592 C perv/imperv/total 1 .061 .194 15 ADD RUNOFF .061 1.2 HYDROGRAPH DISPLAY 1.210 4.113 4.113 c.m/s 27 Volume = .3636135E+04 c.m 5 10 POND
 FOND

 5 Depth - Discharge - Volume sets

 178.800
 .000
 .0

 179.300
 .0260
 1520.0
 180.100 .0440 4649.0 7069.0 .414 180.600 4.113 c.m/s 17 1 Junction Node No. .061 START 1.210 .034 4.131 c.m/s 14 1=Zero; 2=Define COMMENT 35 line(s) of comment 3 PROP DEVELOPMENT SOUTH OF SEGMENT 3 - POND P31 ********* 4 CATCHMENT ID No.ó 99999 33.000 12,960 Area in hectares Length (PERV) metres 294.000 Gradient (%) Per cent Impervious Length (IMPERV) 1.000 75.000 294.000 .000 %Imp. with Zero Dpth 1 .250 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C 74.000 Ia/S Coefficient Initial Abstraction .100 8.924 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 28 .000 .034 4.131 c.m/s 94 .863 .696 C perv/imperv/total 1 1.428 .194 ADD RUNOFF 1.428 15 1.428 .034 4.131 c.m/s HYDROGRAPH DISPLAY 27 CATCHMENT UISPLAY is # of Hyeto/Hydrograph chosen Volume = .3513004E+04 c.m 4 34.000 ID No.ó 99999 Area in hectares .660 Length (PERV) metres Gradient (%) Per cent Impervious 66.000 1.000 60.000 Length (IMPERV) %Imp. with Zero Dpth 66.000 .000 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C . 250 74.000 .100 Ia/S Coefficient 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .059 1.428 .034 .856 .591 4.131 c.m/s C perv/imperv/total .194 ADD RUNOFF 15 ADD RUNOFF .059 1.478 .034 HYDROGRAPH DISPLAY 5 is # of Hyeto/Hydrograph chosen Volume = .3665095E+04 c.m POND 4.131 c.m/s 27 10 POND 6 Depth - Discharge - Volume sets .000 178.300 .0 1927.0 178.900 179.600 .0540 4692.0 .150 179.800 5590.0
 180.000
 .321
 6538.0

 180.300
 1.922
 8059.0

 Peak Outflow
 =
 .043 c.m/s

 Maximum Depth
 =
 179.201 metres

 Maximum Storage
 =
 3116. c.m

 .059
 1.478
 .043
 180.000 .321 6538.0 4.131 c.m/s 17 Junction Node No 1 .059 START 1.478 .043 4.153 c.m/s 14 1=Zero; 2=Define CONFLUENCE 18 1 Junction Node No. .059 4.153 .043 .000 c.m/s 35 COMMENT line(s) of comment 3 REALIGNED CHANNEL - SEGMENT 3 CATCHMENT 4 302.000 TD No. 6 99999 Area in hectares Length (PERV) metres 1.610 104.000 .200 Gradient (%) Per cent Impervious Length (IMPERV) 104.000 %Imp. with Zero Dpth
Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 . 250 Manning "n" SCS Curve No or C 74.000

.100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 4.153 .043 .000 c.m/s .262 C perv/imperv/total .024 .194 .868 COMMENT 3 line(s) of comment 3 FLOW U/S OF NIAGARA ST CULVERT - OUTLET D

15 ADD RUNOFF

35

4.177 .043 .000 c.m/s 14

1 1=Zero; 2=Define 35 COMMENT 5-YEAR STORM EVENT STORM 2 1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic 830.000 Coefficient a Constant b (min) Exponent c 7.300 Fraction to peak r Duration ó 240 min 45.874 mm Total depth .450 240.000 3 IMPERVIOUS Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" 1 .015 SCS Curve No or C Ia/S Coefficient Initial Abstraction 98.000 .100 .518 35 COMMENT 3 line(s) of comment EXISTING RES. WEST OF SEGMENT 1 4 CATCHMENT 1.000 TD No. 6 99999 17.520 Area in hectares Length (PERV) metres Gradient (%) 343.000 1.000 Per cent Impervious 35.000 343.000 Length (IMPERV) Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 250 Manning "n" SCS Curve No or C Ia/S Coefficient 74.000 .100 8.924 Ditial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 1.082 .000 .000 .000 c.m/s .461 C perv/imperv/total .236 ADD RUNOFF 1.082 15 1.082 .000 .000 c.m/s 35 COMMENT REALIGNED CHANNEL - SEGMENT 1 ****** CATCHMENT 4 100.000 ID No.ó 99999 Area in hectares Length (PERV) metres 2.020 116.000 .400 Gradient (%) 15.000 Per cent Impervious Length (IMPERV) 116.000 %Imp. with Zero Dpth .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" 1 .250 SCS Curve No or C 74.000 .100 Ia/S Coefficient 8.924 Initial Abstraction
 Option
 1=Trianglr;
 2=Rectanglr;
 3=SWM HYD;
 4=Lin.
 Reserv

 55
 1.082
 .000
 .000 c.m/s
 .000
 .332
 C perv/imperv/total
 .055 .236 COMMENT 35 3 line(s) of comment FLOW AT FUT ROADWAY CULVERT - SEGMENT 1 ADD RUNOFF 15 .055 1.137 .000 .000 c.m/s ROUTE Conduit Length .000 .000 No Conduit defined .000 Zero lag Beta weighting factor .000 Routing timestep No. of sub-reaches .000 0 .055 1.137 1.137 .000 c.m/s COMBINE 17 Junction Node No. 1 .055 START 1.137 1.137 1.137 c.m/s 14 1=Zero; 2=Define 1 35 COMMENT line(s) of comment PROP DEVELOPMENT NORTH OF SEGMENT 1 - POND P10 CATCHMENT 4 10.000 4.050 ID No.ó 99999 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious 164.000 1.000 70.000 164.000 Length (IMPERV) %Imp. with Zero Dpth .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1 . 250 Manning "n" SCS Curve No or C 74.000 .100 Ta/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 8.924 1 .000 1.137 .871 .681 1.137 1.137 c.m/s .681 C perv/imperv/total .477 .236 15 ADD RUNOFF .477 1.137 CATCHMENT L1.000 ID No.6 99999 Area in hectar .477 1.137 c.m/s 11.000 Area in hectares

82.000 Length (PERV) metres 1.000 Gradient (%) Per cent Impervious 82.000 Length (IMPERV) %Imp. with Zero Dpth .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" 1 .250 74.000 SCS Curve No or C Ia/S Coefficient Initial Abstraction .100 8.924
 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv

 20
 .477

 35
 .875

 .299
 C perv/imperv/total
 1 .020 .235 15 ADD RUNOFF .020 .497 1.137 1.137 c.m/s POND 10
 6 Depth - Discharge - Volume sets

 184.800
 .000
 .0

 185.750
 .0210
 1.0
 .0230 186.000 503.0 186.250 1091.0 186.500 .0280 1765.0 -.244 2370.0 reax Outflow = .026 c.m/s Maximum Depth = 186.226 metres Maximum Storage = 1035. c -.020 = 1035. c.m .497 .020 COMBINE 1.137 c.m/s 17 Junction Node No. .020 .497 1 .020 START .026 1.160 c.m/s 14 1=Zero; 2=Define L 1=Zero CONFLUENCE 18 1 Junction Node No. .020 1.160 .020 COMMENT .000 c.m/s .026 35 3 line(s) of comment REALIGNED CHANNEL - SEGMENT 1 **** CATCHMENT 4 101.000 TD No. 6 99999 .610 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious 1.000 10.000 Length (IMPERV) 64.000 %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 .250 Manning "n" SCS Curve No or C Ia/S Coefficient 74.000 .100 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .012 1.160 .026 .000 c.m/s .235 .873 .299 C perv/imperv/total 8.924 ADD RUNOFF 15 .012 1.172 .026 .000 c.m/s 9 ROUTE Conduit Length .000 .000 No Conduit defined .000 Zero lag Beta weighting factor .000 .000 Routing timestep No. of sub-reaches 0 1.172 .012 1.172 .000 c.m/s 17 COMBINE Junction Node No. 1 .012 1.172 1.172 1.172 c.m/s 14 START 1=Zero; 2=Define COMMENT 35 3 line(s) of comment PROP DEVELOPMENT SOUTH OF SEGMENT 1 - POND P11 4 CATCHMENT 12.000 TD No. 6 99999 2.680 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious 1.000 35.000 134.000 Length (IMPERV) .000 %Imp. with Zero Dpth
Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C Ia/S Coefficient .100 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 59 .000 1.172 1.172 c.m/s 36 .866 .456 C perv/imperv/total 8.924 .159 C perv/imperv/total .236 ADD RUNOFF .159 15 1.172 .159 1.172 c.m/s 4 CATCHMENT ID No.ó 99999 13.000 6.980 Area in hectares 216.000 1.000 Length (PERV) metres Gradient (%) 70.000 Per cent Impervious Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 216.000 .000 .250 Manning "n" SCS Curve No or C 74.000 .100 Ia/S Coefficient 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 835 .159 1.172 1.172 c.m/s

	.236	.882	.688	C perv/imperv/total	
15	ADD RUNOFF	.994	1.172	1.172 c.m/s	
4	CATCHMENT			1.1/2 () 5	
		D No.ó 99999 rea in hecta			
	67.000 I	ength (PERV)			
		Fradient (%) Per cent Impe	rvious		
	67.000 I	ength (IMPER	V)		
		Imp. with Ze option 1=SCS		on; 3=Green-Ampt; 4=Repeat	
		Manning "n" SCS Curve No	or C		
	.100 1	a/S Coeffici	ent		
		nitial Abstr ption 1=Tria		anglr; 3=SWM HYD; 4=Lin. Reserv	
	.072	.994	1.172	1.172 c.m/s	
15	.235 ADD RUNOFF	.873	.618	C perv/imperv/total	
27	.072 HYDROGRAPH		1.172	1.172 c.m/s	
27	5 is#c	of Hyeto/Hydr		n	
10	Volume = POND	.2954374E+04	c.m		
	5 Depth - Di	scharge - Vo			
	184.800 185.300	.000	.0 1142.0		
	186.100 186.500	.0240	3519.0		
	186.800		4978.0 6222.0		
	Peak Outflo Maximum Dep	w = xtb = 185	.020 c.m/s .805 metres		
	Maximum Sto	prage = 2	641. c.m		
35	.072 COMMENT	1.052	.020	1.172 c.m/s	
) of comment			
		RICE RD CUL	VERT - OUTLE	T Al	
17	*********** COMBINE	*****			
17		on Node No.			
14	.072 START	1.052	.020	1.185 c.m/s	
		; 2=Define			
35	COMMENT 3 line(s) of comment			
	********	********			
		**************************************		& WEST OF RICE RD PON	
4	CATCHMENT 40.000 I	D No.ó 99999			
	8.210 A	rea in hecta	res		
		ength (PERV) Fradient (%)	metres		
	25.000 F	er cent Impe	rvious		
		ength (IMPER Imp. with Ze			
	.000 % 1 C	Imp. with Ze Option 1=SCS	ro Dpth	on; 3=Green-Ampt; 4=Repeat	
	.000 % 1 C .250 № 74.000 S	Imp. with Ze	ro Dpth CN/C; 2=Hort	on; 3=Green-Ampt; 4=Repeat	
	.000 % 1 C .250 M 74.000 S .100 D	Imp. with Ze Option 1=SCS Manning "n" SCS Curve No Ca/S Coeffici	ro Dpth CN/C; 2=Hort or C ent	on; 3=Green-Ampt; 4=Repeat	
	.000 % 1 C .250 M 74.000 S .100 J 8.924 J 1 C	SImp. with Ze Option 1=SCS Manning "n" SCS Curve No Ca/S Coeffici Cnitial Abstr Option 1=Tria	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect	anglr; 3=SWM HYD; 4=Lin. Reserv	
	.000 % 1 C .250 M 74.000 S .100 J 8.924 J	SImp. with Ze option 1=SCS famming "n" SCS Curve No Ea/S Coeffici initial Abstr option 1=Tria .000	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .020	anglr; 3=SWM HYD; 4=Lin. Reserv	
15	.000 % 1 C .250 M 74.000 S .100 J 8.924 J 1 C .36J .236 ADD RUNOFF	SIMP. with Ze pption 1=SCS Manning "n" CCS Curve No Ca/S Coeffici initial Abstr pption 1=Tria 000 884	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .020 .398	anglr; 3=SWM HYD; 4=Lin. Reserv 1.185 c.m/s C perv/imperv/total	
15	.000 % 1 C .250 M 74.000 S .100 I 8.924 I 1 C .361 .236 ADD RUNOFF .361 ROUTE	SIMP. with Ze Aption 1=SCS lanning "n" ICS Curve No ia/S Coeffici initial Abstr ption 1=Tria .000 .884 .361	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .020 .398 .020	anglr; 3=SWM HYD; 4=Lin. Reserv 1.185 c.m/s	
	.000 % 1 C .250 M 74.000 C 8.924 J 1 C .361 .236 ADD RUNOFF .361 ROUTE .000 C	SIMP. with Ze Option 1=SCS Lanning "n" SCS Curve No Ca/S Coeffici Initial Abstr Option 1=Tria 000 884 361 Conduit Lengt	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .020 .398 .020 h	anglr; 3=SWM HYD; 4=Lin. Reserv 1.185 c.m/s C perv/imperv/total	
	.000 8 1 0 .250 M 74.000 5 8.924 1 1 0 .234 ADD RUNOFF .361 ROUTE .000 0 .000 0	<pre>simp. with Ze ption 1=SCS tanning "n" CS Curve No ta/S Coeffici tabstr option 1=Tria tab</pre>	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .398 .020 h fined	anglr; 3=SWM HYD; 4=Lin. Reserv 1.185 c.m/s C perv/imperv/total	
	.000 % 1 C .250 M 74.000 S .100 1 8.924 1 1 C .361 .235 ADD RUNOFF .361 ROTTE .000 C .000 N .000 S	Imp. with Ze option 1=SCS lanning "n" CCS Curve No initial Abstr option 1=Tria 	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .020 .398 .020 h fined g factor	anglr; 3=SWM HYD; 4=Lin. Reserv 1.185 c.m/s C perv/imperv/total	
	.000 % 1 C .250 M 74.000 5 8.924 1 1 C .361 .234 ADD RUNOFF .361 ROUTE .000 C .000 N .000 2 .000 E .000 F .000 F	LIMP. with Ze Jption 1=SCS Lanning "n" ICS Curve No ICS Curve No Initial Abstr pption 1=Tria 000 884 361 Conduit Lengt to Conduit Lengt	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .020 .398 .020 h fined g factor tep aches	anglr; 3=SWM HYD; 4=Lin. Reserv 1.185 c.m/s C perv/imperv/total 1.185 c.m/s	
	.000 8 1 C .250 M 74.000 5 8.924 1 1 C .361 .234 ADD RUNOFF .361 ROUTE .000 C .000 M .000 2 .000 F .000 F .000 F .361 COME INE	<pre>http://with Zeventeesing the second sec</pre>	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .020 .398 .020 h fined g factor tep	anglr; 3=SWM HYD; 4=Lin. Reserv 1.185 c.m/s C perv/imperv/total	
9	.000 % % % % % % % % % % % % % % % % % %	<pre>htmp. with Ze pption 1=SCS Manning "n" CS Curve No CS Curve No CS Curve No CS Curve No CS Curve No CS Curve No CS Curve No No S</pre>	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .020 .398 .020 h fined g factor tep aches .361	anglr; 3=SWM HYD; 4=Lin. Reserv 1.185 c.m/s C perv/imperv/total 1.185 c.m/s 1.185 c.m/s	
9	.000 % 1 C .250 M 74.000 5 .100 1 8.924 1 1 C .361 .234 ADD RUNOFF .361 ROUTE .000 C .000 M .000 2 .000 E .000 E .000 E .361 COMBINE 2 Juncti .361 START	LIMP. with Ze Joption 1=SCS Lanning "n" ICS Curve No ICS Curve No ICS Curve No ISS Curve No I	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .020 .398 .020 h fined g factor tep aches	anglr; 3=SWM HYD; 4=Lin. Reserv 1.185 c.m/s C perv/imperv/total 1.185 c.m/s	
9 17	.000 % 1 C .250 M 74.000 5 .100 1 8.924 1 1 C .361 .234 ADD RUNOFF .361 ROUTE .000 C .000 M .000 2 .000 E .000 E .000 E .361 COMBINE 2 Juncti .361 START	<pre>htmp. with Ze pption 1=SCS Manning "n" CS Curve No CS Curve No CS Curve No CS Curve No CS Curve No CS Curve No CS Curve No No S</pre>	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .020 .398 .020 h fined g factor tep aches .361	anglr; 3=SWM HYD; 4=Lin. Reserv 1.185 c.m/s C perv/imperv/total 1.185 c.m/s 1.185 c.m/s	
9 17 14	.000 % 1 C .250 M 74.000 S .100 I 8.924 I 1 C .361 .236 ADD RUNOFF .361 ROUTE .000 C .000 N .000 Z .000 E .000 E .000 E .000 E .361 COMBINE 2 JUNCTI .361 START 1 I=ZECC CATCHMENT 1 I=ZECC	LIMP. with Ze Joption 1=SCS Lanning "n" ICS Curve No ICS Curve No I	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .020 .398 .020 h fined g factor tep aches .361 .361	anglr; 3=SWM HYD; 4=Lin. Reserv 1.185 c.m/s C perv/imperv/total 1.185 c.m/s 1.185 c.m/s	
9 17 14	.000 8 1 0 .250 M 74.000 5 .100 1 8.924 1 1 0 .361 .236 .236 .236 .236 .236 .236 .000 C .000 M .000 2 .000 C .000 M .000 2 .000 C .000 S .000 S .000 S .000 S .361 .236 .000 C .000 S .000 S .000 S .000 S .361	<pre>slmp. with Ze X A A A A A A A A A A A A A A A A A A</pre>	ro Dpth CN/C; 2=Hort or C ent action .398 .020 h fined g factor tep aches .361 .361	anglr; 3=SWM HYD; 4=Lin. Reserv 1.185 c.m/s C perv/imperv/total 1.185 c.m/s 1.185 c.m/s	
9 17 14	.000 % % % % % % % % % % % % % % % % % %	LIMP. with Ze Uption 1=SCS Lanning "n" CS Curve No CS Curve No CS Curve No 1=STial Abstri- 2, 000 3, 884 	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .020 .398 .020 h fined g factor tep aches .361 .361	anglr; 3=SWM HYD; 4=Lin. Reserv 1.185 c.m/s C perv/imperv/total 1.185 c.m/s 1.185 c.m/s	
9 17 14	.000 % 1 C .250 M 74.000 S .100 I 8.924 I 1 C .361 .236 ADD RUNOFF .000 C .000 M .000 Z .000 M .000 Z .000 E .000 E .000 E .000 E .000 E .361 COMBINE 2 JUNCTI .361 START 1 I=Zerc CATCHMENT 1 I=Zerc I I=Zerc I I=Zerc I I=Zerc I I=Zerc I I=Zerc I I=Zerc I I=Zerc I I=Zerc I I=Zerc I I=Zerc I I=Zerc I I=Zerc I I=Zerc I I=Zerc I I I=Zerc I I I I I I I I I I I I I I I I I I I	LIMP. with Ze Joption 1=SCS Lanning "n" ICS Curve No ICS Curve No ICS Curve No ICS Curve No ISS Curve No I	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .020 .398 .020 h fined g factor tep aches .361 .361 .361	anglr; 3=SWM HYD; 4=Lin. Reserv 1.185 c.m/s C perv/imperv/total 1.185 c.m/s 1.185 c.m/s	
9 17 14	.000 % % % % % % % % % % % % % % % % % %	<pre>http://with Ze http://with Ze http://with.ze h</pre>	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .020 .398 .020 h fined g factor tep aches .361 .361 .361 .361 res metres rvious V) ro Dpth	anglr; 3=SWM HYD; 4=Lin. Reserv 1.185 c.m/s C perv/imperv/total 1.185 c.m/s 1.185 c.m/s	
9 17 14	.000 % 1 C .250 M .100 1 8.924 1 1 C .361 .236 ADD RUNOFF .361 ROUTE .000 C .000 N .000 2 .000 F .000 F .000 F .000 S .361 COMBINE 2 Juncti .361 START 1 =ZerC CATCHMENT 1 =ZerC CATCHMENT 1 =2erC CATCHMENT 1 .000 C .350 M .000 S .3500 F .000 S .3500 F .250 S .350 S .3500 F .3500 S .3500	LIMP. with Ze piton 1=SCS Lanning "n" CS Curve No La / S Coeffici initial Abstr piton 1=Tria 000 884 361 Conduit Lengt to Conduit dengt lo Conduit Lengt to Conduit dengt to Conduit Lengt to Conduit Lengt	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .020 .398 .020 h fined g factor tep aches .361 .361 .361 res metres rvious V) ro Dpth CN/C; 2=Hort	anglr; 3=SWM HYD; 4=Lin. Reserv 1.185 c.m/s C perv/imperv/total 1.185 c.m/s 1.185 c.m/s .361 c.m/s	
9 17 14	.000 % % % % % % % % % % % % % % % % % %	<pre>htmp. with Ze Virtual Section 2014 Sect</pre>	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .020 .398 .020 h fined g factor tep aches .361 .361 .361 res metres rvious V) ro Dpth CN/C; 2=Hort or C	anglr; 3=SWM HYD; 4=Lin. Reserv 1.185 c.m/s C perv/imperv/total 1.185 c.m/s 1.185 c.m/s .361 c.m/s	
9 17 14	.000 % 1 C .250 M 74.000 S .100 1 8.924 1 1 C .361 .236 .361 ROUTE .000 C .361 COMBINE 2 JUNCEF .000 C .361 COMBINE 2 JUNCEF .361 START 1 IZZEC CATCHMENT 41.000 C .361 START 1 IZZEC CATCHMENT 41.000 C .361 .361 START 1 IZZEC .361	<pre>http://with Zey for the second s</pre>	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .020 .398 .020 h fined g factor tep aches .361 .361 .361 .361 res metres rvious V) ro Dpth CN/C; 2=Hort or C ent action	<pre>anglr; 3=SWM HYD; 4=Lin. Reserv 1.185 c.m/s C perv/imperv/total 1.185 c.m/s 1.185 c.m/s .361 c.m/s on; 3=Green-Ampt; 4=Repeat</pre>	
9 17 14	.000 % % % % % % % % % % % % % % % % % %	<pre>http://with Zey http://withing.com/ http:</pre>	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .020 .398 .020 h fined g factor tep aches .361 .361 .361 res metres rvious V) ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .361	<pre>anglr; 3=SWM HYD; 4=Lin. Reserv 1.185 c.m/s C perv/imperv/total 1.185 c.m/s 1.185 c.m/s .361 c.m/s on; 3=Green-Ampt; 4=Repeat anglr; 3=SWM HYD; 4=Lin. Reserv .361 c.m/s</pre>	
9 17 14	.000 % 1 0 250 M 74.000 S 361 250 M 74.000 I 8.924 I 1 0 .361 .236 ADD RUNOFF .361 RUTTE .000 C .000 M .000 Z .000 F .000	<pre>http://with Zey http://withing.com/ http:</pre>	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .020 .398 .020 h fined g factor tep aches .361 .361 .361 .361 cres metres rvious V) ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect	<pre>anglr; 3=SWM HYD; 4=Lin. Reserv</pre>	
9 17 14 4	.000 % % % % % % % % % % % % % % % % % %	<pre>http://with Zey Stanning "n" http://withing.com/section http://section.com/section http://section.com/section.com/section http://section.com/</pre>	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .020 .398 .020 h fined g factor tep aches .361 .361 .361 res metres rvious V) ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .361	<pre>anglr; 3=SWM HYD; 4=Lin. Reserv 1.185 c.m/s C perv/imperv/total 1.185 c.m/s 1.185 c.m/s .361 c.m/s on; 3=Green-Ampt; 4=Repeat anglr; 3=SWM HYD; 4=Lin. Reserv .361 c.m/s</pre>	
9 17 14 4	.000 % % % % % % % % % % % % % % % % % %	<pre>htmp. with Ze you with Ze</pre>	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .020 .398 .020 h fined g factor tep aches .361 .361 res metres rvious V) ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .361 .459 .361	<pre>anglr; 3=SWM HYD; 4=Lin. Reserv 1.185 c.m/s C perv/imperv/total 1.185 c.m/s 1.185 c.m/s .361 c.m/s on; 3=Green-Ampt; 4=Repeat anglr; 3=SWM HYD; 4=Lin. Reserv .361 c.m/s C perv/imperv/total</pre>	
9 17 14 4	.000 % 1 0 0 1 250 M 74.000 S .250 M 74.000 I 8.924 I 1 0 .361 .236 ADD RUNOFF .000 C .000 M .000 C .000 M .000 C .000 F .000 C	<pre>http://with Ze by the second sec</pre>	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .020 .398 .020 h fined g factor tep aches .361 .361 .361 cres rvious V) ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .361 .361	<pre>anglr; 3=SWM HYD; 4=Lin. Reserv 1.185 c.m/s C perv/imperv/total 1.185 c.m/s 1.185 c.m/s .361 c.m/s on; 3=Green-Ampt; 4=Repeat anglr; 3=SWM HYD; 4=Lin. Reserv .361 c.m/s C perv/imperv/total</pre>	
9 17 14 4	.000 % % % % % % % % % % % % % % % % % %	<pre>http://with Zey ption 1=SCS tanning "n" iCS Curve No</pre>	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .020 .398 .020 h fined g factor tep aches .361 .361 .361 .361 cres metres rvious V) ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .361 .361	<pre>anglr; 3=SWM HYD; 4=Lin. Reserv 1.185 c.m/s C perv/imperv/total 1.185 c.m/s 1.185 c.m/s .361 c.m/s on; 3=Green-Ampt; 4=Repeat anglr; 3=SWM HYD; 4=Lin. Reserv .361 c.m/s C perv/imperv/total</pre>	
9 17 14 4	.000 % % % % % % % % % % % % % % % % % %	<pre>http://with Zey ption 1=SCS lanning "n" iCS Curve No initial Abstr ption 1=Tria000361 Conduit Lengt to Conduit de iero lag teta weightin to conduit de iero lag teta weightin to of sub-re361</pre>	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .020 .398 .020 h fined g factor tep aches .361 .361 .361 .361 cres metres rvious V) ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .361 .459 .361 res metres rvious	<pre>anglr; 3=SWM HYD; 4=Lin. Reserv 1.185 c.m/s C perv/imperv/total 1.185 c.m/s 1.185 c.m/s .361 c.m/s on; 3=Green-Ampt; 4=Repeat anglr; 3=SWM HYD; 4=Lin. Reserv .361 c.m/s C perv/imperv/total</pre>	
9 17 14 4	.000 % % % % % % % % % % % % % % % % % %	<pre>http://with Zest famming "n" CS Curve No arX Coeffici initial Abstr option 1=Trial arX Coeffici initial Abstr option 1=Trial arX and arX and conduit Lengt is associated and conduct Lengt is associated and conduct and</pre>	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .020 .398 .020 h fined g factor tep aches .361 .361 .361 cres metres rvious V) ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .361 .459 .361 .459 .361	<pre>anglr; 3=SWM HYD; 4=Lin. Reserv 1.185 c.m/s C perv/imperv/total 1.185 c.m/s 1.185 c.m/s .361 c.m/s on; 3=Green-Ampt; 4=Repeat anglr; 3=SWM HYD; 4=Lin. Reserv .361 c.m/s C perv/imperv/total .361 c.m/s</pre>	
9 17 14 4	.000 % % % % % % % % % % % % % % % % % %	<pre>http://with Zest famming "n" CS Curve No arX Coeffici initial Abstr option 1=Trial arX Coeffici initial Abstr option 1=Trial arX and arX and conduit Lengt is associated and conduct Lengt is associated and conduct and</pre>	ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .020 .398 .020 h fined g factor tep aches .361 .361 .361 cres metres rvious V) ro Dpth CN/C; 2=Hort or C ent action nglr; 2=Rect .361 .459 .361 .459 .361	<pre>anglr; 3=SWM HYD; 4=Lin. Reserv 1.185 c.m/s C perv/imperv/total 1.185 c.m/s 1.185 c.m/s .361 c.m/s on; 3=Green-Ampt; 4=Repeat anglr; 3=SWM HYD; 4=Lin. Reserv .361 c.m/s C perv/imperv/total</pre>	

			ve No or C efficient		
	8.924	Initial	Abstractio		
	1 1.5	Option	<pre>1=Trianglr; .044</pre>		glr; 3=SWM HYD; 4=Lin. Reserv
	.2	36	.884	.361 .690	.361 c.m/s C perv/imperv/total
15	ADD RUNOFI				
9	1.5 ROUTE	56	1.594	.361	.361 c.m/s
			Length		
		No Cond Zero la	uit defined		
			ighting fac	tor	
			timestep		
	0		sub-reaches 1.594	1.594	.361 c.m/s
17	COMBINE				
	2 Junct 1.5	tion Nod 56		1.594	1.955 c.m/s
14	START	50	1.554	1.554	1.999 C.m/B
4	1 1=Zei		fine		
4	CATCHMENT 43.000	ID No.ć	99999		
	.330	Area in	hectares		
		Length Gradien	(PERV) metr	es	
			t Imperviou	s	
			(IMPERV)		
			ith Zero Dp 1=SCS CN/C:		; 3=Green-Ampt; 4=Repeat
	.250	Manning	"n"		,
	74.000 .100		ve No or C efficient		
			Abstractio	n	
					glr; 3=SWM HYD; 4=Lin. Reserv
	.02		.000 .875	1.594 .460	1.955 c.m/s C perv/imperv/total
15	ADD RUNOFI	F			
4	.02 CATCHMENT		.022	1.594	1.955 c.m/s
4		ID No.ć	99999		
			hectares		
		Length Gradien	(PERV) metr	es	
	70.000	Per cen	t Imperviou	s	
			(IMPERV) with Zero Dp	+h	
					; 3=Green-Ampt; 4=Repeat
		Manning			
			ve No or C efficient		
	8.924	Initial	Abstractio		
	1			2=Rectan 1.594	glr; 3=SWM HYD; 4=Lin. Reserv 1.955 c.m/s
	.2		.880	.687	C perv/imperv/total
15	ADD RUNOFI		.782	1.594	1.955 c.m/s
9	ROUTE		.,02	1.554	1.999 C.m/B
		Conduit	Length uit defined		
		Zero la			
	.000	Beta we	ighting fac	tor	
			timestep sub-reaches		
	.70		.782	.782	1.955 c.m/s
17	COMBINE 2 Junci	tion Nod	e No.		
	.70		.782	.782	2.737 c.m/s
14	START 1 1=Zei		fine		
18	CONFLUENCE		ittile		
	2 Junct				
4	.70 CATCHMENT		2.737	.782	.000 c.m/s
-	45.000	ID No.ć			
			hectares (PERV) metr	es	
		Gradien		65	
			t Imperviou (IMPERV)	s	
			(IMPERV) with Zero Dp	th	
	1	Option	1=SCS CN/C;		; 3=Green-Ampt; 4=Repeat
		Manning	ve No or C		
	.100	Ia/S Co	efficient		
			Abstractio		
	.10	Option 07	2.737	.782	glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s
	. 23	36	.876		C perv/imperv/total
15	ADD RUNOFI	F 07	2.832	.782	.000 c.m/s
27	HYDROGRAPH	H DISPLA	Y		
			o/Hydrograp 41E+04 c.m	h chosen	
10	POND				
			e - Volume		
	186.000 186.800	.0		.0	
	187.300	.07	30 709	1.0	
	187.500 187.800	.1	.70 842 57 1055		
	188.000	.8	80 1209	4.0	
	Peak Outf		.072 187.266		
	Maximum De Maximum St	torage =	6887.	metres c.m	
	.10	07	2.832	.072	.000 c.m/s
17	COMBINE 2 Junct	tion Nod	le No.		
	.10		2.832	.072	.072 c.m/s
					D -

14 START 1=Zero; 2=Define 1 COMMENT 35 3 line(s) of comment EXISTING AREA ON QUAKER RD, WEST OF RICE RD CATCHMENT 4 TD No. 6 99999 2.000 9.020 Area in hectares 245.000 Length (PERV) metres 1.000 Gradient (%) Per cent Impervious 245.000 Length (IMPERV) Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 .250 Manning "n" SCS Curve No or C 74.000 Ia/S Coefficient .100 Initial Abstraction 8.924 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .072 c.m/s C perv/imperv/total .624 .000 .885 .072 .496 236 15 ADD RUNOFF .624 .624 .072 .072 c.m/s 9 Conduit Length .000 . 000 No Conduit defined Zero lag Beta weighting factor .000 .000 Routing timestep No. of sub-reaches .000 0 .624 . 624 .072 c.m/s .624 17 COMBINE Junction Node No. 2 .624 .624 . 624 .660 c.m/s START 14 1=Zero; 2=Define 18 CONFLUENCE Junction Node No. .660 .624 .000 c.m/s .624 COMMENT 35 3 line(s) of comment EXISTING AREA ON QUAKER RD, WEST OF RICE RD CATCHMENT 4 3.000 5.680 TD No. 6 99999 Area in hectares 195.000 Length (PERV) metres 1.000 Gradient (%) Per cent Impervious 195.000 Length (IMPERV) Length (IMPERV)
%Imp. with Zero Dpth
Option 1=SCS CM/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 Manning "n" SCS Curve No or C 250 74.000 Ia/S Coefficient .100 Initial Abstraction 8.924 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .660 . 392 .624 .492 .000 c.m/s C perv/imperv/total .236 .877 ADD RUNOFF 15 . 392 1.052 .624 .000 c.m/s ROUTE 9 Conduit Length .000 .000 No Conduit defined Zero lag Beta weighting factor .000 .000 .000 Routing timestep No. of sub-reaches 0 .392 1.052 .000 c.m/s 1.052 17 COMBINE Junction Node No. 2 .392 1.052 1.052 1.052 c.m/s 14 START 1=Zero; 2=Define 35 COMMENT PROP DEVELOPMENT SOUTH OF QUAKER RD, EAST OF RICE RD CATCHMENT 4 50.000 ID No.ó 99999 Area in hectares Length (PERV) metres 3.420 151.000 1.000 Gradient (%) Per cent Impervious 151.000 Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 .250 Manning "n" SCS Curve No or C Ia/S Coefficient 74.000 .100 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .066 .000 1.052 .868 .299 1.052 1.052 c.m/s .299 C perv/imperv/total .236 ADD RUNOFF 15 1.052 1.052 c.m/s .066 .066 CATCHMENT 4 ID No.ó 99999 51.000 1.980 115.000 Area in hectares Length (PERV) metres Gradient (%) 1.000 10.000 Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth 115.000 .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1

.250 Manning "n" 74.000 SCS Curve No or C .100 Ta/S Coefficient Ditial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 8.924 1 .066 1.052 1.052 c.m/s C perv/imperv/total . 039 .236 15 ADD RUNOFF .039 1.052 .104 1.052 c.m/s 9 ROUTE .000 Conduit Length No Conduit defined Zero lag Beta weighting factor 000 .000 .000 .000 Routing timestep No. of sub-reaches 0 .039 .104 .104 1.052 c.m/s COMBINE 17 Junction Node No. 2 .039 .104 .104 1.156 c.m/s START 14 1=Zero; 2=Define 1 35 COMMENT 3 line(s) of comment EXISTING AREA WEST OF RICE RD AND SOUTH OF QUAKER ROAD 4 CATCHMENT ID No.ó 99999 4.000 13.940 Area in hectares Length (PERV) metres Gradient (%) 305.000 1.000 Per cent Impervious 305.000 Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Ditial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .000 . 988 .104 1.156 c.m/s .236 .883 .495 C perv/imperv/total 15 ADD RUNOFF .988 .988 .104 1.156 c.m/s 9 ROUTE Conduit Length .000 .000 No Conduit defined Zero lag Beta weighting factor .000 Routing timestep No. of sub-reaches .000 0 .988 .988 .988 1.156 c.m/s COMBINE 17 Junction Node No. 2 .988 2.144 c.m/s .988 .988 14 START 1=Zero; 2=Define 1 CONFLUENCE 18 Junction Node No. 2 .988 2.144 .988 .000 c.m/s 35 COMMENT 3 line(s) of comment RICE ROAD FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUNDA 4 CATCHMENT 501.000 ID No.ó 99999 1.570 Area in hectares 102.000 Length (PERV) metres Gradient (%) 1.000 Per cent Impervious 102.000 Length (IMPERV) %Imp. with Zero Dpth .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1 Manning "n" SCS Curve No or C .250 74.000 .100 Ta/S Coefficient Ditial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 8.924 1 2.144 .988 .000 c.m/s C perv/imperv/total .182 .236 ADD RUNOFF 15 .182 2.317 . 988 .000 c.m/s ROUTE Conduit Length .000 .000 No Conduit defined Zero lag .000 Beta weighting factor Routing timestep No. of sub-reaches .000 0 2.317 .182 2.317 .000 c.m/s 35 COMMENT 3 line(s) of comment FLOW D/S OF RICE RD CULVERT - OUTLET A2 17 COMBINE Junction Node No. 1 2.317 .182 2.317 3.502 c.m/s 14 START 1=Zero; 2=Define 1 COMMENT 35 line(s) of comment PROP DEVELOPMENT SOUTH OF QUAKER RD - QUALLITY CONTROL ONLY 4 CATCHMENT 20.100 ID No.ó 99999

