Sifton Properties Limited

Conceptual Stormwater Management Report and Water Balance

187 Dorchester Road

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Revision History

Rev #	Date	Revised By:	Revision Description
1	2019-08-16	JB	First Submission
2	2020-07-13	JB	Second Submission – Addressing UTRCA Comments

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1. Introduction

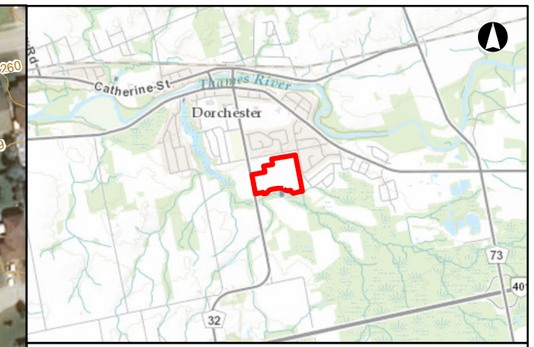
AECOM Canada Limited (AECOM) has been retained by Sifton Properties Limited (Client) to undertake a conceptual stormwater management (SWM) report prepared in support of the Draft Plan of Subdivision Approval process for the proposed Dorchester Subdivision. This report provides calculations and hydrological modelling to demonstrate that the proposed development is capable of meeting both quantity and quality control targets required by the Municipality of Thames Centre (Municipality) and the Ministry of the Environment, Conservation and Parks (MECP) for stormwater discharge.

1.1 Background Information

The Draft Plan of Subdivision document (March 19, 2020) provides details on the proposed development. The site is approximately 20.8 ha with 161 single-family lots, one medium-density / multi-family block, three street-facing townhouse blocks, and one mixed-used/commercial block. The proposed subdivision entrances are located off Dorchester Road and Byron Avenue South of Canterbury Drive. Together, the entrances will serve the single-family, multi-family and the commercial block. Refer to **Figure 1** and **Figure 2** for details regarding the study area and the conceptual draft plan of subdivision.

The subject site is located in a Wellhead Protection Area (WHPA) ‘A’ and ‘B’. The area of the site located in the WHPA-‘A’ is approximately 1.35 ha (southwest corner of the site, adjacent the municipal well), and there is an additional 17.41 ha located within the WHPA-‘B’; both areas have an aquifer vulnerability score of ‘10’. On March 27, 2018, a meeting was held with the Client, AECOM and staff at the MECP’s London District Office to discuss development and servicing restrictions within the WHPA. It was noted that, as the proposed residential development is less than 100 ha in size, it is not considered a significant threat within the Source Water Protection Areas but that there may be some restrictions to the proposed commercial and medium-density multi-family blocks related to sanitary sewers which may require enhanced design or construction requirements. For details regarding the meeting minutes, refer to **Appendix B**.

The Municipality has also expressed concerns relating to the proposed design, as they would prefer a simple and maintainable system for the conveyance and treatment of stormwater runoff. The Municipality has agreed to infiltration of runoff volumes from ‘clean’ sources, which are restricted to the rear yard areas. They have also expressed concerns relating to systems that would increase infiltration beyond existing conditions which may have a negative impact on the local groundwater levels, given the site’s close proximity to the Municipal wellhead which provides drinking water for Dorchester.



Legend

- Contours (1 m)
- WHPA-A
- WHPA-B
- Flooding Hazard (UTRCA)
- Permanent Watercourse
- Waterbody
- Property Line

0 25 50 100
Meters

187 Dorchester Road

Study Area

June 2020	1:2,700	Datum: NAD83 UTM17 Source: LIO, UTRCA
P#:	V#:	**Figure 1**

AECOM

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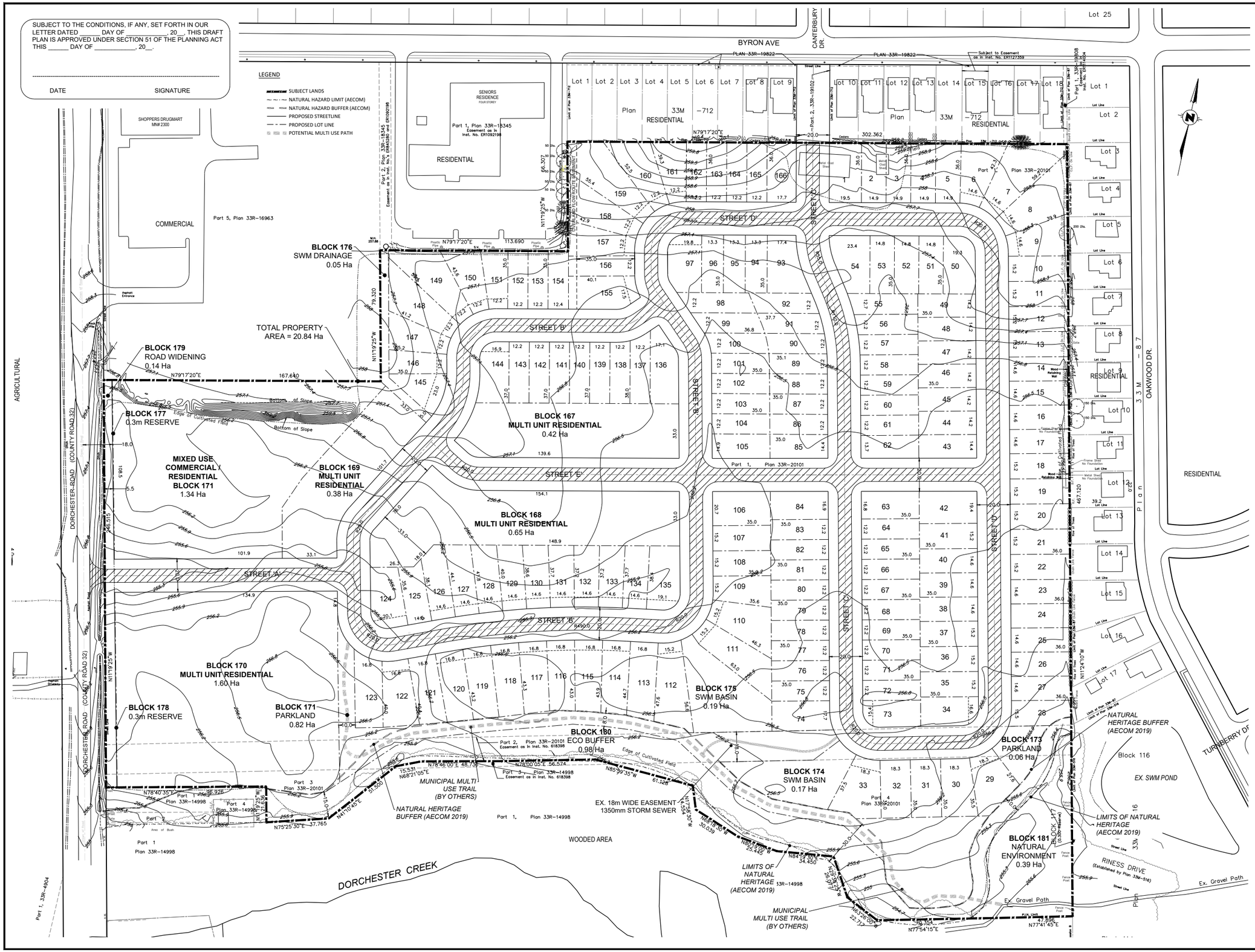
Map location: C:\Users\anna.wax\Documents\1_Projects\60568884_SiltonDorchester\GIS\MXD\MAP-2020-06-23-StudyArea-60568884.mxd
Date Saved: 2020-06-23 11:53:22 AM User Name: anna.wax

SUBJECT TO THE CONDITIONS, IF ANY, SET FORTH IN OUR LETTER DATED _____ DAY OF _____, 20__, THIS DRAFT PLAN IS APPROVED UNDER SECTION 51 OF THE PLANNING ACT THIS _____ DAY OF _____, 20__.

DATE SIGNATURE



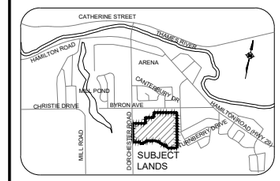
mbpc

Monteith+Brown planning consultants

610 PRINCESS AVENUE, LONDON, ONTARIO N6B 2B9
Tel.: (519) 686-1300 E-mail: mbpc@mbpc.ca

DRAFT PLAN OF SUBDIVISION

PART LOT 17 CONCESSION B, SOUTH OF THAMES RIVER, 33R-16963 PART 1
NORTH DORCHESTER
MUNICIPALITY OF THAMES CENTRE



KEY PLAN N.T.S.

OWNER'S CERTIFICATE

I, Jay McGuffin of Monteith Brown Planning Consultants, am authorized to submit this Draft Plan of Subdivision on behalf of the owner, Sifton Properties Ltd.

J McGuffin, MCIP, RPP — Date
Monteith Brown Planning Consultants

SURVEYOR'S CERTIFICATE

I hereby certify that the boundary of the lands to be subdivided as shown on this plan and their relationship to the adjacent lands are accurately and correctly shown.

Jason Wilband, O.L.S. — Date
AGM Plan, Survey , Engineer

REQUIREMENTS UNDER SECTION 51 (17) OF THE PLANNING ACT, 1990

a) as shown on plan
b) as shown on plan
c) as shown on key plan
d) as shown on land use schedule
e) as shown on plan
f) as shown on plan
g) as shown on plan
h) municipal water
i) sandy silt till
j) as shown on plan
k) municipal sewers
l) as shown on plan
l) as shown on plan

LAND USE SCHEDULE

LAND USE	AREA in Ha	PERCENT
SINGLE DETACHED RESIDENTIAL LOTS 1 to 166	9.42	45.2
MULTI UNIT RESIDENTIAL BLOCKS 167 to 170	3.05	14.6
MIXED USED COMMERCIAL / RESIDENTIAL BLOCK 171	1.34	6.4
OPEN SPACE - PARKLAND BLOCKS 172 &173	0.88	4.2
OPEN SPACE - SWM DRAINAGE BLOCKS 174 to 176	0.41	2.0
ROAD WIDENING & RESERVES BLOCKS 177 to 179	0.14	0.7
STREETS A to E	4.23	20.3
OPEN SPACE - ECO BUFFER BLOCK 180	0.98	4.7
OPEN SPACE - NATURAL ENVIRONMENT BLOCK 181	0.39	1.9
TOTAL SITE AREA	20.84	100.00

No.	Revision	Date	Initial
1	MUNICIPAL & PUBLIC COMMENTS	03/20	BS

CLIENT

Sifton

Experience. The Difference.™

BAR SCALE

1: 1,000

0 15 30 45 60m

ADDRESS

HAWTHORNE PARK SUBDIVISION
187 Dorchester Road

DRAWN BY:	CHECKED BY:	PROJECT No. :
BS	JMC	12-827
DESIGNED BY:	APPROVED BY:	DRAWING No.
BS	-	Figure 2
SCALE: on 24x36 1:1000	DATE: Mar 19, 2020	

1.2 Opportunities and Constraints

The proposed development of the subject lands provides several opportunities and constraints:

Constraints:

- Maintain existing minor/major conveyance from external areas through the site;
- Limit infiltration across the site to match existing conditions due to the presence of the wellheads adjacent to the southwest corner of the subject property, as per request from the Municipality; and,
- Address the limited opportunity to provide conventional SWM solutions based on the size of the development and limited open-space, risk to nearby wellheads; and,
- Provide a simplified, streamlined SWM system to facilitate ease of future maintenance upon assumption by the Municipality.

Opportunities:

- Provide naturalized stormwater management controls, utilizing the existing sandy soil conditions to provide infiltration through rear-yard infiltration and disconnected rainwater leaders;
- Minimize the requirement for traditional SWM systems (i.e. SWM facilities);
- Utilize remaining capacity within the trunk storm sewer to convey the 2-year design event (minor system only);
- Maintain infiltration of ‘clean’ runoff sources across the subdivision lands; and,
- Provide allowable discharge rates for the future development of the medium-density / multi-family and commercial blocks;

2. Stormwater Management

2.1 SWM Criteria

The SWM criteria for the proposed development area are based on the following documents as well as outlined in **Section 3**:

- Ministry of the Environment Stormwater Management Planning and Design Manual (2003);
- City of London 2019 Design Specifications and Requirements Manual; and,

The following SWM criteria are required for the proposed development:

- *Water Quality:* Treatment level is to be Level 1 "Enhanced" (Level 1) - 80% long-term treatment of suspended solids removal for the entire subdivision, as identified in Table 3.2 of the MOE Stormwater Management Practices Planning and Design Manual (March 2003). A treatment train approach for the front yard and ROW areas is to assist with removal efficiencies. Rear yards are to be designed to infiltrate the majority of runoff volume with zero discharge to the storm sewer network. On-site water quality treatment is required for the proposed medium-density and commercial blocks;
- *Peak Flow Attenuation:* Discharge the minor storm event (2-year City of London) to the existing trunk storm sewer, attenuate 5-year through 100-year events prior to discharging to existing trunk storm sewer as well as providing on-site attenuation for the medium-density and commercial blocks. Safe conveyance of the 250-year event is required; and,
- *Water Balance:* Provide adequate on-site water balance while limiting annual infiltration to existing (pre-development) levels in order to satisfy concerns related to the site's proximity to Municipal well-heads.