	TOO Date in herbauer	
	.780 Area in hectares 72.000 Length (PERV) metres	
	1.000 Gradient (%)	
	35.000 Per cent Impervious	
	72.000 Length (IMPERV) .000 %Imp. with Zero Dpth	
	1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat	
	.250 Manning "n"	
	74.000 SCS Curve No or C .100 Ia/S Coefficient	
	8.924 Initial Abstraction	
	1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserved	v
	.049 .000 2.317 3.502 c.m/s .236 .873 .459 C perv/imperv/total	
15	.236 .873 .459 C perv/imperv/total ADD RUNOFF	
	.049 .049 2.317 3.502 c.m/s	
4	CATCHMENT 20.000 ID No.6 99999	
	3.210 Area in hectares	
	146.000 Length (PERV) metres	
	1.000 Gradient (%) 85.000 Per cent Impervious	
	146.000 Length (IMPERV)	
	.000 %Imp. with Zero Dpth	
	1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n"	
	74.000 SCS Curve No or C	
	.100 Ia/S Coefficient	
	8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reser	v
	.452 .049 2.317 3.502 c.m/s	
15	.236 .866 .772 C perv/imperv/total	
15	ADD RUNOFF .452 .494 2.317 3.502 c.m/s	
9	ROUTE	
	.000 Conduit Length .000 No Conduit defined	
	.000 No Conduit defined .000 Zero lag	
	.000 Beta weighting factor	
	.000 Routing timestep 0 No. of sub-reaches	
	.452 .494 .494 3.502 c.m/s	
17	COMBINE	
	1 Junction Node No. .452 .494 .494 3.996 c.m/s	
14	.452 .494 .494 3.996 c.m/s START	
	1 1=Zero; 2=Define	
18	CONFLUENCE 1 Junction Node No.	
	.452 3.996 .494 .000 c.m/s	
35	COMMENT	
	3 line(s) of comment	
	~~~~~~~~~~~~~~~~~~	
	REALIGNED CHANNEL - SEGMENT 2	
	REALIGNED CHANNEL - SEGMENT 2	
4	**************************************	
4	********************* CATCHMENT 200.000 ID No.6 99999	
4	**************************************	
4	**************************************	
4	**************************************	
4	**************************************	
4	**************************************	
4	**************************************	
4	**************************************	
4	**************************************	A.
4	**************************************	v
-	**************************************	v
4	**************************************	v
-	**************************************	v
-	<pre>cATCHMENT 200.000 ID No.6 99999 .970 Area in hectares 80.416 Length (PERV) metres 1.000 Gradient (%) 10.000 Per cent Impervious 80.416 Length (IMPERV) .000 %Imp. with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reser .019 3.996 .494 .000 c.m/s .236 .875 .299 C perv/imperv/total COMMENT 3 line(s) of comment *************** FLOW D/S OF AREA A20 - OUTLET B</pre>	v
-	<pre> ************************************</pre>	v
35	<pre>************************************</pre>	v
35	<pre>************************************</pre>	v
35	<pre>cATCHMENT ZO0.000 ID No.6 99999 .970 Area in hectares 80.416 Length (PERV) metres 1.000 Gradient (%) 10.000 Per cent Impervious 80.416 Length (IMPERV) .000 %Imp. with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Triang1r; 2=Rectang1r; 3=SWM HYD; 4=Lin. Reser .236 .875 .299 C perv/imperv/total COMMENT 3 line(s) of comment ************************************</pre>	v
35	<pre>cATCHMENT CONCHMENT 200.000 ID No.6 99999 .970 Area in hectares 80.416 Length (PERV) metres 1.000 Gradient (%) 10.000 Per cent Impervious 80.416 Length (IMPERV) .000 %Imp. with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reser .019 3.996 .494 .000 c.m/s .236 .875 .299 C perv/imperv/total COMMENT 3 line(s) of comment ************************************</pre>	Ŷ
35 15 35	<pre>cATCHMENT 200.000 ID No.6 99999 .970 Area in hectares 80.416 Length (PERV) metres 1.000 Gradient (%) 10.000 Per cent Impervious 80.416 Length (IMPERV) .000 %Imp. with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reser .019 3.996 .494 .000 c.m/s .236 .875 .299 C perv/imperv/total COMMENT 3 line(s) of comment ************************************</pre>	v
35	<pre>cATCHMENT CONCHMENT 200.000 ID No.6 99999 .970 Area in hectares 80.416 Length (PERV) metres 1.000 Gradient (%) 10.000 Per cent Impervious 80.416 Length (IMPERV) .000 %Imp. with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reser .019 3.996 .494 .000 c.m/s .236 .875 .299 C perv/imperv/total COMMENT 3 line(s) of comment ************************************</pre>	v
35 15 35	<pre>cATCHMENT CATCHMENT 200.000 ID No.6 99999 .970 Area in hectares 80.416 Length (PERV) metres 1.000 Gradient (%) 10.000 Per cent Impervious 80.416 Length (IMPERV) .000 %Imp. with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/s Coefficient 8.924 Initial Abstraction 1 Option 1=Triang1r; 2=Rectang1r; 3=SWM HYD; 4=Lin. Reser .236 .875 .299 C perv/imperv/total COMMENT 3 line(s) of comment ************************************</pre>	v
35 15 35	<pre>cATCHMENT CATCHMENT 200.000 ID No.6 99999 .970 Area in hectares 80.416 Length (PERV) metres 1.000 Gradient (%) 10.000 Per cent Impervious 80.416 Length (IMPERV) .000 %Imp. with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reser .019 3.996 .494 .000 c.m/s .236 .875 .299 C perv/imperv/total COMMENT 3 line(s) of comment ************************************</pre>	v
35 15 35	<pre>cATCHMENT CATCHMENT 200.000 ID No.6 99999 .970 Area in hectares 80.416 Length (PERV) metres 1.000 Gradient (%) 10.000 Per cent Impervious 80.416 Length (IMPERV) .000 %Imp. with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/s Coefficient 8.924 Initial Abstraction 1 Option 1=Triang1r; 2=Rectang1r; 3=SWM HYD; 4=Lin. Reser .236 .875 .299 C perv/imperv/total COMMENT 3 line(s) of comment ************************************</pre>	v
35 15 35	<pre>cATCHMENT CONCHMENT 200.000 ID No.6 99999 .970 Area in hectares 80.416 Length (PERV) metres 1.000 Gradient (%) 10.000 Per cent Impervious 80.416 Length (IMPERV) .000 %Imp. with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reser .019 3.996 .494 .000 c.m/s .236 .875 .299 C perv/imperv/total COMMENT 3 line(s) of comment ************************************</pre>	v
35 15 35	<pre>cATCHMENT CONCHENT 200.000 ID No.6 99999 .970 Area in hectares 80.416 Length (PERV) metres 1.000 Gradient (%) 10.000 Per cent Impervious 80.416 Length (IMPERV) .000 %Imp. with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reser .019 3.996 .494 .000 c.m/s .236 .875 .299 C perv/imperv/total COMMENT 3 line(s) of comment ************************************</pre>	v
35 15 35	<pre>cATCHMENT CATCHMENT 200.000 ID No.6 99999 .970 Area in hectares 80.416 Length (PERV) metres 1.000 Gradient (%) 10.000 Per cent Impervious 80.416 Length (IMPERV) .000 %Imp. with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reser .019 3.996 .494 .000 c.m/s .236 .875 .299 C perv/imperv/total COMMENT 3 line(s) of comment ************************************</pre>	•
35 15 35	CATCHMENT CATCHMENT 200.000 ID No.6 99999 .970 Area in hectares 80.416 Length (PERV) metres 1.000 Gradient (%) 10.000 Per cent Impervious 80.416 Length (IMPERV) .000 %Imp. with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reser .019 3.996 .494 .000 c.m/s .236 .875 .299 C perv/imperv/total COMMENT 3 line(s) of comment ************************************	v
35 15 35	<pre>cATCHMENT 200.000 ID No.6 99999 .970 Area in hectares 80.416 Length (PERV) metres 1.000 Gradient (%) 10.000 Per cent Impervious 80.416 Length (IMPERV) .000 %Imp. with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reser .019 3.996 .494 .000 c.m/s .236 .875 .299 C perv/imperv/total COMMENT 3 line(s) of comment ************************************</pre>	v
35 15 35	CATCHMENT 200.000 ID No.6 99999 .970 Area in hectares 80.416 Length (PERV) metres 1.000 Gradient (%) 10.000 Per cent Impervious 80.416 Length (IMPERV) .000 %Imp. with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reser .019 3.996 .494 .000 c.m/s .236 .875 .299 C perv/imperv/total COMMENT 3 line(s) of comment ************************************	
35 15 35	<pre>cATCHMENT 200.000 ID No.6 99999 .970 Area in hectares 80.416 Length (PERV) metres 1.000 Gradient (%) 10.000 Per cent Impervious 80.416 Length (IMPERV) .000 % Imp. with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reser .019 3.996 .494 .000 c.m/s .236 .875 .299 C perv/imperv/total COMMENT 3 line(s) of comment ************************************</pre>	
35 15 35	CATCHMENT 200.000 ID No.6 99999 .970 Area in hectares 80.416 Length (PERV) metres 1.000 Gradient (%) 10.000 Per cent Impervious 80.416 Length (IMPERV) .000 %Imp. with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reser .019 3.996 .494 .000 c.m/s .236 .875 .299 C perv/imperv/total COMMENT 3 line(s) of comment ************************************	
35 35 35 4	CATCHMENT 200.000 ID No.6 99999 .970 Area in hectares 80.416 Length (PERV) metres 1.000 Gradient (%) 10.000 Fer cent Impervious 80.416 Length (IMPERV) .000 %Imp. with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reser .019 3.996 .494 .000 c.m/s .236 .875 .299 C perv/imperv/total COMMENT 3 line(s) of comment ************************************	
35 15 35 4	CATCHMENT 200.000 ID No.6 99999 .970 Area in hectares 80.416 Length (PERV) metres 1.000 Gradient (%) 10.000 Per cent Impervious 80.416 Length (IMPERV) .000 % Imp. with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reser .019 3.996 .494 .000 c.m/s .236 .875 .299 C perv/imperv/total COMMENT 3 line(s) of comment ************************************	
35 35 35 4	CATCHMENT 200.000 ID No.6 99999 .970 Area in hectares 80.416 Length (PERV) metres 1.000 Gradient (%) 10.000 Fer cent Impervious 80.416 Length (IMPERV) .000 %Imp. with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reser .019 3.996 .494 .000 c.m/s .236 .875 .299 C perv/imperv/total COMMENT 3 line(s) of comment ************************************	
35 35 35 4	CATCHMENT 200.000 ID No.6 99999 .970 Area in hectares 80.416 Length (PERV) metres 1.000 Gradient (%) 10.000 Per cent Impervious 80.416 Length (IMPERV) .000 %Imp. with Zero Dpth 1 Option 1=SCS CM/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reser .019 3.996 .494 .000 c.m/s .236 .875 .299 C perv/imperv/total COMMENT 3 line(s) of comment ************************************	
35 35 35 4	CATCHMENT 200.000 ID No.6 99999 .970 Area in hectares 80.416 Length (PERV) metres 1.000 Gradient (%) 10.000 Per cent Impervious 80.416 Length (IMPERV) .000 %Imp. with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reser .019 3.996 .494 .000 c.m/s .236 .875 .299 C perv/imperv/total COMMENT 3 line(s) of comment ********************* FLOW D/S OF AREA A20 - OUTLET B ************************************	
35 35 35 4	CATCHMENT 200.000 ID No.6 99999 .970 Area in hectares 80.416 Length (PERV) metres 1.000 Gradient (%) 10.000 Per cent Impervious 80.416 Length (IMPERV) .000 %Imp. with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reser .019 3.996 .494 .000 c.m/s .236 .875 .299 C perv/imperv/total COMMENT 3 line(s) of comment ********************* FLOW D/S OF AREA A20 - OUTLET B ************************************	

25		
35	COMMENT 3 line(s) of comment	
	FLOW U/S OF FIRST AVE CULVERT	
	******	
17	COMBINE 1 Junction Node No.	
	.229 4.202 4.202	4.202 c.m/s
14	START 1 1=Zero; 2=Define	
35	COMMENT 3 line(s) of comment	
	*****	
	PROP DEVELOPMENT SOUTH OF QUAKER, EAST *********	OF RICE - POND P50
4	CATCHMENT	
	52.000 ID No.ó 99999 6.430 Area in hectares	
	207.000 Length (PERV) metres 1.000 Gradient (%)	
	70.000 Per cent Impervious	
	207.000 Length (IMPERV) .000 %Imp. with Zero Dpth	
	<pre>1 Option 1=SCS CN/C; 2=Horton; .250 Manning "n"</pre>	3=Green-Ampt; 4=Repeat
	74.000 SCS Curve No or C	
	.100 Ia/S Coefficient 8.924 Initial Abstraction	
		(lr; 3=SWM HYD; 4=Lin. Reserv
		4.202 c.m/s C perv/imperv/total
15	ADD RUNOFF .768 .768 4.202	4.202 c.m/s
9	ROUTE	
	.000 Conduit Length .000 No Conduit defined	
	.000 Zero lag .000 Beta weighting factor	
	.000 Routing timestep	
	0 No. of sub-reaches .768 .768 .768	4.202 c.m/s
17	COMBINE 2 Junction Node No.	
	.768 .768 .768	.768 c.m/s
14	START 1 1=Zero; 2=Define	
4	CATCHMENT	
	53.000 ID No.ó 99999 11.340 Area in hectares	
	275.000 Length (PERV) metres 1.000 Gradient (%)	
	70.000 Per cent Impervious	
	275.000 Length (IMPERV) .000 %Imp. with Zero Dpth	
	<pre>1 Option 1=SCS CN/C; 2=Horton; .250 Manning "n"</pre>	3=Green-Ampt; 4=Repeat
	74.000 SCS Curve No or C	
	.100 Ia/S Coefficient 8.924 Initial Abstraction	
	1 Option 1=Trianglr; 2=Rectang 1.397 .000 .768	lr; 3=SWM HYD; 4=Lin. Reserv .768 c.m/s
15		C perv/imperv/total
	1.397 1.397 .768	.768 c.m/s
9	ROUTE .000 Conduit Length	
	.000 No Conduit defined .000 Zero lag	
	.000 Beta weighting factor	
	.000 Routing timestep 0 No. of sub-reaches	
17	1.397 1.397 1.397 COMBINE	.768 c.m/s
17	2 Junction Node No.	
18	1.397 1.397 1.397 CONFLUENCE	2.165 c.m/s
	2 Junction Node No. 1.397 2.165 1.397	.000 c.m/s
4	CATCHMENT	
	54.000 ID No.ó 99999 1.280 Area in hectares	
	92.000 Length (PERV) metres 1.000 Gradient (%)	
	60.000 Per cent Impervious	
	92.000 Length (IMPERV) .000 %Imp. with Zero Dpth	
	1 Option 1=SCS CN/C; 2=Horton; .250 Manning "n"	3=Green-Ampt; 4=Repeat
	74.000 SCS Curve No or C	
	.100 Ia/S Coefficient 8.924 Initial Abstraction	
		lr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s
	.236 .876 .620	C perv/imperv/total
15	ADD RUNOFF .131 2.285 1.397	.000 c.m/s
27	HYDROGRAPH DISPLAY 5 is # of Hyeto/Hydrograph chosen	
	Volume = .5982220E+04 c.m	
10	POND 6 Depth - Discharge - Volume sets	
	182.000 .000 .0 182.800 .0190 5251.0	
	183.150 .0230 7895.0	
	183.500 .238 10751.0 183.800 .396 13425.0	
	184.000 1.028 15337.0 Peak Outflow = .020 c.m/s	
	Maximum Depth = 182.848 metres	
		Л

			5617.				
17	COMBINE	131 :	2.285	.020	.000 c.m/s		
		131 Node		.020	.020 c.m/s		
14	START 1 1=2	lero; 2=De:	fine				
35	COMMENT						
	3 line(s) of comment						
4	******	*******	QUAKER RD, ******	EAST OF R	ICE RD		
4	CATCHMEN 5.000	ID No.ó	99999				
	1.870 112.000		hectares (PERV) metr	<b>6</b> 9			
	1.000	Gradien	t (%)				
	50.000 112.000	Per cent Length	t Imperviou	s			
	.000	%Imp. w	ith Zero Dp				
	1 .250	Option 3 Manning		2=Horton	; 3=Green-Ampt; 4=Repeat		
	74.000		ve No or C				
	.100 8.924		efficient Abstractio	~			
	1	Option 3	1=Trianglr;	2=Rectan	glr; 3=SWM HYD; 4=Lin. Reserv		
		153 236	.000 .873	.020 .554	.020 c.m/s C perv/imperv/total		
15	ADD RUNG	FF					
9	ROUTE	153	.153	.020	.020 c.m/s		
	.000	Conduit					
	.000	No Condu Zero la	uit defined g				
	.000	Beta we	ighting fac	tor			
	.000		timestep sub-reaches				
		153	.153	.153	.020 c.m/s		
17	COMBINE 2 Jur	nction Node	e No.				
18	CONFLUEN	153	.153	.153	.160 c.m/s		
10		nction Node					
35	COMMENT	153	.160	.153	.000 c.m/s		
55	3 lir	ne(s) of c					
		**************************************	4****** QUAKER RD,	EAST OF R	ICE BD		
	******	*******					
4	CATCHMEN 6.000		99999				
	1.920	Area in	hectares				
	113.000 .200	Length Gradien	(PERV) metr t (%)	es			
	65.000	Per cent	t Imperviou	s			
	113.000 .000	Length %Imp.w:	(IMPERV) ith Zero Dp	th			
	1		1=SCS CN/C;		; 3=Green-Ampt; 4=Repeat		
	.250						
	74.000		ve No or C				
	.100	SCS Cur Ia/S Co	ve No or C efficient	n			
	.100 8.924 1	SCS Curr Ia/S Co Initial Option 3	ve No or C efficient Abstractio 1=Trianglr;	2=Rectan	glr; 3=SWM HYD; 4=Lin. Reserv		
	.100 8.924 1	SCS Cur Ia/S Co Initial	ve No or C efficient Abstractio		.000 c.m/s		
15	.100 8.924 1 ADD RUNO	SCS Curr Ia/S Co Initial Option : 214 236 DFF	ve No or C efficient Abstractio 1=Trianglr; .160 .886	2=Rectang .153 .658	.000 c.m/s C perv/imperv/total		
15 35	.100 8.924 1 ADD RUNO	SCS Curr Ia/S Co Initial Option 3 214 236	ve No or C efficient Abstractio 1=Trianglr; .160	2=Rectang .153	.000 c.m/s		
	.100 8.924 1 ADD RUNO COMMENT	SCS Curr Ia/S Co Initial Option 3 214 236 DFF 214 214 214	ve No or C efficient Abstractio 1=Trianglr; .160 .886 .374	2=Rectang .153 .658	.000 c.m/s C perv/imperv/total		
	.100 8.924 1 ADD RUNG COMMENT 3 lin *******	SCS Cur Ia/S Co Initial Option : 214 236 DFF 214 e(s) of ca ****	ve No or C efficient Abstractio 1=Trianglr; .160 .886 .374 omment	2=Rectang .153 .658 .153	.000 c.m/s C perv/imperv/total		
35	.100 8.924 1 ADD RUNG COMMENT 3 lin FIRST AN *******	SCS Cur Ia/S Co Initial Option : 214 236 OFF 214 te(s) of co **** ***	ve No or C efficient Abstractio 1=Trianglr; .160 .886 .374 omment	2=Rectang .153 .658 .153	.000 c.m/s C perv/imperv/total .000 c.m/s		
	.100 8.924 1 ADD RUNG COMMENT 3 lin FIRST AV ******* CATCHME 201.000	SCS Cur Ia/S Co Initial Option : 214 236 FF 214 214 214 214 214 214 214 214 214 214	ve No or C efficient Abstractio 1=Trianglr; .160 .886 .374 omment AKER RD TO 99999	2=Rectang .153 .658 .153	.000 c.m/s C perv/imperv/total .000 c.m/s		
35	.100 8.924 1 ADD RUNG COMMENT 3 lin ******* FIRST AV CATCHMEN 201.000 2.430	SCS Cur Ia/S Con Initial Option : 214 214 214 214 214 214 214 214 214 214	ve No or C efficient Abstractio 1=Trianglr; .160 .374 omment AKER RD TO 99999 hectares (PERV) metr	2=Rectany .153 .658 .153 CITY OF W	.000 c.m/s C perv/imperv/total .000 c.m/s		
35	.100 8.924 1 ADD RUNG COMMENT 3 1in ******* FIRST AI ******* CATCHMEN 201.000 2.430 127.000 1.000	SCS Cur Ia/S Con Initial Option : 214 214 214 214 214 214 214 214 214 214	ve No or C efficient Abstractio 1=Trianglr; .160 .374 omment AKER RD TO 99999 hectares (PERV) metr	2=Rectany .153 .658 .153 CITY OF W	.000 c.m/s C perv/imperv/total .000 c.m/s		
35	.100 8.924 1 ADD RUNG COMMENT 3 111 ******* FIRST AN ******* CATCHMEN 201.000 2.430 127.000	SCS Cur Ia/S Con Initial Option : 214 236 JFF 214 214 214 214 TF FROM QU **** TF FROM QU **** TI No.6 Area in Length Gradiem Per cem	ve No or C efficient Abstractio 1=Trianglr; .160 .374 omment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou	2=Rectany .153 .658 .153 CITY OF WI	.000 c.m/s C perv/imperv/total .000 c.m/s		
35	.100 8.924 1 ADD RUNG COMMENT 3 1in ******* CATCHMEN 201.000 2.430 127.000 1.000 65.000 127.000 .000	SCS Curr Ia/S Con Initial Option : 214 236 PFF 214 es(s) of ca **** IT ID No.6 Area in Length Gradien Per cent Length %Imp. w.	ve No or C efficient Abstractio 1=Triang1r; .160 .886 .374 omment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (IMPERV) ith Zero Dp	2=Rectang .153 .658 .153 CITY OF W es s th	.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA		
35	.100 8.924 1 ADD RUNG COMMENT 3 lin ******* CATCHMES 201.000 2.430 127.000 127.000 127.000 127.000 127.000 127.000	SCS Curr Ia/S Con Initial Option : 214 236 DFF 214 te(s) of curr **** TI ID No.6 Area in Length %Imp. w. Option : %Maning	ve No or C efficient Abstractio 1=Triang1r; .160 .386 .374 omment AKER RD TO 99999 hectares (PERV) met t (%) t Imperviou (IMPERV) ith Zero Dp 1=SCS CN/C; "n"	2=Rectang .153 .658 .153 CITY OF W es s th	.000 c.m/s C perv/imperv/total .000 c.m/s		
35	.100 8.924 1 ADD RUNG COMMENT 3 1ii ******* CATCHMEN 201.000 127.000 127.000 127.000 127.000 127.000 74.000	SCS Cur Ia/S Con Initial Option : 214 236 FF 214 extension for terms of cur terms o	ve No or C efficient Abstractio 1=Trianglr; .160 .374 omment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (IMPERV) ich Zero Dp 1=SCS CN/C; "n" ve No or C	2=Rectang .153 .658 .153 CITY OF W es s th	.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA		
35	.100 8.924 1 ADD RUNG COMMENT 3 lin ******* FIRST AN ******* 201.000 2.430 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 100 8.924	SCS Curr Ia/S Co Initial Option : 214 236 PFF 214 e(s) of co **** IT ID No.6 Area in Length %Imp. w. Option : Manning SCS Curr Ia/S Cou Initial	ve No or C efficient Abstractio 1=Triang1r; .160 .886 .374 omment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (IMPERV) ith Zero Dp 1=SCS CN/C; "n" ve No or C efficient Abstractio	2=Rectang .153 .658 .153 CITY OF W es s th 2=Horton n	.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA ; 3=Green-Ampt; 4=Repeat		
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4	.100 8.924 1 ADD RUNG COMMENT 3 1ii ******** CATCHMEN 201.000 1.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 100 8.924 1	SCS Curr Ia/S Con Initial Option : 214 236 PFF 214 te(s) of cu **** T ID No.6 Area in Length Gradien Per cent Length %Imp. w. Option : Manning SCS Curr Ia/S Con Initial Option : 259 236	ve No or C efficient Abstractio 1=Triang1r; .160 .886 .374 omment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (IMPERV) ith Zero Dp 1=SCS CN/C; "n" ve No or C efficient Abstractio	2=Rectang .153 .658 .153 CITY OF W es s th 2=Horton n 2=Rectang .153	.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA ; 3=Green-Ampt; 4=Repeat		
35	.100 8.924 1 ADD RUNG COMMENT 3 lin ******** CATCHMEN 201.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 11 .250 74.000 .100 8.924 1	SCS Curr Ia/S Con Initial Option : 214 236 PFF 214 te(s) of cu **** T ID No.6 Area in Length Gradien Per cent Length %Imp. w. Option : Manning SCS Curr Ia/S Con Initial Option : 259 236	ve No or C efficient Abstractio 1=Triang1r; .160 .386 .374 omment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (IMPERV) ith Zero Dp 1=SCS CN/C; "n" ve No or C efficient Abstractio 1=Triang1r; .374	2=Rectang .153 .658 .153 CITY OF W es s th 2=Horton n 2=Rectang .153	.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s		
4	.100 8.924 1 ADD RUNG COMMENT 3 1ii FIRST AV ******** CATCHMEN 201.000 2.430 127.000 127.000 127.000 127.000 127.000 127.000 11 .250 74.000 10 8.924 1 1 ADD RUNG ROUTE	SCS Cur Ia/S Con Initial Option : 214 236 FF 214 exe(s) of cu *** FF FROM QU *** TT ID No.66 Area in Length Gradien Per cen Length Gradien SCS Cur Ia/S Con Initial Option : 259 259	ve No or C efficient Abstractio 1=Trianglr; .160 .886 .374 omment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (IMPERV) ith Zero Dp 1=SCS CN/C; "n" ve No or C efficient Abstractio 1=Trianglr; .374 .868 .632	2=Rectan: .153 .658 .153 CITY OF W es s th 2=Horton n 2=Rectan: .153 .647	<pre>.000 c.m/s C perv/imperv/total .000 c.m/s elland MUNICIPAL BOUNDA ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total</pre>		
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35	.100 8.924 1 ADD RUNG COMMENT 3 lii ******** CATCHMEN 201.000 2.430 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 100 8.924 1 ADD RUNG ROUTE .000 .000	SCS Curr Ia/S Co Initial Option : 214 236 DFF 214 e(s) of c **** TT TD No.6 Area in Length Gradien Per cent Length %Imp. w Option : Manning SCS Curr Ia/S Co Initial Option : 259 236 DFF 259 Conduit No Condi Zero lag	ve No or C efficient Abstractio 1=Triang1r; .160 .374 omment AKER RD TO 99999 hectares (PERV) metr t (%) th Imperviou (TMPERV) ith Zero Dp 1=SCS CN/C; "n" ve No or C efficient Abstractio 1=Triang1r; .374 .868 .632 Length uit defined g	2=Rectan: .153 .658 .153 CITY OF W es s th 2=Horton n 2=Rectan: .153 .647 .153	<pre>.000 c.m/s C perv/imperv/total .000 c.m/s elland MUNICIPAL BOUNDA ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total</pre>		
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35 4 15 9	.100 8.924 1 ADD RUNG COMMENT 3 lii ******* CATCHMEN 201.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 1000 8.924 1 ADD RUNG ROUTE ROUTE 000 000 000 000 000 000 000 000 000 0	SCS Curr Ia/S Co Initial Option : 214 236 DFF 214 te(s) of cc **** ID No.6 Area in Length %Imp. w Option : 259 236 DFF 259 Conduit No Condi Zero lag Beta we Routing No. of s	ve No or C efficient Abstractio 1=Trianglr; .160 .886 .374 omment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (IMPERV) ith Zero Dp 1=SCS CN/C; "n" ve No or C efficient Abstractio 1=Trianglr; .374 .868 .632 Length uit defined g ighting fac timestep sub-reaches .632 e No.	2=Rectang .153 .658 .153 CITY OF W es s th 2=Horton n 2=Rectang .153 .647 .153 .647 .153	<pre>.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s</pre>		
35 4 15 9	.100 8.924 1 ADD RUNG COMMENT 3 lii ******** CATCHMEN 201.000 2.430 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 10.000 127.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.00000 10.00000 10.00000000	SCS Curr Ia/S Co Initial Option : 214 236 DFF 214 te(s) of curr **** ID No.6 Area in Length %Imp. w Option : 259 236 DFF 259 Conduit No Condi Zero lag Beta we Routing No. of curr 259 236	ve No or C efficient Abstractio 1=Trianglr; .160 .386 .374 omment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (IMPERV) ith Zero Dp 1=SCS CN/C; "n" ve No or C efficient Abstractio 1=Trianglr; .374 .868 .632 Length uit defined g ighting fac timestep sub-reaches .632 e No. .632	2=Rectang .153 .658 .153 CITY OF W es s th 2=Horton n 2=Rectang .153 .647 .153 .647 .153	.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s		
35 4 15 9	.100 8.924 1 ADD RUNG COMMENT 3 lin ******* CATCHMEN 201.000 2.430 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 100 8.924 1 ADD RUNG ROUTE .000 .000 .000 .000 .000 .000 .000 .0	SCS Curr Ia/S Co Initial Option : 214 236 DFF 214 e(s) of c **** T T D No.6 Area in Length Gradien Per cent Length %Imp. w Option : Manning SCS Curr Ia/S Co Initial Option : 259 236 DFF 259 Conduit No Cond Zero la Beta we Routing No. of r 259 conduit No Cond Zero la Beta we Routing No. of r 259 conduit No Cond Zero la Beta we Routing No. of r 259 conduit No Cond Zero la Beta we Routing Scs Curr	ve No or C efficient Abstractio 1=Triang1r; .160 .886 .374 omment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (PERV) metr t (%) t Imperviou (IMPERV) ith Zero Dp 1=SCS CN/C; "n" ve No or C efficient Abstractio 1=Triang1r; .374 .868 .632 Length uit defined g ighting fac timestep sub-reaches .632 e No. .632	2=Rectan: .153 .658 .153 CITY OF W es s th 2=Horton .153 .647 .153 tor .632 .632	<pre>.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s .000 c.m/s 4.834 c.m/s</pre>		
35 4 15 9	.100 8.924 1 ADD RUNG COMMENT 3 1ii ******* CATCHMEN 201.000 1.27.000 1.000 65.000 127.000 .100 65.000 127.000 .100 8.924 1 ADD RUNG ROUTE .000 .000 .000 .000 .000 .000 .000 .0	SCS Curr Ia/S Co Initial Option : 214 236 DFF 214 e(s) of c **** T T D No.6 Area in Length Gradien Per cent Length %Imp. w Option : Manning SCS Curr Ia/S Co Initial Option : 259 236 DFF 259 Conduit No Cond Zero la Beta we Routing No. of r 259 conduit No Cond Zero la Beta we Routing No. of r 259 conduit No Cond Zero la Beta we Routing No. of r 259 conduit No Cond Zero la Beta we Routing Scs Curr	ve No or C efficient Abstractio 1=Trianglr; .160 .886 .374 omment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (IMPERV) ith Zero Dp 1=SCS CN/C; "n" ve No or C efficient Abstractio 1=Trianglr; .374 .632 Length uit defined g ighting fac timestep sub-reaches .632 e No. .632 omment *******	2=Rectan: .153 .658 .153 CITY OF W es s th 2=Horton .153 .647 .153 tor .632 .632	<pre>.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s .000 c.m/s 4.834 c.m/s</pre>		
35 4 15 9	.100 8.924 1 ADD RUNG COMMENT 3 lin ******* CATCHMEN 201.000 2.430 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 107.000 107.000 107.000 107.000 107.000 107.000 107.000 107.000 107.000 107.000 107.000 107.000 107.000 107.000 107.000 107.000 107.000 107.000 107.000 107.000 107.000 107.000 100 100 100 100 100 100 100 100 100	SCS Curr Ia/S Co Initial Option : 214 236 DFF 214 te(s) of co **** ID No.6 Area in Length %Imp. w Option : 259 Conduit Nanning SCS Curr Ia/S Co Initial Option : 259 236 DFF 259 Conduit No Cond Zero lag Beta we Routing No. of f 259 conduit No Cond Zero lag Beta we Routing Sol of co **** CE	ve No or C efficient Abstractio 1=Trianglr; .160 .386 .374 omment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (IMPERV) ith Zero Dp 1=SCS CN/C; "n" ve No or C efficient Abstractio 1=Trianglr; .374 .868 .632 Length uit defined g ighting fac timestep sub-reaches .632 e No. .632 omment *******	2=Rectan: .153 .658 .153 CITY OF W es s th 2=Horton .153 .647 .153 tor .632 .632	<pre>.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s .000 c.m/s 4.834 c.m/s</pre>		
35 4 15 9 17 35	.100 8.924 1 ADD RUNG COMMENT 3 1ii ******* CATCHMEN 201.000 1.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 100 8.924 1 ADD RUNG ROUTE .000 .000 .000 .000 .000 .000 .000 .0	SCS Curr Ia/S Co Initial Option : 214 236 PFF 214 e(s) of ca **** IT ID No.6 Area in Length % Imp. w. Option : 259 236 PFF 259 236 PFF 259 236 PFF 259 236 PFF 259 259 conduit No Condu Zero lag Beta we Routing No. of 1 259 259 conduit No. of 1 259 259 conduit No. of 1 259 259 conduit No. of 1 259 259 conduit No. of 1 259 259 conduit No. of 1 259 259 conduit No. of 1 259 conduit Sof ca 259 conduit 259 conduit Sof ca 259 conduit Sof ca Sof ca	ve No or C efficient Abstractio 1=Trianglr; .160 .386 .374 omment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (IMPERV) ith Zero Dp 1=SCS CN/C; "n" ve No or C efficient Abstractio 1=Trianglr; .374 .868 .632 Length uit defined g ighting fac timestep sub-reaches .632 e No. .632 omment *******	2=Rectan: .153 .658 .153 CITY OF W es s th 2=Horton .153 .647 .153 tor .632 .632	<pre>.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s .000 c.m/s 4.834 c.m/s</pre>		

COMMENT 35 3 line(s) of comment REALIGNED CHANNEL - SEGMENT 3 4 CATCHMENT 300.000 ID No.ó 99999 3.180 Area in hectares 146.000 .200 15.000 Length (PERV) metres Gradient (%) Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth 146.000 .000 Option 15CS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C 1 .250 74.000 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .100 8.924 1 .632 .000 c.m/s C perv/imperv/total 087 4.834 .236 .880 15 ADD RUNOFF .087 4.921 .632 .000 c.m/s CATCHMENT 4 TD No. 6 99999 301.000 .720 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious . 200 10.000 Length (IMPERV) 69.000 Sump. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" .000 1 SCS Curve No or C Ia/S Coefficient Initial Abstraction 74.000 .100 8.924 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 14 4.921 .632 .000 c.m/s 36 .869 .299 C perv/imperv/total .000 c.m/s C perv/imperv/total .014 .236 15 ADD RUNOFF .014 4.935 .632 .000 c.m/s 9 ROUTE Conduit Length .000 .000 No Conduit defined Zero lag Beta weighting factor . 000 .000 .000 Routing timestep No. of sub-reaches .014 4.935 0 4.935 .000 c.m/s COMBINE 17 Junction Node No. .014 4.935 1 4.935 4.935 c.m/s 14 START 1=Zero; 2=Define COMMENT 35 3 line(s) of comment
********** PROP DEVELOPMENT NORTH OF SEGMENT 3 - POND P30 CATCHMENT 4 30.000 ID No.ó 99999 Area in hectares Length (PERV) metres 8.470 238.000 .200 Gradient (%) Per cent Impervious .100 238.000 Length (IMPERV) .000 %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" SCS Curve No or C Ia/S Coefficient Initial Abstraction 74.000 .100 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 7 .000 4.935 4.935 c.m/s 1 .057 4.935 c.m/s C perv/imperv/total .236 .236 .885 ADD RUNOFF .057 15 .057 4.935 4.935 c.m/s 4 CATCHMENT ID No.ó 99999 31.000 10.420 Area in hectares Length (PERV) metres Gradient (%) 264.000 1.000 75.000 Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth 264.000 .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1 . 250 Manning "n" SCS Curve No or C 74.000 .100 Ia/S Coefficient 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 1.333 .236 ADD RUNOFF .057 4.935 4.935 c.m/s C perv/imperv/total 15 1.333 4.935 c.m/s 1.341 4.935 1.333 1.341 4.935 HYDROGRAPH DISPLAY 5 is # of Hyetc/Hydrograph chosen Volume = .4376407E+04 c.m CATCHMENT 27 5 4 TD No. 6 99999 32.000 .690 Area in hectares Length (PERV) metres 1.000 Gradient (%) Per cent Impervious 68.000 Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 .250 Manning "n" 74.000 SCS Curve No or C

.100 Ia/S Coefficient 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 74 1.341 4.935 4.935 c.m/s 36 .873 .618 C perv/imperv/total 1 .074 .236 15 ADD RUNOFF .074 1.4 HYDROGRAPH DISPLAY 1.401 4.935 4.935 c.m/s 27 Volume = .4571937E+04 c.m 5 10 POND 
 FOND

 5 Depth - Discharge - Volume sets

 178.800
 .000
 .0

 179.300
 .0260
 1520.0
 180.100 .0440 4649.0 7069.0 .414 180.600 .414 100.800 1.204 Peak Outflow = Maximum --.204 8137.0 reak Outflow = .038 c.m/s Maximum Depth = 179.651 metres Maximum Storage = 3675. c.m .074 1.401 COMBINE 4.935 c.m/s 17 1 Junction Node No. .074 .074 START 1.401 .038 4.958 c.m/s 14 1=Zero; 2=Define COMMENT 35 line(s) of comment 3 PROP DEVELOPMENT SOUTH OF SEGMENT 3 - POND P31 ********* 4 CATCHMENT ID No.ó 99999 33.000 12,960 Area in hectares Length (PERV) metres 294.000 Gradient (%) Per cent Impervious Length (IMPERV) 1.000 75.000 294.000 .000 %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" SCS Curve No or C 74.000 Ia/S Coefficient Initial Abstraction .100 8.924 
 Option
 1=Trianglr;
 2=Rectanglr;
 3=SWM HYD;
 4=Lin. Reserv

 1.708
 .000
 .038
 4.958 c.m/s
 .236
 .884
 .722
 C perv/imperv/total
 1 ADD RUNOFF 1.708 15 1.708 .038 4.958 c.m/s HYDROGRAPH DISPLAY 27 CATCHMENT UISPLAY is # of Hyeto/Hydrograph chosen Volume = .4291300E+04 c.m 4 34.000 ID No.ó 99999 Area in hectares .660 Length (PERV) metres Gradient (%) Per cent Impervious 66.000 1.000 60.000 Length (IMPERV) %Imp. with Zero Dpth 66.000 .000 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C . 250 74.000 .100 Ia/S Coefficient 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .072 1.708 .038 .873 .618 4.958 c.m/s C perv/imperv/total .235 .235 .873 .618 ADD RUNOFF .072 1.765 .038 HYDROGRAPH DISPLAY 5 is # of Hyeto/Hydrograph chosen Volume = .4478340E+04 c.m POND 15 4.958 c.m/s 27 10 POND 6 Depth - Discharge - Volume sets .000 178.300 .0 1927.0 178.900 179.600 .0540 4692.0 .150 179.800 5590.0 180.000 .321 6538.0 4.958 c.m/s 17 Junction Node No. .072 1.765 1 .072 START 4.986 c.m/s .048 14 1=Zero; 2=Define CONFLUENCE 18 1 Junction Node No. .072 4.986 COMMENT .048 .000 c.m/s 35 line(s) of comment 3 REALIGNED CHANNEL - SEGMENT 3 CATCHMENT 4 302.000 TD No. 6 99999 Area in hectares Length (PERV) metres 1.610 104.000 .200 Gradient (%) Per cent Impervious Length (IMPERV) 104.000 %Imp. with Zero Dpth
Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 . 250 Manning "n" SCS Curve No or C 74.000

.100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 4.986 .048 .000 c.m/s .301 C perv/imperv/total .030 .236 .884 COMMENT line(s) of comment 3 FLOW U/S OF NIAGARA ST CULVERT - OUTLET D

15 ADD RUNOFF

35

5.016 .048 .000 c.m/s 14

1 1=Zero; 2=Define 35 COMMENT 10-YEAR STORM EVENT STORM 2 1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic 860.000 Coefficient a Constant b (min) Exponent c 6.500 .763 Fraction to peak r Duration ó 240 min 51.471 mm Total depth .450 240.000 3 IMPERVIOUS Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" 1 .015 SCS Curve No or C Ia/S Coefficient Initial Abstraction 98.000 .100 .518 35 COMMENT 3 line(s) of comment EXISTING RES. WEST OF SEGMENT 1 4 CATCHMENT 1.000 TD No. 6 99999 17.520 Area in hectares Length (PERV) metres Gradient (%) 343.000 1.000 Per cent Impervious 35.000 343.000 Length (IMPERV) Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 250 Manning "n" SCS Curve No or C Ia/S Coefficient 74.000 
 Iars Coerricient

 Initial Abstraction

 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv

 1.227
 .000

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 .000
 .100 8.924 1 .000 .000 .000 c.m/s .892 .486 C perv/imperv/total .227 .267 ADD RUNOFF 1.227 15 1.227 .000 .000 c.m/s 35 COMMENT REALIGNED CHANNEL - SEGMENT 1 ****** CATCHMENT 4 100.000 ID No.ó 99999 Area in hectares Length (PERV) metres 2.020 116.000 .400 Gradient (%) 15.000 Per cent Impervious Length (IMPERV) 116.000 %Imp. with Zero Dpth .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" 1 .250 SCS Curve No or C 74.000 .100 Ia/S Coefficient 8.924 Initial Abstraction 
 Option
 1=Trianglr;
 2=Rectanglr;
 3=SWM HYD;
 4=Lin.
 Reserv

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 .063 . 003 . 267 COMMENT 35 3 line(s) of comment FLOW AT FUT ROADWAY CULVERT - SEGMENT 1 ADD RUNOFF 15 .063 1,290 .000 .000 c.m/s ROUTE Conduit Length .000 .000 No Conduit defined .000 Zero lag Beta weighting factor .000 Routing timestep No. of sub-reaches .000 0 .063 1.290 1.290 .000 c.m/s COMBINE 17 Junction Node No. 1 .063 START 1.290 1.290 1.290 c.m/s 14 1=Zero; 2=Define 1 35 COMMENT line(s) of comment PROP DEVELOPMENT NORTH OF SEGMENT 1 - POND P10 CATCHMENT 4 10.000 4.050 ID No.ó 99999 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious 164.000 1.000 70.000 164.000 Length (IMPERV) %Imp. with Zero Dpth .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1 . 250 Manning "n" SCS Curve No or C 74.000 .100 Ta/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 8.924 1 1.290 1.290 c.m/s .695 C perv/imperv/total .000 1.290 .879 .695 .531 .267 15 ADD RUNOFF .531 1.290 CATCHMENT L1.000 ID No.6 99999 Area in hectar .531 1.290 c.m/s 11.000 Area in hectares

82.000 Length (PERV) metres 1.000 Gradient (%) Per cent Impervious 82.000 Length (IMPERV) %Imp. with Zero Dpth .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" 1 .250 74.000 SCS Curve No or C Ia/S Coefficient Initial Abstraction .100 8.924 
 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv

 24
 .531
 1.290
 1.290 c.m/s

 57
 .886
 .329
 C perv/imperv/total
 1 .024 15 ADD RUNOFF .024 .555 1.290 1.290 c.m/s POND 10 
 POND

 6 Depth - Discharge - Volume sets

 184.800
 .000

 185.750
 .0210

 1.0
 .0230 186.000 503.0 186.250 1091.0 186.500 .0280 1765.0 -.244 2370.0 reax Outflow = .026 c.m/s Maximum Depth = 186.301 metres Maximum Storage = 1229. c -.024 .024 COMBINE 1.290 c.m/s 17 Junction Node No. 1 .024 START .555 .026 1.313 c.m/s 14 1=Zero; 2=Define L 1=Zero CONFLUENCE 18 1 Junction Node No. .024 1.313 .024 COMMENT .026 .000 c.m/s 35 3 line(s) of comment REALIGNED CHANNEL - SEGMENT 1 **** CATCHMENT 4 101.000 TD No. 6 99999 .610 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious 1.000 10.000 Length (IMPERV) 64.000 %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 .250 Manning "n" SCS Curve No or C Ia/S Coefficient 74.000 .100 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .016 1.313 .026 .000 c.m/s .266 .884 .328 C perv/imperv/total 8.924 .000 c.m/s C perv/imperv/total .884 ADD RUNOFF 15 .016 1.329 .026 .000 c.m/s 9 ROUTE Conduit Length .000 .000 No Conduit defined .000 Zero lag Beta weighting factor .000 .000 Routing timestep No. of sub-reaches 0 .016 1.329 1.329 .000 c.m/s 17 COMBINE Junction Node No. 1 .016 1.329 1.329 1.329 c.m/s 14 START 1=Zero; 2=Define COMMENT 35 3 line(s) of comment PROP DEVELOPMENT SOUTH OF SEGMENT 1 - POND P11 4 CATCHMENT 12.000 TD No. 6 99999 2.680 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious 1.000 35.000 134.000 Length (IMPERV) .000 %Imp. with Zero Dpth
Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C Ia/S Coefficient .100 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 8 .000 1.329 1.329 c.m/s 7 880 481 C pervi/merv/total 8.924 .178 .481 C perv/imperv/total .267 ADD RUNOFF .880 15 .178 .178 1.329 1.329 c.m/s 4 CATCHMENT ID No.ó 99999 13.000 6.980 Area in hectares 216.000 1.000 Length (PERV) metres Gradient (%) 70.000 Per cent Impervious Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 216.000 .000 .250 Manning "n" SCS Curve No or C 74.000 .100 Ia/S Coefficient Initial Abstraction 8.924 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 1.329 c.m/s 933 .178 1.329

	.26	7.8	390	.703	C perv/imperv/total
15	ADD RUNOFF		112 1	.329	1.329 c.m/s
4	CATCHMENT			. 329	1.329 C.m/s
		ID No.6 99			
		Area in he Length (PH	ERV) metre	S	
		Gradient (			
		Per cent 1 Length (IN	Impervious (PERV)		
			n Zero Dpt		
	1 0 .250 M	Manning "r	acs CN/C; n"	2=Horton;	3=Green-Ampt; 4=Repeat
	74.000	SCS Curve	No or C		
		Ia/S Coeff Initial Ab	Eicient ostraction		
	1 0	Option 1=1	frianglr;	2=Rectang	lr; 3=SWM HYD; 4=Lin. Reserv
	.083		L12 1 384	.329	1.329 c.m/s C perv/imperv/total
15	ADD RUNOFF				
27	.083 HYDROGRAPH		L77 1	.329	1.329 c.m/s
	5 is#o	of Hyeto/H	Iydrograph	chosen	
10	Volume = POND	.34087921	s+04 c.m		
	5 Depth - Di				
	184.800 185.300	.000		.0	
	186.100	.0240	3519	.0	
	186.500 186.800	.287 1.922	4978 6222		
	Peak Outflo	ow =	.022 c	.m/s	
	Maximum Dep Maximum Sto		185.947 m 3066. c		
	.083	3 1.1			1.329 c.m/s
35	COMMENT 3 line(s	s) of com	nent.		
	********	******			
	FLOW U/S OF		CULVERT -	OUTLET A	1
17	COMBINE				
	1 Junct: .083	ion Node N 3 1.1		.022	1.344 c.m/s
14	START				1011 011, 0
35	1 1=Zero COMMENT	o; 2=Defir	he		
55	3 line(s				
	**************************************			KED DD C	WEST OF RICE RD PON
	*****			KEK KD &	WEST OF RICE RD FON
4	CATCHMENT 40.000	ID No.ó 99	0000		
		Area in he			
		Length (PH Gradient (	<pre>SRV) metre (%)</pre>	S	
			(*) Empervious		
		Length (IN			
		ATTEN and the	Zama Dat	<b>h</b>	
			n Zero Dpt SCS CN/C;		3=Green-Ampt; 4=Repeat
	1 0 .250 1	Option 1=8 Manning "r	SCS CN/C; n"		3=Green-Ampt; 4=Repeat
	1 0 .250 1 74.000 s	Option 1=8	SCS CN/C; n" No or C		3=Green-Ampt; 4=Repeat
	1 0 .250 1 74.000 2 .100 2 8.924 2	Option 1=5 Manning "r SCS Curve Ia/S Coeff Initial Ak	SCS CN/C; n" No or C ficient ostraction	2=Horton;	
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15	1 0 .250 1 74.000 5 .100 2 8.924 2 1 0 .400 .267	Option 1=5 Manning "r SCS Curve Ia/S Coeff Initial Ak Option 1=7 8 .( 7 .8	SCS CN/C; h" No or C ficient ostraction Frianglr; 000	2=Horton; 2=Rectang .022	lr; 3=SWM HYD; 4=Lin. Reserv
15	1 0 .250 1 74.000 8 .100 2 8.924 2 1 0 .408	Option 1=5 Manning "r SCS Curve Ia/S Coeff Initial Ak Option 1=7 8 .( 7 .8	SCS CN/C; n" No or C ficient ostraction Frianglr; 000 894	2=Horton; 2=Rectang .022	11r; 3=SWM HYD; 4=Lin. Reserv 1.344 c.m/s
15 9	1 0 .250 b .100 2 8.924 1 1 0 .267 ADD RUNOFF .400 ROUTE	Option 1=5 Manning "r SCS Curve Ia/S Coeff Initial Ak Option 1=7 8 .( 7 .8 8 .4	SCS CN/C; " No or C Ficient ostraction frianglr; 000 394 408	2=Horton; 2=Rectang .022 .423	<pre>{lr; 3=SWM HYD; 4=Lin. Reserv 1.344 c.m/s C perv/imperv/total</pre>
	1 0 .250 1 74.000 8 .100 2 8.924 2 1 0 .265 ADD RUNOFF .400 ROUTE .000 0 0.000 1	Dption 1=5 Manning "r SCS Curve Ia/S Coeff Initial Ab Option 1=7 8 .0 7 .5 8 .4 Conduit Le No Conduit	SCS CN/C; 1" No or C Ficient sstraction Grianglr; 000 394 408 ength	2=Horton; 2=Rectang .022 .423	<pre>{lr; 3=SWM HYD; 4=Lin. Reserv 1.344 c.m/s C perv/imperv/total</pre>
	1 0 .250 1 74.000 8 .100 2 8.924 2 1 0 .401 .26' ADD RUNOFF .401 ROUTE .000 0 .000 1	Dption 1=5 Manning "r SCS Curve Ia/S Coeff Initial Ab Option 1=7 8 7 8 8 Conduit Le No Conduit Zero lag	SCS CN/C; 1" No or C ficient ostraction frianglr; 000 394 408 ength t defined	2=Horton; 2=Rectang .022 .423 .022	<pre>{lr; 3=SWM HYD; 4=Lin. Reserv 1.344 c.m/s C perv/imperv/total</pre>
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9 17 14	1 0 .250 1 74.000 5 8.924 2 8.924 2 8.924 2 .400 .26' ADD RUNOFF .400 ROUTE .400 .000 1 .000 1 .000 1 .000 1 .000 1 .000 1 .000 1 .000 1 .400 START 1 =Zerc CATCHMENT 41.000 2 .690 2 .690 2 .690 2	Dption 1== Manning "r SCS Curve Ta/S Coeff Initial AM Option 1== 8 8 8 6 8 6 8 6 8 6 6 6 6 6 6 6 6 6 6 6 7 8 6 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 6 7 8 6 7 7 8 6 7 8 7 7 8 7 8 7 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	<pre>SIGS CN/C; No or C ficient straction frianglr; 000 994 408 angth - defined hting fact immestep poreaches 408 No. 408 No. 408 he 9999 sctares SRV) metre %)</pre>	2=Horton; 2=Rectang.022 .423 .022 .423 .022 or .408 .408	<pre>ilr; 3=SWM HYD; 4=Lin. Reserv 1.344 c.m/s C perv/imperv/total 1.344 c.m/s 1.344 c.m/s</pre>
9 17 14	1 0 .250 1 74.000 2 .100 2 8.924 2 .267 ADD RUNOFF .000 2 .000 1 .000	Dption 1== Manning "r SCS Curve Ta/S Coeff Initial AM Dption 1=7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	<pre>SCS CN/C; No or C Ficient straction Frianglr; 000 394 408 ength _ defined atting fact mestep reaches 408 40. 408 408 408 408 408 408 408 408 408 408</pre>	2=Horton; 2=Rectang.022 .423 .022 .423 .022 or .408 .408	<pre>ilr; 3=SWM HYD; 4=Lin. Reserv 1.344 c.m/s C perv/imperv/total 1.344 c.m/s 1.344 c.m/s</pre>
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9 17 14	1 0 .250 1 74.000 5 .100 2 8.924 2 .267 ADD RUNOFF .000 2 .000 1 .000	Option 1== Control == SCS Curve Ta/S Coeff Initial AM Option 1== 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 4 Conduit Le No Conduit Zero 1ag Beta weigh Routing ti No. of su 8 4 ion Node N 8 4 ion Node N 8 9 Conduit Le State in he Length (PL Gradient ( Per cent ) Length (PL Stame ) Length (PL State ) Length (PL State ) Length (PL Sta	<pre>CCS CN/C; No or C icient stration 7 394 408 angth c defined hting fact immestep -reaches 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 NO. 10 NO. 10 NO. 10 NO. 10 NO. 10 NO NO. 10 NO NO. 10 NO N</pre>	2=Horton; 2=Rectang .022 .423 .022 or .408 .408	<pre>ilr; 3=SWM HYD; 4=Lin. Reserv 1.344 c.m/s C perv/imperv/total 1.344 c.m/s 1.344 c.m/s</pre>
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9 17 14	1 0 .250 1 74.000 5 8.924 2 8.924 2 .000 1 .267 ADD RUNOFF .000 1 .000 1 .000 1 .000 1 .000 1 .000 1 .000 1 .000 1 .400 COMBINE 2 Juncti .400 START 1 1=Zerc CATCHMENT 1.122 68.000 1 .690 2 .400 5 .000 1 .000 2 .000 1 .400 5 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400 .400	Dption 1== Dption 1== SCS Curve Ta/S Coeff Initial AM Dption 1== 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 4 Conduit Le No Conduit Zero lag Beta weigh Routing ti No. of sul 8 4 ion Node N 8 4 ion Node N 8 4 ion Node S 4 ion Node S 4 conduit Le Seta weigh 6 conduit Le Seta weigh 7 conduit Le Seta weight 7 conduit Le Seta weight 8 conduit Le Seta weight 8 condu	<pre>GCS CN/C; No or C icient straction rrianglr; 00 394 408 angth c defined hting fact immestep o-reaches 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 400 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 No. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO</pre>	2=Horton; 2=Rectang. .022 .423 .022 or .408 .408 s h 2=Horton;	<pre>(lr; 3=SWM HYD; 4=Lin. Reserv 1.344 c.m/s C perv/imperv/total 1.344 c.m/s 1.344 c.m/s .408 c.m/s</pre>
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9 17 14	1 0 .250 1 74.000 5 .100 .26 ADD RUNOFF .400 .400 ROUTE .400 .000 1 .000 5 .250 2 .250 2	Dption 1== Manning "r SCS Curve Ia/S Coeff Initial AM Dption 1== 8 8 6 8 6 8 6 7 8 6 8 6 6 6 6 6 6 6 7 8 6 6 6 6 6 6 6 6 6 6 7 6 6 6 6 6 6 6 6 6 6 6 7 6 7 8 6 6 6 6 6 6 6 6 7 7 8 6 6 6 7 7 8 6 7 8 6 6 7 8 6 7 8 6 7 8 6 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	SGS CN/C; No or C icient straction frianglr; 000 994 108 angth : defined ting fact imsetep c-reaches 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 No. 108 N	2=Rectang .022 .423 .022 .423 .022 .408 .408 .408 .408	<pre>llr, 3=SWM HYD; 4=Lin. Reserv 1.344 c.m/s C perv/imperv/total 1.344 c.m/s 1.344 c.m/s .408 c.m/s .408 c.m/s .408 c.m/s .408 c.m/s .408 c.m/s</pre>
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9 17 14 4	1 0 .250 1 74.000 2 8.924 2 8.924 2 .400 .26' ADD RUNOFF .400 .400 .000 1 .000 1	Dption 1=5 Manning "r SCS Curve Ta/S Coeff Initial AM Dption 1=7 8 8 8 6 8 6 8 6 8 6 7 8 6 8 6 8 6 8 6 7 8 6 8 6 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 7 8 6 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	<pre>GS CN/C; No or C icient straction frianglr; 000 and the straction frianglr; 000 and the straction frianglr; 000 actares fr() metre actares fr() metre actares fr() metre actares fr() metre frianglr; 000 astares frianglr; 000 astares frianglr; 000 astares frianglr; 000 astares frianglr; 000 astares frianglr; 000 astares frianglr; 000 astares frianglr; 000 astares frianglr; 000 astares frianglr; 000 astares frianglr; 000 astares frianglr; 000 astares frianglr; 000 astares frianglr; 000 astares frianglr; 000 astares frianglr; 000 astares frianglr; 000 astares frianglr; 000 astares frianglr; 000 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frianglr; 100 astares frian</pre>	2=Horton; 2=Rectang. .022 .423 .022 .423 .022 or .408 .408 s h 2=Horton; 2=Rectang. .408 .483	<pre>(lr; 3=SWM HYD; 4=Lin. Reserv 1.344 c.m/s C perv/imperv/total 1.344 c.m/s 1.344 c.m/s .408 c.m/s 3=Green-Ampt; 4=Repeat (lr; 3=SWM HYD; 4=Lin. Reserv .408 c.m/s C perv/imperv/total</pre>
9 17 14 4	1 0 .250 1 74.000 2 .100 2 8.924 2 .000 2 .267 ADD RUNOFF .000 2 .000 1 .000 .000 .000 1 .000 .000 .000 1 .000 .000 .000 .000 1 .000 .000 .000 .000 1 .000 .000 .000 .000 .000 .000 .000 .00	Dption 1== Manning "r SGS Curve Ta/S Coeff Initial AM Dption 1=7 8	<pre>GCS CN/C; No or C ficient straction frianglr; 000 394 408 angth i defined ting fact imestep reaches 408 to imestep reaches 408 actares ERV) netre 39999 actares ERV) netre 5CS CN/C; No or C ficient straction frianglr; 000 384 551 3999 actares</pre>	2=Rectang .022 .423 .022 or .408 .408 s h 2=Rectang .408 .408 .408 .408	<pre>(lr; 3=SWM HYD; 4=Lin. Reserv 1.344 c.m/s C perv/imperv/total 1.344 c.m/s 1.344 c.m/s .408 c.m/s 3=Green-Ampt; 4=Repeat (lr; 3=SWM HYD; 4=Lin. Reserv .408 c.m/s C perv/imperv/total</pre>
9 17 14 4	1 0 .250 1 74.000 2 .100 .26' ADD RUNOFF .400 .400 ROUTE .400 .000 1 .000 1	Dption 1== Manning "r SCS Curve Ia/S Coeff Initial AM Option 1== 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 8 8 6 Conduit Le No Conduit Zero lag Beta weig Routing ti No. of sub 8 6 7 8 8 6 7 8 8 6 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	<pre>SIGS CN/C; No or C ficient straction frianglr; 000 394 408 angth idefined ting fact imestep reaches 408 408 408 408 408 408 408 408 408 408</pre>	2=Horton; 2=Rectang .022 .423 .022 or .408 .408 .408 s 2=Horton; 2=Rectang .408 .408 .408 .408	<pre>(lr; 3=SWM HYD; 4=Lin. Reserv 1.344 c.m/s C perv/imperv/total 1.344 c.m/s 1.344 c.m/s .408 c.m/s 3=Green-Ampt; 4=Repeat (lr; 3=SWM HYD; 4=Lin. Reserv .408 c.m/s C perv/imperv/total</pre>
9 17 14 4	1 0 .250 1 74.000 2 .100 2 8.924 2 .000 2 .267 ADD RUNOFF .000 2 .000 1 .000	Dption 1== Manning "r SCS Curve Ia/S Coeff Initial AM Option 1== 8 8 8 7 8 8 8 7 8 8 8 7 8 8 8 8 8 6 Conduit Le No Conduit Zero lag Beta weig Routing ti No. of sub 8 6 7 8 8 6 7 8 8 6 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	<pre>GS CN/C; No or C icient stration 7 394 408 angth c defined hting fact fumestep -reaches 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 408 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 No. 405 NO. 405 NO. 405 NO. 405 NO. 405 NO. 405 NO. 405 NO. 405 NO. 405 NO. 405 NO. 405 NO. 405 NO. 405 NO. 405 NO. 405 NO. 405 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40 NO. 40</pre>	2=Horton; 2=Rectang .022 .423 .022 or .408 .408 .408 s 2=Horton; 2=Rectang .408 .408 .408 .408	<pre>(lr; 3=SWM HYD; 4=Lin. Reserv 1.344 c.m/s C perv/imperv/total 1.344 c.m/s 1.344 c.m/s .408 c.m/s 3=Green-Ampt; 4=Repeat (lr; 3=SWM HYD; 4=Lin. Reserv .408 c.m/s C perv/imperv/total</pre>
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9 17 14 4	1 0 .250 1 74.000 5 .100 5 8.924 5 8.924 5 .267 ADD RUNOFF .000 1 .000 1 .00	Dption 1== Manning "r SGS Curve Ta/S Coeff Initial AM Dption 1== 8 8 Conduit Le No Conduit Le Seta weigh Routing ti No. of sul 8	<pre>GS CN/C; No or C icient straction Final C and C a</pre>	2=Rectang .022 .423 .022 or .408 .408 .408 s h 2=Rectang .408 .408 .408 .408	<pre>(lr; 3=SWM HYD; 4=Lin. Reserv 1.344 c.m/s C perv/imperv/total 1.344 c.m/s 1.344 c.m/s .408 c.m/s 3=Green-Ampt; 4=Repeat (lr; 3=SWM HYD; 4=Lin. Reserv .408 c.m/s C perv/imperv/total</pre>

		urve No or C Coefficient		
		al Abstractic	n	
		n 1=Trianglr;		glr; 3=SWM HYD; 4=Lin. Reserv
	1.695 .267	.051 .897		.408 c.m/s C perv/imperv/total
15	ADD RUNOFF			
9	1.695 ROUTE	1.737	.408	.408 c.m/s
		it Length		
	.000 No Co .000 Zero	nduit defined	1	
	.000 Beta	weighting fac	tor	
		ng timestep f sub-reaches		
	1.695		1.737	.408 c.m/s
17	COMBINE 2 Junction N	odo No		
	2 JUNCTION N 1.695		1.737	2.145 c.m/s
14	START			
4	<pre>1 1=Zero; 2= CATCHMENT</pre>	Define		
	43.000 ID No	.ó 99999		
		in hectares h (PERV) metr	es	
	1.000 Gradi	ent (%)		
	35.000 Per c 47.000 Lengt	ent Imperviou h (IMPERV)	15	
	.000 %Imp.	with Zero Dr	oth	
			2=Horton	; 3=Green-Ampt; 4=Repeat
	.250 Manni 74.000 SCS C	urve No or C		
	.100 Ia/S	Coefficient		
		al Abstractic n 1=Trianglr:		glr; 3=SWM HYD; 4=Lin. Reserv
	.026	.000	1.737	2.145 c.m/s
15	.266 ADD RUNOFF	.885	.483	C perv/imperv/total
15	.026	.026	1.737	2.145 c.m/s
4	CATCHMENT 44.000 ID No	.ó 99999		
	6.400 Area	in hectares		
		h (PERV) metr	es	
		ent (%) ent Imperviou	15	
	207.000 Lengt	h (IMPERV)		
		with Zero Dr n 1=SCS CN/C:		; 3=Green-Ampt; 4=Repeat
	.250 Manni	ng "n"		,
		urve No or C Coefficient		
		al Abstractic	n	
	1 Optio .854	n 1=Trianglr; .026	2=Rectan 1.737	glr; 3=SWM HYD; 4=Lin. Reserv 2.145 c.m/s
	.267	.887	.701	C perv/imperv/total
15	ADD RUNOFF .854	.874	1.737	2.145 c.m/s
9	ROUTE	.0/4	1./3/	2.145 C.m/s
		it Length		
	.000 No Co .000 Zero	nduit defined lag	1	
		weighting fac	tor	
		ng timestep f sub-reaches		
	.854	.874	.874	2.145 c.m/s
17	COMBINE 2 Junction N	ode No.		
	.854	.874	.874	3.019 c.m/s
14	START 1 1=Zero; 2=	Define		
18	CONFLUENCE			
	2 Junction N .854		.874	.000 c.m/s
4	CATCHMENT			
		.ó 99999 in hectares		
	83.000 Lengt	h (PERV) metr	es	
	1.000 Gradi 60.000 Per c	ent (%) ent Imperviou	15	
	83.000 Per c 83.000 Lengt	ent Imperviou h (IMPERV)		
	.000 %Imp.	with Zero Dr	oth	; 3=Green-Ampt; 4=Repeat
	.250 Manni	ng "n"	2-101100	, J-GIGEN-Ampl, 4=Repeat
	74.000 SCS C	urve No or C		
		Coefficient al Abstractic	m	
	1 Optio	n 1=Trianglr;	2=Rectan	glr; 3=SWM HYD; 4=Lin. Reserv
	.122	3.019 .886	.874 .638	.000 c.m/s C perv/imperv/total
15	ADD RUNOFF			
27	.122 HYDROGRAPH DISP	3.124 T.AY	.874	.000 c.m/s
/	5 is # of Hy	eto/Hydrograp	oh chosen	
10	Volume = .929 POND			
10	6 Depth - Discha		sets	
	186.000	.000	.0	
		0550 404 0730 709	18.0 1.0	
	187.500	.170 842	24.0	
		.257 1055 .880 1209		
			c.m/s	
	Peak Outflow Maximum Depth Maximum Storage	= 187.415	metres	
	Maximum Storage .122	= 7854. 3.124	c.m .129	.000 c.m/s
17	COMBINE			
	2 Junction N .122	ode No. 3.124	.129	.129 c.m/s
				D -

D - 17

14 START 1=Zero; 2=Define 1 COMMENT 35 3 line(s) of comment EXISTING AREA ON QUAKER RD, WEST OF RICE RD CATCHMENT 4 TD No. 6 99999 2.000 9.020 Area in hectares 245.000 Length (PERV) metres 1.000 Gradient (%) Per cent Impervious 245.000 Length (IMPERV) Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 .250 Manning "n" SCS Curve No or C 74.000 Ia/S Coefficient .100 Initial Abstraction 8.924 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .129 c.m/s C perv/imperv/total .702 .000 .129 .518 267 15 ADD RUNOFF . 702 .702 .129 .129 c.m/s 9 Conduit Length .000 . 000 No Conduit defined Zero lag Beta weighting factor .000 .000 Routing timestep No. of sub-reaches .000 0 .702 .702 .129 c.m/s .702 17 COMBINE Junction Node No. 2 .702 .702 .702 .745 c.m/s START 14 1=Zero; 2=Define 18 CONFLUENCE Junction Node No. .745 .702 .000 c.m/s .702 COMMENT 35 3 line(s) of comment EXISTING AREA ON QUAKER RD, WEST OF RICE RD CATCHMENT 4 3.000 5.680 TD No. 6 99999 Area in hectares 195.000 Length (PERV) metres 1.000 Gradient (%) Per cent Impervious 195.000 Length (IMPERV) Length (IMPERV)
%Imp. with Zero Dpth
Option 1=SCS CM/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 Manning "n" SCS Curve No or C 250 74.000 Ia/S Coefficient .100 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .440 .745 .885 .702 .000 c.m/s C perv/imperv/total 267 ADD RUNOFF 15 1.185 . 440 .702 .000 c.m/s ROUTE 9 Conduit Length .000 .000 No Conduit defined Zero lag Beta weighting factor .000 .000 .000 Routing timestep No. of sub-reaches 0 1.185 .440 1.185 .000 c.m/s 17 COMBINE Junction Node No. 2 .440 1.185 1.185 1.185 c.m/s 14 START 1=Zero; 2=Define 35 COMMENT PROP DEVELOPMENT SOUTH OF QUAKER RD, EAST OF RICE RD CATCHMENT 4 50.000 ID No.ó 99999 Area in hectares Length (PERV) metres 3.420 151.000 1.000 Gradient (%) Per cent Impervious 151.000 Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 . 250 Manning "n" SCS Curve No or C 74.000 .100 Ia/S Coefficient 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .077 .000 1.185 1.185 c.m/s .875 .328 C perv/imperv/total .267 ADD RUNOFF 15 .077 1.185 1.185 c.m/s .077 CATCHMENT 4 ID No.ó 99999 51.000 1.980 115.000 Area in hectares Length (PERV) metres Gradient (%) 1.000 10.000 Per cent Impervious 115.000 Length (IMPERV) %Imp. with Zero Dpth .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1

.250 Manning "n" 74.000 SCS Curve No or C .100 Ta/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 8.924 1 .077 1.185 c.m/s C perv/imperv/total .046 1.185 .885 .328 .267 15 ADD RUNOFF .123 1.185 1.185 c.m/s .046 9 ROUTE .000 Conduit Length No Conduit defined Zero lag Beta weighting factor 000 .000 .000 .000 Routing timestep No. of sub-reaches 0 .123 .046 .123 1.185 c.m/s COMBINE 17 Junction Node No. 2 .046 .123 .123 1.308 c.m/s START 14 1=Zero; 2=Define 1 35 COMMENT 3 line(s) of comment EXISTING AREA WEST OF RICE RD AND SOUTH OF QUAKER ROAD 4 CATCHMENT ID No.ó 99999 4.000 13.940 Area in hectares Length (PERV) metres Gradient (%) 305.000 1.000 Per cent Impervious 305.000 Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Ditial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .000 .123 1.115 1.308 c.m/s C perv/imperv/total .267 ADD RUNOFF 15 1.115 1.115 .123 1.308 c.m/s 9 ROUTE Conduit Length .000 .000 No Conduit defined Zero lag Beta weighting factor .000 Routing timestep No. of sub-reaches .000 0 1.115 1,115 1,115 1.308 c.m/s COMBINE 17 Junction Node No. 2 1.115 1.115 1.115 2.423 c.m/s START 14 1=Zero; 2=Define 1 CONFLUENCE 18 Junction Node No. 2 1.115 2.423 1.115 .000 c.m/s 35 COMMENT 3 line(s) of comment RICE ROAD FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUNDA 4 CATCHMENT 501.000 ID No.ó 99999 1.570 Area in hectares 102.000 Length (PERV) metres Gradient (%) 1.000 Per cent Impervious 102.000 Length (IMPERV) %Imp. with Zero Dpth .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1 .250 Manning "n" SCS Curve No or C 74.000 .100 Ta/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 8.924 1 .000 c.m/s C perv/imperv/total . 209 2.423 1.115 .267 .886 .700 ADD RUNOFF 15 .209 2.615 1.115 .000 c.m/s ROUTE Conduit Length .000 .000 No Conduit defined Zero lag .000 Beta weighting factor Routing timestep No. of sub-reaches .000 0 2.615 .209 2,615 .000 c.m/s 35 COMMENT FLOW D/S OF RICE RD CULVERT - OUTLET A2 17 COMBINE Junction Node No. 1 .209 2.615 2.615 3.959 c.m/s 14 START 1=Zero; 2=Define 1 COMMENT 35 line(s) of comment PROP DEVELOPMENT SOUTH OF QUAKER RD - QUALLITY CONTROL ONLY 4 CATCHMENT

	700			
		<pre>hectares (PERV) metr</pre>	es	
	1.000 Gradier	nt (%)		
		nt Imperviou (IMPERV)	s	
		vith Zero Dp	th	
				; 3=Green-Ampt; 4=Repeat
	.250 Manning			
		rve No or C Defficient		
		L Abstractio	n	
	1 Option	1=Trianglr;	2=Rectan	glr; 3=SWM HYD; 4=Lin. Reserv
	.057	.000 .884	2.615 .483	3.959 c.m/s C perv/imperv/total
15	ADD RUNOFF	.004	.405	C perv/imperv/cocar
	.057	.057	2.615	3.959 c.m/s
4	CATCHMENT	6 00000		
	20.000 ID No.6 3.210 Area in	hectares		
		(PERV) metr	es	
	1.000 Gradier			
		nt Imperviou (IMPERV)	S	
		with Zero Dp	th	
	1 Option	1=SCS CN/C;		; 3=Green-Ampt; 4=Repeat
	.250 Manning			
		rve No or C pefficient		
		Abstractio	n	
				glr; 3=SWM HYD; 4=Lin. Reserv
	.500		2.615 .785	3.959 c.m/s
15	ADD RUNOFF	.877	./85	C perv/imperv/total
	.500	.549	2.615	3.959 c.m/s
9	ROUTE	Tangth		
		: Length luit defined		
	.000 Xero la			
	.000 Beta we	eighting fac	tor	
		g timestep sub-reaches		
	.500	.549	.549	3.959 c.m/s
17	COMBINE			
	1 Junction Not		E40	4 508 a m/a
14	.500 START	.549	.549	4.508 c.m/s
	1 1=Zero; 2=De	efine		
18	CONFLUENCE	1. M.		
	1 Junction Noc .500		.549	.000 c.m/s
35	COMMENT	11500		
	3 line(s) of a			
	**************************************		2	
	*************		2	
4				
4	CATCHMENT			
4	200.000 ID No.d			
4	200.000 ID No.d .970 Area in	hectares	es	
4	200.000 ID No.d .970 Area in	n hectares (PERV) metr	es	
4	200.000 ID No.6 .970 Area in 80.416 Length 1.000 Gradien 10.000 Per cen	h hectares (PERV) metr ht (%) ht Imperviou		
4	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Per cen 80.416 Length	h hectares (PERV) metr ht (%) ht Imperviou (IMPERV)	s	
4	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Gradier 80.416 Length .000 %Imp. v	h hectares (PERV) metr ht (%) ht Imperviou (IMPERV) with Zero Dp	s	; 3=Green-Ampt; 4=Repeat