The City of London design guidelines are acceptable for use in the Municipality of Thames Centre.

2.2 Existing Conditions

The 20.8 ha site is comprised of an existing agricultural field that has development along both the Northern and Eastern boundaries, with Dorchester Road to the west and Dorchester Creek to the South. Based on the existing topography, the site drainage is split between three existing outfall locations:

- West towards the Dorchester Road east ditch and existing 600 mm CSP culvert;
- Existing 1,350 mm trunk storm sewer outlet, and,
- South towards Dorchester Creek.

There is an existing 825 mm closed conduit Municipal Drain that services the lands north of Byron Avenue including the Dorchester Terrace Retirement Residence (approximately 21 ha) which conveys drainage south across the site and discharges to an existing 1,350 mm storm sewer which in turn services the existing SWM facility to the east (approximately 26 ha). The existing 1,350 mm storm sewer conveys drainage beneath Dorchester Road through the Cromarty Lands, eventually discharging to the Mill Pond. The existing site does not currently have a storm sewer connection to either the storm sewer from Byron Avenue or the 1,350 mm trunk storm sewer. The entire site is a tributary to the South Branch of the Thames River.

2.3 Geotechnical and Hydrogeology

Golder Associates Limited (Golder) were retained to conduct the geotechnical (January 2018) and hydrogeological (March 2018) assessments for the subject site. A total of six boreholes were advanced during the site investigation. Based on the information provided by the borehole logs, it was determined that the site soils are generally sand to gravely sand with trace amounts of silt. For the hydrogeological study, a total of five monitoring wells and two piezometers were utilized to measure the groundwater levels. It was determined that the groundwater levels fluctuated from 1.6 m to 4.3 m below ground surface.

Golder also calculated representative estimates of hydraulic conductivity for the sands and gravelly sands of $5x10^{3}$ cm/s and $1x10^{-2}$ cm/s, respectively. Design infiltration rates for the sands and gravelly sands were estimated based on the assumption of 1 m of initial driving-head, a high potential for siltation and/or biofouling, and low-desired monitoring and maintenance. This yielded design infiltration rate estimates for the sands and gravelly sands on site of 5 cm/hr and 10 cm/hr, respectively. It was recommended to utilize a value of 5 cm/hr (50 mm/hr) for the design of infiltration swales, subsurface LID features, and SWM facilities, assuming LID SWM facility construction remained above the locally high-groundwater levels. For direct surface infiltration, Golder recommended a hydraulic conductivity of 36 mm/hr. Infiltration testing should be confirmed during detailed design.

The hydrogeological study also provided detailed groundwater contouring mapping. Based on the groundwater elevation monitoring, contours have been produced demonstrating the groundwater gradient flows in the southwest direction, towards the Municipal wellhead and Dorchester Creek, refer to **Figure 3** for details.

LEGEND

- BOREHOLE
- BOREHOLE / MONITORING WELL
- BOREHOLE/MONITORING WELL (LOTOWATER TECHNICAL SERVICES INC. 2006)
- MONITORING WELL NOT FOUND
- *254.18m* MEASURED WATER LEVEL - m amsl
- INFERRED GROUNDWATER FLOW DIRECTION
- GROUNDWATER CONTOUR

REFERENCE

DRAWING BASED ON BING IMAGERY AS OF NOVEMBER 7, 2017 (IMAGE DATE UNKNOWN); "CONCEPTUAL LAYOUT D" PROVIDED BY SIFTON, AUTOCAD FILE "18-827 CONCEPT D JAN 17, 2018".DWG"; LOTOWATER TECHNICAL SERVICES INC, FIGURE 2, DORCHESTER PART 1 AQUIFER TEST FINAL, MAY 2007; AND CANMAP STREETFILES V2008.4.

NOTES

THIS DRAWING IS SCHEMATIC ONLY AND IS TO BE READ IN CONJUNCTION WITH ACCOMPANYING TEXT.

BING IMAGERY USED FOR ILLUSTRATION PURPOSES ONLY AND NOT TO BE USED FOR MEASUREMENTS.

ALL LOCATIONS ARE APPROXIMATE.

PROJECT

HYDROGEOLOGICAL ASSESSMENT
PROPOSED DEVELOPMENT
187 BYRON AVENUE
DORCHESTER, MUNICIPALITY OF THAMES CENTRE, ONTARIO

TITLE

GROUNDWATER CONTOURS

GOLDER

PROJECT No.		1788468	FILE No.	1788468-2000-R01007
			SCALE AS SHOWN	REV.
CADD	LMK/ZJB	July 4/19		
CHECK				

Figure 3

Client: Sifton Properties Limited

Original Format is Tabloid 279mm x 432mm

25mm 0

Drawing file: 1788468-2000-R01007.dwg Jul 04, 2019 - 4:05pm

3. Conceptual Stormwater Strategy

The proposed SWM strategy for the residential development at 187 Dorchester Road incorporates several features that will allow the site to meet both quantity and quality control objectives while providing water balance across the site. The total site area is approximately 20.8 ha, which is proposed to increase from 0 ha of imperviousness to 10 ha of imperviousness for an ultimate site imperviousness of approximately 51%.

The proposed SWM controls have been designed using published guidelines from City of London Design Specifications and Requirements Manual (July 2019), and the MOE Stormwater Management Planning and Design Manual (March 2003), as well as input from Thames Centre, MECP, and UTRCA.

The SWM strategy for the proposed residential development is as follows:

- Goss traps combined with catchbasin inserts such as LittaTrap providing pre-treatment of floatables, coarse sediments, and other debris;
- Enhanced catchbasin sumps to facilitate the pre-treatment capture of sediments
- Disconnected building rainwater leaders;
- Rear-yard infiltration where practical and where grading permits, complete with overflow catchbasins and an overflow route to the ROW;
- Water quality treatment for the proposed ROWs provided via oil-grit separators (OGS) units;
- On-site quantity/quality controls for the proposed commercial and medium-density/multi-family blocks;
- Unrestricted conveyance for both minor and major flows for the external lands; and,
- Major overland flow directed to Dorchester Road and Dorchester Creek.

Refer to **Appendix A** for the conceptual storm sewer area plan and design sheet drawings, and **Table 1** below for a general summary of the conceptual subdivision SWM design.

Table 1: Subdivision SWM Systems Summary

Characteristics	Value
Service Catchment Area (ha)	20.83
Level of Water Quality Protection	2 x OGS Units Level 1 - 80% Long-Term S.S. Removal Goss Traps LittaTrap Catchbasin Insert
Impervious Area (ha)	10.58
Total Imperviousness (%)	51
Water Quality Protection	OGS Unit x 2
Minor Storm Sewer Outlet to Dorchester Road	
Service Area (ha) - Total Tributary Area	3.83
Impervious Area (ha)	2.57
Imperviousness (%)	67
2-Year Peak Inflow (m^3/s)	1.52
Minor Storm Sewer Outlet East	
Service Area (ha)	4.22
Impervious Area (ha)	2.11
Imperviousness (%)	50
2-Year Peak Inflow (m^3/s)	0.43
Minor Storm Sewer Outlet West	
Service Area (ha)	3.60
Impervious Area (ha)	1.97
Imperviousness (%)	55
2-Year Peak Inflow (m^3/s)	0.30
Rear-Yards	
Service Area (ha)	7.07
Impervious Area (ha)	3.92
Imperviousness (%)	55
2-Year Peak Inflow (m^3/s)	0.00
Major Overland Flow Attenuation Basin East	
Service Area (ha)	5.56
Impervious Area (ha)	2.85
Imperviousness (%)	51
Depth (m)	0.80
Max. Attenuation Volume (m^3)	480
Outlet Configuration	300 mm Circular Orifice Plate
250-Year 24-hour Major Overland Inflow (m^3/s)	0.92
Major Overland Flow Attenuation Basin West	
Service Area (ha)	28.27
Impervious Area (ha)	15.90
Imperviousness (%)	56
Depth (m)	1.30
Max. Attenuation Volume (m^3)	919

Outlet Configuration	300 mm Circular Orifice Plate
250-Year 24-hour Major Overland Inflow (m^3/s)	2.09

*Buffer space = 2.12 ha

3.1 Source Water Protection

As noted in **Section 1.1**, the majority of the subject lands are located within a WHPA 'A' or WHPA 'B'. As per the meeting with the MECP (formerly MOECC), it was agreed that the proposed development can occur in the WHPAs as it is a residential development and does not exceed 100 ha. It was acknowledged that OGS units and SWM facilities would be allowed within the WHPA 'B', and that infiltration can be utilized to assist with development of the site's SWM controls.

As previously discussed, the subject lands have a high vulnerability score of '10', and care should be taken during detailed design reduce activities that may pose a high risk to drinking water. These may include but are not limited to the selection of enhanced construction techniques, mitigation of risks related fuel spills, implementation of an emergency spill management plan, and selection of appropriate pipe materials.

3.2 Subdivision SWM Systems

3.2.1 Quantity Control

3.2.1.1 Rear-Yards

It is proposed to direct the clean runoff from the rear portion of the residential buildings (grading and disconnected rainwater leaders) toward the rear-yard areas to be infiltrated through topsoil and the existing sandy soils. This assists with limiting discharge to the existing trunk storm sewer and improves the subdivision water balance. It is proposed to allow for only 0.30 m of ponding depth in the rear-yards before overflowing to the ROW. By limiting the ponding depth to 0.30 m, it provides for more useable rear-yard space and virtually reduces nuisance ponding. The design of the rear-yard ponding areas has been calculated based on conceptual grading and a design surface infiltration rate of 36 mm/hr, as per the recommendations provided by Golder. The rear-yards should be graded during detailed design to provide approximately 2,350 m^3 of surface storage to facilitate the infiltration of clean runoff volumes up to and including the 100-year event. A catchbasin inlet set at the top of the proposed ponding elevation will be required to capture any excessive ponding volume and to redirect excess volumes to the storm sewer network within the ROW. An overland flow route should also be designed to provide relief in the event of a catchbasin blockage or during a major storm event producing excessive volumes of runoff; this volume will be directed to the subdivision ROW and follow the proposed overland flow route.

3.2.1.2 Right-of-Way

The existing storm sewer providing conveyance from the Byron Avenue area north of the proposed development through the site outletting to the existing 1,350 mm trunk storm sewer is required to be rerouted as a result of the proposed subdivision layout. This storm sewer will continue to service the upstream areas unimpeded; however, it will be required to convey drainage from a small area of the proposed subdivision ROW, which includes restricted discharge from the proposed commercial and medium-density development blocks. Due to the additional length of the sewer and the slight increase in tributary area, the proposed storm sewer diameter has been increased to provide the necessary conveyance capacity. Refer to **Appendix A** to reference the preliminary engineering drawings.

The minor system for the subdivision is to be designed to convey the 2-year design storm event and will be connected to the existing 1,350 mm trunk storm sewer. Events exceeding the 2-year event will be conveyed overland to downstream attenuation basins before discharging into the 1,350 mm trunk storm sewer. Limiting the discharge to the 2-year event can be achieved via orifice plates or reduced pipe-diameter (sizes to be confirmed during detailed design). It could also be controlled via inlet capacity restrictions through the design of the catchbasin inlets. Details regarding flow limitation/restriction should be discussed with the Municipality during detailed design to determine the most practical design for ease of operation and maintenance by the Municipality. For storm events exceeding the 2-year (minor system) event, the discharge will be conveyed via the overland flow route (the ROW) and discharged into two separate dry-basin facilities located along the south limits of the development. These dry-basins will attenuate the drainage via orifice plates to limit discharge to the 1,350 mm trunk sewer via outlet pipe complete with orifice plates, ultimately reducing the peak discharge to the drain until adequate conveyance capacity is recovered. The block sizes require a minimum block area of 0.17 ha and 0.19 ha for Blocks 174 and 175, respectively. It should be noted the intent of these basins is not to infiltrate the major event volume and the detailed design should incorporate features to prevent infiltration such as a clay liner. Refer to **Appendix C** for more detailed calculations. Details regarding the capacity of this trunk storm sewer are summarized in **Section 3.2.8** of this report.

3.2.2 Quality Control

3.2.2.1 Goss Traps and LittaTraps

To mitigate against excess amounts of coarse sediment buildup within sewers and downstream SWM features, it is proposed to provide a treatment-train approach which includes catchbasin inserts as well as extended (enhanced) catchbasin sumps (900 mm as opposed to standard 600 mm sump depth), complete with a goss trap in each catchbasin within the ROW. The catchbasin inserts, similar to that of the LittaTrap product highlighted in **Figure 4**, are designed to capture the large floatables and coarse debris (greater than 5 mm diameter) that may bypass the goss trap. The maintenance of these inserts are simple and entails lifting them out of the catchbasin and safely disposing of the captured contents.

The goss traps function by providing a submerged outlet design that prevents floatables and larger particles and debris from discharging to the local storm sewer, thereby helping to protect against the buildup of sediments and debris within the pipe network and the downstream facilities. They will provide additional support for floatables that are less than 5 mm that the catchbasin insert cannot effectively remove from the system. The extended catchbasin sumps will also provide additional sediment storage capacity, thereby reducing the requirement maintenance frequency of the inlet devices.