4	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Gradier 80.416 Length .000 Per cen 80.416 Length .000 %Imp. v 1 Option .250 Manning	h hectares (PERV) metr ht (%) ht Imperviou (IMPERV) with Zero Dp 1=SCS CN/C; g "n"	s	; 3=Green-Ampt; 4=Repeat
4	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Gradien 80.416 Length .000 %Imp. v 1 Option .250 Manning 74.000 SCS Cu	h hectares (PERV) metr ht (%) ht Imperviou (IMPERV) with Zero Dp 1=SCS CN/C; g "n" cve No or C	s	; 3=Green-Ampt; 4=Repeat
4	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Gradise 10.000 Per cen 80.416 Length .000 ¥Imp. v 1 Option .250 Manning 74.000 SCS Cun .100 Ia/S CC	h hectares (PERV) metr ht (%) ht Imperviou (IMPERV) with Zero Dp 1=SCS CN/C; g "n" cve No or C pefficient	s th 2=Horton	; 3=Green-Ampt; 4=Repeat
4	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Gradies 10.000 Per cen 80.416 Length .000 ¥Imp. v 1 Option .250 Manning 74.000 SCS Cu .100 Ia/S CC 8.924 Initial 1 Option	<pre>h hectares (PERV) metr ht (%) t Imperviou (IMPERV) vith Zero Dp l=SCS CN/Cp y "n" cve No or C befficient L Abstractio l=Trianglr;</pre>	s 2=Horton n 2=Rectang	glr; 3=SWM HYD; 4=Lin. Reserv
4	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Gradier 10.000 Per cer 80.416 Length .000 % Imp. v 1 Option .250 Manning 74.000 SCS Cu .100 Ia/S CC 8.924 Initial 1 Option .024	h hectares (PERV) metr ht (%) ht Imperviou (IMPERV) with Zero Dp 1=SCS CN/C; y "n" cve No or C befficient L Abstractio 1=Triang1r; 4.508	s 2=Horton n 2=Rectan .549	glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s
35	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Gradies 10.000 Per cen 80.416 Length .000 ¥Imp. v 1 Option .250 Manning 74.000 SCS Cu .100 Ia/S CC 8.924 Initial 1 Option	<pre>h hectares (PERV) metr ht (%) t Imperviou (IMPERV) vith Zero Dp l=SCS CN/Cp y "n" cve No or C befficient L Abstractio l=Trianglr;</pre>	s 2=Horton n 2=Rectang	glr; 3=SWM HYD; 4=Lin. Reserv
-	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Gradien 80.416 Length .000 %Imp. v 1 Option .250 Manning 74.000 SCS Cu .100 Ia/S CC 8.924 Initial 1 Option .024 .267 COMMENT 3 line(s) of co	<pre>h hectares (PERV) metr t (%) t Imperviou (IMPERV) vith Zero Dp 1=SCS CN/C; y "n" cve No or C befficient l Abstractio 1=Trianglr; 4.508 .886 comment</pre>	s 2=Horton n 2=Rectan .549	glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s
-	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Gradiee 10.000 Per cen 80.416 Length .000 %Imp.v 1 Option .250 Manning 74.000 SCS Cu .100 Ia/S C 8.924 Initial 1 Option .024 .267 COMMENT 3 line(s) of c	<pre>h hectares (PERV) metr t (%) ht Imperviou (IMPERV) vith Zero Dp 1=SCS CN/C; y "n" vve No or C befficient 1 Abstractio 1=Trianglr; 4.508 .886 comment *</pre>	s th 2=Horton n 2=Rectany .549 .328	glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s
-	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Gradien 80.416 Length .000 %Imp. v 1 Option .250 Manning 74.000 SCS Cu .100 Ia/S CC 8.924 Initial 1 Option .024 .267 COMMENT 3 line(s) of co	<pre>h hectares (PERV) metr tt (%) tt Imperviou (IMPERV) with Zero Dp l=SCS CN/C; y "n" cve No or C efficient l Abstractio l=Trianglr; 4.508 .886 comment A20 - OUTLE</pre>	s th 2=Horton n 2=Rectany .549 .328	glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s
-	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Gradiae 10.000 Per cen 80.416 Length .000 ¥Imp. v 1 Option .250 Manning 74.000 SCS Cun .100 Ia/S CC 8.924 Initial 1 Option .024 .267 COMMENT 3 line(s) of C FLOW D/S OF AREA	<pre>h hectares (PERV) metr tt (%) tt Imperviou (IMPERV) with Zero Dp l=SCS CN/C; y "n" cve No or C efficient l Abstractio l=Trianglr; 4.508 .886 comment A20 - OUTLE</pre>	s th 2=Horton n 2=Rectany .549 .328	glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s
35	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Gradiem 10.000 Per cen 80.416 Length .000 ¥Imp. v 1 Option .250 Manning 74.000 SCS Cun .100 Ia/S CC 8.924 Initial 1 Option .024 .267 CCOMMENT 3 line(s) of C ************************************	<pre>h hectares (PERV) metr tt (%) tt Imperviou (IMPERV) with Zero Dp 1=SCS CN/C; y nn" cve No or C efficient t Abstractio 1=Trianglr; 4.508 .886 comment * A20 - OUTLE</pre>	s th 2=Horton 2=Rectany .549 .328 T B	glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s
35	200.000 ID No.d .970 Area in 80.416 Length 1.000 Gradiee 10.000 Per cen 80.416 Length .000 %Imp.v 1 Option .250 Manning 74.000 SCS Cu .100 Ia/S C 8.924 Initial 1 Option .224 .267 COMMENT 3 line(s) of c 	<pre>h hectares (PERV) metr t (%) tt Imperviou (IMPERV) vith Zero Dp 1=SCS CN/C; y "n" cve No or C befficient 1=Trianglr; 4.508 .886 comment * 4.532</pre>	s th 2=Horton 2=Rectany .549 .328 T B	glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total
35	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Gradiem 10.000 Per cen 80.416 Length .000 ¥Imp. v 1 Option .250 Manning 74.000 SCS Cun .100 Ia/S CC 8.924 Initial 1 Option .024 .267 CCOMMENT 3 line(s) of C ************************************	<pre>h hectares (PERV) metr t (%) t Imperviou (IMPERV) with Zero Dp l=SCS CN/C; g "n" cve No or C efficient l Abstractio l=Trianglr; 4.508 .886 .00mment 4.532 comment</pre>	s th 2=Horton 2=Rectany .549 .328 T B	glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total
35	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Gradies 10.000 Per cen 80.416 Length .000 ¥Imp. v 1 Option .250 Manning 74.000 SCS Cu .100 Ia/S CC 8.924 Initial 1 Option .226 COMMENT 3 line(s) of 0 .024 .267 COMMENT 3 line(s) of 0 .024 .024 COMMENT 3 line(s) of 0 .024 COMMENT 3 line(s) of 0 .024 COMMENT 3 line(s) of 0 .024 COMMENT 3 line(s) of 0	<pre>h hectares (PERV) metr tt (%) tt Imperviou (IMPERV) with Zero Dp l=SCS CN/C; y nn" cve No or C efficient l Abstractio l=Trianglr; 4.508 .00mment * 4.532 comment * **********************************</pre>	s th 2=Horton n 2=Rectan; .549 .328 T B .549	glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total
35 15 35	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Gradise 10.000 Per cen 80.416 Length .000 ¥Imp. v 1 Option .250 Manning 74.000 SCS Cun .100 Ia/S CC 8.924 Initial 1 Option .024 .267 COMMENT 3 line(s) of control of control .024 .024 COMMENT 3 line(s) of control .024 .024 COMMENT 3 line(s) of control .024 .024	<pre>h hectares (PERV) metr tt (%) tt Imperviou (IMPERV) with Zero Dp l=SCS CN/C; y nn" cve No or C efficient l Abstractio l=Trianglr; 4.508 .00mment * 4.532 comment * **********************************</pre>	s th 2=Horton n 2=Rectan; .549 .328 T B .549	glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s
35	200.000 ID No.d .970 Area in 80.416 Length 1.000 Gradiee 10.000 Per cen 80.416 Length .000 %Imp.v; 1 Option .250 Manning 74.000 SCS Cun .100 Ia/S CC 8.924 Initial 1 Option .224 .267 COMMENT 3 line(s) of AREA .024 .024 .024 .267 COMMENT 3 line(s) of Of .024 .024 .024 .024 .024 .024 .024 .024	<pre>h hectares (PERV) metr t (%) tt Imperviou (IMPERV) vith Zero Dp 1=SCS CN/C; y "n" cve No or C befficient 1=Trianglr; 4.508 .886 comment * 4.532 comment * * ********************************</pre>	s th 2=Horton n 2=Rectan; .549 .328 T B .549	glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s
35 15 35	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Gradiem 10.000 Per cen 80.416 Length .000 ¥Imp. v 1 Option .250 Manning 74.000 SCS Cun .100 Ia/S CC 8.924 Initial 1 Option .024 .267 COMMENT 3 line(s) of of .024 COMMENT 3 line(s) of of .024 COMMENT COMMENT COMMENT COMMENT COMMENT	<pre>h hectares (PERV) metr t (%) tt Imperviou (IMPERV) vith Zero Dp 1=SCS CN/C; y "n" cve No or C befficient 1=Trianglr; 4.508 .886 comment * 4.532 comment * * ********************************</pre>	s th 2=Horton n 2=Rectan; .549 .328 T B .549	glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s
35 15 35	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Gradiee 10.000 Per cen 80.416 Length .000 %Imp.v 1 Option .250 Manning 74.000 SCS Cu .100 Ia/S CC 8.924 Initial 1 Option .024 .267 COMMENT 3 line(s) of 0 .024 .267 COMMENT 3 line(s) of 0 .024 .024 .024 COMMENT 3 line(s) of 0 .024 .024 .024 .024 .024 .024 .024 COMMENT 3 line(s) of 0 .024 .024 COMMENT 3 line(s) of 0 .024 COMMENT 3 line(s) of 0 .024 COMMENT 21.000 ID NO.2	<pre>h hectares (PERV) metr tt (%) tt Imperviou (IMPERV) with Zero Dp l=SCS CN/C; y nn" cve No or C efficient l Abstractio l=Trianglr; 4.508 .886 .0mment * 4.532 .0mment * * * * * * * * * * * * * * * * * * *</pre>	s th 2=Horton n 2=Rectan; .549 .328 T B .549 LANDS BY (	glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s
35 15 35	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Gradiem 10.000 Per cen 80.416 Length .000 ¥Imp. v 1 Option .250 Manning 74.000 SCS Cum .100 Ia/S CC 8.924 Initial 1 Option .024 .267 COMMENT 3 line(s) of 0 	<pre>h hectares (PERV) metr (PERV) metr t (%) t Imperviou (IMPERV) vith Zero Dp 1=SCS CN/C; y "n" 've No or C i=Trianglr; 4.508 .886 .00mment * A.20 - OUTLE * 4.532 .00mment ******** 599999 h hectares (PERV) metr t (%) </pre>	s th 2=Horton n 2=Rectan; .549 .328 T B .549 LANDS BY (	glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s
35 15 35	200.000 ID No.d .970 Area in 80.416 Length 1.000 Gradiee 10.000 Per cen 80.416 Length .000 %Imp.v 1 Option .250 Manning 74.000 SCS Cun .100 Ia/S CC 8.924 Initial 1 Option .227 COMMENT 3 line(s) of d .024 	<pre>h hectares (PERV) metr tt (%) tt Imperviou (IMPERV) with Zero Dp l=SCS CN/C; y nn" cve No or C efficient l Abstractio l=Trianglr; 4.508 .886 .0mment * 4.532 .0mment * * * * * * * * * * * * * * * * * * *</pre>	s th 2=Horton n 2=Rectan; .549 .328 T B .549 LANDS BY (	glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s
35 15 35	200.000 ID No.6 .970 Area in 80.416 Length 1.000 Gradiee 10.000 Per cen 80.416 Length .000 % Imp. x 1 Option .250 Manning 74.000 SCS Cun .100 IA/S CC 8.924 Initia 1 Option .227 COMMENT 3 line(s) of 0 ************************************	<pre>h hectares (PERV) metr t (%) t Imperviou (IMPERV) with Zero Dp l=SCS CN/C; y "n" vre No or C efficient l Abstractio l=Trianglr; 4.508 .886 comment * A20 - OUTLE * A20 - OUTLE * * 4.532 comment * * * * * * * * * * * * * * * * * * *</pre>	s th 2=Horton n 2=Rectan; .549 .328 T B .549 LANDS BY ( es s th	<pre>glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV</pre>
35 15 35	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Gradiee 10.000 Per cen 80.416 Length .000 %Imp.v 1 Option .250 Manning 74.000 SCS Cu .100 Ia/S CC 8.924 Initial 1 Option .227 COMMENT 3 line(s) of 0 .224 .227 COMMENT 3 line(s) of 0 .024 .024 .024 COMMENT 3 line(s) of 0 .024 COMMENT 3 line(s) of 0 COMMENT 3 line(s) of 0 COMMENT 3 line(s) of 0 COMMENT 21.000 ID No.4 35.460 Area in 487.000 Length .000 %Imp.v 1 Option	<pre>h hectares (PERV) metr tt (%) tt Imperviou (IMPERV) with Zero Dp =SCS CN/C; y "n" cve No or C efficient l Abstractio 1=Trianglr; 4.508 .886 .0mment * 4.532 .0mment * 4.532 .0mment * * * * * * * * * * * * * * * * * * *</pre>	s th 2=Horton n 2=Rectan; .549 .328 T B .549 LANDS BY ( es s th	glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s
35 15 35	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Gradiem 10.000 Per cen 80.416 Length .000 ¥Imp. ¥ 1 Option .250 Manning 74.000 SCS Cun .100 Ia/S CC 8.924 Initial 1 Option .024 .267 COMMENT 3 line(s) of d ************************************	<pre>h hectares (PERV) metr tt (%) tt Imperviou (IMPERV) with Zero Dp =SCS CN/C; y "n" cve No or C efficient l Abstractio 1=Trianglr; 4.508 .886 .0mment * 4.532 .0mment * 4.532 .0mment * * * * * * * * * * * * * * * * * * *</pre>	s th 2=Horton n 2=Rectan; .549 .328 T B .549 LANDS BY ( es s th	<pre>glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV</pre>
35 15 35	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Gradies 10.000 Per cen 80.416 Length .000 ¥Imp. v 1 Option .250 Manning 74.000 SCS Cu .100 Ia/S CC 8.924 Initial 1 Option .227 COMMENT 3 line(s) of 0 .227 COMMENT 3 line(s) of 0 .227 COMMENT 3 line(s) of 0 .224 .024 .024 COMMENT 3 line(s) of 0 .024 .024 COMMENT 3 line(s) of 0 .227 COMMENT 3 line(s) of 0 .227 COMMENT 3 line(s) of 0 .224 COMMENT 3 line(s) of 0 .225 Manning 74.000 Length .000 ¥Imp. v 1 Option .250 Manning 74.000 SCS Cu	<pre>h hectares (PERV) metr t (%) the Imperviou (IMPERV) with Zero Dp 1=SCS CN/C; y "n" cve No or C efficient 1=Trianglr; 4.508 .886 .00mment * 4.532 comment * 4.532 comment * * 5 99999 h hectares (%) metr t (%) metr t (%) vith Zero Dp 1=SCS CN/C; y "n" vve No or C vefficient</pre>	s th 2=Horton 2=Rectang .549 .328 T B .549 LANDS BY ( es s th 2=Horton	<pre>glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV</pre>
35 15 35	200.000 ID No.6 .970 Area in 80.416 Length 1.000 Gradiem 10.000 Per cen 80.416 Length .000 ¥Imp.v; 1 Option .250 Manning 74.000 SCS Cun .100 IA/S CC 8.924 Initial 1 Option .224 .257 COMMENT 3 line(s) of 0 ************************************	<pre>h hectares (PERV) metr t (%) t Imperviou (IMPERV) with Zero Dp l=SCS CN/C; y "n" vre No or C efficient t Abstractio l=Trianglr; 4.508 .886 .00mment * A20 - OUTLE * A20 - OUTLE * A20 - OUTLE * * 4.532 .00mment * * 599999 h hectares (PERV) metr t (%) h hectares (PERV) metr t (%) h hectares (PERV) metr (%) 1=SCS CN/C; y "n" vre No or C efficient t Abstractio Abstractio Abstractio Compension t Abstractio t Abstractio</pre>	s th 2=Horton n 2=Rectan; .549 .328 T B .549 LANDS BY ( es s th 2=Horton n	<pre>glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV ; 3=Green-Ampt; 4=Repeat</pre>
35 15 35	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Gradiee 10.000 Per cen 80.416 Length .000 %Imp.v; 1 Option .250 Manning 74.000 SCS Cun .100 Ia/S CC 8.924 Initial 1 Option .226 COMMENT 3 line(s) of 0 .227 COMMENT 3 line(s) of 0 .024 .267 COMMENT 3 line(s) of 0 .024 .267 COMMENT 3 line(s) of 0 .024 .024 COMMENT 3 line(s) of 0 .024 COMMENT 3 line(s) of 0 .024 COMMENT 2 .000 Per cen 487.000 Length .000 %Imp.v .000 .100 Ja/S CC 8.924 lintial 1 Option	<pre>h hectares (PERV) metr t (%) t Imperviou (IMPERV) with Zero Dp l=SCS CN/C; y "n" vre No or C efficient t Abstractio l=Trianglr; 4.508 .886 .00mment * A20 - OUTLE * A20 - OUTLE * A20 - OUTLE * * 4.532 .00mment * * 599999 h hectares (PERV) metr t (%) h hectares (PERV) metr t (%) h hectares (PERV) metr (%) 1=SCS CN/C; y "n" vre No or C efficient t Abstractio Abstractio Abstractio Compension t Abstractio t Abstractio</pre>	s th 2=Horton 2=Rectan .549 .328 T B .549 LANDS BY ( es s th 2=Horton n 2=Rectan	<pre>glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV</pre>
35 15 35 4	200.000 ID No.d .970 Area in 80.416 Length 1.000 Gradiee 10.000 Per cen 80.416 Length .000 WIMp.v; 1 Option .250 Manning 74.000 SCS Cun .100 Ia/S CC 8.924 Initial 1 Option .227 COMMENT 3 line(s) of AREA .024 .024 .024 .267 COMMENT 3 line(s) of AREA .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .024 .026 .026 .027 .024 .026 .026 .026 .026 .026 .026 .026 .026 .026 .026 .026 .000 Per cen 487.000 Length .000 %Imp.v 1 Option .250 Manning 74.000 SCS Cun .100 Ia/S CC 8.924 Initial 1 Option .269 .267	<pre>h hectares (PERV) metr tt (%) tt Imperviou (IMPERV) with Zero Dp =SCS CN/C; y "n" cve No or C efficient l Abstractio 1=Trianglr; 4.508 .0mment * 4.502 .0mment * 4.532 .0mment * * * * * * * * * * * * * * * * * * *</pre>	s th 2=Horton 2=Rectan; .549 .549 th LANDS BY ( es s th 2=Horton n 2=Rectan; .549	<pre>glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv</pre>
35 15 35	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Gradies 10.000 Per cen 80.416 Length .000 ¥Imp. v 1 Option .250 Manning 74.000 SCS Cu .100 Ia/S CC 8.924 Initial 1 Option .227 COMMENT 3 line(s) of 0 .227 COMMENT 3 line(s) of 0 .226 COMMENT 3 line(s) of 0 .226 COMMENT 1 Option .220 Gradies .200 Gradies .200 Gradies .000 ¥Imp. v 1 Option .250 Manning 74.000 SCS Cu .100 Ia/S CC 8.924 Initial 1 Option .267 ADD RUNOFF	<pre>h hectares (PERV) metr t (%) the Imperviou (IMPERV) with Zero Dp 1=SCS CN/C; y "n" cve No or C efficient 1 Abstractio 1=Trianglr; 4.508 .00mment * 4.532 comment * 4.532 comment * * 4.532 comment * * * * * * * * * * * * * * * * * * *</pre>	s th 2=Horton 2=Rectang .549 .328 T B .549 LANDS BY ( es s th 2=Horton n 2=Rectang .549 .298	<pre>glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total</pre>
35 15 35 4	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Gradies 10.000 Per cent 80.416 Length .000 ¥Imp. v 1 Option .250 Manning 74.000 SCS Cun .100 Ia/S CC 8.924 Initial 1 Option .227 COMMENT 3 line(s) of A .024 .267 COMMENT 3 line(s) of AREA ************************************	<pre>h hectares (PERV) metr tt (%) tt Imperviou (IMPERV) with Zero Dp l=SCS CN/C; y "n" vre No or C efficient t Abstractio l=TriangIr; 4.538 comment * * 4.532 comment * * * * * * * * * * * * * * * * * * *</pre>	s th 2=Horton 2=Rectan; .549 .549 th LANDS BY ( es s th 2=Horton n 2=Rectan; .549	<pre>glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s</pre>
35 35 35 4	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Gradiem 10.000 Per cen 80.416 Length .000 Yimp, 1 .1 Option .250 Manning 74.000 SCS Cun .100 Ia/S CC .267 COMMENT 3 line(s) of 0 .024 .024 .267 COMMENT 3 line(s) of 0 .024 COMMENT 3 line(s) of 0 .024 .024 COMMENT 3 line(s) of 0 .024 COMMENT 3 line(s) of 0 .024 COMMENT 3 line(s) of 0 .024 COMMENT 3 line(s) of 0 .024 .004 .004 .004 .004 .005 .004 .004 .004 .004 .004 .005 .004 .000 .006 .000 .000 .000 .250 Manning 74.000 SCS Cun .1 Option .269 ROUTE .000 Conduit	<pre>h hectares (PERV) metr tt (%) tt Imperviou (IMPERV) with Zero Dp l=SCS CN/C; y "n" vre No or C efficient t Abstractio l=Trianglr; 4.508 .886 .00mment * 4.532 .00mment * 4.532 .00mment * ******* 5 99999 h hectares (PERV) metr tt (%) l=SCS CN/C; y "n" vre No or C (IMPERV) with Zero Dp l=SCS CN/C; y "n" vre No or C l=SCS CN/C; s "n" t (%) 1=Trianglr; 4.532 .897 4.762 z Length</pre>	s th 2=Horton 2=Rectan .549 .328 T B .549 LANDS BY ( es s th 2=Horton n 2=Rectan .549 .298 .549	<pre>glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total</pre>
35 35 35 4	200.000 ID No.d .970 Area in 80.416 Length 1.000 Gradiem 10.000 Per cen 80.416 Length .000 WIMP.v 1 Option .250 Manning 74.000 SCS Cun .100 Ia/S CC 8.924 Initial 1 Option .227 COMMENT 3 line(s) of d .226 COMMENT 3 line(s) of AREA 	<pre>h hectares (PERV) metr (PERV) metr t (%) t Imperviou (IMPERV) vith Zero Dp l=SCS CN/C; y "n" "ve No or C befficient A.532 comment * A.532 comment * A.532 comment * * * * * * * * * * * * * * * * * * *</pre>	s th 2=Horton 2=Rectan .549 .328 T B .549 LANDS BY ( es s th 2=Horton n 2=Rectan .549 .298 .549	<pre>glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total</pre>
35 35 35 4	200.000 ID No.4 .970 Area in 80.416 Length 1.000 Gradies 10.000 Per cen 80.416 Length .000 ¥Imp. v 1 Option .250 Manning 74.000 SCS Cu .100 Ia/S CC 8.924 Initial 1 Option .227 COMMENT 3 line(s) of A .227 COMMENT 3 line(s) of A .226 .227 COMMENT 3 line(s) of A .226 .226 .226 .220 Manning 74.000 Length .000 ¥Imp. v 1 Option .250 Manning 74.000 SCS Cu .100 Ia/S CC 8.924 Initial 1 Option .267 ADD RUNOFF .267 ADD RUNOFF .267 ADD RUNOFF .267 ADD RUNOFF .267 ADD RUNOFF .267 ADD RUNOFF .267	<pre>h hectares (PERV) metr t (%) the Imperviou (IMPERV) with Zero Dp 1=SCS CN/C; y "n" cve No or C efficient 1 Abstractio 1=Trianglr; 4.508 .886 .00mment * 4.532 .00mment * 4.532 .00mment * * 4.532 .00mment * * * * * * * * * * * * * * * * * * *</pre>	s th 2=Horton .549 .328 T B .549 LANDS BY ( es s th 2=Horton .549 .298 .549	<pre>glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total</pre>
35 35 35 4	200.000 ID No.d .970 Area in 80.416 Length 1.000 Gradiem 10.000 Per cen 80.416 Length .000 ¥Imp.v; 1 Option .250 Manning 74.000 SCS Cun .100 Ia/S CC 8.924 Initial 1 Option .227 COMMENT 3 line(s) of c ************************************	<pre>h hectares (PERV) metr tt (%) tt Imperviou (IMPERV) with Zero Dp l=SCS CN/C; y "n" cve No or C efficient l Abstractio l=Trianglr; 4.508 .0mment * 4.532 comment * 4.532 comment * * * * * * * * * * * * * * * * * * *</pre>	s th 2=Horton 2=Rectany .549 .328 T B .549 LANDS BY ( es s th 2=Horton n 2=Rectany .549 .298 .549 tor	<pre>glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total</pre>
35 35 35 4	200.000 ID No.d .970 Area in 80.416 Length 1.000 Gradiem 10.000 Per cen 80.416 Length .000 Wimp.v 1 Option .250 Manning 74.000 SCS Cun .100 IA/S CC 8.924 Initial 1 Option .267 COMMENT 3 line(s) of d 	<pre>h hectares (PERV) metr tt (%) tt Imperviou (IMPERV) with Zero Dp l=SCS CN/C; g "n" cve No or C efficient t Abstractio l=TriangIr; 4.508 .886 .00mment A20 - OUTLE 4.532 .00mment A20 - OUTLE 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00mment 4.532 00 00</pre>	s th 2=Horton 2=Rectan .549 .328 T B .549 LANDS BY ( es s th 2=Horton n 2=Rectan .549 .298 .549 tor	<pre>glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s OTHERS WEST OF FIRST AV ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total</pre>

25	2010/7117				
35	COMMENT 3 line(s	) of comment			
		**************************************			
	*******	*****			
17	COMBINE 1 Juncti	on Node No.			
	.269	4.762	4.762	4.762 c.m/s	
14	START 1 1=Zero	; 2=Define			
35	COMMENT 3 line(s	) of commont			
	********	) of comment			
	PROP DEVELO	PMENT SOUTH O	F QUAKER, E	AST OF RICE - POND P50	)
4	CATCHMENT				
	6.430 A	D No.ó 999999 rea in hectar			
	207.000 L 1.000 G	ength (PERV) radient (%)	metres		
	70 000 8	or cont Impor	vious		
	207.000 L .000 %	ength (IMPERV Imp. with Zer	o Dpth		
		ption 1=SCS C anning "n"	N/C; 2=Horto	on; 3=Green-Ampt; 4=Re	epeat
	74.000 S	CS Curve No o			
		a/S Coefficie nitial Abstra			
	1 O .858		glr; 2=Recta 4.762	anglr; 3=SWM HYD; 4=Li 4.762 c.m/s	n. Reserv
	.267		.701	C perv/imperv/total	
15	ADD RUNOFF .858	.858	4.762	4.762 c.m/s	
9	ROUTE .000 C	onduit Length			
	.000 N	o Conduit def			
		ero lag eta weighting	factor		
	.000 R	outing timest	ep		
	.858	o. of sub-rea .858	.858	4.762 c.m/s	
17	COMBINE 2 Juncti	on Node No.			
	.858		.858	.858 c.m/s	
14	START 1 1=Zero	; 2=Define			
4	CATCHMENT 53.000 I	D No.ó 99999			
	11.340 A	rea in hectar			
	1.000 G	ength (PERV) radient (%)			
		er cent Imper ength (IMPERV			
	.000 %	Imp. with Zer	o Dpth		
	.250 M	anning "n"		on; 3=Green-Ampt; 4=Re	epear
		CS Curve No o a/S Coefficie			
	8.924 I	nitial Abstra	ction	anglr; 3=SWM HYD; 4=Li	n Bogory
	1.523	.000	.858	.858 c.m/s	
15	.267 ADD RUNOFF	.897	.708	C perv/imperv/total	
9	1.523 ROUTE	1.523	.858	.858 c.m/s	
		onduit Length o Conduit def			
	.000 Z	ero lag			
	.000 R	eta weighting outing timest	ep		
	0 N 1.523	o. of sub-rea	ches	.858 c.m/s	
17	COMBINE		11010	1000 01m, D	
	1.523	on Node No. 1.523	1.523	2.381 c.m/s	
18	CONFLUENCE 2 Juncti	on Node No.			
4		2.381	1.523	.000 c.m/s	
•	54.000 I	D No.ó 99999			
		rea in hectar ength (PERV)			
		radient (%) er cent Imper	riour		
	92.000 L	ength (IMPERV	)		
		Imp. with Zer ption 1=SCS C		on; 3=Green-Ampt; 4=Re	epeat
	.250 M	anning "n" CS Curve No o			
	.100 I	a/S Coefficie	nt		
	1 0		glr; 2=Recta	anglr; 3=SWM HYD; 4=Li	n. Reserv
	.149	2.381	1.523	.000 c.m/s C perv/imperv/total	
15	ADD RUNOFF .149	2.514	1.523	.000 c.m/s	
27	HYDROGRAPH	DISPLAY			
	Volume =	f Hyeto/Hydro .6870401E+04		1	
10	POND 6 Depth - Di	scharge - Vol	ume sets		
	182.000 182.800	.000 .0190	.0 5251.0		
	183.150	.0230	7895.0		
	183.500 183.800	.396	10751.0 13425.0		
	184.000 Peak Outflo		15337.0 021 c.m/s		
		th = 182.			
					Л

			6474.			
17	COMBINE		2.514	.021	.000 c.m/s	
	2 Ju	nction Nod .149	e No. 2.514	.021	.021 c.m/s	
14	START	Zero; 2=De	fino			
35	COMMENI					
		ne(s) of c				
		IG AREA ON	QUAKER RD,	EAST OF	RICE RD	
4	CATCHME	INT				
	5.000 1.870		99999 hectares			
	112.000 1.000	Length	(PERV) metr	es		
	50.000	Per cen	t Imperviou	ıs		
	112.000 .000		(IMPERV) ith Zero Dr	oth		
	1 .250	Option	1=SCS CN/C;		n; 3=Green-Ampt; 4=Repeat	
	74.000	SCS Cur	ve No or C			
	.100 8.924	Initial	efficient Abstractic			
	1	Option .175	<pre>1=Trianglr; .000</pre>	2=Recta .021	nglr; 3=SWM HYD; 4=Lin. Reser .021 c.m/s	v
		.267	.885	.576	C perv/imperv/total	
15			.175	.021	.021 c.m/s	
9	ROUTE	Conduit	Length			
	.000	No Cond	uit defined	1		
	.000		ighting fac	tor		
	.000		timestep sub-reaches	1		
17	COMBINE	.175	.175	.175	.021 c.m/s	
	2 Ju	nction Nod				
18	CONFLUE		.175	.175	.180 c.m/s	
		nction Nod .175		.175	.000 c.m/s	
35	COMMENT					
	******	********	******			
		IG AREA ON	QUAKER RD,	EAST OF	RICE RD	
4	CATCHME 6.000		99999			
	1.920	Area in	hectares			
	113.000 .200	Length Gradien	(PERV) metr t (%)	es		
	65.000 113.000	Per cen Length	t Imperviou (IMPERV)	15		
	.000	%Imp. w	ith Zero Dr		a 2 Guine Brack ( Dranch	
	1 .250	Option Manning		2=Horto	n; 3=Green-Ampt; 4=Repeat	
	74.000		ve No or C efficient			
	8.924 1		Abstractic		nglr; 3=SWM HYD; 4=Lin. Reser	
	-	.240	.180	.175	.000 c.m/s	•
15	ADD RUN		.896	.676	C perv/imperv/total	
35	COMMENT	.240	.418	.175	.000 c.m/s	
	3 li ******	ne(s) of c	omment			
	FIRST A		AKER RD TO	CITY OF	WELLAND MUNICIPAL BOUNDA	
4	CATCHME					
	201.000 2.430	ID No.ó Area in	99999 hectares			
	127.000 1.000	Length Gradien	(PERV) metr	es		
	65.000	Per cen	t Imperviou	IS		
	127.000 .000	Length %Imp. w	(IMPERV) ith Zero Dr	oth		
	1 .250	Option	I=SCS CN/C;	2=Horto	n; 3=Green-Ampt; 4=Repeat	
	74.000	SCS Cur	ve No or C			
	.100 8.924	Initial	efficient Abstractio			
	1	Option .287	<pre>1=Trianglr; .418</pre>	2=Recta: .175	nglr; 3=SWM HYD; 4=Lin. Reser .000 c.m/s	v
15	ADD RUN	.267	.882	.667	C perv/imperv/total	
		.287	.705	.175	.000 c.m/s	
9	ROUTE	Conduit				
	.000	No Cond Zero la	uit defined g	1		
	.000	Beta we	ighting fac timestep	tor		
	000	No. of	sub-reaches			
17	COMBINE		.705	.705	.000 c.m/s	
	COMBINE					
	1 Ju	nction Nod	e No. .705	.705	5.467 c.m/s	
35	1 Ju COMMENT	nction Nod .287	.705	.705	5.467 c.m/s	
35	1 Ju COMMENT 3 li *******	nction Nod .287 ne(s) of c	.705 omment ******			
35	1 Ju COMMENT 3 li ******* FLOW D/	nction Nod .287 ne(s) of c	.705 omment ****** AVE CULVER			
35 18	1 Ju COMMENT 3 li ******* FLOW D/ *******	nction Nod .287 ne(s) of c 's OF FIRST	.705 omment ******* AVE CULVEF ******			
	1 Ju COMMENT 3 li ******* FLOW D/ *******	nction Nod .287	.705 omment ******* AVE CULVEF ******			

COMMENT 35 3 line(s) of comment REALIGNED CHANNEL - SEGMENT 3 4 CATCHMENT 300.000 ID No.ó 99999 3.180 Area in hectares 146.000 .200 15.000 Length (PERV) metres Gradient (%) Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth 146.000 .000 Option 15CS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C 1 .250 74.000 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .100 8.924 1 .705 .000 c.m/s C perv/imperv/total . 099 5.467 .894 .267 15 ADD RUNOFF . 099 5.566 .705 .000 c.m/s CATCHMENT 4 TD No. 6 99999 301.000 .720 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious . 200 10.000 Length (IMPERV) 69.000 Sump. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" .000 1 SCS Curve No or C Ia/S Coefficient Initial Abstraction 74.000 .100 8.924 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 16 5.566 .705 .000 c.m/s 57 .876 .328 C perv/imperv/total .000 c.m/s C perv/imperv/total .016 .267 15 ADD RUNOFF .016 5.582 .705 .000 c.m/s 9 ROUTE Conduit Length .000 .000 No Conduit defined Zero lag Beta weighting factor . 000 .000 .000 Routing timestep No. of sub-reaches .016 5.582 0 5.582 .000 c.m/s COMBINE 17 Junction Node No. .016 5.582 1 5.582 5.582 c.m/s 14 START 1=Zero; 2=Define COMMENT 35 3 line(s) of comment
********** PROP DEVELOPMENT NORTH OF SEGMENT 3 - POND P30 CATCHMENT 4 30.000 ID No.ó 99999 Area in hectares Length (PERV) metres 8.470 238.000 .200 Gradient (%) Per cent Impervious .100 238.000 Length (IMPERV) .000 %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" SCS Curve No or C Ia/S Coefficient Initial Abstraction 74.000 .100 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 77 .000 5.582 5.582 c.m/s 1 .077 C perv/imperv/total .267 .267 .896 ADD RUNOFF 15 .077 5.582 5.582 c.m/s 4 CATCHMENT ID No.ó 99999 31.000 10.420 Area in hectares Length (PERV) metres Gradient (%) 264.000 1.000 75.000 Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth 264.000 .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1 . 250 Manning "n" SCS Curve No or C 74.000 .100 Ia/S Coefficient 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 1.498 .077 5.582 5.582 c.m/s .739 C perv/imperv/total ADD RUNOFF 15 1.498 5.582 c.m/s 1.509 5.582 1.498 1.509 5.582 HYDROGRAPH DISPLAY 5 is # of Hyeto/Hydrograph chosen Volume = .5129908E+04 c.m CATCHMENT 27 5 4 TD No. 6 99999 32.000 .690 Area in hectares Length (PERV) metres 1.000 Gradient (%) Per cent Impervious 68.000 Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 .250 Manning "n" 74.000 SCS Curve No or C

.100 Ia/S Coefficient 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 85 1.509 5.582 5.582 c.m/s 67 .884 .637 C perv/imperv/total 1 .085 15 ADD RUNOFF .085 1.5 HYDROGRAPH DISPLAY 1.576 5.582 5.582 c.m/s 27 Volume = .5356146E+04 c.m 5 10 POND 
 FOND

 5 Depth - Discharge - Volume sets

 178.800
 .000
 .0

 179.300
 .0260
 1520.0