There are several manufacturers who produce such products that can be installed after purchase, and others that can be ordered directly installed from the manufacturer such as the units produced by Forterra and LittaTrap, as noted in **Figure 4**.

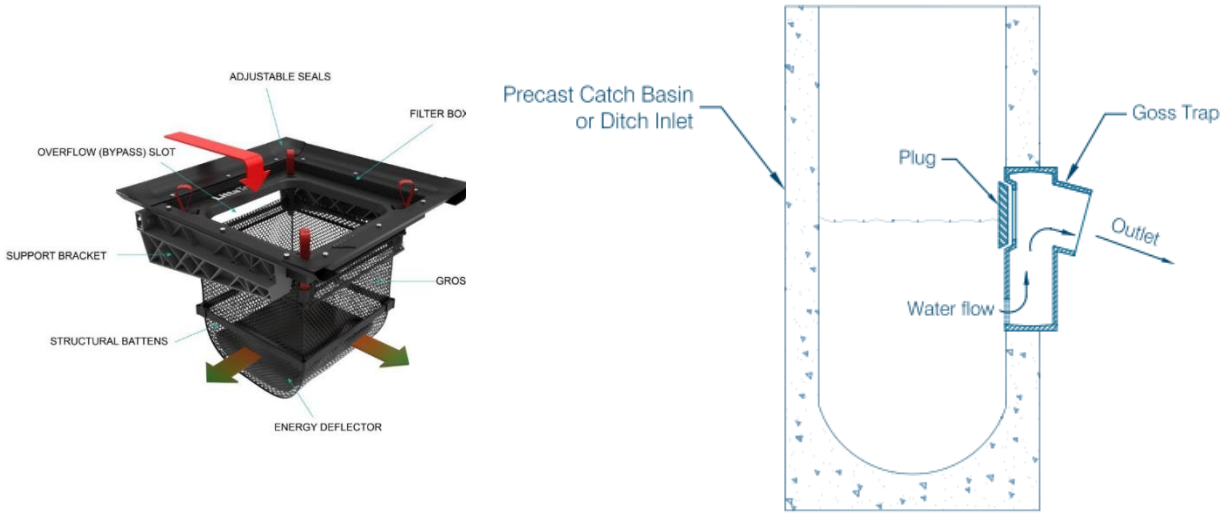


Figure 4: LittaTrap and Goss Trap (Typical)

3.2.2.2 Oil-Grit Separators

Enhanced water quality treatment (i.e. 80% long-term TSS removal) will be provided by oil-grit separator (OGS) units that treat the discharge from the ROW after the coarse sediment removal afforded by the goss and LittaTraps. It is proposed to provide two strategically-placed units to treat drainage prior to discharging to the existing 1,350 mm trunk storm sewer. The drainage from lands north of the proposed development are not to be treated as it is an existing condition; drainage will be re-routed to the existing 1,350 mm trunk storm sewer as per the existing conditions. The units were sized based on the continuously deflective separators developed by Contech; however, alternatives may be considered but are subject to approval by the design engineer. Sizing to be confirmed during detailed design. Refer to **Table 2** for a Contech unit summary, and **Appendix C** for detailed unit sizing calculations.

Table 2: OGS Unit Sizing

Parameters	OGS Unit #1	OGS Unit #2
Tributary Area (ha)	3.21	4.78
Imperviousness (%)	50	51
MOE (2003) Treatment Level	Level 1 “Enhanced” Treatment (80% Annual TSS Removal)	Level 1 “Enhanced” Treatment (80% Annual TSS Removal)
Model	CDS 3030_6	CDS 3035_6ES
Structure Size (mm)	1829	1829
Particle Size Distribution	Fine	Fine
Treatment Flow Rate (L/s)	85	108
Annual Load Removal Efficiency (%)	82.1	80.2
Predicted Annual Rainfall Treated (%)	97.4	96.3
Hydrocarbon Storage (L)	895	994
Sediment Storage (L)	2,402	3,203
Total Holding Capacity (L)	5,284	6,476
Estimated Cleanout Frequency (months)	18-24	18-24

3.2.3 Commercial and Medium-Density Blocks

The proposed mixed-use/commercial and medium-density/multi-family blocks are to have on-site quantity and quality control systems to treat stormwater drainage prior to outletting to the subdivision's storm sewer network. The proposed discharge restrictions for the blocks have been determined through the detailed modeling and are required to reduce peak discharge and time-to-peak to the receiving storm sewer network. Refer to **Table 3** for details regarding the peak discharge requirements.

Table 3: Peak Discharge Restrictions for Private Blocks

Block	2-Year Discharge (L/s/ha)	100-Year Discharge (L/s/ha)
Mixed-Use/Commercial	8	10
Medium-Density / Multi-Family	8	20

The quality control systems that are to be provided are to meet MOE (2003) Level 1 "Enhanced" treatment (80% annual TSS removal) prior to discharging to the subdivision storm sewer network. The Engineer of Record for the design of both blocks should consider systems that will not have a negative impact on the groundwater, as the commercial and medium-density / multi-family blocks are located in WHPA-'A' and WHPA-'B' locations. It has been proposed to limit excess infiltration from the proposed impervious areas within these blocks due to their proximity to the WHPAs, as runoff from impervious areas is typically of a lower quality and often associated with contaminants like roads salts.

3.2.4 SWM Hydrologic Modeling

PCSWMM was used to model the minor and major conveyance system including the functionality of both the existing conditions and the proposed on-site SWM systems. The hydraulic component of the model is comprised of nodes and 1-dimensional flow links which define both the street network and underground storm sewer conveyance system.

3.2.5 Conveyance

As part of the overland SWM strategy, conveyance of stormwater runoff is to be safely conveyed through the proposed development to the proposed storm sewer network. Both minor and major systems have been designed to adequately convey the discharge to the minor and major inlets to either the trunk storm sewer or Dorchester Creek.

3.2.5.1 Minor System

The 20.8 ha subdivision is to be serviced via storm sewer networks to convey drainage from the proposed ROW to the existing trunk storm sewer along the south portion of the site. The rear-yards are to be provided with an overflow catchbasin to intercept excessive volumes and conveyed to the storm sewer network. The rear-yards are also to be provided with overflow locations in the event of frozen ground and / or major storm events in which the drainage will be conveyed by the ROW.

The minor system is to convey runoff from front yards and the ROW to be treated by downstream quality control units prior to discharging to the existing trunk storm sewer. Approximately 11.65 ha of area directly contributes runoff to the storm sewer network across the site. Refer to **Appendix A** for the preliminary engineering drawings for details regarding tributary area draining to the proposed storm sewer network.

3.2.5.2 Major System

Proposed internal roadways are assumed to have the following typical cross section parameters:

- 20.0 m ROW width;
- 10 m pavement width;
- 2.0% roadway cross slope;
- 0.15 m curb height;
- 0.5% longitudinal slope (shallowest); and,
- 2.0% boulevard cross slope.

Table 4 provides the conveyance flow rate for the typical road cross-sections at various longitudinal slopes, assuming maximum road depth of 0.30 m (at the gutter). Further details related these calculations are provided in **Appendix C**. Overland flow and ROW slopes should be confirmed during detailed design.

Table 4: Road Conveyance

Slope (%)	Flow Rate (10 m Pavement Width) (m^3/s)	Velocity-Flow Depth Product (m^2/s)	Safe for Pedestrians?
0.25	4.0	0.02	Yes
0.50	5.6	0.03	Yes
0.75	6.9	0.04	Yes
1.00	7.9	0.04	Yes

The largest expected major overland peak flow rate through the subdivision ROW is approximately 3.0 m^3/s and can be conveyed through a standard 20 m cross-section with a minimum longitudinal slope of 0.25%, but a minimum slope of 0.50% is recommended. The velocity-flow depth product is required to be less than 0.80 m^2/s as per Section WC-13, 3.2.2 of the MTO Highway Drainage Design Standards.

Careful consideration should be taken during detailed design to provide adequate overland flow inlet sizing to the proposed dry-basin facilities for the control of overland flow through the subdivision. This relates to ensuring adequate spacing between lots and clearance from proposed doorways and window wells.

3.2.6 Existing Conditions

3.2.6.1 Existing Land Use

As discussed in **Section 2.2**, the existing land-use is agricultural, with the entire property being under cultivation as an agricultural field.

3.2.6.2 Soil Conditions

The Golder study concluded the existing on-site soils are underlain by glaciolacustrine derived sandy to gravelly sands, and massive fine textured silt deposits. Based on these findings, a conservative SCS curve number of 74 was applied to the open field areas, whereas curve numbers of 60, 70, and 75 were applied to the woodlot, existing residential, and commercial areas, respectively. A CN of 69 was applied to the existing residential subdivision to the southeast, as per the Quail Run Subdivision, Dorchester Stormwater Management Plan (Stantec, 2003). These curve

numbers were corrected to a CN III* number based on initial abstractions then converted to CN II* to be inputted into the PCSWMM modeling software.

The curve numbers were based on SCS runoff curve numbers for agricultural lands in "*Hydrology", suppl. A to Sec 4, Engineering Handbook, USDA, Soil Conservation Service, 1968*, and MTO Drainage Manual Design Chart 1.09. Refer to **Appendix C** for details regarding the subcatchment CN values. The modified CN II* calculations were calculated utilizing the equation listed in the Otthymo Manual:

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

$$CN\ II^* = \frac{10CN\ III^*}{23 - 0.13CN\ III^*}$$

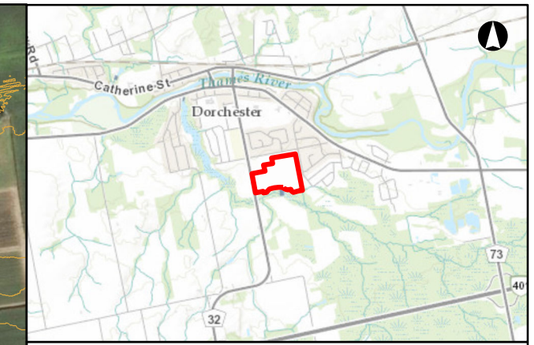
Where: CN II* = Modified SCS soil Curve Number, and S* = Soil Storage(mm)

3.2.6.3 Existing Catchments

Catchment parameters were based on the City of London Design Specifications and Requirements Manual (Updated: 2019), as the Municipality of Thames Centre does not have published values. This was utilized to address site specific drainage conditions as determined by soil survey maps, topographic contours and historical aerial photos. Catchment drainage areas were delineated using historical 0.5 m and 1.0 m contours and detailed topographic survey, where the external lands tributary areas were derived from existing record drawings. Soil curve numbers (CN) were determined based on soil survey maps and land cover. The CN parameters were adjusted to CN II* (modified curve number) to correlate with the applied initial abstraction (IA); refer to **Section 3.2.6.2** above for further details. Refer to **Table 5** for details regarding the existing conditions catchment areas and **Figure 5** for the existing conditions catchments.

Table 5: Existing Conditions Catchment Input Parameters

Catchment ID	Area	TIMP	Pervious IA	Impervious IA	Catchment Length	CN II*
	(ha)	(%)	(mm)	(mm)	(m)	
A1	15.55	0	5	2	180	71
A2	5.29	0	5	2	75	69
Total Subdivision Lands	**20.83**	**0**	**-**	**-**	**-**	**-**
External Lands						
EXT1	20.02	55	5	2	370	65
EXT2	25.80	55	5	2	410	65
EXT3	3.24	75	5	2	150	72
EXT4	1.29	88	5	2	90	72
EXT5	0.72	55	5	2	25	65
EXT6	0.49	50	5	2	60	65
EXT7	0.89	55	5	2	20	65
EXT8	16.26	55	5	2	330	64
Total External Lands	**68.71**	**57**	**-**	**-**	**-**	**-**
Total Tributary Area	**89.54**	**43**	**-**	**-**	**-**	**-**



Legend

- Outfall
- Contours (1 m)
- WHPA-A
- WHPA-B
- Flooding Hazard (UTRCA)
- Intermittent Watercourse
- Permanent Watercourse
- Waterbody
- Property Line

Existing Catchments

- Field
- External

0 50 100 150 200 250
Meters

187 Dorchester Road

Existing Conditions

June 2020	1:5,500	Datum: NAD83 UTM17 Source: LIO, UTRCA
P#:	V#:	

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Figure 5

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3.2.6.4 Existing Model Results

The results produced from the existing conditions PCSWMM model have been summarized according to outfall location in **Table 6**, below. Refer to **Appendix D** for details regarding outfall locations, detailed model schematic, input, and output.

Table 6: Existing Conditions Peak Outfall Discharge

Outfall ID	Peak Flow (m^3/s)								
	25 mm 24-hr SCS	2-Yr 3-hr Chc	5-Yr 3-hr Chc	10-Yr 3-hr Chc	25-Yr 3-hr Chc	50-Yr 3-hr Chc	100-Yr 3-hr Chc	250-Yr 3-hr Chc	250-Yr 24-hr Chc
Dorchester Creek	0.00	0.02	0.02	0.04	0.08	0.18	0.25	0.32	0.40
Existing Ditch / Culvert	0.34	0.66	0.68	0.82	1.03	1.19	1.37	2.13	2.77
Existing Sewer Outlet	1.67	3.08	3.12	3.28	3.53	3.69	3.80	3.86	3.90

3.2.7 Proposed Conditions

The proposed development is to include 20 m right-of-ways complete with storm sewers, sanitary sewers, and watermains. The subdivision grading is to be split east and west to provide adequate sanitary sewer design, utilizing existing capacity at the facility located along Oakwood Drive. As discussed in **Section 3.2.1.2**, a small portion of the ROW on the west portion of the site will be a tributary to the proposed realigned storm sewer servicing the Byron Avenue area north of the proposed development, as providing dual storm sewer networks would not be possible or practical through the subdivision ROW. For details regarding the proposed conditions, refer to **Appendix A** to reference the proposed preliminary engineering drawings.

3.2.7.1 Proposed Land-Use

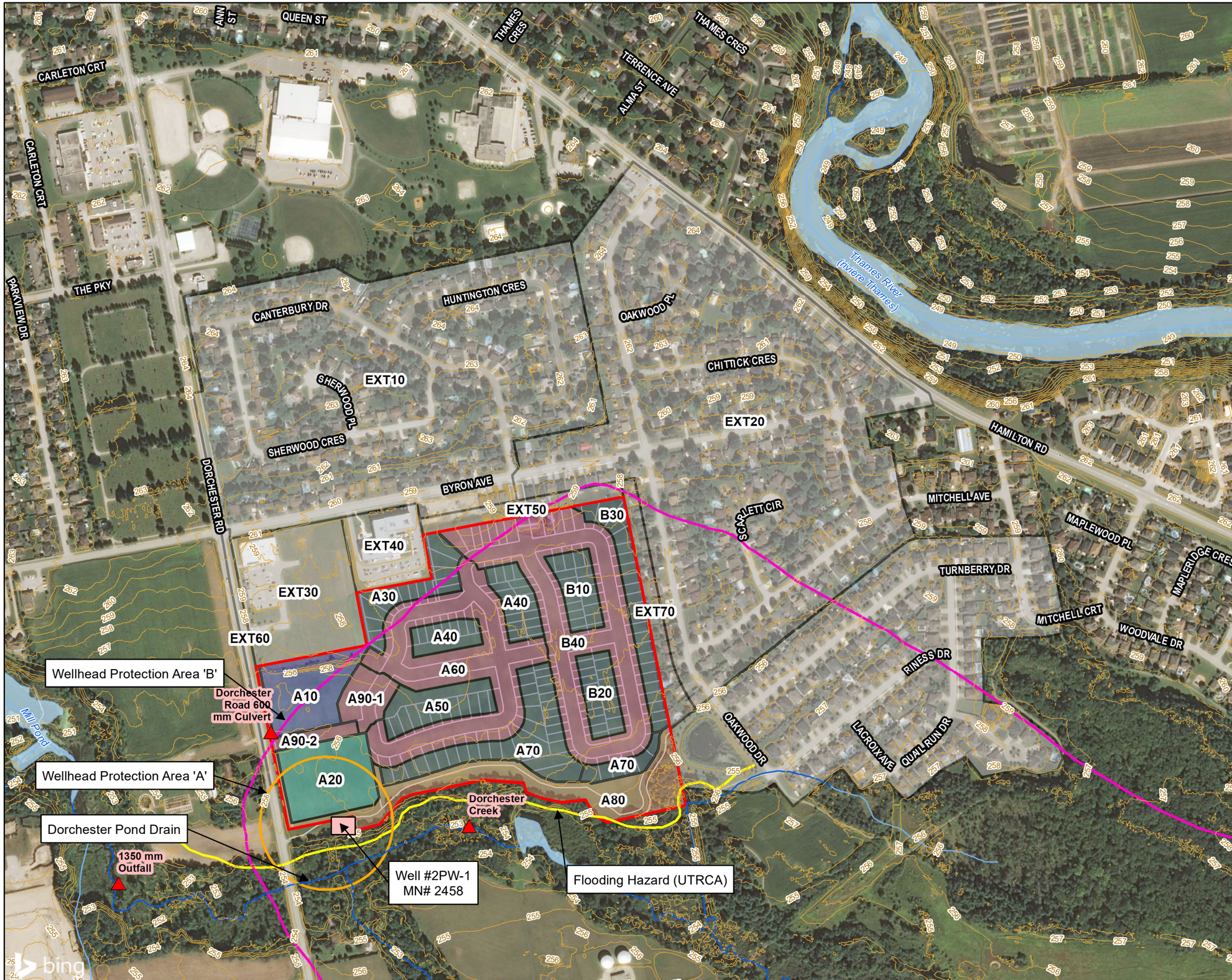
The proposed land-use for the development is to include 161 single-family lots, one medium-density / multi-family block, three medium-density / street-facing townhouse blocks, and one mixed-used/commercial block. The assigned imperviousness for the single-family residential, medium-density, commercial blocks are, 55%, 65%, and 75%, respectively.

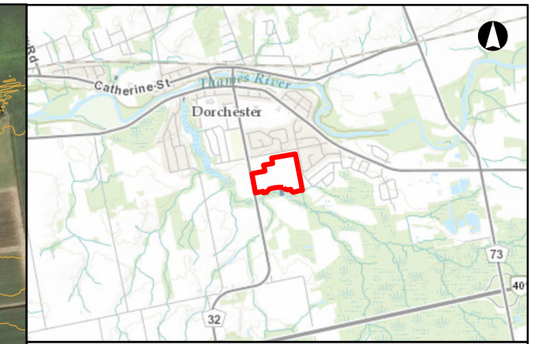
3.2.7.2 Proposed Catchments

Catchment parameters were based on the City of London Design Specifications and Requirements Manual (Updated: 2019), as the Municipality of Thames Centre does not have published values. This was utilized to address the proposed site drainage conditions as determined by both the pervious surfaces (land-use) and existing underlying soils. Catchment areas were delineated based on conceptual grading (as discussed in **Section 3.2.7**) and storm area plan, while routing surface runoff to the appropriate outlet locations. Utilizing the same outfalls as the existing conditions will assist with comparing the post-development and existing conditions. The curve number for the subdivision lands was set to CN = 74, which was corrected to a CN III* number based on initial abstractions then converted to CN II* to be inputted into the PCSWMM modeling software; a CN II* of 65 was applied to residential areas. The curve number was selected to reflect a thicker (0.6 m) topsoil depth which is intended to enhance the abstraction of runoff. Refer to **Table 7** for details regarding the proposed conditions catchment areas and **Figure 6** for the proposed conditions catchments.

Table 7: Proposed Conditions Catchment Input Parameters

Catchment Number	Area	TIMP	Pervious IA	Impervious IA	Catchment Length	CN II*
	(ha)	(%)	(mm)	(mm)	(m)	
A10	1.34	75	2	5	90	65
A20	1.60	65	2	5	100	65
A30	0.87	55	2	5	30	65
A40	1.04	55	2	5	30	65
A50	0.88	59	2	5	30	65
A60	3.60	55	2	5	160	65
A70	1.97	55	2	5	110	65
A80	2.12	0	2	5	45	65
A90.1	0.57	65	2	5	60	65
A90.2	0.32	50	2	5	50	65
B10	0.63	55	2	5	30	65
B20	0.62	55	2	5	30	65
B30	1.05	55	2	5	30	65
B40	4.22	50	2	5	170	65
Total Subdivision Lands	**20.83**	**51**	**-**	**-**	**-**	**-**
External Lands						
EXT10	20.02	55	2	5	370	65
EXT20	25.80	55	2	5	410	65
EXT30	3.24	75	2	5	150	72
EXT40	1.29	75	2	5	90	72
EXT50	0.72	55	2	5	25	65
EXT60	0.49	50	2	5	60	65
EXT70	0.89	55	2	5	20	65
EXT80	16.26	55	2	5	330	64
Total External Lands	**68.71**	**56**	**-**	**-**	**-**	**-**
Total Tributary Area	**89.54**	**55**	**-**	**-**	**-**	**-**





Legend

- Outfall
- Contours (1 m)
- WHPA-A
- WHPA-B
- Flooding Hazard (UTRCA)
- Intermittent Watercourse
- Permanent Watercourse
- Waterbody
- Property Line

Proposed Catchments

- Buffer
- Commercial
- External
- Medium-Density
- Right of Way
- Rear Yard

0 50 100 150 200 250
Meters

187 Dorchester Road

Proposed Conditions

June 2020	1:5,500	Datum: NAD83 UTM17 Source: LIO, UTRCA
P#:	V#:	

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Figure 6

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3.3.3.3 Proposed Conditions Model Results

A systems approach was used to analyze the peak inflow, attenuation, infiltration volume, and discharge from the proposed SWM system. The design of the proposed SWM system utilizes the pre-existing capacity of the 1,350 mm trunk storm sewer while attenuating runoff volumes which exceed the 2-year to 100-year (inclusive) City of London design storm event prior to overflowing to the south buffer and, ultimately, to the Dorchester Creek and Mill Pond. Refer to **Table 8** for proposed conditions summary details.

Table 8: Proposed Conditions Peak Outfall Discharge

Outfall ID	Peak Flow (m^3/s)								
	25 mm 24-hr Chc	2-Yr 3-hr Chc	5-Yr 3-hr Chc	10-Yr 3-hr Chc	25-Yr 3-hr Chc	50-Yr 3-hr Chc	100-Yr 3-hr Chc	250-Yr 3-hr Chc	250-Yr 24-hr Chc
Dorchester Creek	0.00	0.01	0.02	0.03	0.06	0.08	0.12	1.38	2.39
Existing Ditch / Culvert	0.33	0.64	0.65	0.78	0.94	1.06	1.19	1.43	1.50
Existing Sewer	1.99	3.58	3.65	4.19	4.50	4.62	4.77	4.94	4.99

3.2.8 Trunk Storm Sewer Capacity

As discussed in **Section 3.2.1.2**, it is proposed to discharge the front-yards and ROWs of the single-family portion of the subdivision to the existing 1,350 mm trunk storm sewer to take advantage of the available capacity remaining in the trunk storm sewer. Based on the results of the existing conditions model, the trunk sewer is operating at approximately 80% of it's available full-flow capacity during the 2-year storm event with minor surcharging in one portion of sewer length. With the additional uncontrolled discharge from the proposed front yards and ROW during the 2-year event, the trunk storm sewer is operating near full-flow capacity during the 2-year design storm event with an average 90% of the available full-flow depth being utilized. There is minor surcharging of approximately 0.15 m at the approximate connection points for the subdivision storm sewer. The surcharging is negligible as the timing of the surcharge spans less than 10 minutes over the course of the 3-hour event, as per model simulations. Due to the additional volume provided by the re-routed 975 mm sewer to Dorchester Road, the hydraulic head at Byron Avenue has been reduced by approximately 0.30 m. During detailed design, the outlet velocities of the trunk storm sewer should be evaluated, and a determination made as to whether or not increased riprap protection or other materials should be used if the existing protection is deemed inadequate. Refer to **Figure 7** and **Figure 8** for details regarding the hydraulic grade line in the 1,350 mm trunk storm sewer for the 2-year event.

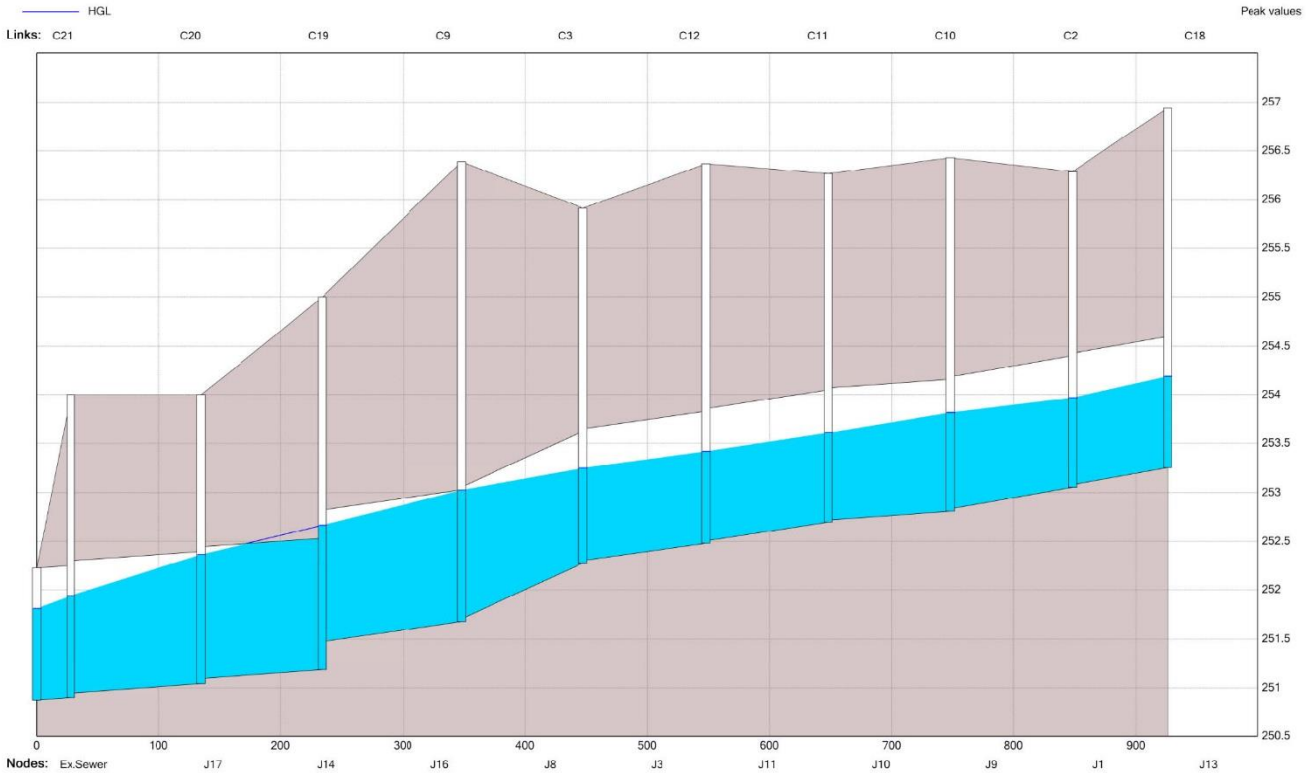

Figure 7: Existing Hydraulic Grade Line - 1,350 mm Trunk Storm Sewer (2-Year)