 180.100 .0440 4649.0 7069.0 .414 180.600 -.204 8137.0 reak Outflow = .042 c.m/s Maximum Depth = 180.027 metres Maximum Storage = 4365. c.m .085 1.576 .... ____0.027 met: _____4365. c.m 1.576 5.582 c.m/s 17 1 Junction Node No. .085 START 1.576 .042 5.608 c.m/s 14 1=Zero; 2=Define COMMENT 35 line(s) of comment 3 PROP DEVELOPMENT SOUTH OF SEGMENT 3 - POND P31 ********* 4 CATCHMENT ID No.ó 99999 33.000 12,960 Area in hectares Length (PERV) metres 294.000 Gradient (%) Per cent Impervious Length (IMPERV) 1.000 75.000 294.000 .000 %Imp. with Zero Dpth 1 .250 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C 74.000 Ia/S Coefficient Initial Abstraction .100 8.924 1 15 ADD RUNOFF 1.919 1.919 .042 5.608 c.m/s HYDROGRAPH DISPLAY 27 _______is # of Hyeto/Hydrograph chosen Volume = .4931688E+04 c.m CATCHMENT 4 34.000 ID No.ó 99999 Area in hectares .660 Length (PERV) metres Gradient (%) Per cent Impervious 66.000 1.000 60.000 Length (IMPERV) %Imp. with Zero Dpth 66.000 .000 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C . 250 74.000 .100 Ia/S Coefficient 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .082 1.919 .042 .884 .637 5.608 c.m/s C perv/imperv/total .267 ADD RUNOFF 15 ADD RUNOFF .082 1.983 .042 HYDROGRAPH DISPLAY 5 is # of Hyeto/Hydrograph chosen Volume = .5148061E+04 c.m POND 5.608 c.m/s 27 10 POND 6 Depth - Discharge - Volume sets .000 178.300 .0 1927.0 178.900 179.600 .0540 4692.0 .150 179.800 5590.0 180.000 .321 6538.0 180.000 .321 6538.0 180.300 1.922 8059.0 Peak Outflow = .052 c.m/s Maximum Depth = 179.543 metres Maximum Storage = 4465. c.m .082 1.983 .052 COMBINE 5.608 c.m/s 17 Junction Node No. .082 1.983 1 .082 START .052 5.642 c.m/s 14 1=Zero; 2=Define CONFLUENCE 18 1 Junction Node No. .082 5.642 COMMENT .052 .000 c.m/s 35 line(s) of comment 3 REALIGNED CHANNEL - SEGMENT 3 CATCHMENT 4 302.000 TD No. 6 99999 Area in hectares Length (PERV) metres 1.610 104.000 .200 Gradient (%) Per cent Impervious Length (IMPERV) 104.000 %Imp. with Zero Dpth
Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 . 250 Manning "n" SCS Curve No or C 74.000

.100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .035 5.642 .052 .000 c.m/s .329 C perv/imperv/total .893 COMMENT line(s) of comment 3 FLOW U/S OF NIAGARA ST CULVERT - OUTLET D

15 ADD RUNOFF

35

- .035 START 5.677 .052 .000 c.m/s 14
- 1 1=Zero; 2=Define

35 COMMENT 25-YEAR STORM EVENT STORM 2 1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic 900.000 Coefficient a Constant b (min) Exponent c 5.200 .745 Fraction to peak r Duration ó 240 min 59.713 mm Total depth .450 240.000 3 IMPERVIOUS Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" 1 .015 SCS Curve No or C Ia/S Coefficient Initial Abstraction 98.000 .100 .518 35 COMMENT 3 line(s) of comment EXISTING RES. WEST OF SEGMENT 1 4 CATCHMENT 1.000 TD No. 6 99999 17.520 Area in hectares Length (PERV) metres Gradient (%) 343.000 1.000 Per cent Impervious 35.000 343.000 Length (IMPERV) Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 250 Manning "n" SCS Curve No or C Ia/S Coefficient 74.000 .100 8.924 Ditial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 1.445 .000 .000 .000 c.m/s .518 C perv/imperv/total .308 ADD RUNOFF 1.445 15 1.445 .000 .000 c.m/s 35 COMMENT line(s) of comment REALIGNED CHANNEL - SEGMENT 1 ************** CATCHMENT 4 100.000 ID No.ó 99999 Area in hectares Length (PERV) metres 2.020 116.000 .400 Gradient (%) 15.000 Per cent Impervious Length (IMPERV) 116.000 %Imp. with Zero Dpth .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" 1 .250 SCS Curve No or C 74.000 .100 Ia/S Coefficient 8.924 Initial Abstraction 
 Option
 1=Trianglr;
 2=Rectanglr;
 3=SWM HYD;
 4=Lin. Reserv

 77
 1.445
 .000
 .000 c.m/s

 08
 .891
 .396
 C perv/imperv/total
 .077 .308 COMMENT 35 3 line(s) of comment FLOW AT FUT ROADWAY CULVERT - SEGMENT 1 ADD RUNOFF 15 1,522 .000 .000 c.m/s ROUTE Conduit Length .000 .000 No Conduit defined .000 Zero lag Beta weighting factor .000 Routing timestep No. of sub-reaches .000 0 1.522 -077 1.522 .000 c.m/s COMBINE 17 Junction Node No. 1 .077 START 1.522 1.522 1.522 c.m/s 14 1=Zero; 2=Define 1 35 COMMENT line(s) of comment PROP DEVELOPMENT NORTH OF SEGMENT 1 - POND P10 CATCHMENT 4 10.000 4.050 ID No.ó 99999 Area in hectares 164.000 Length (PERV) metres Gradient (%) 1.000 70.000 Per cent Impervious 164.000 Length (IMPERV) %Imp. with Zero Dpth .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1 . 250 Manning "n" SCS Curve No or C 74.000 .100 Ta/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 8.924 1 .000 1.522 .889 .715 .612 1.522 c.m/s .715 C perv/imperv/total .308 15 ADD RUNOFF .612 1.522 CATCHMENT CATCHMENT CATCHMENT CANCELLE CATCHMENT CANCELLE CATCHMENT .612 1.522 c.m/s 11.000 1.000 Area in hectares

82.000 Length (PERV) metres 1.000 Gradient (%) Per cent Impervious 82.000 Length (IMPERV) %Imp. with Zero Dpth .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" 1 .250 74.000 SCS Curve No or C Ia/S Coefficient Initial Abstraction .100 8.924 
 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv

 33
 .612
 1.522
 c.m/s

 08
 .898
 .367
 C perv/imperv/total
 1 .033 .308 15 ADD RUNOFF .033 .644 1.522 1.522 c.m/s POND 10 
 6 Depth - Discharge - Volume sets

 184.800
 .000
 .0

 185.750
 .0210
 1.0
 .0230 186.000 503.0 186.250 1091.0 186.500 .0280 1765.0 -.244 2370.0 Peak Outflow = .027 c.m/s Maximum Depth = 186.413 metres Maximum Storage = 1531. c -.033 = 1531. c.m .644 .0 .033 COMBINE 1.522 c.m/s 17 Junction Node No. 1 .033 START .027 1.546 c.m/s .644 14 1=Zero; 2=Define L 1=Zero CONFLUENCE 18 1 Junction Node No. .033 1.546 .033 COMMENT .027 .000 c.m/s 35 3 line(s) of comment REALIGNED CHANNEL - SEGMENT 1 **** CATCHMENT 4 101.000 TD No. 6 99999 .610 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious 1.000 10.000 Length (IMPERV) 64.000 %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 .250 Manning "n" SCS Curve No or C Ia/S Coefficient 74.000 .100 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .023 1.546 .027 .000 c.m/s 308 899 367 C. peru/imperu/total 8.924 .027 .000 c.m/s .367 C perv/imperv/total .308 .899 ADD RUNOFF 15 .023 1.567 .027 .000 c.m/s 9 ROUTE Conduit Length .000 .000 No Conduit defined .000 Zero lag Beta weighting factor .000 .000 Routing timestep No. of sub-reaches 0 1.567 .023 1.567 .000 c.m/s 17 COMBINE Junction Node No. .023 1.567 1 1.567 1.567 c.m/s 14 START 1=Zero; 2=Define COMMENT 35 3 line(s) of comment PROP DEVELOPMENT SOUTH OF SEGMENT 1 - POND P11 4 CATCHMENT 12.000 TD No. 6 99999 2.680 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious 1.000 35.000 134.000 Length (IMPERV) .000 %Imp. with Zero Dpth
Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C Ia/S Coefficient .100 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 99 .000 1.567 1.567 c.m/s 18 .897 .514 C perv/imperv/total 8.924 .209 .308 ADD RUNOFF .209 15 1.567 .209 1.567 c.m/s CATCHMENT 4 ID No.ó 99999 13.000 6.980 Area in hectares 216.000 1.000 Length (PERV) metres Gradient (%) 70.000 Per cent Impervious Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 216.000 .000 .250 Manning "n" SCS Curve No or C 74.000 .100 Ia/S Coefficient Initial Abstraction 8.924 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 1 083 .209 1.567 1.567 c.m/s

	. 3	08	.897	.721	C perv/imperv/total
15	ADD RUNOF		.292	1.567	1.567 c.m/s
4	CATCHMENT			1.507	1.507 C.m/B
	14.000 .670	ID No.ó			
	67.000	Area in 1 Length (1	PERV) metre	es	
		Gradient			
		Length (	Impervious IMPERV)	5	
			th Zero Dpi		
	1 .250	Manning	=SCS CN/C; "n"	2=Horton	; 3=Green-Ampt; 4=Repeat
	74.000	SCS Curv	e No or C		
	.100 8.924	Ia/S Coe Initial	fficient Abstraction	n	
	1	Option 1	=Trianglr;	2=Rectan	glr; 3=SWM HYD; 4=Lin. Reserv
		99 1 08	.292 : .898	.662	1.567 c.m/s C perv/imperv/total
15	ADD RUNOF	F			
27	.U			1.567	1.567 c.m/s
	5 is#	of Hyeto	/Hydrograph	h chosen	
10	Volume = POND	.409143	0E+04 C.m		
	5 Depth - 1				
	184.800 185.300	.00		.0 2.0	
	186.100	.024			
	186.500 186.800	.28 1.92			
	Peak Outf		.048 0	c.m/s	
			186.136 i 3650. d		
	.0	99 1			1.567 c.m/s
35	COMMENT 3 line	(s) of com	mment		
	*******	*******			
	FLOW U/S (		D CULVERT ·	- OUTLET	Al
17	COMBINE				
		tion Node 99 1		.048	1.583 c.m/s
14	START				
35	1 1=Ze: COMMENT	ro; 2=Def	ine		
	3 line				
	********* PROP DEVE			AKER RD &	WEST OF RICE RD PON
	*******	******			
4	CATCHMENT 40.000	ID No.ó	99999		
	8.210	Area in 1	hectares		
	234.000 1.000	Length () Gradient	PERV) metre (%)	es	
	25.000	Per cent	Impervious	5	
	234.000	Length (	IMPERV) th Zero Dpi	⊦h	
	1	Option 1	=SCS CN/C;		; 3=Green-Ampt; 4=Repeat
	.250 74.000	Manning SCS Curv	"n" e No or C		
			fficient		
		Initial 2	Abstraction		ılr: 3=SWM HYD: 4=Lin. Reserv
	1	Initial Option 1 84	Abstraction =Trianglr; .000	2=Rectan .048	glr; 3=SWM HYD; 4=Lin. Reserv 1.583 c.m/s
15	1 .4 .3	Initial 2 Option 1 84 08	Abstraction =Trianglr;	2=Rectan	
15	1 .4 .3 ADD RUNOF .4	Initial 2 Option 1 84 08 F	Abstraction =Trianglr; .000	2=Rectan .048	1.583 c.m/s
15 9	1 .4 .3 ADD RUNOF .4 ROUTE	Initial A Option 1 84 08 F 84	Abstraction =Trianglr; .000 .902 .484	2=Rectang .048 .457	1.583 c.m/s C perv/imperv/total
	1 .4 ADD RUNOF: .4 ROUTE .000 .000	Initial . Option 1 84 08 F 84 Conduit : No Condu	Abstraction =Trianglr; .000 .902 .484 Length it defined	2=Rectang .048 .457	1.583 c.m/s C perv/imperv/total
	1 .4 ADD RUNOF .4 ROUTE .000 .000 .000	Initial . Option 1 84 08 F 84 Conduit : No Condu Zero lag	Abstraction =Trianglr; .000 .902 .484 Length it defined	2=Rectany .048 .457 .048	1.583 c.m/s C perv/imperv/total
	1 .4' .3 ADD RUNOFF .4' ROUTE .000 .000 .000 .000 .000	Initial . Option 1 84 08 F 84 Conduit : No Condu Zero lag Beta wei Routing	Abstraction =Trianglr; .000 .902 .484 Length it defined ghting fact timestep	2=Rectany .048 .457 .048	1.583 c.m/s C perv/imperv/total
	1 .4' .33 ADD RUNOF .4' ROUTE .000 .000 .000 .000 .000 .000 .000 .0	Initial . Option 1 84 08 F 84 Conduit : No Condu Zero lag Beta wei. Routing : No. of s	Abstraction =Trianglr; .000 .902 .484 Length it defined ghting fact	2=Rectany .048 .457 .048	1.583 c.m/s C perv/imperv/total
	1 .4' .3 ADD RUNOF .4' ROUTE .000 .000 .000 .000 .000 .000 .000 .4' COMBINE	Initial . Option 1 84 08 F 84 Conduit : No Condu Zero lag Beta wei Routing No. of s 84	Abstraction =Trianglr; .000 .902 .484 Length it defined ghting fact timestep ub-reaches .484	2=Rectang .048 .457 .048	1.583 c.m/s C perv/imperv/total 1.583 c.m/s
9	1 .4' .3 ADD RUNOF .4' ROUTE .000 .000 .000 .000 .000 .000 .000 .4' COMBINE	Initial . Option 1 84 08 F 84 Conduit : No Condu Zero lag Beta wei No. of s 84 tion Node	Abstraction =Trianglr; .000 .902 .484 Length it defined ghting fact timestep ub-reaches .484	2=Rectang .048 .457 .048	1.583 c.m/s C perv/imperv/total 1.583 c.m/s
9	1 .4: .3 ADD RUNOF .4: ROUTE .000 .000 .000 .000 .000 .000 .000 .4: COMBINE 2 JUNC .4: START	Initial . Option 1 84 08 F 84 Conduit : No Condu Zero lag Beta wei No. of s 84 tion Node 84	Abstraction =Trianglr; .000 .902 .484 Length it defined ghting fact timestep ub-reaches .484 No. .884	2=Rectang .048 .457 .048 tor .484	<pre>1.583 c.m/s C perv/imperv/total 1.583 c.m/s 1.583 c.m/s</pre>
9 17	1 .4: .3 ADD RUNOF: .4000 .000 .000 .000 .000 .000 .000 .0	Initial . Option 1 84 08 F 84 Conduit : No Condu Zero lag Beta wei Routing No. of s 84 tion Node 84 ro; 2=Def	Abstraction =Trianglr; .000 .902 .484 Length it defined ghting fact timestep ub-reaches .484 No. .484 ine	2=Rectang .048 .457 .048 tor .484	<pre>1.583 c.m/s C perv/imperv/total 1.583 c.m/s 1.583 c.m/s</pre>
9 17 14	1 .4 .3 ADD RUNOF ROUTE .000 .000 .000 .000 .000 .000 .000 .0	Initial. Option 1 84 08 F 84 Conduit: No Condu Zero lag Beta wei Routing No. of s 84 tion Node 84 tion Node 84 ID No.6	Abstraction =Trianglr; .000 .902 .484 Length it defined ghting fact timestep ub-reaches .484 No. .484 ine 99999	2=Rectang .048 .457 .048 tor .484	<pre>1.583 c.m/s C perv/imperv/total 1.583 c.m/s 1.583 c.m/s</pre>
9 17 14	1 .4: .3 ADD RUNOF: .4000 .000 .000 .000 .000 .000 .000 .0	Initial . Option 1 84 88 84 Conduit : No Condu Zero Lag Beta wei Routing No. of s 84 tion Node 84 to; 2=Def ID No.6 Area in i	Abstraction =Trianglr; .000 .902 .484 Length it defined ghting fact timestep ub-reaches .484 No. .484 ine 99999	2=Rectan; .048 .457 .048 tor .484	<pre>1.583 c.m/s C perv/imperv/total 1.583 c.m/s 1.583 c.m/s</pre>
9 17 14	1 .4 .3 ADD RUNOF ROUTE .000 .000 .000 .000 .000 .000 .000 .0	Initial . Option 1 84 08 F 84 Conduit : No Condu Zero lag Beta wei Routing : No. of s 84 tion Node 84 tion Node 84 tion Node 84 Conduit : No. of s 84 tion Node 84 Conduit : No. of s 84 Conduit : No. of s 84 Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Con	Abstraction =Trianglr; .000 .902 .484 Length it defined ghting fact timestep ub-reaches .484 No. .484 ine 99999 hectares PERV) metro (%)	2=Rectan; .048 .457 .048 tor .484 .484	<pre>1.583 c.m/s C perv/imperv/total 1.583 c.m/s 1.583 c.m/s</pre>
9 17 14	1 .4: .3 ADD RUNOF: .4 ROUTE .000 .000 .000 .000 .000 .000 .000 .0	Initial . Option 1 84 08 F 84 Conduit : No Condu Zero lag Beta wei Routing : No. of s 84 tion Node 84 tion Node 84 tion Node 84 Conduit : No. of s 84 tion Node 84 Conduit : No. of s 84 Conduit : No. of s 84 Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Condu Con	Abstraction =Trianglr; .000 .902 .484 Length it defined ghting fact timestep ub-reaches .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 Time S9999 hectares PERV) metro (%)	2=Rectan; .048 .457 .048 tor .484 .484	<pre>1.583 c.m/s C perv/imperv/total 1.583 c.m/s 1.583 c.m/s</pre>
9 17 14	1 .4: .3 ADD RUNOF: .4 ROUTE .000 .000 .000 .000 .000 .000 .000 .0	Initial . Option 1 84 88 84 Conduit : No Condu Zero Lag Beta wei Routing No. of s 84 tion Node 84 tion Node 8	Abstraction =Trianglr; .000 .902 .484 Length it defined ghting fact timestep ub-reaches .484 No. .484 ine 99999 hectares PERV) metre (%) Imperviour IMPERV)	2=Rectan; .048 .457 .048 tor .484 .484	1.583 c.m/s C perv/imperv/total 1.583 c.m/s 1.583 c.m/s .484 c.m/s
9 17 14	1 .4: .3 ADD RUNOF: .4: ROUTE .000 .000 .000 .000 .000 .000 .000 .0	Initial . Option 1 84 88 84 Conduit : No Condu Zero Lag Beta wei Routing No. of s 84 tion Node 84 tion Node 8	Abstraction =Trianglr; .000 .902 .484 Length it defined ghting fact timestep ub-reaches .484 No. .484 ine 99999 hectares PERV) metr( (%) Impervioun IMPERV) th Zero DpU th Zero DpU	2=Rectan; .048 .457 .048 tor .484 .484	<pre>1.583 c.m/s C perv/imperv/total 1.583 c.m/s 1.583 c.m/s</pre>
9 17 14	1 .4: .3 ADD RUNOF: .4 ROUTE .000 .000 .000 .000 .000 .000 .000 .0	Initial . Option 1 84 85 86 Conduit : No Condu Zero lag Beta wei: Routing No. of s 84 tion Node 84 tion Node 84 TD No.6 Area in 1 Length ( Gradient Per cent Length ( Gradient Per cent Length ( Manning SCS Curv	Abstraction =Trianglr; .000 .902 .484 Length it defined ghting fact timestep ub-reaches .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495 No. .495	2=Rectan; .048 .457 .048 tor .484 .484	1.583 c.m/s C perv/imperv/total 1.583 c.m/s 1.583 c.m/s .484 c.m/s
9 17 14	1 .4 .3 ADD RUNOF: .000 .000 .000 .000 .000 .000 .000 .0	Initial . Option 1 84 08 85 84 Conduit : No Condu Zero lag Beta wei Routing No. of s 84 tion Node 84 tion Node 85 tion Node 10 Node 10 Node 10 Node 10 Node 10 No	Abstraction =Trianglr; .000 .902 .484 Length it defined ghting fact timestep ub-reaches .484 No. .484 ine 99999 hectares PERV) metro (%) Imperviou thZero Dpl =SCS CN/C; "n" e No or C fficient Abstraction	2=Rectan; .048 .457 .048 tor .484 .484 .484 s th 2=Horton	<pre>1.583 c.m/s C perv/imperv/total 1.583 c.m/s 1.583 c.m/s .484 c.m/s ; 3=Green-Ampt; 4=Repeat</pre>
9 17 14	1 .4 .3 ADD RUNOF .000 .000 .000 .000 .000 .000 .000 .0	Initial . Option 1 84 85 86 Conduit : No Condu Zero lag Beta wei Routing : No. of s 84 tion Node 84 tion Node 84 tion Node 84 Cordiant : Gradient Per cent Length ( %Imp. wi Option 1 a/s Corv. In/s Corv.	Abstraction =Trianglr; .000 .902 .484 Length it defined ghting fact timestep ub-reaches .484 No. .484 No. .484 ine 99999 hectares PERV) metr( (%) IMPERV) th Zero Dp() =SCS CN/C; "n" e SCS CN/C; "n"	2=Rectan; .048 .457 .048 tor .484 .484 .484 .484 .2=Horton n 2=Rectan;	<pre>1.583 c.m/s C perv/imperv/total 1.583 c.m/s 1.583 c.m/s .484 c.m/s ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv</pre>
9 17 14 4	1 .4 .3 ADD RUNOF: .4 ROUTE .000 .000 .000 .000 .000 .000 .000 .0	Initial . Option 1 84 84 Conduit : No Condu Zero lag Beta wei Routing No. of s 84 tion Node 84 tion Node 84 tion Node 84 tion Node 84 Scale ID No.6 Area in 1 Length ( Gradient Per cent Length ( Gradient Per cent Length ( Option 1 Manning SCS Curv. Ia/S Coe Initial . Option 1 61	Abstraction =Trianglr; .000 .902 .484 Length it defined ghting fact timestep ub-reaches .484 No. .484 ine 99999 hectares PERV) metro (%) Imperviou thZero Dpl =SCS CN/C; "n" e No or C fficient Abstraction	2=Rectang .048 .457 .048 tor .484 .484 .484 s th 2=Horton n 2=Rectang .484	<pre>1.583 c.m/s C perv/imperv/total 1.583 c.m/s 1.583 c.m/s .484 c.m/s ; 3=Green-Ampt; 4=Repeat</pre>
9 17 14	1 .4 .3 ADD RUNOF .000 .000 .000 .000 .000 .000 .000 .0	Initial . Option 1 84 08 F 84 Conduit : No Condu Zero lag Beta wei Routing : No. of s 84 tion Node 84 tion Node 84 tion Node 84 tion Node 84 TD No.6 Area in : Length () Gradient Per cent Length () SCS Curv IA/S Core Initial . Option 1 61 08 F	Abstraction =Trianglr; .000 .902 .484 Length it defined ghting fact timestep ub-reaches .484 No. .484 No. .484 No. .484 ine 99999 hectares PERV) metr( (%) Impervioun Impervioun IMPERV) th Zero Dp( =SCS CN/C; "n" e No or C fficient Abstraction =Trianglr; .000 .898	2=Rectan; .048 .457 .048 tor .484 .484 .484 s th 2=Horton .484 .515	<pre>1.583 c.m/s C perv/imperv/total 1.583 c.m/s 1.583 c.m/s .484 c.m/s ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .484 c.m/s C perv/imperv/total</pre>
9 17 14 4	1 .4. .3 ADD RUNOF: .4 ROUTE .000 .000 .000 .000 .000 .000 .000 .0	Initial . Option 1 84 84 Conduit : No Condu Zero lag Beta wei. Routing : No. of s 84 tion Node 84 tion Node 84 tion Node 84 Co; 2=Def ID No.6 Area in : Length (: Gradient Per cent Length (: % lmp. wi Option 1 Manning SCS Curv. Ia/S Coe Initial . Option 1 61	Abstraction =Trianglr; .000 .902 .484 Length it defined ghting fact timestep ub-reaches .484 No. .484 ine 99999 hectares PERV) metre (%) Imperviou IMPERV) th Zero Dpl =SCS CN/C; "n" e No or C fficient Abstraction =Trianglr; .000 .898 .061	2=Rectang .048 .457 .048 tor .484 .484 .484 s th 2=Horton n 2=Rectang .484	<pre>1.583 c.m/s C perv/imperv/total 1.583 c.m/s 1.583 c.m/s .484 c.m/s ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .484 c.m/s</pre>
9 17 14 4	1 .4 .3 ADD RUNOF ROUTE .000 .000 .000 .000 .000 .000 .000 .0	Initial. Option 1 84 08 F 84 Conduit: No Condu Zero lag Beta wei Routing 7 No. of s 84 tion Node 84 tion Node 84 tion Node 84 tion Node 84 TD No.6 Area in 1 Length () Gradient Per cent Length () Gradient Per cent Length () SCS Curv Ia/S Coe Initial. Option 1 61 DS F 61 ID No.6	Abstraction =Trianglr; .000 .902 .484 Length it defined ghting fact timestep ub-reaches .484 No. .484 No. .484 ine 99999 hectares PERV) metro (%) Impervioun Impervioun Impervioun thZero Dpt =SCS CN/C; "n" e No or C fficient Abstraction =Trianglr; .000 .898 .061 99999	2=Rectan; .048 .457 .048 tor .484 .484 .484 s th 2=Horton .484 .515	<pre>1.583 c.m/s C perv/imperv/total 1.583 c.m/s 1.583 c.m/s .484 c.m/s ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .484 c.m/s C perv/imperv/total</pre>
9 17 14 4	1 .4 .3 ADD RUNOE .000 .000 .000 .000 .000 .000 .000 .0	Initial . Option 1 84 08 F 84 Conduit : No Condu Zero lag Beta wei Routing : No. of s 84 tion Node 84 tion Node 84 tion Node 84 tion Node 84 tion Node 84 TD No.6 Area in : Length () % Jup. wi Option 1 Manning SCS Curv Ia/S Coe Initial . Option 1 61 D No.6 Area in : Longth () STS Lurght () 10 No.6 Area in : Longth () STS Lurght () STS Lurght () STS Lurght () Langth () STS Lurght	Abstraction =Trianglr; .000 .902 .484 Length it defined ghting fact timestep ub-reaches .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .493 No. .493 No. .493 No. .493 No. .493 No. .493 No. .493 No. .493 No. .493 No. .493 No. .593 .594 .593 .595 .595 .595 .595 .595 .595 .595	2=Rectang .048 .457 .048 tor .484 .484 .484 es s th 2=Horton 2=Horton .484 .484 .484	<pre>1.583 c.m/s C perv/imperv/total 1.583 c.m/s 1.583 c.m/s .484 c.m/s ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .484 c.m/s C perv/imperv/total</pre>
9 17 14 4	1 .4 .3 ADD RUNOF: .000 .000 .000 .000 .000 .000 .000 .0	Initial . Option 1 84 08 57 84 Conduit : No Condu Zero lag Beta wei Routing : No. of s 84 tion Node 84 tion Node 85 tion Node 86 tion Node 87 tion N	Abstraction =Trianglr; .000 .902 .484 Length it defined ghting fact timestep ub-reaches .484 No. .484 ine 99999 hectares PERV) metro (%) Tmperviou th Zero Dpd =SCS CN/C; "n" e No or C est CN/C; "n" e No or C fficient Abstraction =Trianglr; .000 .898 .061 99999 hectares PERV) metro (%)	2=Rectang .048 .457 .048 .tor .484 .484 .484 .484 .2=Horton .2=Rectang .484 .515 .484	<pre>1.583 c.m/s C perv/imperv/total 1.583 c.m/s 1.583 c.m/s .484 c.m/s ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .484 c.m/s C perv/imperv/total</pre>
9 17 14 4	1 .4: .3 ADD RUNOF: ROUTE .000 .000 .000 .000 .000 .000 .000 .0	Initial. Option 1 84 08 F 84 Conduit: No Condu Zero lag Beta wei Routing 1 No. of s 84 tion Node 84 tion Node 84 tion Node 84 tion Node 84 TD No.6 Area in 1 Length () SCS Curv Length () SCS Curv IA/S Coe Initial. Option 1 61 DS F 61 ID No.6 Area in 1 Length () Cadient Fr cent Length () Cadient Fr cent Cadient Fr cent Fr cent	Abstraction =Trianglr; .000 .902 .484 Length it defined ghting fact timestep ub-reaches .484 No. .484 No. .484 No. .484 ine 99999 hectares PERV) metro (%) Impervioun IMPERV) th Zero Dp1 =SCS CN/C; "n" e No or C fficient Abstraction =Trianglr; .000 .898 .061 99999 hectares PERV) metro (%) Impervioun Impervioun Impervioun	2=Rectang .048 .457 .048 tor .484 .484 .484 .484 .2=Rorton .484 .515 .484 .484	<pre>1.583 c.m/s C perv/imperv/total 1.583 c.m/s 1.583 c.m/s .484 c.m/s ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .484 c.m/s C perv/imperv/total</pre>
9 17 14 4	1 .4 .3 ADD RUNOF: .4 ROUTE .000 .000 .000 .000 .000 .000 .000 .0	Initial . Option 1 84 84 Conduit : No Condu Zero lag Beta wei. Routing No. of s 84 tion Node 84 tion Node 84 tion Node 84 tion Node 84 Corect 2 Secolar 1 Length ( %Imp. wi Option 1 Length ( %Imp. initial . Option 1 Start 1 Manning SCS Curv. Initial . Option 1 Start 1 St	Abstraction =Trianglr; .000 .902 .484 Length it defined ghting fact timestep ub-reaches .484 No. .484 No. .484 No. .484 ine 99999 hectares PERV) metro (%) Impervioun IMPERV) th Zero Dpf scs CN/C; "n" e No or C fficient Abstraction =Trianglr; .000 .061 99999 hectares PERV) metro (%) Impervioun IMPERV) metro	2=Rectang .048 .457 .048 tor .484 .484 .484 as s th 2=Rectang .484 .515 .484 es s th	<pre>1.583 c.m/s C perv/imperv/total 1.583 c.m/s 1.583 c.m/s .484 c.m/s ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .484 c.m/s C perv/imperv/total .484 c.m/s</pre>
9 17 14 4	1 .4 .3 ADD RUNOF: .4 ROUTE .000 .000 .000 .000 .000 .000 .000 .0	Initial . Option 1 84 84 Conduit : No Condu Zero lag Beta wei. Routing No. of s 84 tion Node 84 tion Node 84 tion Node 84 tion Node 84 Corect 2 Secolar 1 Length ( %Imp. wi Option 1 Length ( %Imp. initial . Option 1 Start 1 Manning SCS Curv. Initial . Option 1 Start 1 St	Abstraction =Trianglr; .000 .902 .484 Length it defined ghting fact timestep ub-reaches .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .484 No. .499 No. .499 No. .499 No. .499 No. .499 No. .499 No. .499 No. .499 No. .499 No. .499 .50 .407 .50 .507 .507 .507 .507 .507 .507 .50	2=Rectang .048 .457 .048 tor .484 .484 .484 as s th 2=Rectang .484 .515 .484 es s th	<pre>1.583 c.m/s C perv/imperv/total 1.583 c.m/s 1.583 c.m/s .484 c.m/s ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .484 c.m/s C perv/imperv/total</pre>

		rve No or C		
		cefficient	n	
	1 Option 1.980	<pre>.061</pre>		glr; 3=SWM HYD; 4=Lin. Reserv
	.308	.910		.484 c.m/s C perv/imperv/total
15	ADD RUNOFF 1.980	2.030	.484	.484 c.m/s
9	ROUTE		.101	
		t Length duit defined		
	.000 Zero 1	ag		
		eighting fac g timestep	tor	
	0 No. of	sub-reaches		
17	1.980 COMBINE	2.030	2.030	.484 c.m/s
	2 Junction No			
14	1.980 START	2.030	2.030	2.514 c.m/s
	1 1=Zero; 2=D	efine		
4	CATCHMENT 43.000 ID No.	ó 99999		
	.330 Area i	n hectares		
	47.000 Length 1.000 Gradie	(PERV) metr	es	
	35.000 Per ce	nt Imperviou	s	
	47.000 Length	(IMPERV) with Zero Dp	-h	
				; 3=Green-Ampt; 4=Repeat
	.250 Mannin			
		rve No or C cefficient		
		1 Abstractio		
	1 Option .031	.000	2=Rectang 2.030	glr; 3=SWM HYD; 4=Lin. Reserv 2.514 c.m/s
	.308	.898		C perv/imperv/total
15	ADD RUNOFF .031	.031	2.030	2.514 c.m/s
4	CATCHMENT	<		
	44.000 ID No. 6.400 Area i	o 99999 n hectares		
	207.000 Length	(PERV) metr	es	
	1.000 Gradie 70.000 Per ce	nt (%) nt Imperviou	s	
	207.000 Length	(IMPERV)		
		with Zero Dp 1=SCS CN/C;		; 3=Green-Ampt; 4=Repeat
	.250 Mannin	ıg "n"		
		rve No or C cefficient		
	8.924 Initia	l Abstractio		
	1 Option .990		2=Rectang 2.030	glr; 3=SWM HYD; 4=Lin. Reserv 2.514 c.m/s
	.308	.896	.719	C perv/imperv/total
15	ADD RUNOFF .990	1.014	2.030	2.514 c.m/s
9	ROUTE	t Iongth		
		t Length duit defined		
	.000 Zero 1			
		eighting fac g timestep	LOL	
		sub-reaches		
17	.990 COMBINE	1.014	1.014	2.514 c.m/s
	2 Junction No .990		1 014	
14	.990 START	1.014	1.014	3.528 c.m/s
10	<pre>1 1=Zero; 2=D CONFLUENCE</pre>	efine		
18	2 Junction No			
4	.990 CATCHMENT	3.528	1.014	.000 c.m/s
4	45.000 ID No.	ó 99999		
		n hectares (PERV) metr		
	1.000 Gradie	nt (%)		
	60.000 Per ce	nt Imperviou (IMPERV)	s	
	.000 %Imp.	with Zero Dp		
	1 Option .250 Mannin		2=Horton	; 3=Green-Ampt; 4=Repeat
	74.000 SCS Cu	rve No or C		
		oefficient 1 Abstractio	n	
	1 Option	1=Trianglr;	2=Rectang	glr; 3=SWM HYD; 4=Lin. Reserv
	.147 .308	3.528 .899		.000 c.m/s C perv/imperv/total
15	ADD RUNOFF			
27	.147 HYDROGRAPH DISPL		1.014	.000 c.m/s
	5 is # of Hye	to/Hydrograp	h chosen	
10	Volume = .1120 POND	983E+05 c.m		
	6 Depth - Dischar			
	186.000 . 186.800 .0	000 550 404	.0	
	187.300 .0	730 709	1.0	
		170 842 257 1055		
	188.000 .	880 1209	4.0	
	Peak Outflow Maximum Depth			
	Maximum Storage	= 9121.	c.m	
17	.147 COMBINE	3.648	.198	.000 c.m/s
	2 Junction No			
	.147	3.648	.198	.198 c.m/s
				D -

14 START 1=Zero; 2=Define 1 COMMENT 35 EXISTING AREA ON QUAKER RD, WEST OF RICE RD CATCHMENT 4 TD No. 6 99999 2.000 9.020 Area in hectares 245.000 Length (PERV) metres 1.000 Gradient (%) Per cent Impervious 245.000 Length (IMPERV) Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 .250 Manning "n" SCS Curve No or C 74.000 Ia/S Coefficient .100 Initial Abstraction 8.924 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .198 c.m/s C perv/imperv/total .824 .000 .904 .198 .547 308 15 ADD RUNOFF .824 .824 .198 .198 c.m/s 9 Conduit Length .000 . 000 No Conduit defined Zero lag Beta weighting factor .000 .000 Routing timestep No. of sub-reaches .000 0 .824 .824 .198 c.m/s .824 17 COMBINE Junction Node No. 2 .824 .824 .877 c.m/s .824 START 14 1=Zero; 2=Define 18 CONFLUENCE Junction Node No. .877 .824 .000 c.m/s .824 COMMENT 35 3 line(s) of comment EXISTING AREA ON QUAKER RD, WEST OF RICE RD CATCHMENT 4 3.000 5.680 TD No. 6 99999 Area in hectares 195.000 Length (PERV) metres Gradient (%) Per cent Impervious 1.000 40.000 195.000 Length (IMPERV) Length (IMPERV)
%Imp. with Zero Dpth
Option 1=SCS CM/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 Manning "n" SCS Curve No or C 250 74.000 Ia/S Coefficient .100 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .877 .515 .824 .543 .000 c.m/s C perv/imperv/total .308 .894 ADD RUNOFF 15 .515 1.392 .824 .000 c.m/s ROUTE 9 Conduit Length .000 .000 No Conduit defined Zero lag Beta weighting factor .000 .000 .000 Routing timestep No. of sub-reaches 0 .515 1.392 .000 c.m/s 1.392 17 COMBINE Junction Node No. 2 .515 1.392 1.392 1.392 c.m/s 14 START 1=Zero; 2=Define 35 COMMENT PROP DEVELOPMENT SOUTH OF QUAKER RD, EAST OF RICE RD CATCHMENT 4 50.000 ID No.ó 99999 Area in hectares Length (PERV) metres 3.420 151.000 1.000 Gradient (%) Per cent Impervious 151.000 Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 . 250 Manning "n" SCS Curve No or C 74.000 .100 Ia/S Coefficient 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .097 .000 1.392 1.392 c.m/s .892 .367 C perv/imperv/total .308 ADD RUNOFF 15 .097 1.392 1.392 c.m/s .097 CATCHMENT 4 ID No.ó 99999 51.000 1.980 115.000 Area in hectares Length (PERV) metres Gradient (%) 1.000 10.000 Per cent Impervious 115.000 Length (IMPERV) %Imp. with Zero Dpth .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1

.250 Manning "n" 74.000 SCS Curve No or C .100 Ta/S Coefficient Ditial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 8.924 1 .097 1.392 1.392 c.m/s C perv/imperv/total .059 .899 .308 15 ADD RUNOFF .059 .156 1.392 1.392 c.m/s 9 ROUTE .000 Conduit Length No Conduit defined Zero lag Beta weighting factor 000 .000 .000 .000 Routing timestep No. of sub-reaches 0 .059 .156 .156 1.392 c.m/s COMBINE 17 Junction Node No. 2 .059 .156 .156 1.548 c.m/s START 14 1=Zero; 2=Define 1 35 COMMENT 3 line(s) of comment EXISTING AREA WEST OF RICE RD AND SOUTH OF QUAKER ROAD 4 CATCHMENT ID No.6 99999 4.000 13.940 Area in hectares Length (PERV) metres Gradient (%) 305.000 1.000 Per cent Impervious 305.000 Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Ditial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .000 .156 1.548 c.m/s C perv/imperv/total 1.270 .308 ADD RUNOFF .549 15 1.270 1.270 .156 1.548 c.m/s 9 ROUTE Conduit Length .000 No Conduit defined Zero lag . 000 .000 Beta weighting factor .000 Routing timestep No. of sub-reaches .000 0 1.270 1,270 1,270 1.548 c.m/s COMBINE 17 Junction Node No. 2 1.270 1.270 1,270 2.818 c.m/s START 14 1=Zero; 2=Define 1 CONFLUENCE 18 Junction Node No. 2 1.270 2.818 1.270 .000 c.m/s 35 COMMENT 3 line(s) of comment RICE ROAD FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUNDA 4 CATCHMENT 501.000 ID No.ó 99999 1.570 Area in hectares Length (PERV) metres Gradient (%) 102.000 1.000 Per cent Impervious 102.000 Length (IMPERV) %Imp. with Zero Dpth .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1 .250 Manning "n" SCS Curve No or C 74.000 .100 Ta/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 8.924 1 1.270 .000 c.m/s C perv/imperv/total . 250 2.818 .308 .901 ADD RUNOFF 15 .250 3.038 1.270 .000 c.m/s ROUTE Conduit Length .000 .000 No Conduit defined Zero lag .000 Beta weighting factor Routing timestep No. of sub-reaches .000 0 3.038 .250 3.038 .000 c.m/s 35 COMMENT FLOW D/S OF RICE RD CULVERT - OUTLET A2 17 COMBINE Junction Node No. 1 .250 3.038 4.621 c.m/s 3.038 14 START 1=Zero; 2=Define 1 COMMENT 35 line(s) of comment PROP DEVELOPMENT SOUTH OF QUAKER RD - QUALLITY CONTROL ONLY 4 CATCHMENT

20.100 ID No.6 99999

	TOO Deven in	h	
		hectares (PERV) metres	
	1.000 Gradient		
		t Impervious	
	72.000 Length ( .000 %Imp. wi	(IMPERV) ith Zero Dpth	
		1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat	
	.250 Manning	"n"	
		ve No or C	
		efficient Abstraction	
		Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv	,
		.000 3.038 4.621 c.m/s	
	.308	.897 .514 C perv/imperv/total	
15	ADD RUNOFF .068	.068 3.038 4.621 c.m/s	
4	CATCHMENT	.000 5.050 4.021 C.m/B	
	20.000 ID No.ó	99999	
	3.210 Area in		
	146.000 Length ( 1.000 Gradient	(PERV) metres	
		t Impervious	
	146.000 Length (		
		ith Zero Dpth	
	1 Option 1 .250 Manning	1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat	
		ve No or C	
		efficient	
		Abstraction	
		1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .068 3.038 4.621 c.m/s	r
	.308	.068 3.038 4.621 c.m/s .893 .806 C perv/imperv/total	
15	ADD RUNOFF		
-	.575	.639 3.038 4.621 c.m/s	
9	ROUTE .000 Conduit	Length	
		Length uit defined	
	.000 Zero lag		
		ighting factor	
		timestep sub-reaches	
	.575	.639 .639 4.621 c.m/s	
17	COMBINE		
	1 Junction Node		
14	.575 START	.639 .639 5.253 c.m/s	
11	1 1=Zero; 2=Def	fine	
18	CONFLUENCE		
	1 Junction Node		
35	.575 5 COMMENT	5.253 .639 .000 c.m/s	
35	3 line(s) of co	omment	
	****		
	REALIGNED CHANNEL	- SEGMENT 2	
4	**************************************		
-	200.000 ID No.ó	99999	
	.970 Area in	hectares	
	80.416 Length (	(PERV) metres	
	80.416 Length ( 1.000 Gradient	(PERV) metres t (%)	
	80.416 Length ( 1.000 Gradient	(PERV) metres t (%) t Impervious	
	80.416         Length (           1.000         Gradient           10.000         Per cent           80.416         Length (           .000         %Imp. wi	(PERV) metres t (%) t Impervious (IMPERV) ith Zero Dpth	
	80.416 Length ( 1.000 Gradient 10.000 Per cent 80.416 Length ( .000 %Imp. wi 1 Option 1	(PERV) metres t (%) t Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat	
	80.416 Length ( 1.000 Gradient 10.000 Per cent 80.416 Length ( .000 %Imp. wi 1 Option 1 .250 Manning	<pre>(PERV) metres t (%) t Impervious (IMPERV) ith Zero Dpth l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n"</pre>	
	80.416 Length ( 1.000 Gradient 10.000 Per cent 80.416 Length ( .000 %Imp. wi 1 Option 1 .250 Manning 74.000 SCS Curv	(PERV) metres t (%) t Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat	
	80.416         Length (           1.000         Gradient           10.000         Per cent           80.416         Length (           .000         %Imp.wi           1         Option 1           .250         Manning           74.000         SCS Curv.           .100         Ia/s Cco           8.924         Initial	<pre>(PERV) metres t (%) t Impervious (IMPERV) ith Zero Dpth I=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction</pre>	
	80.416 Length ( 1.000 Gradient 10.000 Per cent 80.416 Length ( .000 %Imp.wi 1 Option 1 .250 Manning 74.000 SCS Curv .100 Ia/S Coe 8.924 Initial 1 Option 1	<pre>(PERV) metres t (%) t Impervious (IMPERV) ich Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv</pre>	r
	80.416         Length (           1.000         Gradient           10.000         Per cent           80.416         Length (           .000         *Imo. wi           1         Option 1           .250         Manning           74.000         SCS Curv           .100         Ia/S Coe           8.924         Initial           1         Option 1           .032         5	<pre>(PERV) metres t (%) t Impervious (IMPERV) ith Zero Dpth I=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s</pre>	r
35	80.416 Length ( 1.000 Gradient 10.000 Per cent 80.416 Length ( .000 %Imp.wi 1 Option 1 .250 Manning 74.000 SCS Curv .100 Ia/S Coe 8.924 Initial 1 Option 1 .032 5 .308 COMMENT	<pre>(PERV) metres t (%) t Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .898 .367 C perv/imperv/total</pre>	r
35	80.416 Length ( 1.000 Gradient 10.000 Per cent 80.416 Length ( .000 % Imp.wi 1 Option 1 .250 Manning 74.000 SCS Curv .100 Ia/S Cos 8.924 Initial 1 Option 1 .032 5 .308 COMMENT 3 line(s) of cc	<pre>(PERV) metres t (%) t Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .898 .367 C perv/imperv/total</pre>	ŗ
35	80.416 Length ( 1.000 Gradient 10.000 Per cent 80.416 Length ( .000 %Tmp.wi 1 Option 1 .250 Manning 74.000 SCS Curv .100 Ia/S CO 8.924 Initial 1 Option 1 .338 COMMENT 3 line(s) of cc	<pre>(PERV) metres t (%) t Impervious (IMPERV) ith zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .898 .367 C perv/imperv/total omment</pre>	r
35	80.416 Length ( 1.000 Gradient 10.000 Per cent 80.416 Length ( .000 % Imp.wi 1 Option 1 .250 Manning 74.000 SCS Curv .100 Ia/S Cos 8.924 Initial 1 Option 1 .032 5 .308 COMMENT 3 line(s) of cc	<pre>(PERV) metres t (%) t Impervious (IMPERV) ith zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .898 .367 C perv/imperv/total omment</pre>	r
35	80.416 Length ( 1.000 Gradient 10.000 Per cent 80.416 Length ( .000 %Tmp.wi 1 Option 1 .250 Manning 74.000 SCS Curv .100 Ia/S CO 8.924 Initial 1 Option 1 .328 COMMENT 3 line(s) of cc ***********************************	<pre>(PERV) metres t (%) 1 Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .898 .367 C perv/imperv/total omment A20 - OUTLET B</pre>	r
15	80.416 Length ( 1.000 Gradient 10.000 Per cent 80.416 Length ( .000 % Imp.wi 1 Option 1 .250 Manning 74.000 SCS Curv .100 Ia/S Cos 8.924 Initial 1 Option 1 .328 S .308 COMMENT 3 line(s) of co ************************************	<pre>(PERV) metres t (%) t Impervious (IMPERV) ith zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .898 .367 C perv/imperv/total omment</pre>	r
	80.416 Length ( 1.000 Gradient 10.000 Per cent 80.416 Length ( .000 %Imp.wi 1 Option 1 .250 Manning 74.000 SCS Curv .100 Ia/S COG 8.924 Initial 1 Option 1 .338 COMMENT 3 line(s) of cc .032 5 .032 5 COMMENT	<pre>(PERV) metres t (%) it Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .898 .367 C perv/imperv/total comment A20 - OUTLET B 5.284 .639 .000 c.m/s</pre>	r
15	<pre>80.416 Length ( 1.000 Gradient 10.000 Per cent 80.416 Length ( .000 % Tmp. wi 1 Option 1 .250 Manning 74.000 SCS Curv .100 Ia/s Cos 8.924 Initial 1 Option 1 .032 5 .308 COMMENT 3 line(s) of cc ***********************************</pre>	<pre>(PERV) metres t (%) 1 Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .898 .367 C perv/imperv/total omment A20 - OUTLET B 5.284 .639 .000 c.m/s omment *******</pre>	7
15	80.416 Length ( 1.000 Gradient 10.000 Per cent 80.416 Length ( .000 %Tmp.wi 1 Option 1 .250 Manning 74.000 SCS Curv .100 Ia/S COG 8.924 Initial 1 Option 1 .338 COMMENT 3 line(s) of cc .032 5 .032 5 COMMENT 3 Line(s) of cc .032 5 COMMENT 3 Line(s) of cc .032 5 COMMENT 3 Line(s) of cc .032 5 .032 5 COMMENT 3 Line(s) of cc	<pre>(PERV) metres t (%) 1 Impervious (IMPERV) ith zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .898 .367 C perv/imperv/total omment A20 - OUTLET B 5.284 .639 .000 c.m/s omment ******* EVELOPMENT LANDS BY OTHERS WEST OF FIRST AV</pre>	7
15 35	80.416         Length (           1.000         Gradient           10.000         Per cent           80.416         Length (           .000         %Imp.wi           1         Option 1           .250         Manning           74.000         SCS Curv           .100         Ia/S Cos           8.924         Initial           1         Option 1           .032         5           .308         COMMENT           3         line(s) of cc           .032         5           COMMENT         .032           3         line(s) of cc           .032         5           COMMENT         .3           3         line(s) of cc           ************************************	<pre>(PERV) metres t (%) 1 Impervious (IMPERV) ith zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .898 .367 C perv/imperv/total omment A20 - OUTLET B 5.284 .639 .000 c.m/s omment ******* EVELOPMENT LANDS BY OTHERS WEST OF FIRST AV</pre>	7
15	80.416 Length ( 1.000 Gradient 10.000 Per cent 80.416 Length ( .000 % Imp. wi 1 Option 1 .250 Manning 74.000 SCS Curv .100 Ia/S COG 8.924 Initial 1 Option 1 .032 5 .308 COMMENT 3 line(s) of cc .032 5 COMMENT 3 line(s) of cc .032 5 .032 5 COMMENT 3 line(s) of cc .032 5 .032 5 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035 .035	<pre>(PERV) metres t (%) it Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .898 .367 C perv/imperv/total comment A20 - OUTLET B 5.284 .639 .000 c.m/s comment ******* EVELOPMENT LANDS BY OTHERS WEST OF FIRST AV *******</pre>	7
15 35	80.416         Length (           1.000         Gradient           10.000         Per cent           80.416         Length (           .000         %Imp.wi           1         Option 1           .250         Manning           74.000         SCS Curv           .100         Ia/S Cos           8.924         Initial           1         Option 1           .032         5           .308         COMMENT           3         line(s) of cc           .032         5           COMMENT         .032           3         line(s) of cc           .032         5           COMMENT         .3           3         line(s) of cc           ************************************	<pre>(PERV) metres t (%) 1 Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .898 .367 C perv/imperv/total omment A20 - OUTLET B 5.284 .639 .000 c.m/s omment ******* SVELOPMENT LANDS BY OTHERS WEST OF FIRST AV ******* 99999</pre>	7
15 35	80.416 Length ( 1.000 Gradient 10.000 Per cent 80.416 Length ( .000 %Tmp.wi 1 Option 1 .250 Manning 74.000 SCS Curv .100 Ia/S COG 8.924 Initial 1 Option 1 .032 5 .308 COMMENT 3 line(s) of cc ***********************************	<pre>(PERV) metres t (%) 1 Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .898 .367 C perv/imperv/total omment A20 - OUTLET B 5.284 .639 .000 c.m/s omment ******* EVELOPMENT LANDS BY OTHERS WEST OF FIRST AV ******* 99999 hectares (PERV) metres</pre>	7
15 35	80.416         Length (           1.000         Gradient           10.000         Per cent           80.416         Length (           .000         %Imp.wi           1         Option 1           .250         Manning           74.000         SCS Curv.           .100         Info ScS Curv.           .101         Is/S Co           .303         ScS Curv.           .303         ScS ComMENT           3         line(s) of cc           .032         S           COMMENT         .032           3         line(s) of cc           .032         S           COMMENT         .032           3         line(s) of cc           CATCHMENT         21.000           21.000         ID No.6           .35.460         Area in           487.000         Length (           .200         Gradient	<pre>(PERV) metres t (%) 1 Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .839 .367 C perv/imperv/total omment A20 - OUTLET B 5.284 .639 .000 c.m/s omment ******* EVELOPMENT LANDS BY OTHERS WEST OF FIRST AV ******* 99999 hectares (PERV) metres t (%)</pre>	7
15 35	80.416 Length ( 1.000 Gradient 10.000 Per cent 80.416 Length ( .000 % Imp. wi 1 Option 1 .250 Manning 74.000 SCS Curv .100 Ia/S COS 8.924 Initial 1 Option 1 .032 5 .308 COMMENT 3 line(s) of cc 	<pre>(PERV) metres t (%) 1 Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .898 .367 C perv/imperv/total comment A20 - OUTLET B 5.284 .639 .000 c.m/s comment ******* EVELOPMENT LANDS BY OTHERS WEST OF FIRST AV ******* 99999 hectares (PERV) metres t (%) t Impervious</pre>	7
15 35	80.416         Length (           1.000         Gradient           10.000         Per cent           80.416         Length (           .000         %Imp.wi           1         Option 1           .250         Manning           74.000         SCS Curv           .100         Infs Coc           8.924         Initial           1         Option 1           .308         COMMENT           3         line(s) of cc           ************************************	<pre>(PERV) metres t (%) 1 Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .898 .367 C perv/imperv/total omment A20 - OUTLET B 5.284 .639 .000 c.m/s omment ******* EVELOPMENT LANDS BY OTHERS WEST OF FIRST AV ******* 99999 hectares (PERV) metres t (%) t Impervious (IMPERV) ith Zero Dpth</pre>	7
15 35	80.416 Length ( 1.000 Gradient 10.000 Per cent 80.416 Length ( .000 %Tmp.wi 1 Option 1 .250 Manning 74.000 SCS Curv .100 Ia/S COG 8.924 Initial 1 Option 1 .338 COMMENT 3 line(s) of cc .332 5 .032 5 COMMENT 3 line(s) of cc .032 5 .032 5 .035 6 .035 4 .035 4 .035 6 .035 4 .035	<pre>(PERV) metres t (%) 1 Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .898 .367 C perv/imperv/total omment A20 - OUTLET B 5.284 .639 .000 c.m/s omment ******* EVELOPMENT LANDS BY OTHERS WEST OF FIRST AV ******* 99999 hectares (PERV) metres t (%) t Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat</pre>	7
15 35	80.416         Length (           1.000         Gradient           10.000         Per cent           80.416         Length (           .000         %Imp.wi           1         Option 1           .250         Manning           74.000         SCS Curv.           .100         Inf(s) con           .308         COMMENT           3         line(s) of contextrest           ADD RUNOFF         .032           .032         5           COMMENT         3           3         line(s) of contextrest           CATCHMENT         21.000         ID No.6           35.460         Area in           487.000         Length (           .200         Gradient           5.000         Per cent           487.000         Length (           .000         %Imp.wi           1         Option 1           .250         Manning	<pre>(PERV) metres t (%) 1 Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .839 .367 C perv/imperv/total omment A20 - OUTLET B 5.284 .639 .000 c.m/s omment ****** ******* System Source Second Second Second Second Second Second Performance Second S</pre>	7
15 35	80.416 Length ( 1.000 Gradient 10.000 Per cent 80.416 Length ( .000 % Imp. wi 1 Option 1 .250 Manning 74.000 SCS Curv .100 Ia/S COS 8.924 Initial 1 .032 5 .308 COMMENT 3 line(s) of cc ***********************************	<pre>(PERV) metres t (%) 1 Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .898 .367 C perv/imperv/total omment A20 - OUTLET B 5.284 .639 .000 c.m/s omment ******* EVELOPMENT LANDS BY OTHERS WEST OF FIRST AV ******* 99999 hectares (PERV) metres t (%) t Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat</pre>	7
15 35	80.416         Length (           1.000         Gradient           10.000         Per cent           80.416         Length (           .000         %Imp.wi           1         Option 1           .250         Manning           74.000         SCS Curv.           .100         Infs Cos           8.924         Initial           1         Option 1           .308         COMMENT           3         line(s) of cc           ************************************	<pre>(PERV) metres t (%) i Impervious (IMPERV) ith Zero Dpth l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" or V efficient Abstraction l=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .898 .367 C perv/imperv/total omment A20 - OUTLET B 5.284 .639 .000 c.m/s omment ******* ******* SUELOPMENT LANDS BY OTHERS WEST OF FIRST AV ******* 99999 hectares (PERV) metres t (%) t Impervious (IMPERV) ith Zero Dpth l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction</pre>	
15 35	80.416 Length ( 1.000 Gradient 10.000 Per cent 80.416 Length ( .000 % Imp. wi 1 Option 1 .250 Manning 74.000 SCS Curv .100 Ia/S COG 8.924 Initial 1 Option 1 .032 5 .308 COMMENT 3 line(s) of cc 	<pre>(PERV) metres t (%) impervious (IMPERV) ish Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .898 .367 C perv/imperv/total omment A20 - OUTLET B 5.284 .639 .000 c.m/s omment ******* EVELOPMENT LANDS EY OTHERS WEST OF FIRST AV ******* 99999 hectares (PERV) metres t (%) t Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv</pre>	
15 35	80.416         Length (           1.000         Gradient           10.000         Per cent           80.416         Length (           .000         %Imp.wi           1         Option 1           .250         Manning           74.000         SCS Curv.           .100         Ia/S Co           .308         COMMENT           3         line(s) of co           ************************************	<pre>(PERV) metres t (%) 1 Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .839 .367 C perv/imperv/total omment A20 - OUTLET B 5.284 .639 .000 c.m/s omment ******* *VELOPMENT LANDS BY OTHERS WEST OF FIRST AV ******* 99999 hectares (PERV) metres t (%) t Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.284 .639 .000 c.m/s</pre>	
15 35	80.416 Length ( 1.000 Gradient 10.000 Per cent 80.416 Length ( .000 % Imp. wi 1 Option 1 .250 Manning 74.000 SCS Curv .100 Ia/S Coc 8.924 Initial 1 Option 1 .308 COMMENT 3 line(s) of cc ***********************************	<pre>(PERV) metres t (%) impervious (IMPERV) ish Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .898 .367 C perv/imperv/total omment A20 - OUTLET B 5.284 .639 .000 c.m/s omment ******* EVELOPMENT LANDS EY OTHERS WEST OF FIRST AV ******* 99999 hectares (PERV) metres t (%) t Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv</pre>	
15 35 4 15	80.416         Length (           1.000         Gradient           10.000         Per cent           80.416         Length (           .000         %Imp.wi           1         Option 1           .250         Manning           74.000         SCS Curv.           .100         Inf:S Co           8.924         Initial           1         Option 1           .308         COMMENT           3         line(s) of cc           ************************************	<pre>(PERV) metres t (%) 1 Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .839 .367 C perv/imperv/total omment A20 - OUTLET B 5.284 .639 .000 c.m/s omment ******* *VELOPMENT LANDS BY OTHERS WEST OF FIRST AV ******* 99999 hectares (PERV) metres t (%) t Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.284 .639 .000 c.m/s</pre>	
15 35 4	80.416 Length ( 1.000 Gradient 10.000 Per cent 80.416 Length ( .000 % Imp. wi 1 Option 1 .250 Manning 74.000 SCS Curv .100 Ia/S COE 8.924 Initial 1 Option 1 .032 5 .032 5 .032 5 COMMENT 3 line(s) of cc ***********************************	<pre>(PERV) metres t (%) impervious (IMPERV) isth Zero Dpth l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction l=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .898 .367 C perv/imperv/total omment A20 - OUTLET B 5.284 .639 .000 c.m/s omment ******* EVELOPMENT LANDS EY OTHERS WEST OF FIRST AV ******* EVELOPMENT LANDS EY OTHERS WEST OF FIRST AV ******* 99999 hectares (PERV) metres t (%) t Impervious (IMPERV) ith Zero Dpth l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction l=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.284 .639 .000 c.m/s .911 .339 C perv/imperv/total 5.586 .639 .000 c.m/s</pre>	
15 35 4 15	80.416         Length (           1.000         Gradient           10.000         Per cent           80.416         Length (           .000         %Imp.wi           1         Option 1           .250         Manning           74.000         SCS Curv.           .100         Ia/S Co           .308         COMMENT           3         line(s) of cc           ************************************	<pre>(PERV) metres t (%) i Impervious (IMPERV) ist Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .839 .367 C perv/imperv/total omment A20 - OUTLET B 5.284 .639 .000 c.m/s omment ****** ****** Syspep hectares (PERV) metres t (%) t Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.284 .639 .000 c.m/s .911 .339 C perv/imperv/total 5.586 .639 .000 c.m/s Length</pre>	
15 35 4 15	80.416 Length ( 1.000 Gradient 10.000 Per cent 80.416 Length ( .000 % Imp. wi 1 Option 1 .250 Manning 74.000 SCS Curv .100 Ia/S Cos 8.924 Initial 1 Option 1 .308 COMMENT 3 line(s) of cc ***********************************	<pre>(PERV) metres t (%) impervious (IMPERV) ith Zero Dpth l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction l=Trianglr; 2=Rectanglr; 3=SWM HTD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .898 .367 C perv/imperv/total omment A20 - OUTLET B 5.284 .639 .000 c.m/s omment ******* EVELOPMENT LANDS BY OTHERS WEST OF FIRST AV ******* 99999 hectares (PERV) metres t (%) t Impervious (IMPERV) ith Zero Dpth l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HTD; 4=Lin. Reserv 5.284 .639 .000 c.m/s .911 .339 C perv/imperv/total 5.586 .639 .000 c.m/s Length uit defined g</pre>	
15 35 4 15	80.416         Length (           1.000         Gradient           10.000         Per cent           80.416         Length (           .000         %Imp.wi           1         Option 1           .250         Manning           74.000         SCS Curv.           .100         Infs Cos           8.924         Initial           1         Option 1           .308         COMMENT           3         line(s) of cc           ************************************	<pre>(PERV) metres t (%) 1 Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .839 .367 C perv/imperv/total omment A20 - OUTLET B 5.284 .639 .000 c.m/s omment ******* ******* ******* 99999 hectares (PERV) metres t (%) t Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.284 .639 .000 c.m/s .911 .339 C perv/imperv/total 5.586 .639 .000 c.m/s</pre>	
15 35 4 15	80.416 Length ( 1.000 Gradient 10.000 Per cent 80.416 Length ( .000 % Imp. wi 1 Option 1 .250 Manning 74.000 SCS Curv .100 Ia/S COS 8.924 Initial 1 Option 1 .308 COMMENT 3 line(s) of cc 	<pre>(PERV) metres t (%) 1 Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .898 .367 C perv/imperv/total comment A20 - OUTLET B 5.284 .639 .000 c.m/s comment ******* EVELOPMENT LANDS BY OTHERS WEST OF FIRST AV ******* EVELOPMENT LANDS BY OTHERS WEST OF FIRST AV ******* 99999 hectares (PERV) metres t (%) t Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.284 .639 .000 c.m/s .911 .339 C perv/imperv/total 5.586 .639 .000 c.m/s Length uit defined g ighting factor timestep</pre>	
15 35 4 15	80.416 Length ( 1.000 Gradient 10.000 Per cent 80.416 Length ( .000 % Imp. wi 1 Option 1 .250 Manning 74.000 SCS Curv. .100 Ia/S COC 8.924 Initial 1 Option 1 .308 COMMENT 3 line(s) of cc ***********************************	<pre>(PERV) metres t (%) 1 Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.253 .639 .000 c.m/s .839 .367 C perv/imperv/total omment A20 - OUTLET B 5.284 .639 .000 c.m/s omment ******* ******* ******* 99999 hectares (PERV) metres t (%) t Impervious (IMPERV) ith Zero Dpth 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat "n" ve No or C efficient Abstraction 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 5.284 .639 .000 c.m/s .911 .339 C perv/imperv/total 5.586 .639 .000 c.m/s</pre>	

35	COMMENT	
		e(s) of comment
		OF FIRST AVE CULVERT
		*******
17	COMBINE 1 Jun	action Node No.
		338 5.586 5.586 5.586 c.m/s
14	START 1 1=Z	ero; 2=Define
35	COMMENT	
	3 lin *******	e(s) of comment
	PROP DEV	ELOPMENT SOUTH OF QUAKER, EAST OF RICE - POND P50
4	CATCHMEN	
	52.000	ID No.6 99999
	6.430 207.000	Area in hectares Length (PERV) metres
	1.000	Gradient (%)
	70.000 207.000	Per cent Impervious Length (IMPERV)
	.000	%Imp. with Zero Dpth
	.250	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n"
	74.000	SCS Curve No or C Ia/S Coefficient
	.100 8.924	Initial Abstraction
	1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 995 .000 5.586 5.586 c.m/s
		308 .896 .719 C perv/imperv/total
15	ADD RUNC	995 .995 5.586 5.586 c.m/s
9	ROUTE	
	.000	Conduit Length No Conduit defined
	.000	Zero lag
	.000	Beta weighting factor Routing timestep
	0	No. of sub-reaches
17	COMBINE	995 .995 .995 5.586 c.m/s
		action Node No. 995 .995 .995 .995 c.m/s
14	START	
4	1 1=Z CATCHMEN	Sero; 2=Define
	53.000	ID No.ó 99999
	11.340 275.000	Area in hectares Length (PERV) metres
	1.000	Gradient (%)
	70.000 275.000	Per cent Impervious Length (IMPERV)
	.000	%Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
	.250	Manning "n"
	74.000 .100	SCS Curve No or C Ia/S Coefficient
	8.924	Initial Abstraction
	1	Option         1=Trianglr;         2=Rectanglr;         3=SWM         HYD;         4=Lin.         Reserv           776         .000         .995         .995 c.m/s
15	ADD RUNC	308 .908 .728 C perv/imperv/total
	1.	776 1.776 .995 .995 c.m/s
9	ROUTE	Conduit Length
	.000	No Conduit defined
	.000	Zero lag Beta weighting factor
	.000	Routing timestep
	0	No. of sub-reaches 776 1.776 1.776 .995 c.m/s
17	COMBINE 2 Jun	action Node No.
	1.	776 1.776 1.776 2.771 c.m/s
18	CONFLUEN 2 Jun	ICE Action Node No.
	1.	776 2.771 1.776 .000 c.m/s
4	CATCHMEN 54.000	ID No.ó 99999
	1.280	Area in hectares Length (PERV) metres
	92.000 1.000	Gradient (%)
	60.000 92.000	Per cent Impervious Length (IMPERV)
	.000	%Imp. with Zero Dpth
	1 .250	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n"
	74.000	SCS Curve No or C
	.100 8.924	Ia/S Coefficient Initial Abstraction
	1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 179 2.771 1.776 .000 c.m/s
_		308 .900 .663 C perv/imperv/total
15		)FF 179 2.924 1.776 .000 c.m/s
	ADD RUNC	
27	HYDROGRA	PH DISPLAY
27	HYDROGRA 5 is	
27 10	HYDROGRA 5 is Volume POND	PH DISPLAY # of Hyeto/Hydrograph chosen = .8196629E+04 c.m
	HYDROGRA 5 is Volume POND 6 Depth - 182.000	<pre>PH DISPLAY # of Hyeto/Hydrograph chosen = .8196629±04 c.m Discharge - Volume sets .000 .0</pre>
	HYDROGRA 5 is Volume POND 6 Depth - 182.000 182.800	<pre>PH DISPLAY # of Hysto/Hydrograph chosen = .8196629E+04 c.m Discharge - Volume sets</pre>
	HYDROGRA 5 ims POND 6 Depth - 182.000 183.150 183.150	<pre>PH DISPLAY # of Hyeto/Hydrograph chosen = .8196629E+04 c.m . Discharge - Volume sets000 .0 .0190 5251.00230 7895.0238 10751.0</pre>
	HYDROGRA 5 is Volume POND 6 Depth - 182.000 182.800 183.150	<pre>PH DISPLAY # of Hyeto/Hydrograph chosen = .8196629E+04 c.m * Discharge - Volume sets     .000    .0     .0190    5251.0     .0230    7895.0     .238    10751.0     .396    13425.0     l.028    15337.0</pre>
	HYDROGRA 5 is Volume POND 6 Depth - 182.800 183.500 183.500 183.500 183.800 184.000 Peak Out	<pre>PH DISPLAY # of Hyeto/Hydrograph chosen = .8196629E+04 c.m .Discharge - Volume sets .000 .0 .0190 5251.0 .0230 7895.0 .238 10751.0 .396 13425.0 1.028 15337.0</pre>

		Storage =	7762.		
17	COMBINE	179 :	2.924	.023	.000 c.m/s
		iction Node	e No. 2.924	.023	.023 c.m/s
14	START	ero; 2=De:			
35	COMMENT				
	******	le(s) of co	*****		
	EXISTING	AREA ON (	QUAKER RD,	EAST OF R	ICE RD
4	CATCHMEN	т			
	5.000 1.870	ID No.ó Area in	99999 hectares		
	112.000 1.000	Length	(PERV) metr	es	
	50.000		t Imperviou	s	
	112.000 .000	Length %Imp.w	(IMPERV) ith Zero Dp	th	
	1	Option 3	l=SCS CN/C;		; 3=Green-Ampt; 4=Repeat
	.250 74.000	Manning SCS Cur	"n" ve No or C		
	.100 8.924		efficient Abstractio	<b>n</b>	
	1	Option 3	l=Trianglr;	2=Rectan	glr; 3=SWM HYD; 4=Lin. Reserv
		211 308	.000 .900		.023 c.m/s C perv/imperv/total
15	ADD RUNC		.211	.023	.023 c.m/s
9	ROUTE			1025	1025 0111, 5
	.000	Conduit No Condu	Length uit defined		
	.000	Zero las	g ighting fac	tor	
	.000	Routing	timestep		
	0	No. of : 211	<pre>sub-reaches .211</pre>	.211	.023 c.m/s
17	COMBINE	ction Node	No		
	-	211	.211	.211	.217 c.m/s
18	CONFLUEN 2 Jun	ICE Iction Node			
35	COMMENT	211	.217	.211	.000 c.m/s
	3 lin	le(s) of c			
	EXISTING	AREA ON	QUAKER RD,	EAST OF R	ICE RD
4	******* CATCHMEN	*********	******		
	6.000	ID No.ó			
	1.920 113.000		hectares (PERV) metr	es	
	.200 65.000	Gradien	t (%) t Imperviou	e	
	113.000	Length	(IMPERV)		
	.000 1		ith Zero Dp 1=SCS CN/C;		; 3=Green-Ampt; 4=Repeat
	.250 74.000	Manning SCS Cur	"n" ve No or C		
	.100 8.924	Ia/S Co	efficient Abstractio		
	0.924			2	
	1	Option :	l=Trianglr;	2=Rectan	glr; 3=SWM HYD; 4=Lin. Reserv
				2=Rectan .211	<pre>glr; 3=SWM HYD; 4=Lin. Reserv     .000 c.m/s C perv/imperv/total</pre>
15	ADD RUNC	Option 279 308 DFF	1=Trianglr; .217 .906	2=Rectan .211 .697	.000 c.m/s C perv/imperv/total
15 35	ADD RUNC COMMENT	Option : 279 308 FF 279	1=Trianglr; .217 .906 .486	2=Rectan .211	.000 c.m/s
	ADD RUNC COMMENT 3 lin	Option : 279 308 DFF 279 ae(s) of co	l=Trianglr; .217 .906 .486 comment	2=Rectan .211 .697 .211	.000 c.m/s C perv/imperv/total .000 c.m/s
	ADD RUNC COMMENT 3 lin	Option : 279 308 DFF 279 ae(s) of co	l=Trianglr; .217 .906 .486 comment	2=Rectan .211 .697 .211	.000 c.m/s C perv/imperv/total
	ADD RUNC COMMENT 3 lin ******* FIRST AV *******	Option : 279 308 PFF 279 He(s) of co *** TE FROM QUA ***	1=Trianglr; .217 .906 .486 omment AKER RD TO	2=Rectan .211 .697 .211	.000 c.m/s C perv/imperv/total .000 c.m/s
35	ADD RUNC COMMENT 3 lin ******* FIRST AV	Option : 279 308 FFF 279 He(s) of c *** TE FROM QUI *** TID No.6 Area in	1=Trianglr; .217 .906 .486 omment AKER RD TO 99999 hectares	2=Rectan .211 .697 .211 CITY OF W	.000 c.m/s C perv/imperv/total .000 c.m/s
35	ADD RUNG COMMENT 3 lin ******* FIRST AV ******** CATCHMEN 201.000 2.430 127.000	Option : 279 308 FF 279 e(s) of co *** E FROM QU *** TT ID No.6 Area in Length	1=Trianglr; .217 .906 .486 omment AKER RD TO 99999 hectares (PERV) metr	2=Rectan .211 .697 .211 CITY OF W	.000 c.m/s C perv/imperv/total .000 c.m/s
35	ADD RUNC COMMENT 3 111 ******* CATCHMEN 201.000 2.430 127.000 1.000 65.000	Option : 279 308 FF 279 te(s) of c *** TE FROM QU *** TI D No.6 Area in Length Gradien Per cem	<pre>1=Trianglr; .217 .906 .486 comment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou</pre>	2=Rectan .211 .697 .211 CITY OF W es	.000 c.m/s C perv/imperv/total .000 c.m/s
35	ADD RUNG COMMENT 3 lin ******** FIRST AV ******** CATCHMEN 201.000 2.430 127.000 1.000	Option : 279 308 FF 279 te(s) of c *** TE FROM QU *** TI D No.6 Area in Length Gradien Per cem	1=Trianglr; .217 .906 .486 omment AKER RD TO 99999 hectares (PERV) metr	2=Rectan .211 .697 .211 CITY OF W es	.000 c.m/s C perv/imperv/total .000 c.m/s