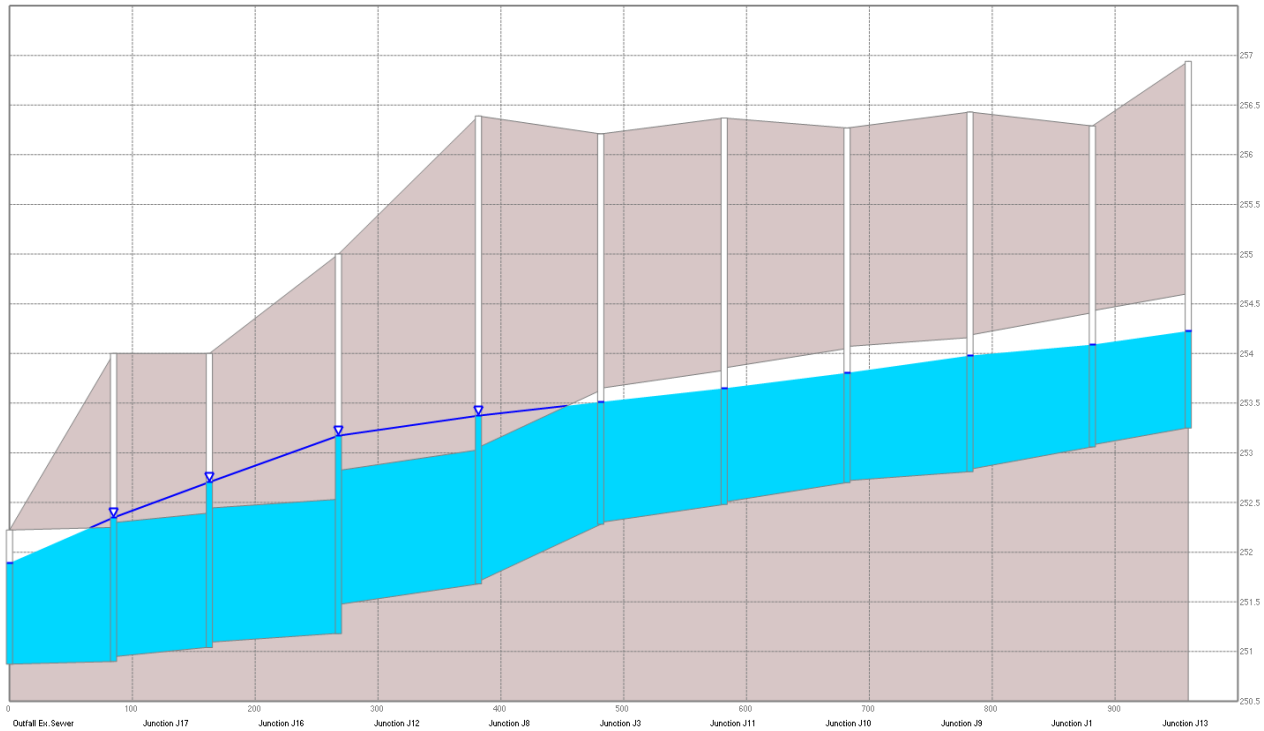

Figure 8: Proposed Hydraulic Grade Line - 1,350 mm Trunk Storm Sewer (2-Year)

3.3 Summary of Results

The conceptual SWM strategy utilizes both the remaining conveyance capacity in the 1,350 mm trunk storm sewer to convey the minor storm event (2-year City of London) as well as on-site controls for the medium-density and commercial blocks, while infiltrating 'clean' runoff in the rear-yard areas. Peak discharge from the subdivision decreased to Dorchester Road as well as Dorchester Creek as compared to the existing conditions. A minor (16%) increase in peak discharge at the 1,350 mm trunk storm sewer outlet occurs during the 2-year event with a minor surcharge increase (0.19 m depth) at the locations of the proposed subdivision storm sewer connection. Rerouting of the existing storm sewer from Byron Avenue results in a net overall improvement to conveyance capacity; thereby reducing hydraulic impacts to the external storm sewer network. The rear-yard swales effectively store and infiltrate the runoff from the rear portion of the buildings and landscaped area eliminating discharge during the majority of storm events and reducing the overall peak discharge to the existing trunk storm sewer system while promoting infiltration for water balance. The proposed dry-basin facilities effectively attenuate peak discharge from the events which exceed the capacity of the proposed local storm sewer network and dampen the discharge to the existing trunk storm sewer.

4. Water Balance

4.1 Introduction

To address UTRCA requirements, AECOM completed a water balance analysis to demonstrate that no adverse impact to the overall site water balance will occur as a result of the development, and also to demonstrate that adequate controls have been included within the design to promote infiltration across the site. This was completed for each of the existing site outfalls identified in **Figure 4** and **Figure 5**.

The water balance can be expressed in terms of inputs (precipitation (P)) and outputs (evapotranspiration (ET), runoff (R), and infiltration (I)).

$$P = ET + R + I$$

A monthly average water balance approach was developed, utilizing monthly average climate information for London, ON (1981-2010), from the Federal Ministry of the Environment and Climate Change. Parameters such as average monthly temperature and total monthly precipitation were utilized to estimate the monthly heat index, potential evapotranspiration, daylight correction value, and the surplus and deficit potential based on the Thornthwaite and Mather method (1957). If precipitation exceeds evapotranspiration and the excess is not used by plants, there is a surplus of water in soil moisture conditions. When evapotranspiration exceeds precipitation, there is a deficit of moisture, and recharge occurs until this deficit is recovered. There is typically a water surplus in the winter months which results in runoff and infiltration when melting and thaw occurs. From this information, it was determined that the annual water budget (based on average monthly data) results in 1,012 mm of precipitation, 496 mm of evapotranspiration (adjusted), including a surplus and deficit of 516 mm and 167 mm, respectively. This equates to a total water surplus of 516 mm annually (which includes both total annual infiltration + runoff). Furthermore, both the existing and proposed subdivision catchments were analyzed using on the MOE Stormwater Management Planning and Design Manual (2003) Table 3.1: Hydrological Cycle Component Values; the relative infiltration and runoff split is consistent with the values in this table.

Only the subdivision catchment areas were included in this assessment according to both the existing and proposed conditions. For details regarding the existing and proposed conditions water balance assessment, refer to **Appendix F.**

4.2 Existing Conditions

Using the climate information and derived parameters summarized in **Section 4.1** above, the existing conditions water balance was evaluated, refer to **Table 10** for details. Based on the calculations, it was determined that approximately 28,100 m^3 of annual runoff volume is directed to the existing 600 mm CSP that crosses beneath Dorchester Road, and 9,600 m^3 to Dorchester Creek (total of 37,700 m^3). The annual infiltration volume was estimated to be approximately 69,900 m^3. When considered in conjunction with the groundwater contour information produced by the hydrogeology study, this suggests that there will be some discharge to Dorchester Creek and the wellhead location. Groundwater contour mapping suggests that infiltration from the subject lands is directed towards Dorchester Creek. Refer to **Table 11** for details pertaining to the discharge to each outlet.

Table 9: Existing Conditions Annual Water Budget for the Subdivision

Parameter	Volume (m^3/year)	Depth (mm/year)
Precipitation	210,800	1,012
Evapotranspiration	103,300	496
Infiltration	69,900	335
Runoff	37,600	181

Table 10:Existing Conditions Annual Discharge

Parameter (ID)	Sewer/Culvert (m^3/year)	Dorchester Creek (m^3/year)
Precipitation	157,300	53,500
Evapotranspiration	103,300	
Infiltration	69,900	
Runoff	28,100	9,600
Total Discharge	**28,100**	**79,500**

4.3 Proposed Conditions

The location of the existing municipal wellhead in relation to the subject site imposes additional stormwater design constraints, particularly with respect to meeting the water balance targets within the proposed development lands. The Municipality of Thames Centre has expressed concerns regarding the maintenance of infiltration across the site. While the Municipality does not want net infiltration to decrease, it is more important that infiltration is not increased in such a way that it may negatively affect groundwater quality. As such, infiltration measures have been proposed in locations where clean runoff sources exist. This includes the infiltration of runoff from portions of the impervious building areas and rear-yards, whereas the ROW drainage is to be treated through the more conventional use of a treatment train approach which includes a combination of catchbasin inserts, goss traps, extended sumps, and OGS units, prior to discharge to the trunk storm sewer. The net result of these constraints is that it leaves limited opportunities to increase infiltration capacity, and to reduce the resultant increase in runoff volume to the trunk storm sewer discharging to the Mill Pond to the west. However, an increase in treated runoff volume from the site to the Mill Pond should have little affect as the subject site accounts for approximately 0.9% of the total Mill Pond tributary area (~2,191 ha, MNRF OFAT).

The proposed conditions analysis utilized the same approach as the existing conditions analysis, based on a total tributary area of 20.8 ha (subdivision only). The corresponding water balance analysis indicates there will be a 32% decrease in evapotranspiration due to the creation of new impervious areas, and a 13% decrease in infiltration across the site. A 113% increase in annual runoff volumes across the site was calculated, with the additional volumes directed to the 1,350 mm trunk storm sewer. Overall, an estimated 19% reduction in total discharge (infiltration and runoff) to Dorchester Creek was calculated, which is considered to be a minor deviation from existing conditions in light of the need to safeguard the WHPA. The increase in runoff volume to the trunk storm sewer is due to the impervious area of the subdivision and limitations on the annual infiltration volume the Municipality would be comfortable with due to the proximity of the wellhead. Furthermore, no additional infiltration of runoff from the ROW or impervious areas from within the commercial or medium-density blocks has been explored due to their location within or adjacent to the WHPA-'A', and this has been done deliberately in order to reduce the risk of impacting the wellhead, as per Municipal request. Additional measures may be undertaken during detailed design to increase infiltration to match existing conditions; however, any additional measures would be limited to the ROW area where enhanced pre-treatment will be required prior to infiltration. Further refinements to the water balance can be explored during detailed design. Refer to **Table 11**, **Table 12** and **Table 13** for further details, and **Appendix F** for detailed calculations.

Table 11: Proposed Conditions Annual Water Budget for Subdivision

Parameter	Volume (m^3/year)	Depth (mm/year)
Precipitation	210,800 **(unchanged)**	1,012
Evapotranspiration	70,300 **(32% decrease)**	337
Infiltration	60,500 **(13% decrease)**	290
Runoff	80,100 **(113% increase)**	385

Table 12: Proposed Conditions Annual Discharge

Parameter (ID)	Sewer/Culvert (m^3/year)	Dorchester Creek (m^3/year)
Precipitation	117,900	92,900
Evapotranspiration	70,300	
Infiltration	60,500	
Runoff	76,300	3,800
Total Discharge	**76,300**	**64,300**

Table 13: Water Balance Outlet Summary

Parameter	Existing Sewer / Dorchester Road (m^3/year)	Existing Dorchester Creek (m^3/year)	Proposed Existing Sewer / Dorchester Road	Proposed Dorchester Creek (m^3/year)
Precipitation	157,300	53,500	117,900	92,900
Evapotranspiration	103,300		70,300	
Infiltration	69,900		60,500	
Runoff	28,100	9,600	76,300	3,800
Total Discharge (Infiltration+ Runoff)	28,100	79,500	76,300	64,300

***19% reduction to Dorchester Creek.**

5. Salt Management

Chloride loading to receiving watercourses and groundwater may increase due to urban development and associated winter salt application. Chloride concentrations commonly increase with increasing salt application and decreasing streamflow as less dilution is provided during low flows. Chloride loading will be higher during the de-icing season; however, receiving watercourses will still be subject to elevated salt loadings during the non-de-icing season due to the baseflow augmentation of the chloride-impacted shallow groundwater system. Shallow groundwater systems can act as a reservoir for salt which slowly discharges into streams throughout the year. A salt management plan is therefore necessary to control chloride concentration from an “at-source” perspective. It is understood from discussions with the Municipality of Thames Centre that winter salting applications occur throughout the Municipality, including in close proximity to the Municipal wellhead and Mill Pond areas. The Municipality’s winter sand/salt operations are limited due to the Municipality’s size and available funds. It is our recommendation that winter sanding and salt operations be coordinated between the Municipality and UTRCA to develop a salt management plan using the principles outlined in the Transportation Association of Canada’s “Best Management Practices of Road Salt Management”.

6. Conclusions and Recommendations

A conceptual SWM strategy has been prepared in accordance with appropriate guidelines for submission of the proposed Draft Plan of Subdivision for 187 Dorchester Road.

The following design elements should be implemented as part of the overarching SWM strategy for the site:

- *Water Quality:* Treatment level is to be Level 1 “Enhanced” (Level 1) - 80% long-term treatment of suspended solids removal for the entire subdivision, as identified in Table 3.2 of the MOE Stormwater Management Practices Planning and Design Manual (March 2003). A treatment train approach for the front yard and ROW areas is to assist with removal efficiencies. Rear yards are to be designed to infiltrate the majority of runoff volume with zero discharge to the storm sewer network. On-site water quality treatment is required for the proposed medium-density and commercial blocks;
- *Peak Flow Attenuation:* Discharge the minor storm event (2-year City of London) to the existing trunk storm sewer, attenuate 5-year through 100-year events prior to discharging to existing trunk storm sewer as well as providing on-site attenuation for the medium-density and commercial blocks. Safe conveyance of the 250-year event is required; and,
- *Water Balance:* Provide adequate on-site water balance while limiting annual infiltration to existing (pre-development) levels in order to satisfy concerns related to the site’s proximity to Municipal well-heads.

Water quality is to be provided via treatment train approach which includes catchbasin inserts, goss traps, and an extended sump along with OGS units to treat residential front yard and ROW areas. On-site quality controls are to be provided for the medium-density and commercial blocks as part of detailed design.

Detailed hydrologic/hydraulic models were created to evaluate both the existing and proposed conditions for the subdivision lands and to assess the effect the development will have on the existing infrastructure servicing the upstream external lands. The model results indicate that a reduction in peak discharge to both the Dorchester Road ditch and culvert as well as Dorchester Creek for the 2-year through 100-year design events is expected. The model also indicated that there will be a slight increase in peak discharge to the existing 1,350 mm trunk storm sewer along the Southern boundary of the proposed development, with a 16% increase in peak discharge to the outlet at the Mill Pond. The additional volume in the trunk storm sewer increases surcharging by 0.15 m during the 2-year event, which is not expected to have a negative impact on the upstream areas. The proposed re-routing and increased diameter of the existing storm sewer servicing Byron Avenue provides a benefit by reducing the surcharging at Byron Avenue by approximately 0.30 m.

The proposed rear-yard ponding areas adequately capture and infiltrate isolated rear-yard runoff volumes for the majority of the storm events. The proposed dry-basin facilities adequately attenuate and discharge runoff volumes in exceedance of the 2-year design storm event up to and including the 100-year design storm event, with overflow directed to Dorchester Creek.

The water balance for the site generally matches that of the existing conditions, but with a 13% decrease in projected annual infiltration across the subject site. The annual runoff volume assessment demonstrates that a net increase will result due to the creation of impervious areas proposed as part of the development. Increasing the infiltration within the subdivision lands was not explored due to valid Municipal concerns regarding the site’s proximity to the Municipal wellhead.

7. References

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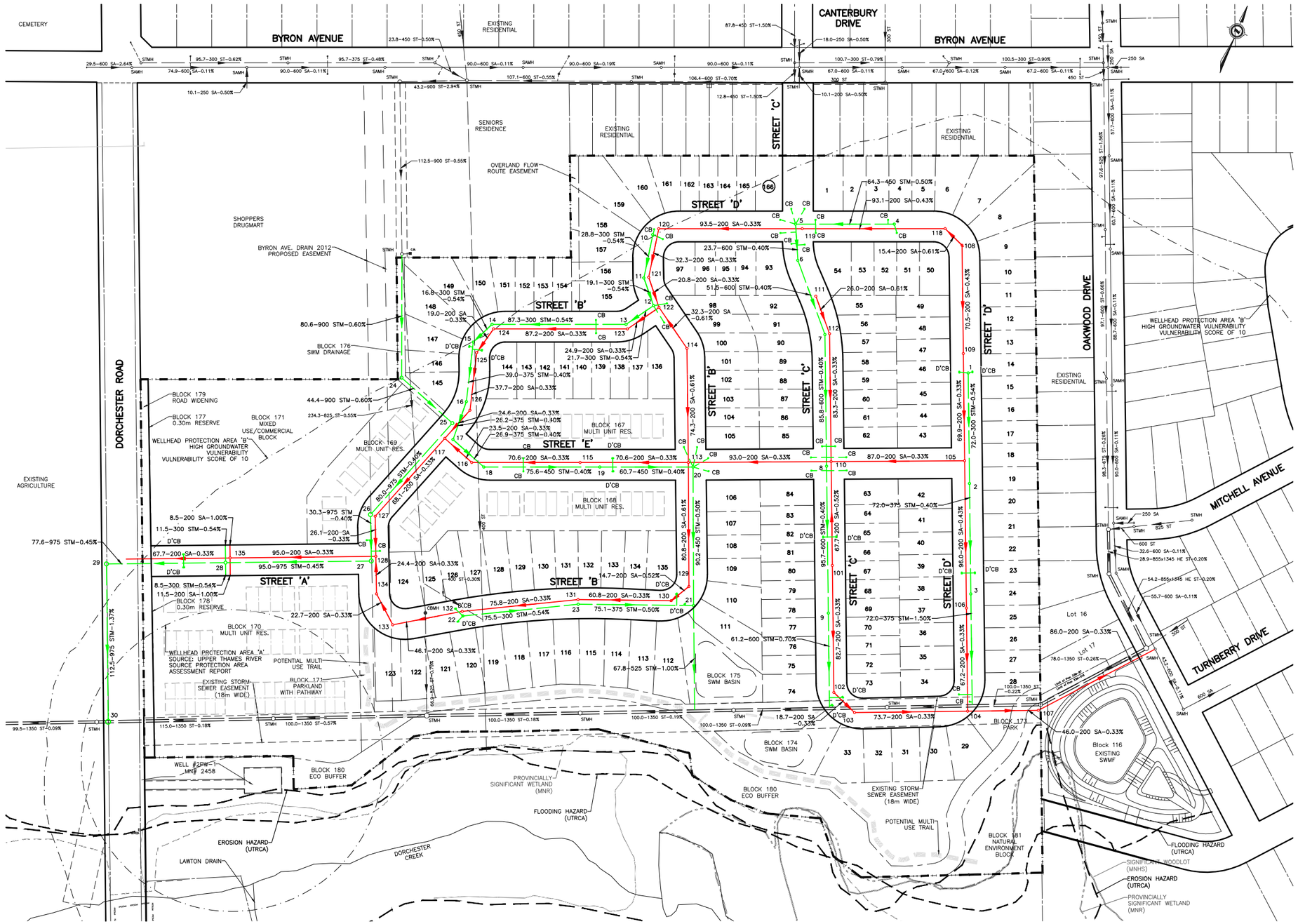
Appendix A

Conceptual Engineering Drawings



PRELIMINARY

EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION

DETAILS	
DESIGN	RJG/JCB
DRAWN BY	RJG
CHECKED	RDM
APPROVED	JCB
DATE	OCT. 2018

No.	REVISIONS	DATE	CONSULTANT
1.	UPDATED DRAFT PLAN–MARCH 19, 2020	JULY 6/20	AECOM

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DORCHESTER SUBDIVISION
SIFTON PROPERTIES LIMITED

SEWER AREA PLAN

PROJECT No. 60568894
SHEET No. 1
PLAN FILE No.

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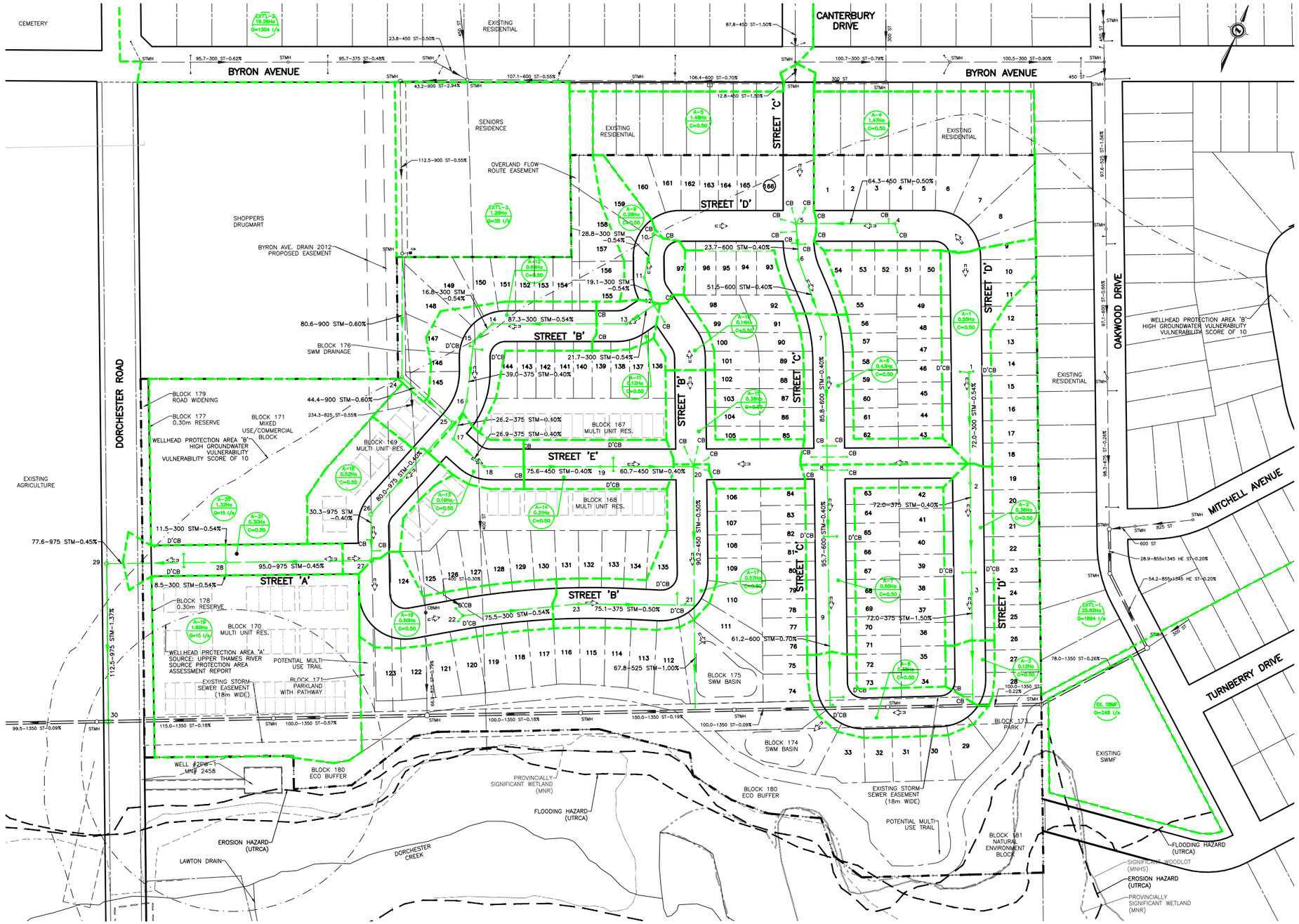

LEGEND

- STORM MANHOLE
- OIL GRIT SEPARATOR
- STORM SEWER
- EXISTING STORM MANHOLE
- EXISTING STORM SEWER
- MAJOR OVERLAND FLOW ROUTE
- STORM CATCHMENT AREA
- STORM AREA No.
- STORM CATCHMENT AREA
- RUNOFF COEFFICIENT

PRELIMINARY

EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION

DETAILS	
DESIGN	RJG/JCB
DRAWN BY	RJG
CHECKED	RDM
APPROVED	JCB
DATE	OCT. 2018

No.	REVISIONS	DATE	CONSULTANT
1.	UPDATED DRAFT PLAN–MARCH 19, 2020	JULY 6/20	AECOM

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DORCHESTER SUBDIVISION
SIFTON PROPERTIES LIMITED

STORM AREA PLAN

PROJECT No. 60568894
SHEET No. 2
PLAN FILE No.