35	ADD RUNC COMMENT 3 lin FIRST AV ******* 201.000 2.430 127.000 127.000 65.000 127.000 .000 1	Option : 279 308 FFF 279 TE FROM QUI *** TE FROM QUI *** TI ID No.6 Area in Length Gradien Per cen Length %Imp. w. Option :	<pre>l=Trianglr; .217 .906 .486 omment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (IMPERV) ith Zero Dp leSCS CN/C;</pre>	2=Rectan .211 .697 .211 CITY OF W es s th	.000 c.m/s C perv/imperv/total .000 c.m/s
35	ADD RUNC COMMENT 3 lin ******* CATCHME 201.000 2.430 127.000 1.27.000 127.000 127.000 127.000 1250 74.000	Option : 279 308 577 279 279 279 279 279 TE FROM QU *** TI ID No.6 Area in Length Gradien Per cem Length & Imp. w Option : Manning SCS Cur	<pre>l=Trianglr; .217 .906 .486 omment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (IMPERV) ich Zero Dp l=SCS CN/C; "n" ve No or C</pre>	2=Rectan .211 .697 .211 CITY OF W es s th	.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA
35	ADD RUNC COMMENT 3 lin ******* FIRST AV ******* 201.000 2.430 127.000 1.000 65.000 127.000 .000 127.000 127.000 127.000	Option : 279 308 SFF 279 e(s) of cr *** TE FROM QU *** TT ID No.6 Area in Length Gradien Per cent Length %Imp. w Option : Manning SCS Cur Ia/S CO	<pre>1=Trianglr; .217 .906 .486 omment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (IMPERV) ith Zero Dp 1=SCS CN/C; "n"</pre>	2=Rectan .211 .697 .211 CITY OF W es s th 2=Horton	.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA
35	ADD RUNC COMMENT 3 lin ******* CATCHMEN 201.000 2.430 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.0000 127.0000 127.0000 127.0000 127.00000 127.00000 127.000000000000000000000000000000000000	Option : 279 308 577 279 e(s) of c *** T ID No.6 Area in Length %Imp. w. Option : Manning SCS Curr Ia/S Co Initial Option :	<pre>l=Trianglr; .217 .906 .486 omment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (IMPERV) ith Zero Dp l=SCS CN/C; "n" ve No or C afficient Abstractio l=Trianglr;</pre>	2=Rectan .211 .697 .211 CITY OF W es s th 2=Horton n 2=Rectan	.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv
4	ADD RUNC COMMENT 3 lin ******* FIRST AU ******* 201.000 2.430 127.000 1.000 65.000 127.000 125.000 125.000 125.000 125.000 125.000 125.000 100 8.250 74.000 .100 8.224 1	Option : 279 308 577 279 e(s) of c *** T ID No.6 Area in Length Gradien Per cent Manning SCS Cur Initial Option : 344 308	<pre>l=Trianglr; .217 .906 .486 Domment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (IMPERV) ith Zero Dp l=SCS CN/C; "n" ve No or C efficient Abstractio</pre>	2=Rectan .211 .697 .211 CITY OF W es s th 2=Horton n 2=Rectan .211	.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA ; 3=Green-Ampt; 4=Repeat
35	ADD RUNG COMMENT 3 lin ******* CATCHMEN 201.000 2.430 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.00000 10.00000 10.00000000	Option : 279 308 577 279 e(s) of c *** T ID No.6 Area in Length Gradien Per cent Manning SCS Cur Initial Option : 344 308	<pre>l=Trianglr; .217 .906 .486 omment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (IMPERV) ith Zero Dp l=SCS CN/C; "n" ve No or C efficient Abstractio l=Trianglr; .486</pre>	2=Rectan .211 .697 .211 CITY OF W es s th 2=Horton n 2=Rectan .211	.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s
4	ADD RUNC COMMENT 3 lin ******* 201.000 2.430 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 10.000 127.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.00000 10.00000 10.00000000	Option : 279 308 FFF 279 e(s) of c *** T ID No.6 Area in Length Gradien Per cem Her cem SCS Cur Initial Option : 344	<pre>l=Trianglr; .217 .906 .486 Omment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (IMPERV) ich Zero Dp l=SCS CN/C; "n" ve No or C efficient Abstractio l=Trianglr; .486 .898 .816</pre>	2=Rectan .211 .697 .211 CITY OF W es s th 2=Horton 2=Rectan .211 .692	.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total
35	ADD RUNC COMMENT 3 lin ******* FIRST AV ******* 201.000 2.430 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 100 8.924 1 ADD RUNC ROUTE .000 .000	Option : 279 308 FFF 279 e(s) of c *** T T ID No.6 Area in Length Gradient Per cent Manning SCS Cur Initial Option : 344 308 FFF SCS Cur Initial Option : 344 Conduit No Conduit	<pre>l=Trianglr; .217 .906 .486 Domment AKER RD TO 99999 hectares (PERV) metr t (%) tit Zero Dp l=SCS CN/C; "n" ve No or C efficient Abstractio l=Trianglr; .486 .898 .816 Length uit defined</pre>	2=Rectan .211 .697 .211 CITY OF W es s th 2=Horton n 2=Horton .211 .692 .211	.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total
35	ADD RUNG COMMENT 3 lin ******* CATCHMEN 201.000 2.430 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 100 8.924 1  ADD RUNG RUTE  ROUTE  000 .000 .000 .000	Option : 279 308 FFF 279 *** T EFROM QU *** T ID No.6 Area in Length Gradien Per cent Length Gradien Per cent Length Wimp. w Option : %Imp. w Option : 344 308 FFF 344 Conduit No Condu Zero lay Beta we	<pre>l=Trianglr; .217 .906 .486 comment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (IMPERV) tit Zero Dp l=SCS CN/C; "n" ve No or C efficient Abstractio l=Trianglr; .486 .898 .816 Length mit defined gighting fac</pre>	2=Rectan .211 .697 .211 CITY OF W es s th 2=Horton 2=Rectan .211 .692 .211	.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total
35	ADD RUNC COMMENT 3 lin ******* 201.000 2.430 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 100 8.924 1 3.000 8.924 1 0.000 8.924 1 0.000 0.000	Option : 279 308 377 279 (e(s) of c *** T ID No.6 Area in Length Gradien Per cent Length Gradien Per cent Scs Cur Initial 308 SCS Cur Initial 308 SCS Cur Asa Scs Cur Initial 308 SCS Cur Initial 308 SCS Cur Initial 308 SCS Cur Reaction Scs Cur Reaction Scs Cur Initial 308 SCS Cur Reaction Scs Cu	<pre>l=Trianglr; .217 .906 .486 omment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (IMPERV) ith Zero Dp l=SCS CN/C; "n" ve No or C efficient Abstractio l=Trianglr; .486 .898 .816 Length uit defined g</pre>	2=Rectan .211 .697 .211 CITY OF W es s th 2=Horton n .211 .692 .211	.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total
35 4 15 9	ADD RUNC COMMENT 3 lin ******* FIRST AV ******* CATCHMEN 201.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 100 8.924 1 ROUTE ROUTE ROUTE .000 .000 .000 .000 .000 .000 .000 .0	Option : 279 308 277 277 277 277 277 277 277 277 277 27	<pre>l=Trianglr; .217 .906 .486 omment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (IMPERV) ith Zero Dp l=SCS CN/C; "n" ve No or C efficient Abstractio l=Trianglr; .486 .898 .816 Length nit defined g ighting fac timestep sub-reaches</pre>	2=Rectan .211 .697 .211 CITY OF W es s th 2=Horton n .211 .692 .211	.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total
35	ADD RUNC COMMENT 3 lin ******* 201.000 2.430 127.000 1.000 65.000 127.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.000 65.000 1.27.000 1.000 65.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.0000 0.0000 0.000000	Option : 279 308 FFF 279 *** T lb No.6 Area in Length Gradient Per cent Length Gradient Per cent Length Wimp. w Option : Wimp. w Option : 344 308 FFF 344 Conduit No Condu Zero lay Beta we Routing No. 6 f 344	<pre>l=Trianglr; .217 .906 .486 Domment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (IMPERV) tith Zero Dp l=SCS CN/C; "n" ve No or C efficient Abstractio l=Trianglr; .486 .898 .816 Length mit defined g ighting fac timestep sub-reaches .816</pre>	2=Rectan .211 .697 .211 CITY OF W es s th 2=Horton .211 .692 .211 .692 .211 tor .816	.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s
35 4 15 9	ADD RUNC COMMENT 3 lin ******* 201.000 2.430 127.000 1.000 65.000 127.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.000 65.000 1.27.000 1.000 65.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.27.000 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.0000 0.0000 0.000000	Option : 279 308 279 279 279 E FROM QU *** T ID No.6 Area in Length %Imp. w. Option : Manning SCS Cur In/tial Option : 344 Conduit No Conduit Zero lay Beta we: Routing No. of : 344	<pre>l=Trianglr; .217 .906 .486 Domment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (IMPERV) tith Zero Dp l=SCS CN/C; "n" ve No or C efficient Abstractio l=Trianglr; .486 .898 .816 Length mit defined g ighting fac timestep sub-reaches .816</pre>	2=Rectan .211 .697 .211 CITY OF W es s th 2=Horton .211 .692 .211 .692 .211 tor .816	.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s
35 4 15 9	ADD RUNC COMMENT 3 lin ******* FIRST AV ******* 201.000 2.430 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 100 8.924 1  ROUTE  ROUTE  COMEINE 1 JUN  COMMENT 3 lin	Option : 279 308 FFF 279 *** T lb No.6 Area in Length Gradient Per cent Length Gradient Per cent Length Wimp. w Option : Wimp. w Option : 344 308 FFF 344 Conduit No Condu Zero lay Beta we Routing No. 6 f 344	<pre>l=Trianglr; .217 .906 .486 Domment AKER RD TO 99999 hectares (PERV) metr t (%) ith Zero Dp l=SCS CN/C; "n" vc No or C efficient Abstraction l=Trianglr; .486 .816 Length nit defined gighting fac timestep sub-reaches .816 e No. .816</pre>	2=Rectan .211 .697 .211 CITY OF W es s th 2=Horton .211 .692 .211 .692 .211 tor .816	.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s
35 4 15 9	ADD RUNC COMMENT 3 lin ******* CATCHMEN 201.000 2.430 127.000 1.000 65.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Option : 279 308 FFF 279 e(s) of c: *** T ID No.6 Area in Length Gradient Per cent Length Gradient Per cent Length Wimp. w Option : % Imp.	<pre>l=Trianglr; .217 .906 .486 Domment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (IMPERV) ith Zero Dp l=SCS CN/C; "n" ve No or C efficient Abstractio l=Trianglr; .486 .898 .816 Length mit defined g ighting fac timestep sub-reaches .816 e No. .816 omment ************************************</pre>	2=Rectan .211 .697 .211 CITY OF W es s th 2=Horton .211 .692 .211 tor .816 .816	.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s .000 c.m/s 6.402 c.m/s
35 4 15 9	ADD RUNC COMMENT 3 lin ******* 201.000 2.430 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.00000 10.00000 10.00000000	Option : 279 308 279 279 279 277 T (a) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	<pre>l=Trianglr; .217 .906 .486 omment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (IMPERV) th Zero Dp l=SCS CN/C; "n" ve No or C afficient Abstractio l=Trianglr; .486 .898 .816 Length nit defined y ighting fac timestep sub-reaches .816 e No. .816 omment *******</pre>	2=Rectan .211 .697 .211 CITY OF W es s th 2=Horton .211 .692 .211 tor .816 .816	.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s .000 c.m/s 6.402 c.m/s
35 4 15 9 17 35	ADD RUNC COMMENT 3 lin ******** FIRST AV ******** CATCHMEN 201.000 2.430 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 127.000 100 8.924 1 ADD RUNC ROUTE .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .0000 .000 .000 .000 .000 .000	Option : 279 308 279 279 279 T T ID No.6 Area in Gradient Per cent Manning SCS Cur Initial Option : 344 Conduit No Cond Zero lay Beta we Routing No.6 344 conduit No Cond Zero lay Beta we Routing 344 cof conduit SCS Cur Initial Option : 344 conduit SCS Cur Initial Conduit No Cond Zero lay Beta we Routing SCS Cur Initial Conduit No Cond Zero lay Beta we Routing SCS Cur Initial Conduit No Cond Zero lay Beta we Routing SCS Cur Initial Conduit No Cond Zero lay Beta we Routing SCS Cur Initial Conduit Conduit SCS Cur Initial Conduit Conduit SCS Cur Initial Conduit Conduit SCS Cur Initial Conduit Conduit SCS Cur Initial Conduit Conduit Conduit SCS Cur Initial Conduit Conduit SCS Cur Initial Conduit Conduit SCS Cur Initial Conduit Conduit Conduit Conduit Cur Initial Conduit Cur Cur Cur Cur Cur Cur Cur Cur Cur Cur	<pre>l=Trianglr; .217 .906 .486 omment AKER RD TO 99999 hectares (PERV) metr t (%) t Imperviou (IMPERV) th Zero Dp l=SCS CN/C; "n" ve No or C afficient Abstractio l=Trianglr; .486 .898 .816 Length nit defined y ighting fac timestep sub-reaches .816 e No. .816 omment *******</pre>	2=Rectan .211 .697 .211 CITY OF W es s th 2=Horton .211 .692 .211 tor .816 .816	.000 c.m/s C perv/imperv/total .000 c.m/s ELLAND MUNICIPAL BOUNDA ; 3=Green-Ampt; 4=Repeat glr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s 6.402 c.m/s T C

COMMENT 35 3 line(s) of comment REALIGNED CHANNEL - SEGMENT 3 4 CATCHMENT 300.000 ID No.ó 99999 3.180 Area in hectares 146.000 .200 15.000 Length (PERV) metres Gradient (%) Per cent Impervious 146.000 Length (IMPERV) %Imp. with Zero Dpth Option 15CS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C 1 .250 74.000 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .100 8.924 1 .816 .000 c.m/s C perv/imperv/total .119 6.402 .910 .308 15 ADD RUNOFF .119 6.521 .816 .000 c.m/s CATCHMENT 4 TD No. 6 99999 301.000 .720 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious . 200 10.000 Length (IMPERV) 69.000 Sump. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" .000 1 SCS Curve No or C Ia/S Coefficient Initial Abstraction 74.000 .100 8.924 
 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv

 20
 6.521
 .816
 .000 c.m/s
 .000 c.m/s C perv/imperv/total .020 .816 .308 .892 15 ADD RUNOFF .020 6.541 .816 .000 c.m/s 9 ROUTE Conduit Length .000 .000 No Conduit defined Zero lag Beta weighting factor . 000 .000 .000 Routing timestep No. of sub-reaches .020 6.541 0 6.541 .000 c.m/s COMBINE 17 Junction Node No. .020 6.541 1 6.541 6.541 c.m/s 14 START 1=Zero; 2=Define COMMENT 35 3 line(s) of comment
********** PROP DEVELOPMENT NORTH OF SEGMENT 3 - POND P30 CATCHMENT 4 30.000 ID No.ó 99999 Area in hectares Length (PERV) metres 8.470 238.000 .200 Gradient (%) Per cent Impervious .100 238.000 Length (IMPERV) .000 %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" SCS Curve No or C Ia/S Coefficient Initial Abstraction 74.000 .100 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 3 .000 6.541 6.541 c.m/s 1 .113 .309 C perv/imperv/total .308 .906 ADD RUNOFF .113 15 .113 6.541 6.541 c.m/s 4 CATCHMENT ID No.ó 99999 31.000 10.420 Area in hectares Length (PERV) metres Gradient (%) 264.000 1.000 75.000 Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth 264.000 .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1 . 250 Manning "n" SCS Curve No or C 74.000 .100 Ia/S Coefficient 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 1.743 .308 ADD RUNOFF .113 6.541 6.541 c.m/s .758 C perv/imperv/total 15 1.743 6.541 c.m/s 1.763 6.541 1.743 1.763 6.541 HYDROGRAPH DISPLAY 5 is # of Hyeto/Hydrograph chosen Volume = .6276292E+04 c.m CATCHMENT 27 5 4 TD No. 6 99999 32.000 .690 Area in hectares Length (PERV) metres 1.000 Gradient (%) Per cent Impervious 68.000 Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 .250 Manning "n" 74.000 SCS Curve No or C

.100 Ia/S Coefficient 8.924 Initial Abstraction 
 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv

 02
 1.763
 6.541
 6.541 c.m/s

 08
 .898
 .662
 C perv/imperv/total
 1 .102 .308 15 ADD RUNOFF .102 1.3 HYDROGRAPH DISPLAY 1.840 6.541 6.541 c.m/s 27 Volume = .6549078E+04 c.m 5 10 POND 
 FOND

 5 Depth - Discharge - Volume sets

 178.800
 .000
 .0

 179.300
 .0260
 1520.0
 180.100 .0440 4649.0 7069.0 .414 180.600 یں۔ یاں۔194 met۔ = 5104.c.m 1.840 6.541 c.m/s 17 1 Junction Node No. .102 START 1.840 .114 6.569 c.m/s 14 1=Zero; 2=Define COMMENT 35 line(s) of comment 3 PROP DEVELOPMENT SOUTH OF SEGMENT 3 - POND P31 ********* 4 CATCHMENT ID No.ó 99999 33.000 12,960 Area in hectares Length (PERV) metres 294.000 Gradient (%) Per cent Impervious Length (IMPERV) 1.000 75.000 294.000 .000 %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" SCS Curve No or C 74.000 Ia/S Coefficient Initial Abstraction .100 8.924 
 Option
 1=Trianglr;
 2=Rectanglr;
 3=SWM HYD;
 4=Lin. Reserv

 2.171
 .000
 .114
 6.569 c.m/s
 .308
 .910
 .759
 C perv/imperv/total
 1 ADD RUNOFF 2.171 15 2.171 .114 6.569 c.m/s HYDROGRAPH DISPLAY 27 LISTONER DISPLAY 5 is # of Hyeto/Hydrograph chosen Volume = .5876996E+04 c.m CATCHMENT 4 34.000 ID No.ó 99999 Area in hectares .660 Length (PERV) metres Gradient (%) Per cent Impervious 66.000 1.000 60.000 Length (IMPERV) %Imp. with Zero Dpth 66.000 .000 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C . 250 74.000 .100 Ia/S Coefficient 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .098 2.171 .114 .662 6.569 c.m/s C perv/imperv/total .308 ADD RUNOFF .098 2.245 .114 HYDROGRAPH DISPLAY 5 is # of Hyeto/Hydrograph chosen Volume = .6138025E+04 c.m POND ADD RUNOFF 15 6.569 c.m/s 27 10 POND 6 Depth - Discharge - Volume sets .000 178.300 .0 1927.0 178.900 179.600 .0540 4692.0 .150 179.800 5590.0 180.000 .321 6538.0 
 180.300
 1.922
 8059.0

 Peak Outflow
 .107 c.m/s

 Maximum Depth
 179.709 metres
 Maximum Storage = 5 .098 2.245 COMBINE 5183. c.m .107 6.569 c.m/s 17 Junction Node No. .098 2.245 1 .098 START .107 6.606 c.m/s 14 1=Zero; 2=Define CONFLUENCE 18 1 Junction Node No. .098 6.606 COMMENT .107 .000 c.m/s 35 line(s) of comment 3 REALIGNED CHANNEL - SEGMENT 3 CATCHMENT 4 302.000 TD No. 6 99999 Area in hectares Length (PERV) metres 1.610 104.000 .200 Gradient (%) Per cent Impervious Length (IMPERV) 104.000 %Imp. with Zero Dpth
Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 . 250 Manning "n" SCS Curve No or C 74.000

.100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 6.606 .107 .000 c.m/s .368 C perv/imperv/total 043 .308 .901 COMMENT 3 line(s) of comment 3 FLOW U/S OF NIAGARA ST CULVERT - OUTLET D

15 ADD RUNOFF

35

.043 START 6.649 .107 .000 c.m/s 14

1 1=Zero; 2=Define 35 COMMENT 100-YEAR STORM EVENT STORM 2 1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic 1020.000 Coefficient a Constant b (min) Exponent c 4.700 Fraction to peak r Duration ó 240 min 73.203 mm Total depth .450 240.000 3 IMPERVIOUS Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" 1 .015 SCS Curve No or C Ia/S Coefficient Initial Abstraction 98.000 .100 .518 35 COMMENT 3 line(s) of comment EXISTING RES. WEST OF SEGMENT 1 4 CATCHMENT 1.000 TD No. 6 99999 17.520 Area in hectares Length (PERV) metres Gradient (%) 343.000 1.000 Per cent Impervious 35.000 343.000 Length (IMPERV) Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 250 Manning "n" SCS Curve No or C Ia/S Coefficient 74.000 .100 8.924 Ditial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 1.731 .000 .000 .000 c.m/s .925 .563 C perv/imperv/total .368 ADD RUNOFF 1.731 15 1.731 .000 .000 c.m/s 35 COMMENT REALIGNED CHANNEL - SEGMENT 1 ****** CATCHMENT 4 100.000 ID No.ó 99999 Area in hectares Length (PERV) metres 2.020 116.000 .400 Gradient (%) 15.000 Per cent Impervious Length (IMPERV) 116.000 %Imp. with Zero Dpth .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" 1 .250 SCS Curve No or C 74.000 .100 Ia/S Coefficient 8.924 Initial Abstraction 
 Option
 1=Trianglr;
 2=Rectanglr;
 3=SWM HYD;
 4=Lin.
 Reserv

 01
 1.731
 .000
 .000 c.m/s
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 .</t .101 . 101 . 368 COMMENT 35 3 line(s) of comment FLOW AT FUT ROADWAY CULVERT - SEGMENT 1 ADD RUNOFF 15 .101 1.832 .000 .000 c.m/s ROUTE Conduit Length .000 .000 No Conduit defined .000 Zero lag Beta weighting factor .000 Routing timestep No. of sub-reaches .000 0 .101 1.832 1.832 .000 c.m/s COMBINE 17 Junction Node No. 1 .101 START 1.832 1.832 1.832 c.m/s 14 1=Zero; 2=Define 1 35 COMMENT line(s) of comment PROP DEVELOPMENT NORTH OF SEGMENT 1 - POND P10 CATCHMENT 4 10.000 4.050 ID No.ó 99999 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious 164.000 1.000 70.000 164.000 Length (IMPERV) %Imp. with Zero Dpth .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1 . 250 Manning "n" SCS Curve No or C 74.000 .100 Ta/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 8.924 1 .000 1.832 .909 .747 .735 1.832 c.m/s .747 C perv/imperv/total .367 15 ADD RUNOFF .735 1.832 CATCHMENT 1 000 ID No.ó 99999 2 bectar .735 1.832 c.m/s 11.000 1.000 Area in hectares

82.000 Length (PERV) metres 1.000 Gradient (%) Per cent Impervious 82.000 Length (IMPERV) %Imp. with Zero Dpth .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" 1 .250 74.000 SCS Curve No or C Ia/S Coefficient Initial Abstraction .100 8.924 
 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv

 54
 .735
 1.832
 1.832 c.m/s

 57
 .912
 .422
 C perv/imperv/total
 1 .054 15 ADD RUNOFF .054 .783 1.832 1.832 c.m/s POND 10 
 6 Depth - Discharge - Volume sets

 184.800
 .000
 .0

 185.750
 .0210
 1.0
 .0230 186.000 503.0 186.250 1091.0 186.500 .0280 1765.0 -.244 2370.0 Peak Outflow = .105 c.m/s Maximum Depth = 186.513 metres Maximum Storage = 1804. c -.054 = 1804. c.m .783 .10 .054 COMBINE 1.832 c.m/s 17 Junction Node No. 1 .054 START .105 1.857 c.m/s .783 14 1=Zero; 2=Define L 1=Zero CONFLUENCE 18 1 Junction Node No. .054 1.857 .054 COMMENT .000 c.m/s .105 35 3 line(s) of comment REALIGNED CHANNEL - SEGMENT 1 **** CATCHMENT 4 101.000 TD No. 6 99999 .610 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious 1.000 10.000 Length (IMPERV) 64.000 %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 .250 Manning "n" SCS Curve No or C Ia/S Coefficient 74.000 .100 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .038 1.857 .105 .000 c.m/s .367 .914 .422 C perv/imperv/total 8.924 .000 c.m/s C perv/imperv/total .914 ADD RUNOFF 15 .038 1.890 .105 .000 c.m/s 9 ROUTE Conduit Length .000 .000 No Conduit defined .000 Zero lag Beta weighting factor .000 .000 Routing timestep No. of sub-reaches 0 .038 1.890 1.890 .000 c.m/s 17 COMBINE Junction Node No. .038 1.890 1 1.890 1.890 c.m/s 14 START 1=Zero; 2=Define COMMENT 35 3 line(s) of comment PROP DEVELOPMENT SOUTH OF SEGMENT 1 - POND P11 4 CATCHMENT 12.000 TD No. 6 99999 2.680 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious 1.000 35.000 134.000 Length (IMPERV) .000 %Imp. with Zero Dpth
Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" 74.000 SCS Curve No or C Ia/S Coefficient .100 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 2 .000 1.890 1.890 c.m/s 8.924 .262 .559 C perv/imperv/total .367 ADD RUNOFF .914 15 .262 .262 1.890 1.890 c.m/s CATCHMENT 4 ID No.ó 99999 13.000 6.980 Area in hectares 216.000 1.000 Length (PERV) metres Gradient (%) 70.000 Per cent Impervious Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 216.000 .000 .250 Manning "n" SCS Curve No or C 74.000 .100 Ia/S Coefficient Initial Abstraction 8.924 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 1.890 c.m/s 1 307 .262 1.890

	.368	.908	.746	C perv/imperv/total
15	ADD RUNOFF 1.307	1.567	1.890	1.890 c.m/s
4	CATCHMENT			
		D No.ó 99999 rea in hectare	s	
	67.000 L	ength (PERV) m		
		radient (%) er cent Imperv	ious	
	67.000 L	ength (IMPERV)		
		Imp. with Zero ption 1=SCS CN		n; 3=Green-Ampt; 4=Repeat
	.250 Ma	anning "n"		
		CS Curve No or a/S Coefficien		
		nitial Abstrac		nglr; 3=SWM HYD; 4=Lin. Reserv
	.124	1.567	1.890	1.890 c.m/s
15	.367 ADD RUNOFF	.914	.695	C perv/imperv/total
	.124		1.890	1.890 c.m/s
27	HYDROGRAPH 1 5 is # o:	f Hyeto/Hydrog	raph chosen	L
10	Volume = POND	.5247869E+04 c	.m	
10	5 Depth - Di	scharge - Volu	me sets	
	184.800 185.300	.000	.0 1142.0	
	186.100	.0240	3519.0	
	186.500 186.800	.287 1.922	4978.0 6222.0	
	Peak Outflow	w = .1 th = 186.2		
	Maximum Dep Maximum Sto		0. c.m	
35	.124 COMMENT	1.659	.143	1.890 c.m/s
55	3 line(s			
	**************** FLOW U/S OF	***** RICE RD CULVE	RT - OUTLET	· A1
	********			
17	COMBINE 1 Junctio	on Node No.		
	.124		.143	1.908 c.m/s
14	START 1 1=Zero	; 2=Define		
35	COMMENT 3 line(s	) of commont		
	********	******		
		PMENT SOUTH OF	QUAKER RD	& WEST OF RICE RD PON
4	CATCHMENT			
	40.000 II 8.210 A	D No.ó 999999 rea in hectare	s	
	234.000 L	ength (PERV) m		
	25.000 Pe	radient (%) er cent Imperv	ious	
		ength (IMPERV) Imp. with Zero	Doth	
	1 Oj	ption 1=SCS CN		n; 3=Green-Ampt; 4=Repeat
		anning "n" CS Curve No or	с	
	.100 Ia	a/S Coefficien	t	
			lr; 2=Recta	nglr; 3=SWM HYD; 4=Lin. Reserv
	.607		.143 .503	1.908 c.m/s C perv/imperv/total
15	ADD RUNOFF			
9	.607 ROUTE	.607	.143	1.908 c.m/s
		onduit Length o Conduit defi:		
	.000 Ze	ero lag		
		eta weighting outing timeste		
	0 Ne	o. of sub-read	hes	1 000 /
17	.607 COMBINE	.607	.607	1.908 c.m/s
	2 Junctio .607	on Node No. .607	.607	
14				.607 c.m/s
	START		.007	.607 c.m/s
4	START	; 2=Define	.007	.607 c.m/s
	START 1 1=Zero CATCHMENT 41.000 II	D No.ó 99999		.607 c.m/s
	START 1 1=Zero CATCHMENT 41.000 II .690 A:		s	.607 c.m/s
	START           1         1=Zero           CATCHMENT           41.000         II           .690         A:           68.000         Le           1.000         G:	D No.ó 99999 rea in hectare ength (PERV) m radient (%)	s etres	.607 c.m/s
	START 1 1=Zero CATCHMENT 41.000 II .690 A: 68.000 IA 1.000 G: 35.000 PA 68.000 IA	D No.6 99999 rea in hectare ength (PERV) m radient (%) er cent Imperv ength (IMPERV)	s etres ious	.607 c.m/s
	START 1 1=Zero CATCHMENT 41.000 II .690 A: 68.000 L. 1.000 G: 35.000 P. 68.000 L. .000 %:	D No.ó 99999 rea in hectare ength (PERV) m radient (%) er cent Imperv ength (IMPERV) Imp. with Zero	s etres ious Dpth	
	START           1         1=Zero           CATCHMENT         41.000         11           41.000         11         68.000         14           1.000         G2         15.000         14           68.000         14         68.000         14           .000         %         1         00           .250         Ma         1         00	D No.6 99999 rea in hectare ength (PERV) m radient (%) er cent Imperv ength (IMPERV) Imp. with Zero ption 1=SCS CN anning "n"	s etres ious Dpth /C; 2=Hortc	.607 c.m/s n; 3=Green-Ampt; 4=Repeat
	START 1 = Zero CATCHMENT 41.000 II 690 A2 68.000 IA 1.000 P 68.000 IA .000 P 68.000 IA .000 S 1.00 .250 MM 74.000 S .100 IA	D No.6 99999 rea in hectare ength (PERV) m radient (%) er cent Imperv ength (IMPERV) Imp. with Zero ption 1=SCS CN anning "n" CS Curve No or a/S Coefficien	s etres ious Dpth /C; 2=Hortc C t	
	START           1         1=Zero           CATCHMENT         1           41.000         DI           68.000         L           1.000         GR           35.000         PR           .680.000         L           .000         SR           .1         OQ           .250         MR           74.000         SR           .100         T           8.924         DI	D No.6 99999 rea in hectare ength (PERV) m radient (%) er cent Imperv ength (IMPERV) Imp. with Zero ption 1=SCS CM anning "n" CS Curve No or a/S Coefficien nitial Abstrac	s etres Dpth /C; 2=Hortc C t t tion	n; 3=Green-Ampt; 4=Repeat
	START 1 1=Zero CATCHMENT 41.000 II 68.000 IA 1.000 S 35.000 P 68.000 IA .000 S 1 00 .250 MA 74.000 S .100 II 8.924 II 1 00 .078	D No.6 99999 rea in hectare ength (PERV) m radient (%) er cent Imperv ength (IMPERV) Imp. with Zero ption 1=SCS CN anning "n" CS Curve No or a/S Coefficien nitial Abstrac ption 1=Triang .000	s etres Dpth /C; 2=Hortc C t tin I; 2=Recta .607	n; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reserv .607 c.m/s
	START           1         1=Zero           CATCHMENT         41.000         II           68.000         Lu         50.000           1.000         S35.000         Pu           68.000         Lu         .000           2.50         Mu         .000           74.000         S3         .100           1.000         II         .000           1.000         II         .000           1.000         II         .000	D No.6 99999 rea in hectare ength (PERV) m radient (%) er cent Imperv ength (IMPERV) Imp. with Zero ption 1=SCS CN anning "n" CS Curve No or a/S Coefficien nitial Abstrac ption 1=Triang .000	s etres ious Dpth /C; 2=Hortc C t tion 1r; 2=Recta	n; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reserv
4	START 1 L=ZerO CATCHMENT 41.000 L1 .690 A2 68.000 L4 1.000 G: 35.000 P4 68.000 L4 .000 K2 .100 X .100 S0 .100 S0 .100 S0 .078 .367 ADD RUNOFF .078	D No.6 99999 rea in hectare ength (PERV) m radient (%) er cent Imperv ength (IMPERV) Imp. with Zero ption 1=SCS CN anning "n" CS Curve No or a/S Coefficien nitial Abstrac tion 1=Triang .000 .914	s etres Dpth /C; 2=Hortc C t tin I; 2=Recta .607	n; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reserv .607 c.m/s
4	START 1 1=Zero CATCHMENT 41.000 II .690 Az 68.000 La 1.000 S 1.000 K 1.000 K 1.00 II 8.924 I 1.078 .367 ADD RUNOFF .078 CATCHMENT 42.000 II	D No.6 99999 rea in hectare ength (PERV) m radient (%) er cent Imperv ength (IMPERV) Imp. with Zero ption 1=SCS CN anning "n" CS Curve No or a/S Coefficien nitial Abstrac ption 1=Triang .000 .914 .078 D No.6 99999	s etres Dpth /C; 2=Hortc C t tion lr; 2=Recta .607 .559 .607	n; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reserv .607 c.m/s C perv/imperv/total
4	START 1 1=ZerO CATCHMENT 41.000 II .690 Az 68.000 Lz 1.000 % 35.000 P 68.000 L .000 % 100 % 100 % .100 S .100 S .100 S .100 S .100 S .100 S .078 .367 ADD RUNOFF .078 CATCHMENT 42.000 II 12.660 Az	D No.6 99999 rea in hectare ength (PERV) m radient (%) er cent Imperv ength (IMPERV) Imp. with Zero ption 1=SCS CM CS Curve No or a/S Coefficien nitial Abstrac ption 1=Triang .000 .914 .078 D No.6 99999 rea in hectare	s etres ious Dpth /C; 2=Horto C t tion lr; 2=Recta .607 .559 .607 s	n; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reserv .607 c.m/s C perv/imperv/total
4	START           1         L=Zero           CATCHMENT         1           41.000         II           .690         Aa           68.000         L           1.000         GS           35.000         P           68.000         L           .000         K           .100         T           .250         M           74.000         SS           .100         T           .8924         II           1         00           .078         .367           ADD RUNOFF         .078           .078         .078           .078         .078           .2000         II           12.640         Ai           290.000         II           1.000         G	D No.6 99999 rea in hectare ength (PERV) m radient (%) er cent Imperv ength (IMPERV) Imp. with Zero ption 1=SCS CN anning "n" CS Curve No or a/S Coefficien nitial Abstrac ption 1=Triang .000 .914 .078 D No.6 99999 rea in hectare ength (PERV) m radient (%)	s etres ious Dpth /C; 2=Hortc C tion lr; 2=Recta .607 .559 .607 s etres	n; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reserv .607 c.m/s C perv/imperv/total