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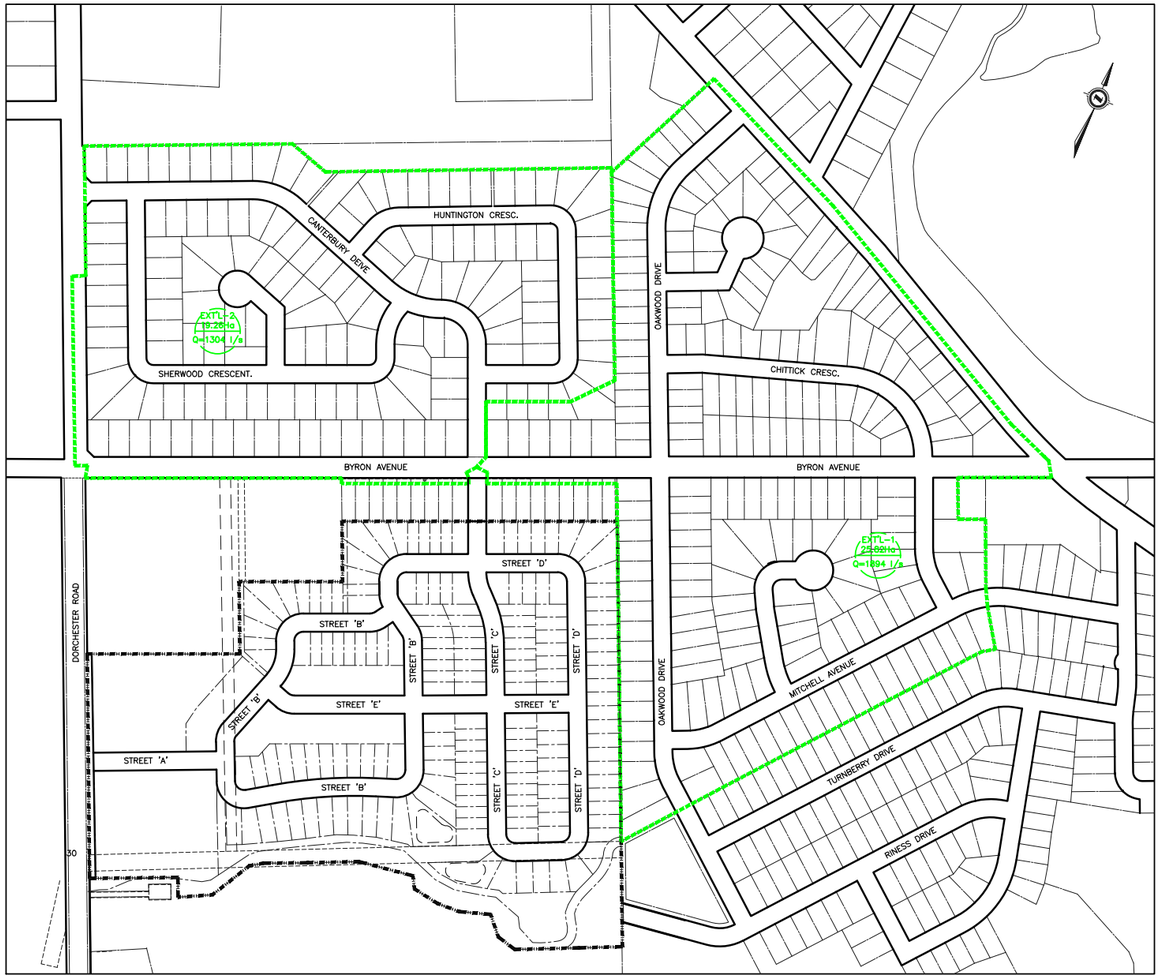

EXTERNAL STORM AREA PLAN
SCALE 1:3000

LEGEND

10 OGS	STORM MANHOLE
	OIL GRIT SEPARATOR
87.0–300 ST–0.54%	STORM SEWER
STMH 2U00018	EXISTING STORM MANHOLE
300 ST	EXISTING STORM SEWER
	STORM CATCHMENT AREA
A–1	STORM AREA No.
1.06Ha	STORM CATCHMENT AREA
C=0.70	RUNOFF COEFFICIENT

RUNOFF COEFFICIENT 'C':

PARKS & PLAYGROUNDS	- 0.20
RESIDENTIAL- SINGLE & DUPLEX	- 0.50
- ROWHOUSING	- 0.65
- APARTMENTS	- 0.65 to 0.70
COMMERCIAL & INDUSTRIAL	- 0.90 & 0.70
DENSELY BUILT, PAVED	- 0.90

FLOW, Q = 2.78 CiA
WHERE Q = PEAK FLOW IN LITRES PER SECOND (L/s)
C = RUNOFF COEFFICIENT (See Above)
i = RAINFALL INTENSITY (mm/hr), RETURN PERIOD = 2 years
A = AREA IN HECTARES (ha)

STORM SEWER DESIGN SHEET
(BASED ON CITY OF LONDON 2-YR STORM)

DORCHESTER SUBDIVISION

PROJECT Dorchester Subd.
PROJECT NO. \JECT NO. 60568894
DRAINAGE AREA \GE AREA 54.32 ha
DESIGNED BY IGNED BY RJG
CHECKED BY \CKED BY JB
DATE DATE 07/10/20

SEWER LOCATION				AREA		A X C					RAINFALL INTENSITY			Q								PROFILE					
AREA NO.	STREET	MH	TO MH	AREA ha.	TOT. AREA ha.	RUNOFF COEFF. (above)	INCR AxC	TOTAL SECT. AxC A X C	TOTAL LAT. A X C	CUM. SEWER (2.78 x) A x C	TIME ENT. SECT. min.	TIME ENT. ACCUM. min.	INTENSITY 'I' mm/hr	l/s	"n"	NOM. PIPE D mm	STORM SLOPE %	CAPACITY Q l/s	VELOCITY m/s. (min. 1.0 m/s	LENGTH m	FLOW TIME minutes	SEWER FALL m	HEADLOSS m	DROP IN MANHOLE m	INVERT ELEVATION U.S. m	INVERT ELEVATION D.S. m
EXTL-1	*OAKWOOD DRIVE*	*EX. STMH*	*EX. STMH*	*25.82*	*25.82*	*0.45*	*11.62*			*32.30*		*27.89*	*58.63*	*1893.91*	*0.013*	*1350*	*0.26*	*2839.59*	*1.98*	*78.0*	*0.66*	*0.203*				
	Ex. SWMF													248.00												
A-1	STREET 'D'	1	2	0.55	0.55	0.50	0.28			0.76		19.00	74.60	57.03	0.013	300	0.54	74.14	1.05	72.0	1.14	0.389				
A-2	STREET 'D'	2	3	0.36	0.91	0.50	0.18	0.28		1.26	1.14	20.14	72.03	91.12	0.013	375	0.40	115.70	1.05	72.0	1.15	0.288				
A-3	STREET 'D'	3	*EX. 1350 ST*	0.12	1.03	0.50	0.06	0.46		1.43	1.15	21.29	69.65	99.71	0.013	375	1.50	224.05	2.03	72.0	0.59	1.080				
	EX. 1350 ST	*EX. 1350 ST*	*EX. STMH*	*0.00*	*26.85*	*0.50*	*0.00*	*12.13*		*33.73*	*0.66*	*28.55*	*57.74*	*2195.73*	*0.013*	*1350*	*0.22*	*2612.05*	*1.82*	*100.0*	*0.91*	*0.220*				
A-4	STREET 'D'	4	5	1.47	1.47	0.50	0.74			2.04		19.00	74.60	152.44	0.013	450	0.50	210.34	1.32	64.3	0.81	0.322				
A-5	STREET 'C'	5	*6*	1.48	2.95	0.50	0.74	0.74		4.10	0.81	19.81	72.76	298.37	0.013	600	0.40	405.18	1.43	23.7	0.28	0.095				
	STREET 'C'	6	7	0.00	2.95	0.50	0.00	1.48		4.10	0.28	20.09	72.16	295.89	0.013	600	0.40	405.18	1.43	51.5	0.60	0.206				
A-6	STREET 'C'	7	8	0.43	3.38	0.50	0.22	1.48		4.70	0.60	20.68	70.88	333.03	0.013	600	0.40	405.18	1.43	85.8	1.00	0.343				
A-7	STREET 'C'	8	9	0.50	3.88	0.50	0.25	1.69		5.39	1.00	21.68	68.86	371.40	0.013	600	0.40	405.18	1.43	95.7	1.11	0.383				
A-8	STREET 'C'	9	*EX. 1350 ST*	0.38	4.26	0.50	0.19	1.94		5.92	1.11	22.80	66.75	395.27	0.013	600	0.70	536.00	1.90	61.2	0.54	0.428				
	EX. 1350 ST	*EX. STMH*	*EX. STMH*	*0.00*	*31.11*	*0.50*	*0.00*	*14.26*		*39.65*	*0.91*	*29.46*	*56.54*	*2490.19*	*0.013*	*1350*	*0.09*	**1670.67**	*1.17*	*100.0*	*1.43*	*0.090*				
A-9	STREET 'D'	10	11	0.28	0.28	0.50	0.14			0.39		19.00	74.60	29.04	0.013	300	0.54	74.14	1.05	28.8	0.46	0.156				
	STREET 'D'	11	12	0.00	0.28	0.50	0.00	0.14		0.39	0.46	19.46	73.55	28.63	0.013	300	0.54	74.14	1.05	19.1	0.30	0.103				
A-10	STREET 'B'	12	13	0.14	0.42	0.50	0.07	0.14		0.58	0.30	19.76	72.87	42.54	0.013	300	0.54	74.14	1.05	21.7	0.34	0.117				
A-11	STREET 'B'	13	14	0.12	0.54	0.50	0.06	0.21		0.75	0.34	20.11	72.12	54.13	0.013	300	0.54	74.14	1.05	87.3	1.39	0.471				
	STREET 'B'	14	15	0.00	0.54	0.50	0.00	0.27		0.75	1.39	21.49	69.24	51.98	0.013	300	0.54	74.14	1.05	16.8	0.27	0.091				
A-12	STREET 'B'	15	16	0.64	1.18	0.50	0.32	0.27		1.64	0.27	21.76	68.71	112.71	0.013	375	0.40	115.70	1.05	39.0	0.62	0.156				
	STREET 'B'	16	17	0.00	1.18	0.50	0.00	0.59		1.64	0.62	22.38	67.52	110.76	0.013	375	0.40	115.70	1.05	26.2	0.42	0.105				
	STREET 'E'	17	18	0.00	1.18	0.50	0.00	0.59		1.64	0.42	22.80	66.75	109.50	0.013	375	0.40	115.70	1.05	26.9	0.43	0.108				
A-13	STREET 'E'	18	19	0.19	1.37	0.50	0.10	0.59		1.90	0.43	23.23	65.98	125.65	0.013	450	0.40	188.14	1.18	75.6	1.07	0.302				
A-14	STREET 'E'	19	20	0.31	1.68	0.50	0.16	0.69		2.34	1.07	24.29	64.13	149.76	0.013	450	0.40	188.14	1.18	60.7	0.86	0.243				
A-15	STREET 'B'	20	21	0.38	2.06	0.50	0.19	0.84		2.86	0.86	25.15	62.72	179.61	0.013	450	0.50	210.34	1.32	90.2	1.14	0.451				
A-16	STREET 'B'	22	23	0.50	0.50	0.50	0.25			0.70		19.00	74.60	51.85	0.013	300	0.54	74.14	1.05	75.5	1.20	0.408				
A-17	STREET 'B'	23	21	0.57	1.07	0.50	0.29	0.25		1.49	1.20	20.20	71.91	106.96	0.013	375	0.50	129.35	1.17	75.1	1.07	0.376				
		21	*EX. 1350 ST*	0.00	3.13	0.50	0.00	1.57		4.35	1.14	26.28	60.96	265.21	0.013	525	1.00	448.72	2.07	67.8	0.55	0.678				
	EX. 1350 ST	*EX. 1350 ST*	*EX. STMH*	*0.00*	*34.24*	*0.50*	*0.00*	*15.83*		*44.01*	*1.43*	*30.89*	*54.78*	*2658.42*	*0.013*	*1350*	*0.19*	**2427.43**	*1.70*	*100.0*	*0.98*	*0.190*				
	EX. 1350 ST	*EX. STMH*	*EX. STMH*	*0.00*	*34.24*	*0.50*	*0.00*	*15.83*		*44.01*	*0.98*	*31.87*	*53.63*	*2607.87*	*0.013*	*1350*	*0.18*	**2362.68**	*1.65*	*100.0*	*1.01*	*0.180*				
	EX. 1350 ST	*EX. STMH*	*EX. STMH*	*0.00*	*34.24*	*0.50*	*0.00*	*15.83*		*44.01*	*1.01*	*32.88*	*52.50*	*2558.26*	*0.013*	*1350*	*0.57*	*4204.43*	*2.94*	*100.0*	*0.57*	*0.570*				
	EX. 1350 ST	*EX. STMH*	*EX. STMH*	*0.00*	*34.24*	*0.50*	*0.00*	*15.83*		*44.01*	*0.57*	*33.45*	*51.89*	*2531.36*	*0.013*	*1350*	*0.18*	**2362.68**	*1.65*	*115.0*	*1.16*	*0.207*				
EXTL-2	*BYRON AVE*	*EX. STMH*	*EX. STMH*	*19.26*	*19.26*	*0.45*	*8.67*			*24.09*		*30.87*	*54.16*	1304.95	*0.013*	*900*	*0.55*	*1400.79*	*2.20*	*112.5*	*0.85*	*0.619*				
EXTL-3	*SENIORS RESIDENCE*	*EX. CB*	*EX. STMH*											*35.00*												
		EX. STMH	24	0.00	19.26	0.50	0.00	8.67		24.09	0.85	31.72	53.80	1331.19	0.013	900	0.60	1463.08	2.30	80.6	0.58	0.484				
		24	25	0.00	19.26	0.50	0.00	8.67		24.09	0.58	32.31	53.13	1315.22	0.013	900	0.60	1463.08	2.30	44.4	0.32	0.266				
	STREET 'B'	25	26	0.00	19.26	0.50	0.00	8.67		24.09	0.32	32.63	52.78	1306.60	0.013	975	0.40	1478.84	1.98	80.0	0.67	0.320				
A-18	STREET 'B'	26	27	0.52	19.78	0.50	0.26	8.67		24.82	0.67	33.30	52.04	1326.59	0.013	975	0.40	1478.84	1.98	30.3	0.25	0.121				
	STREET 'A'	27	28	0.00	19.78	0.50	0.00	8.93		24.82	0.25	33.56	51.77	1319.85	0.013	975	0.45	1568.55	2.10	95.0	0.75	0.428				
A-19	M.D. RESIDENTIAL	PLUG	28	1.60	1.60									15.00	0.013	300	0.54	74.14	1.05	8.5	0.14	0.046				
A-20	COMMERCIAL	PLUG	28	1.32	1.32									15.00	0.013	300	0.54	74.14	1.05	11.5	0.18	0.062				
A-21	STREET 'A'	28	29	0.30	20.08	0.90	0.27	8.93		25.57	0.75	34.31	50.99	1368.65	0.013	975	0.45	1568.55	2.10	77.6	0.62	0.349				
	DORCHESTER ROAD	29	30	0.00	20.08	0.50	0.00	9.20		25.57	0.62	34.92	50.37	1352.74	0.013	975	1.37	2736.86	3.67	112.5	0.51	1.541				
		30	*EX. STMH*	*0.00*	*54.32*	*0.50*	*0.00*	*25.03*		*69.57*	*0.51*	*35.44*	*49.86*	3781.98	*0.013*	*1350*	*0.09*	**1670.67**	*1.17*	*99.5*	*1.42*	*0.090*				
		EX. STMH	*EX. STMH*	*0.00*	*54.32*	*0.50*	*0.00*	*25.03*		*69.57*	*1.42*	*36.86*	*48.51*	3688.32	*0.013*	*1350*	*0.09*	**1670.67**	*1.17*	*106.5*	*1.52*	*0.096*				
		EX. STMH	*EX. HW*	*0.00*	*54.32*	*0.50*	*0.00*	*25.03*		*69.57*	*1.52*	*38.38*	*47.16*	3593.94	*0.013*	*1350*	*0.09*	**1670.67**	*1.17*	*51.5*	*0.74*	*0.046*				