4	START 1 1=Zero CATCHMENT 41.000 II .690 Az 68.000 L 1.000 S 35.000 P 68.000 L .000 % .1 00 .250 M 74.000 S .100 II 8.924 I 1 00 .078 .367 ADD RUNOFF .078 290.000 L 1.000 S 70.000 F	D No.6 99999 rea in hectare ength (PERV) m radient (%) er cent Imperv ength (IMPERV) Imp. with Zero ption 1=SCS CN anning "n" CS Curve No or a/S Coefficien nitial Abstrac ption 1=Triang .000 .914 .078 D No.6 99999 rea in hectare ength (PERV) m	s etres ious Dpth /C; 2=Hortc C tion lr; 2=Recta .607 .559 .607 s etres	n; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reserv .607 c.m/s C perv/imperv/total
4	START 1 1=Zero CATCHMENT 41.000 II .690 Az 68.000 Lz .000 K 35.000 P 68.000 P 68.000 K .000 K .000 K .000 K .078 CATCHMENT 12.660 Az 290.000 Lz 1.000 K .000	D No.6 99999 rea in hectare ength (PERV) m radient (%) er cent Imperv ength (IMPERV) Imp. with Zero ption 1=SCS CM CS Curve No or a/S Coefficien nitial Abstrac ption 1=Triang .000 .914 .078 D No.6 99999 rea in hectare ength (PERV) m radient (%) er cent Imperv ength (IMPERV) Imp. with Zero	s etres ious Dpth /C; 2=Horto C t tion lr; 2=Recta .607 .559 .607 s etres ious Dpth	n; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reserv .607 c.m/s C perv/imperv/total .607 c.m/s
4	START 1 1=Zero CATCHMENT 41.000 II .690 Az 68.000 Lu .500 Pu 68.000 Lu .000 X; 1 00 .250 Mu 74.000 S; .100 II 8.924 ID .078 .078 ADD RUNOFF .078 290.000 Lu 1.000 Pu 290.000 Lu .000 %; 1 00	D No.6 99999 rea in hectare ength (PERV) m radient (%) er cent Imperv ength (IMPERV) Imp. with Zero ption 1=SCS CM CS Curve No or a/S Coefficien nitial Abstrac ption 1=Triang .000 .914 .078 D No.6 99999 rea in hectare ength (PERV) m radient (%) er cent Imperv ength (IMPERV) Imp. with Zero	s etres ious Dpth /C; 2=Horto C t tion lr; 2=Recta .607 .559 .607 s etres ious Dpth	n; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reserv .607 c.m/s C perv/imperv/total

	74.000 SCS Cu:	rve No or C		
		cefficient 1 Abstractio	n	
	1 Option 2.409	<pre>1=Trianglr; .078</pre>		glr; 3=SWM HYD; 4=Lin. Reserv .607 c.m/s
	.368	.921		C perv/imperv/total
15	ADD RUNOFF 2.409	2.475	.607	.607 c.m/s
9	ROUTE			
		t Length duit defined		
	.000 Zero 1	ag		
		eighting fac g timestep	tor	
	0 No. of 2.409	sub-reaches 2.475	2.475	.607 c.m/s
17	COMBINE		2.1/5	
	2 Junction No 2.409		2.475	3.082 c.m/s
14	START 1 1=Zero: 2=D	. 61		
4	1 1=Zero; 2=D CATCHMENT	erine		
		ó 99999 n hectares		
		(PERV) metr	es	
	1.000 Gradie: 35.000 Per ce:	nt (%) nt Imperviou		
	47.000 Length	(IMPERV)		
		with Zero Dp 1=SCS CN/C:		; 3=Green-Ampt; 4=Repeat
	.250 Mannin	g "n"	2-1102 0011	
		rve No or C oefficient		
	8.924 Initia	l Abstractio		
	1 Option .039			glr; 3=SWM HYD; 4=Lin. Reserv 3.082 c.m/s
15	.367 ADD RUNOFF	.911	.557	C perv/imperv/total
13	.039	.039	2.475	3.082 c.m/s
4	CATCHMENT 44.000 ID No.	5 99999		
	6.400 Area i	n hectares		
	207.000 Length 1.000 Gradie:	(PERV) metr nt (%)	es	
	70.000 Per ce	nt Imperviou	s	
		(IMPERV) with Zero Dp	th	
	1 Option .250 Manning	1=SCS CN/C;	2=Horton;	; 3=Green-Ampt; 4=Repeat
	74.000 SCS Cu	rve No or C		
		cefficient 1 Abstractio	n	
	1 Option	1=Trianglr;	2=Rectang	glr; 3=SWM HYD; 4=Lin. Reserv
	1.193 .368	.039 .906	2.475 .744	3.082 c.m/s C perv/imperv/total
15	ADD RUNOFF 1.193	1.226	2.475	3.082 c.m/s
9	ROUTE		2.175	5:002 0:m/B
		t Length duit defined		
	.000 Zero 1	ag		
		eighting fac g timestep	tor	
	0 No. of 1.193	sub-reaches	1.226	3.082 c.m/s
17	COMBINE		1.220	5:002 0:m/B
	2 Junction No 1.193		1.226	4.308 c.m/s
14	START			
18	1 1=Zero; 2=Do CONFLUENCE	efine		
	2 Junction No 1.193		1.226	.000 c.m/s
4	CATCHMENT		1.220	.000 C.m/B
	45.000 ID No. 1.030 Area is	ó 99999 n hectares		
	83.000 Length	(PERV) metr	es	
	1.000 Gradie: 60.000 Per ce	nt Imperviou	s	
	83.000 Length	(IMPERV)		
	1 Option			; 3=Green-Ampt; 4=Repeat
	.250 Manning 74.000 SCS Cu	g "n" rve No or C		
	.100 Ia/S C	oefficient		
		<pre>l Abstractio 1=Trianglr;</pre>		glr; 3=SWM HYD; 4=Lin. Reserv
	.184	4.308	1.226	.000 c.m/s
15	.367 ADD RUNOFF	.912	.694	C perv/imperv/total
27	.184 HYDROGRAPH DISPL		1.226	.000 c.m/s
	5 is # of Hye	to/Hydrograp	h chosen	
10	Volume = .1443 POND	723E+05 c.m		
	6 Depth - Dischar			
	186.000 .0	000 550 404	.0 8.0	
	187.300 .0	730 709 170 842	1.0	
	187.800 .	257 1055	2.0	
		880 1209 = .430		
	Peak Outflow Maximum Depth	= 187.856	metres	
	Maximum Storage . .184	= 10981. 4.453	c.m .430	.000 c.m/s
17	COMBINE 2 Junction No			
		4.453	.430	.430 c.m/s
				D -

14 START 1=Zero; 2=Define 1 COMMENT 35 3 line(s) of comment EXISTING AREA ON QUAKER RD, WEST OF RICE RD CATCHMENT 4 TD No. 6 99999 2.000 9.020 Area in hectares 245.000 Length (PERV) metres 1.000 Gradient (%) Per cent Impervious 245.000 Length (IMPERV) Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 .250 Manning "n" SCS Curve No or C 74.000 Ia/S Coefficient .100 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 1.013 .430 c.m/s C perv/imperv/total .000 .430 .586 .368 ADD RUNOFF 1.013 15 1.013 . 4 3 0 .430 c.m/s DOITTE 9 Conduit Length .000 . 000 No Conduit defined Zero lag Beta weighting factor .000 .000 Routing timestep No. of sub-reaches 1.013 1.013 .000 0 1.013 .430 c.m/s 17 COMBINE Junction Node No. 2 1.013 1.074 c.m/s 1.013 1.013 START 14 1=Zero; 2=Define 18 CONFLUENCE Junction Node No. 1.013 .000 c.m/s 1.013 1.074 35 COMMENT 3 line(s) of comment EXISTING AREA ON QUAKER RD, WEST OF RICE RD CATCHMENT 4 3.000 5.680 TD No. 6 99999 Area in hectares 195.000 Length (PERV) metres Gradient (%) Per cent Impervious 1.000 40.000 195.000 Length (IMPERV) Length (IMPERV)
%Imp. with Zero Dpth
Option 1=SCS CM/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 Manning "n" SCS Curve No or C 250 74.000 Ia/S Coefficient .100 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 1.013 .632 1.074 .000 c.m/s C perv/imperv/total .367 .903 .582 ADD RUNOFF 15 1.706 .632 1.013 .000 c.m/s ROUTE 9 Conduit Length .000 .000 No Conduit defined Zero lag Beta weighting factor .000 .000 Routing timestep No. of sub-reaches .000 0 1.706 .632 1.706 .000 c.m/s 17 COMBINE Junction Node No. 2 .632 1.706 1.706 1.706 c.m/s 14 START 1=Zero; 2=Define 35 COMMENT PROP DEVELOPMENT SOUTH OF QUAKER RD, EAST OF RICE RD CATCHMENT 4 50.000 ID No.ó 99999 Area in hectares Length (PERV) metres 3.420 151.000 1.000 Gradient (%) Per cent Impervious 151.000 Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 . 250 Manning "n" SCS Curve No or C 74.000 .100 Ia/S Coefficient 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .148 .000 1.706 1.706 c.m/s .912 .422 C perv/imperv/total .367 ADD RUNOFF 15 1.706 1.706 c.m/s .148 .148 CATCHMENT 4 ID No.ó 99999 51.000 1.980 115.000 Area in hectares Length (PERV) metres Gradient (%) 1.000 10.000 Per cent Impervious 115.000 Length (IMPERV) %Imp. with Zero Dpth .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1

.250 Manning "n" 74.000 SCS Curve No or C .100 Ta/S Coefficient Ditial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 8.924 1 .148 1.706 c.m/s C perv/imperv/total . 092 1.706 .422 .368 15 ADD RUNOFF .092 .240 1.706 1.706 c.m/s 9 ROUTE .000 Conduit Length No Conduit defined Zero lag Beta weighting factor 000 .000 .000 .000 Routing timestep No. of sub-reaches 0 .092 .240 .240 1.706 c.m/s COMBINE 17 Junction Node No. 2 .092 .240 .240 1.925 c.m/s START 14 1=Zero; 2=Define 1 35 COMMENT 3 line(s) of comment EXISTING AREA WEST OF RICE RD AND SOUTH OF QUAKER ROAD 4 CATCHMENT ID No.ó 99999 4.000 13.940 Area in hectares Length (PERV) metres Gradient (%) 305.000 1.000 Per cent Impervious 305.000 Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 1 .250 Manning "n" 74.000 SCS Curve No or C .100 Ia/S Coefficient 8.924 Ditial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .000 .240 1.566 1.925 c.m/s C perv/imperv/total .367 ADD RUNOFF 15 1.566 1.566 .240 1.925 c.m/s 9 ROUTE Conduit Length .000 .000 No Conduit defined Zero lag .000 Beta weighting factor Routing timestep No. of sub-reaches .000 0 1.566 1.566 1,566 1.925 c.m/s COMBINE 17 Junction Node No. 2 1.566 1.566 1,566 3.491 c.m/s START 14 1=Zero; 2=Define 1 CONFLUENCE 18 Junction Node No. 2 1.566 3.491 1.566 .000 c.m/s 35 COMMENT 3 line(s) of comment RICE ROAD FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUNDA 4 CATCHMENT 501.000 ID No.ó 99999 1.570 Area in hectares 102.000 Length (PERV) metres Gradient (%) 1.000 Per cent Impervious 102.000 Length (IMPERV) %Imp. with Zero Dpth .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1 .250 Manning "n" SCS Curve No or C 74.000 .100 Ta/S Coefficient Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 8.924 1 .314 3.491 .000 c.m/s C perv/imperv/total 1.566 .751 ADD RUNOFF 15 .314 3.754 1.566 .000 c.m/s ROUTE Conduit Length .000 .000 No Conduit defined Zero lag .000 Beta weighting factor Routing timestep No. of sub-reaches .000 0 3.754 .314 3.754 .000 c.m/s 35 COMMENT FLOW D/S OF RICE RD CULVERT - OUTLET A2 17 COMBINE Junction Node No. 1 .314 START 3.754 3.754 5.662 c.m/s 14 1=Zero; 2=Define 1 COMMENT 35 line(s) of comment PROP DEVELOPMENT SOUTH OF QUAKER RD - QUALLITY CONTROL ONLY 4 CATCHMENT

20.100 ID No.ó 99999

	.780 Area in hectares 72.000 Length (PERV) metres
	1.000 Gradient (%)
	35.000 Per cent Impervious
	72.000 Length (IMPERV)
	.000 %Imp. with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
	.250 Manning "n"
	74.000 SCS Curve No or C
	.100 Ia/S Coefficient
	8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
	.087 .000 3.754 5.662 c.m/s
	.366 .914 .558 C perv/imperv/total
15	ADD RUNOFF .087 .087 3.754 5.662 c.m/s
4	CATCHMENT
	20.000 ID No.ó 99999
	3.210 Area in hectares
	146.000 Length (PERV) metres 1.000 Gradient (%)
	85.000 Per cent Impervious
	146.000 Length (IMPERV)
	.000 %Imp. with Zero Dpth 1 Option 1=SCS CN/C: 2=Horton: 3=Green-Ampt: 4=Repeat
	<pre>1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n"</pre>
	74.000 SCS Curve No or C
	.100 Ia/S Coefficient
	8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
	.720 .087 3.754 5.662 c.m/s
	.368 .913 .831 C perv/imperv/total
15	ADD RUNOFF .720 .807 3.754 5.662 c.m/s
9	ROUTE
	.000 Conduit Length
	.000 No Conduit defined
	.000 Zero lag .000 Beta weighting factor
	.000 Routing timestep
	0 No. of sub-reaches
17	.720 .807 .807 5.662 c.m/s COMBINE
	1 Junction Node No.
	.720 .807 .807 6.417 c.m/s
14	START 1 1=Zero; 2=Define
18	CONFLUENCE
	1 Junction Node No.
35	.720 6.417 .807 .000 c.m/s COMMENT
55	3 line(s) of comment
	*********
	REALIGNED CHANNEL - SEGMENT 2
4	CATCHMENT
	200.000 ID No.ó 99999
	.970 Area in hectares
	80.416 Length (PERV) metres 1.000 Gradient (%)
	10.000 Per cent Impervious
	80.416 Length (IMPERV)
	.000 %Imp. with Zero Dpth 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
	.250 Manning "n"
	74.000 SCS Curve No or C
	.100 Ia/S Coefficient
	8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
	.053 6.417 .807 .000 c.m/s
25	.367 .912 .422 C perv/imperv/total
35	COMMENT 3 line(s) of comment
	********
	FLOW D/S OF AREA A20 - OUTLET B
15	**************************************
15	.053 6.464 .807 .000 c.m/s
35	COMMENT
	3 line(s) of comment
	EX RES. AND FUT DEVELOPMENT LANDS BY OTHERS WEST OF FIRST AV
	***************************************
4	CATCHMENT
	21.000 ID No.ó 99999 35.460 Area in hectares
	487.000 Length (PERV) metres
	.200 Gradient (%)
	5.000 Per cent Impervious 487.000 Length (IMPERV)
	.000 %Imp. with Zero Dpth
	<pre>1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat</pre>
	.250 Manning "n" 74.000 SCS Currue No.er C
	74.000 SCS Curve No or C .100 Ia/S Coefficient
	8.924 Initial Abstraction
	1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
	.559 6.464 .807 .000 c.m/s .368 .922 .395 C perv/imperv/total
15	ADD RUNOFF
	.559 6.890 .807 .000 c.m/s
9	ROUTE .000 Conduit Length
	.000 No Conduit defined
	.000 Zero lag
	.000 Beta weighting factor .000 Routing timestep
	0 No. of sub-reaches
	.559 6.890 6.890 .000 c.m/s

35	COMMENT				
	3 lin	e(s) of commer	nt		
		OF FIRST AVE			
17	******** COMBINE	*************	***		
17		ction Node No.			
14	START	559 6.890	6.890	6.890 c.m/s	
	1 1=Z	ero; 2=Define			
35	COMMENT 3 lin	e(s) of commer	nt		
	*******	***			
	********		1 OF QUAKER, 1	EAST OF RICE - POND P50	
4	CATCHMEN 52.000	T ID No.ó 9999	0		
	6.430	Area in hect	ares		
	207.000 1.000	Length (PER) Gradient (%)			
	70.000	Per cent Imp	pervious		
	207.000	Length (IMPE %Imp. with 2			
	1 .250	Option 1=SCS Manning "n"	S CN/C; 2=Hort	con; 3=Green-Ampt; 4=Rep	eat
	74.000	SCS Curve No			
	.100 8.924	Ia/S Coeffic Initial Abst			
	1	Option 1=Tri	Langlr; 2=Rect	anglr; 3=SWM HYD; 4=Lin	. Reserv
		198 .000 368 .906	0 6.890 5 .744	6.890 c.m/s C perv/imperv/total	
15	ADD RUNO	FF 198 1.198	6.890	6.890 c.m/s	
9	ROUTE			01090 01m, 5	
	.000	Conduit Leng No Conduit d			
	.000	Zero lag			
	.000	Beta weighti Routing time			
	0	No. of sub-1 198 1.198		6.890 c.m/s	
17	COMBINE			01090 01m, 5	
		ction Node No. 198 1.198		1.198 c.m/s	
14	START	ero; 2=Define			
4	CATCHMEN				
	53.000 11.340	ID No.ó 9999 Area in hect			
	275.000	Length (PERV	<ol> <li>metres</li> </ol>		
	1.000 70.000	Gradient (%) Per cent Imp			
	275.000	Length (IMPE %Imp. with 2			
	1	Option 1=SCS		on; 3=Green-Ampt; 4=Rep	eat
	.250 74.000	Manning "n" SCS Curve No	orC		
	.100	Ia/S Coeffic	cient		
	8.924 1	Initial Abst Option 1=Tri	langlr; 2=Rect	anglr; 3=SWM HYD; 4=Lin	. Reserv
		157 .000 368 .919		1.198 c.m/s C perv/imperv/total	
15	ADD RUNO	FF			
9	ROUTE	157 2.157	1.198	1.198 c.m/s	
	.000	Conduit Leng No Conduit d			
	.000	Zero lag			
	.000	Beta weighti Routing time	agten		
	0	No. of sub-r	reaches		
17	COMBINE	157 2.157	2.157	1.198 c.m/s	
		ction Node No. 157 2.157		3.355 c.m/s	
18	CONFLUEN	CE		51555 CTM, 5	
		ction Node No. 157 3.355		.000 c.m/s	
4	CATCHMEN	T ID No.6 9999	0		
	1.280	Area in hect Length (PER)	ares		
	1 000	Gradient (%)			
	60.000 92.000	Per cent Imp Length (IMPF %Imp. with 2	pervious		
	92.000 .000	Length (IMPE %Imp. with 2	ERV) Mero Dpth		
	1 .250	Option 1=SCS Manning "n"	S CN/C; 2=Hort	:on; 3=Green-Ampt; 4=Rep	eat
	74.000	SCS Curve No			
	.100 8.924	Ia/S Coeffic Initial Abst			
	1		langlr; 2=Rect	anglr; 3=SWM HYD; 4=Lin	. Reserv
	•	367 .913		.000 c.m/s C perv/imperv/total	
15	ADD RUNO	FF 225 3.539	2.157	.000 c.m/s	
27	HYDROGRA	PH DISPLAY			
	Volume	# of Hyeto/Hyd = .1040810E+0		n	
10	POND 6 Depth -	Discharge - N	<i>V</i> olume sets		
	182.000	.000	.0		
	182.800 183.150	.0230	5251.0 7895.0		
	183.500 183.800	.238	10751.0 13425.0		
	184.000	1.028	15337.0		
	Peak Out: Maximum 1	flow = Depth = 18	.132 c.m/s 33.327 metres		
					Л

		Storage = 934			
17	COMBINE	.225 3.539	.132	.000 c.m/s	
		nction Node No. .225 3.539	.132	.132 c.m/s	
14	START 1 1=	Zero; 2=Define			
35	COMMENT				
		ne(s) of comment			
		G AREA ON QUAKER F *****	D, EAST OF	RICE RD	
4	CATCHME	NT			
	5.000 1.870	ID No.ó 99999	-		
	112.000	Area in hectare Length (PERV) m			
	1.000	Gradient (%) Per cent Imperv	d ou a		
	50.000 112.000	Length (IMPERV)			
	.000	%Imp. with Zero		1; 3=Green-Ampt; 4=Repeat	
	.250	Manning "n"	I/C; Z=HOICO	i; S=Green-Ampt; 4=Repeat	
	74.000 .100	SCS Curve No or Ia/S Coefficier			
	8.924	Initial Abstrac	tion		
	1	Option 1=Triang .266 .000		nglr; 3=SWM HYD; 4=Lin. Reserv .132 c.m/s	7
		.367 .916	.642	C perv/imperv/total	
15	ADD RUN	.266 .266	.132	.132 c.m/s	
9	ROUTE				
	.000	Conduit Length No Conduit defi	ned		
	.000	Zero lag Beta weighting	feater		
	.000	Routing timeste			
	0	No. of sub-read .266 .266	hes.266	.132 c.m/s	
17	COMBINE			.102 0111, 5	
		nction Node No. .266 .266	.266	.274 c.m/s	
18	CONFLUE	NCE			
		nction Node No. .266 .274	.266	.000 c.m/s	
35	COMMENT	ne(s) of comment			
	******	*****			
		G AREA ON QUAKER F *****	D, EAST OF	RICE RD	
4	CATCHME				
	6.000 1.920	ID No.ó 99999 Area in hectare	s		
	113.000	Length (PERV) m			
	.200 65.000	Gradient (%) Per cent Imperv	vious		
	113.000 .000	Length (IMPERV) %Imp. with Zero			
	1	Option 1=SCS CN		1; 3=Green-Ampt; 4=Repeat	
	.250 74.000	Manning "n" SCS Curve No or	· C		
	.100	Ia/S Coefficier	it		
	8.924 1	Initial Abstrac Option 1=Triang		nglr; 3=SWM HYD; 4=Lin. Reserv	,
		.339 .274 .368 .914	.266	.000 c.m/s C perv/imperv/total	
15	ADD RUN	OFF			
35	COMMENT	.339 .594	.266	.000 c.m/s	
		ne(s) of comment			
			TO CITY OF	VELLAND MUNICIPAL BOUNDA	
4	******* CATCHME				
•	201.000	ID No.ó 99999			
	2.430 127.000	Area in hectare Length (PERV) m	etres		
	1.000	Gradient (%) Per cent Imperv			
	65.000 127.000	rer cent Imperv	Lous		
	.000	Length (IMPERV)			
		Length (IMPERV) %Imp. with Zero	Dpth	. 3=Green_Amnt. 4=Percet	
	1 .250	%Imp. with Zerc Option 1=SCS CN Manning "n"	Dpth I/C; 2=Horton	n; 3=Green-Ampt; 4=Repeat	
	1 .250 74.000	%Imp. with Zero Option 1=SCS CN Manning "n" SCS Curve No or	Dpth I/C; 2=Horton	1; 3=Green-Ampt; 4=Repeat	
	1 .250 74.000 .100 8.924	%Imp. with Zerc Option 1=SCS CN Manning "n" SCS Curve No or Ia/S Coefficier Initial Abstrac	Dpth J/C; 2=Horton C Lt Stion		
	1 .250 74.000 .100 8.924 1	%Imp. with Zerc Option 1=SCS CN Manning "n" SCS Curve No or Ia/S Coefficier Initial Abstrac	Dpth J/C; 2=Horton C Lt Stion	1; 3=Green-Ampt; 4=Repeat nglr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s	Ţ
15	1 .250 74.000 .100 8.924 1	<pre>%Imp. with Zerc Option 1=SCS CN Manning "n" SCS Curve No or Ia/S Coefficier Initial Abstrac Option 1=Triang .433 .594 .367 .915</pre>	Dpth I/C; 2=Horton C It It J1r; 2=Rectau	nglr; 3=SWM HYD; 4=Lin. Reserv	7
15	1 .250 74.000 .100 8.924 1 ADD RUN	<pre>%Imp. with Zerc Option 1=SCS CN Manning "n" SCS Curve No or Ia/S Coefficier Initial Abstrac Option 1=Triang .433 .594 .367 .915</pre>	Dpth J/C; 2=Horton C tt ttion flr; 2=Rectau .266	nglr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s	7
15 9	1 .250 74.000 .100 8.924 1 ADD RUN	<pre>%Imp. with Zerc Option 1=SCS CN Manning "n" SCS Curve No or Ia/S Coefficier Initial Abstrac Option 1=Triang .433 .594 .367 .915 SPF .433 .991</pre>	<pre>&gt; Dpth I/C; 2=Horton : C ut :tion (lr; 2=Rectan .266 .723</pre>	nglr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total	7
	1 .250 74.000 .100 8.924 1 ADD RUN ROUTE .000 .000	<pre>%Imp. with Zerc Option 1=SCS CN Manning "n" SCS Curve No or Ia/S Coefficier Initial Abstrac Option 1=Triang 433 .594 .367 .915 DFF .433 .991 Conduit Length No Conduit defi</pre>	<pre>&gt; Dpth 1/C; 2=Horton : C :tt :tion llr; 2=Rectan .266 .723 .266</pre>	nglr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total	7
	1 .250 74.000 .100 8.924 1 ADD RUN ROUTE .000 .000 .000	<pre>%Imp. with Zerc Option 1=SCS CM Manning "n" SCS Curve No or Ia/S Coefficier Initial Abstrac Option 1=Triang .433 .594 .367 .915 OFF .433 .991 Conduit Length</pre>	<pre>&gt; Dpth I/C; 2=Horton c C tt ttion llr; 2=Rectan .266 .723 .266 .ned</pre>	nglr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total	7
	1 .250 74.000 8.924 1 ADD RUN ROUTE .000 .000 .000 .000 .000	<pre>%Imp. with Zerc Option 1=SCS CN Manning "n" SCS Curve No or Ia/s Coefficier Initial Abstrac Option 1=Triang .433 .594 .367 .915 DFF .433 .991 Conduit Length No Conduit Length No Conduit Length Routing timeste</pre>	<pre>&gt; Dpth I/C; 2=Hortou : C tt t:ion (lr; 2=Rectau .266 .723 .266 .723 .266 .ned factor up</pre>	nglr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total	7
9	1 .250 74.000 .100 8.924 1 ADD RUN ROUTE .000 .000 .000 .000 .000 .000 .000	<pre>%Imp. with Zerc Option 1=SCS CM Manning "n" SCS Curve No or Ia/S Coefficier Initial Abstrac Option 1=Triang 433 .594 .367 .915 OFF .433 .991 Conduit Length No Conduit defi Zero lag Beta weighting Routing timeste Mo. of sub-reac .433 .991</pre>	<pre>&gt; Dpth I/C; 2=Hortou : C tt t:ion (lr; 2=Rectau .266 .723 .266 .723 .266 .ned factor up</pre>	nglr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total	7
	1 .250 74.000 .100 8.924 1 ADD RUN ROUTE .000 .000 .000 .000 .000 0 0 COMBINE	<pre>%Imp. with Zerc Option l=SCS CM Manning "n" SCS Curve No or Ia/S Coefficier Initial Abstrac Option l=Triang 433 .594 .367 .915 DFF .433 .991 Conduit Length No Conduit Length No Conduit Length No Conduit Length No Conduit Length No. of sub-reac .433 .991</pre>	<pre>&gt; Dpth I/C; 2=Horton t/C; 2=Horton tition (lr; 2=Rectan .266 .723 .266 .723 .266 .ned factor pp thes</pre>	nglr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s	7
9	1 .250 74.000 .100 8.924 1 ADD RUN ROUTE .000 .000 .000 .000 0 COMBINE 1 Ju	<pre>%Imp. with Zerc Option 1=SCS CM Manning "n" SCS Curve No or Ia/S Coefficier Initial Abstrac Option 1=Triang .433 .594 .367 .915 DFF .433 .991 Conduit Length No Conduit defi Zero lag Beta weighting Routing timeste No. of sub-reac .433 .991</pre>	<pre>&gt; Dpth I/C; 2=Horton : C tt ::ion ; 2=Rectan ; 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 2266 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 2266 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 2266 2</pre>	nglr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s	7
9	1 .250 74.000 .100 8.924 1 ADD RUM ROUTE .000 .000 .000 .000 .000 .000 .000 .0	<pre>%Imp. with Zerc Option 1=SCS CM Manning "n" SCS Curve No or Ia/S Coefficier Initial Abstrac Option 1=Triang .433 .594 .433 .594 .433 .991 Conduit Length No Conduit Length No Conduit defi Zero Lag Beta weighting Routing timeste No. of sub-reac .433 .991 nction Node No. .433 .991</pre>	<pre>&gt; Dpth I/C; 2=Horton : C tt ::ion ; 2=Rectan ; 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 2266 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 2266 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 226 2266 2</pre>	nglr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s .000 c.m/s	7
9	1 .250 74.000 .100 8.924 1 ADD RUN ROUTE .000 .000 .000 .000 .000 0 COMBINE 1 JU COMMENT 3 111 *********************************	<pre>%Imp. with Zerc Option 1=SCS CM Manning "n" SCS Curve No or Ia/S Coefficier Initial Abstrac Option 1=Triang 433 .594 .367 .915 DFF .433 .991 Conduit Length No Conduit defi Zero lag Beta weighting Routing timeste No. of sub-reac .433 .991 nction Node No. .433 .991</pre>	<pre>&gt; Dpth I/C; 2=Horton C tt t: (lr; 2=Rectan .266 .723 .266 .723 .266 ned factor pp </pre>	nglr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s .000 c.m/s 7.881 c.m/s	7
9 17 35	1 .250 74.000 .100 8.924 1 ADD RUM ROUTE .000 .000 .000 .000 0 COMBINE 1 Ju COMMENT 3 11: *******	<pre>%Imp. with Zerc Option 1=SCS CM Manning "n" SCS Curve No or Ia/S Coefficier Initial Abstrac Option 1=Triang .433 .594 .367 .915 OFF .433 .991 Conduit Length No Conduit Length No conduit Length No conduit defi Zero lag Beta weighting Routing timeste No. of sub-reac .433 .991 nction Node No. .433 .991</pre>	<pre>&gt; Dpth I/C; 2=Horton C tt t: (lr; 2=Rectan .266 .723 .266 .723 .266 ned factor pp </pre>	nglr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s .000 c.m/s 7.881 c.m/s	7
9	1 .250 74.000 .100 8.924 1 ADD RUM ROUTE .000 .000 .000 .000 .000 0 COMBINE 1 JU COMMENT 3 15: ******* FLOW D/ ******	<pre>%Imp. with Zerc Option 1=SCS CM Manning "n" SCS Curve No or Ia/S Coefficier Initial Abstrac Option 1=Triang .433 .594 .433 .594 Conduit Length No Conduit Length No Conduit Length No Conduit defi Zero 1ag Beta weighting Routing timeste No. of sub-reac .433 .991 nction Node No. .433 .991 nction Node No. .433 .991</pre>	<pre>&gt; Dpth I/C; 2=Horton C tt t: (lr; 2=Rectan .266 .723 .266 .723 .266 ned factor pp </pre>	nglr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s .000 c.m/s 7.881 c.m/s	7
9 17 35	1 .250 74.000 .100 8.924 1 ADD RUM ROUTE .000 .000 .000 .000 .000 .000 .000 .0	<pre>%Imp. with Zerc Option 1=SCS CM Manning "n" SCS Curve No or Ia/S Coefficier Initial Abstrac Option 1=Triang .433 .594 .367 .915 OFF .433 .991 Conduit Length No Conduit Length No conduit Length No conduit defi Zero lag Beta weighting Routing timeste No. of sub-reac .433 .991 nction Node No. .433 .991</pre>	<pre>&gt; Dpth I/C; 2=Horton C tt t: (lr; 2=Rectan .266 .723 .266 .723 .266 ned factor pp </pre>	nglr; 3=SWM HYD; 4=Lin. Reserv .000 c.m/s C perv/imperv/total .000 c.m/s .000 c.m/s 7.881 c.m/s	7

COMMENT 35 3 line(s) of comment ******** REALIGNED CHANNEL - SEGMENT 3 4 CATCHMENT 300.000 ID No.ó 99999 3.180 Area in hectares 146.000 .200 15.000 Length (PERV) metres Gradient (%) Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth 146.000 .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C 1 .250 74.000 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .100 8.924 1 .991 .451 .000 c.m/s C perv/imperv/total .148 7.881 .368 .924 15 ADD RUNOFF .148 8.029 .991 .000 c.m/s CATCHMENT 4 TD No. 6 99999 301.000 .720 Area in hectares Length (PERV) metres Gradient (%) Per cent Impervious . 200 10.000 Length (IMPERV) 69.000 Sump. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" .000 1 SCS Curve No or C Ia/S Coefficient Initial Abstraction 74.000 .100 8.924 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 30 8.029 .991 .000 c.m/s .000 c.m/s C perv/imperv/total .030 .991 .367 .911 15 ADD RUNOFF .030 8.057 .991 .000 c.m/s 9 ROUTE Conduit Length .000 .000 No Conduit defined Zero lag Beta weighting factor . 000 .000 .000 Routing timestep No. of sub-reaches .030 8.057 0 8.057 .000 c.m/s COMBINE 17 Junction Node No. .030 8.057 1 8.057 8.057 c.m/s 14 START 1=Zero; 2=Define COMMENT 35 3 line(s) of comment
********** PROP DEVELOPMENT NORTH OF SEGMENT 3 - POND P30 CATCHMENT 4 30.000 ID No.ó 99999 Area in hectares Length (PERV) metres 8.470 238.000 .200 Gradient (%) Per cent Impervious .100 238.000 Length (IMPERV) .000 %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" SCS Curve No or C Ia/S Coefficient Initial Abstraction 74.000 .100 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 38 .000 8.057 8.057 c.m/s 1 .188 .368 C perv/imperv/total .368 .916 ADD RUNOFF .188 15 .188 8.057 8.057 c.m/s 4 CATCHMENT ID No.ó 99999 31.000 10.420 Area in hectares Length (PERV) metres Gradient (%) 264.000 1.000 75.000 Per cent Impervious Length (IMPERV) %Imp. with Zero Dpth 264.000 .000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1 . 250 Manning "n" SCS Curve No or C 74.000 .100 Ia/S Coefficient 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 2.113 .188 .917 8.057 8.057 c.m/s C perv/imperv/total ADD RUNOFF 15 2.113 8.057 c.m/s 2.151 8.057 2.113 2.151 8.057 HYDROGRAPH DISPLAY 5 is # of Hyetc/Hydrograph chosen Volume = .8226000E+04 c.m CATCHMENT 27 5 4 TD No. 6 99999 32.000 .690 Area in hectares Length (PERV) metres 1.000 Gradient (%) Per cent Impervious 68.000 Length (IMPERV) %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 .250 Manning "n" 74.000 SCS Curve No or C

.100 Ia/S Coefficient 8.924 Initial Abstraction 
 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv

 27
 2.151
 8.057
 8.057 c.m/s

 67
 .914
 .695
 C perv/imperv/total
 1 .127 .367 15 ADD RUNOFF .127 2.2 HYDROGRAPH DISPLAY 2.246 8.057 8.057 c.m/s 27 Volume = .8577177E+04 c.m 5 10 POND 
 FOND

 5 Depth - Discharge - Volume sets

 178.800
 .000
 .0

 179.300
 .0260
 1520.0
 180.100 .0440 4649.0 7069.0 .414 180.600 .414 .su.800 1.204 Peak Outflow = Maximum P: -.204 8137.0 reak Outflow = .250 c.m/s Maximum Depth = 180.379 metres Maximum Storage = 5999. c.m .127 2.246 COMBINE یں۔ ____30.379 met: _____5999.c.m 2.246 8.057 c.m/s 17 1 Junction Node No. .127 START 2.246 .250 8.089 c.m/s 14 1=Zero; 2=Define COMMENT 35 line(s) of comment 3 PROP DEVELOPMENT SOUTH OF SEGMENT 3 - POND P31 ********* 4 CATCHMENT ID No.ó 99999 33.000 12,960 Area in hectares Length (PERV) metres 294.000 Gradient (%) Per cent Impervious Length (IMPERV) 1.000 75.000 294.000 .000 %Imp. with Zero Dpth Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .250 Manning "n" SCS Curve No or C 74.000 Ia/S Coefficient Initial Abstraction .100 8.924 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 2.640 .000 .250 8.089 c.m/s .368 .922 .783 C perv/imperv/total 1 15 ADD RUNOFF 2.640 2.640 .250 8.089 c.m/s HYDROGRAPH DISPLAY 27 LIGHTER DISPLAY 5 is # of Hyeto/Hydrograph chosen Volume = .7430276E+04 c.m CATCHMENT 4 34.000 ID No.ó 99999 Area in hectares .660 Length (PERV) metres Gradient (%) Per cent Impervious 66.000 1.000 60.000 Length (IMPERV) %Imp. with Zero Dpth 66.000 .000 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Manning "n" SCS Curve No or C . 250 74.000 .100 Ia/S Coefficient 8.924 Initial Abstraction Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1 .122 2.640 .250 .914 .695 8.089 c.m/s C perv/imperv/total .367 ADD RUNOFF 15 ADD RUNOFF .122 2.731 .250 HYDROGRAPH DISPLAY 5 is # of Hyeto/Hydrograph chosen Volume = .7766209E+04 c.m POND 8.089 c.m/s 27 10 POND 6 Depth - Discharge - Volume sets .000 178.300 .0 1927.0 178.900 179.600 .0540 4692.0 .150 179.800 5590.0 180.000 .321 6538.0 
 180.300
 1.922
 8059.0

 Peak Outflow
 221 c.m/s

 Maximum Depth
 179.883 metres
 Maximum Storage = 5 .122 2.731 COMBINE 5982. c.m .221 8.089 c.m/s 17 BINE Junction Node No. .122 2.731 1 .122 START .221 8.131 c.m/s 14 1=Zero; 2=Define CONFLUENCE 18 1 Junction Node No. .122 8.131 COMMENT .221 .000 c.m/s 35 line(s) of comment 3 REALIGNED CHANNEL - SEGMENT 3 CATCHMENT 4 302.000 TD No. 6 99999 Area in hectares Length (PERV) metres 1.610 104.000 .200 Gradient (%) Per cent Impervious Length (IMPERV) 104.000 %Imp. with Zero Dpth
Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 . 250 Manning "n" SCS Curve No or C 74.000

.100 Ia/S Coefficient 8.924 Initial Abstraction 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .057 8.131 .221 .000 c.m/s .422 C perv/imperv/total .910 COMMENT 3 line(s) of comment 3 FLOW U/S OF NIAGARA ST CULVERT - OUTLET D

15 ADD RUNOFF

35

8.188 .221 .000 c.m/s 14

1 1=Zero; 2=Define