PRELIMINARY

EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION

DETAILS	
DESIGN	RJG/JCB
DRAWN BY	RJG
CHECKED	RDM
APPROVED	JCB
DATE	OCT. 2018

No.	REVISIONS	DATE	CONSULTANT
1.	UPDATED DRAFT PLAN–MARCH 19, 2020	JULY 6/20	AECOM

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MUNICIPALITY OF Thames Centre

SCALE
SCALE – 1 : 3000

DORCHESTER SUBDIVISION
SIFTON PROPERTIES LIMITED

EXTERNAL STORM AREA PLAN & STORM SEWER DESIGN SHEET

PROJECT No. 60568894
SHEET No. 2A
PLAN FILE No.

C:\Users\grozelier\Desktop\temp-Dorchester Subdivision\C\CURRENT\Revised June29'20\P02_DORCHESTER SUB-STORM.dwg

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Appendix B

Background Information

AECOM
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Minutes of Meeting

Date of Meeting	March 27, 2018	Start Time	1:30 pm	Project Number	60568894
Project Name	Dorchester Subdivision (Byron Ave.)				
Location	MOECC Office (733 Exeter Road)				
Regarding	Project Introduction and Preliminary SWM Servicing Strategy Review				
Attendees	Craig Newton, MOECC Scott Abernathy, MOECC Angelune DesLauriers, MOECC Mark Sinden, Sifton Properties Limited Jay McGuffin, MBPC Jack Brand, AECOM Peter McAllister, AECOM				
Distribution	All present				
Minutes Prepared By	Jack Brand				

PLEASE NOTE: **If this report does not agree with your records of the meeting, or if there are any omissions, please advise, otherwise we will assume the contents to be correct.**

		Action
1	**Introductions**	
	• Everyone introduced themselves and noted their role within the project. • The purpose of the meeting was to present the upcoming proposed development project and to discuss any potential impacts or restrictions since the development falls within the Well Head Protection Area for wells located south of the development next to Dorchester Road. The intent is to identify any special considerations or restrictions related to Source Water Protection.	Info.
2	**Development Plan Overview**	
	• AECOM/Sifton/MBPC provided an overview of the proposed development, located south of Byron Ave., and east of Dorchester Road, consisting largely of single-family residential lots (approximately 200) and small commercial and medium density blocks fronting Dorchester Road. • The overall subdivision plan is still being finalized, subject to MOECC comments, and coordination with the proposed sanitary servicing outlet on the west side of Dorchester Road and associated development. • It is proposed to submit the plan for Draft Plan Approval with the Municipality and County as soon as any final revisions are resolved, including submission of all applicable servicing reports.	Info.

	SWM EA • Further to discussions with the Municipality, it was unclear whether the Stormwater EA completed for the surrounding area was completed, and filed. It is Sifton/AECOM understanding that the EA was never fully completed. • Craig Newton indicated that he will review his files to confirm whether the EA was completed and has status. • AECOM noted that it is proposed to develop the site using SWM measures that do not rely on an external SWM facility. The intent is to utilize an OGS and LID measures for quality control, along with potential oversized ("superpipe") pipe storage for quantity control. **Source Water Protection** • The proposed development is located within the WHPA, both A and B, with a proposed medium density residential block being located in WHPA-A, and the majority of the remainder of the site within WHPA-B. • Angelune DesLauriers confirmed that since the proposed subdivision is less than 100ha it is not considered a significant threat within the Source Water Protection areas, therefore generally no restrictions. • Some restrictions will apply to the commercial and medium density blocks, related to sanitary sewers, which may require enhanced design or construction methods.	Info. MOECC Info. MOECC
3	**Preliminary Servicing Strategy**	
	Sanitary • Proposed sanitary servicing strategy will rely on an external sanitary pumping station to be constructed on a proposed development to the west of Dorchester Road. Sifton is coordinating with the adjacent developers to confirm alignments and overall construction timing. • A portion of the proposed development is permitted to outlet to the east, connecting to Oakwood Drive, with the final limits and routing to be determined during detailed design. Thames Centre has confirmed that the outlet is available and has encouraged Sifton/AECOM to maximize the area that outlets to Oakwood Drive where possible. • AECOM will be preparing a sanitary servicing memo for submission with the Draft Plan. Water • Water servicing will connect to the local watermain system within Dorchester, connecting at Byron Ave. and Dorchester Road. • Thames Centre has indicated that there are no capacity or quality concerns. • AECOM to prepare a watermain distribution analysis report for submission with the Draft Plan. Roads • All local streets within the proposed subdivision, consisting of standard road cross section with curbs and sidewalks. • Connections at Byron Ave. and Dorchester Road.	Info. Info. Info.

	SWM • Proposed SWM strategy will include local storm sewers to collect road drainage, conveying flows to an outlet on Dorchester Road. • Dorchester Road outlet will either be open ditch or piped, connecting to the existing 1050mm storm sewer that crosses along the south limit of the proposed development. This sewer will be maintained across the development, which presently provides an outlet for the existing SWM facility located northeast of the proposed subdivision. • There are no plans to convey any storm sewer flows to the existing SWM facility. • The majority of the lots will use LID measures, by conveying roof, sumps, and rear yard drainage to the rear of the lots. The whole site consists of free-draining sand, therefore is very conducive to infiltration. • Local storm sewers will generally accommodate roads and front yards (driveways, sidewalks). • Additional quality control measures will be provided by used an OGS (oil/grit separator) unit to treat the road drainage. Storm sewers throughout the site will generally only be conveying road drainage. The OGS unit would be placed prior to outletting at Dorchester Road. • MOECC confirmed that an OGS unit can be located within the WHPA-B area, therefore there is no restriction on where the unit needs to be placed on site. • Oversized storm sewers along Street 'A', prior to outletting to Dorchester Road, are proposed to provide quantity control storage. • MOECC suggested considering utilizing perforated storm sewers as an option, subject to groundwater elevations. AECOM to review further and to discuss with Thames Centre and UTRCA. • Medium-density and commercial blocks will require permanent private systems (PPS) to meet quality and quantity control targets. • AECOM will be prepared a functional SWM Report including detailed quality and quantity control calculations as part of the Draft Plan submission. MOECC will be consulted at that time for further review prior to any ECA applications or submissions.	Info. MOECC MOECC/AECOM AECOM/MOECC
4	**Next Steps**	
	• MBPC to coordinate meeting with Thames Centre and other stakeholders as necessary. • AECOM will be preparing various supporting documentation to be included with the Draft Plan Submission. • AECOM will consult with the MOECC as part of the Functional Servicing Report and in advance of the ECA application preparation, which is a newer requirement to address. • Any questions related to Source Water Protection to be directed through Craig Newton, to forward to Angelune DesLauriers as needed.	Sifton AECOM AECOM/MOECC

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Appendix C

SWM Design Calculations

Land Use

Existing Conditions - Land Use																	
Catchment Number	Total Area	Park / Open Space	Undeveloped	Single Family Residential	Medium Density Residential	High Density Residential	Commercial	SWM	Road ROW Existing	Road ROW Proposed	Paved	Net % XImp	Net % TImp	Drainage Length	Drainage Width	Percentage Routed	Routing Type
	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)			(m)	(m)	(%)	(-)
TIMP		0.20	0.00	0.55	0.65	0.88	0.75	0.20	0.50	0.90	0.99						
XIMP		0.05	0.00	0.45	0.50	0.88	0.70	0.85	0.50	0.85	0.99						
A1	15.55		15.55									0%	0%	180	864	100%	Pervious
A2	5.29		5.29									0%	0%	75	706	100%	Pervious
EXT1	20.02			20.02								45%	55%	370	541	50%	Pervious
EXT2	25.80			25.80								45%	55%	410	629	50%	Pervious
EXT3	3.24						3.24					70%	75%	150	216	100%	Impervious
EXT4	1.29					1.29						88%	88%	90	143	100%	Impervious
EXT5	0.72			0.72								45%	55%	25	288	100%	Pervious
EXT6	0.49								0.49			50%	50%	60	82	100%	Pervious
EXT7	0.89			0.89								45%	55%	20	445	100%	Pervious
EXT8	16.26			16.26								45%	55%	330	493	100%	Impervious
Totals	89.55	0.00	20.84	63.69	0.00	1.29	3.24	0.00	0.49	0.00	0.00	-	-	-	-	-	-

Proposed Conditions - Land Use																	
Catchment Number	Total Area	Park / Open Space	Undeveloped	Single Family Residential	Medium Density Residential	High Density Residential	Commercial	SWM	Road ROW Existing	Road ROW Proposed[1]	Paved[2]	Net % XImp	Net % TImp	Drainage Length	Drainage Width	% Routed	Routing Type
	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)			(m)	(m)	(%)	(-)
TIMP		0.20	0.00	0.55	0.65	0.75	0.75	0.20	0.50	0.50	0.99						
XIMP		0.05	0.00	0.45	0.50	0.55	0.70	0.85	0.50	0.50	0.99						
A10	1.34						1.34					70%	75%	90	149	100%	Impervious
A20	1.60				1.60							50%	65%	100	160	100%	Impervious
A30	0.87			0.87								45%	55%	30	292	100%	Pervious
A40	1.04			1.04								45%	55%	30	347	100%	Pervious
A50	0.88			0.56	0.32							47%	59%	30	293	100%	Pervious
A60	3.60				1.13					2.48		50%	55%	160	225	30%	Pervious
A70	1.97			1.97								45%	55%	110	179	100%	Impervious
A80	2.12		2.12									0%	0%	45	471	100%	Pervious
A90.1	0.57				0.57							50%	65%	60	95	30%	Pervious
A90.2	0.32									0.32		50%	50%	50	64	30%	Pervious
B10	0.63			0.63								45%	55%	30	210	100%	Pervious
B20	0.62			0.62								45%	55%	30	208	100%	Pervious
B30	1.05			1.05								45%	55%	30	351	100%	Pervious
B40	4.22									4.22		50%	50%	170	248	30%	Impervious
EXT10	20.02			20.02								45%	55%	370	541	50%	Pervious
EXT20	25.80			25.80								45%	55%	410	629	50%	Pervious
EXT30	3.24						3.24					70%	75%	150	216	31%	Impervious
EXT40	1.29					1.29						55%	75%	90	143	27%	Impervious
EXT50	0.72			0.72								45%	55%	25	288	100%	Pervious
EXT60	0.49								0.49			50%	50%	60	82	100%	Pervious
EXT70	0.89			0.89								45%	55%	20	445	100%	Pervious
EXT80	16.26			16.26								45%	55%	330	493	100%	Impervious
Totals	89.55	0.03	2.15	70.47	3.65	1.32	4.61	0.03	0.52	7.04	0.03	-	-	-	-	-	-

Notes:

1. Imperviousness and routing for EXT8 and EXT80 calibrated to discharge peak flows per Quail Run Subdivision, Dorchester Stormwater Management Plan (Stantec, 2003).

Existing Catchment Conditions							CN Calculation									
Catchment	Hydrologic Soil Group	Area		Soil and Landuse	CN	Weighted Average CN	CN II	CN III	P* (mm)	IA Perv (mm)	S (mm)	IA (0.2 S) (mm)	Q (mm)	S* (mm)	CN III*	CN II*
A1	B	15.55	7.91	Field	74	74	74	87	72	5	38.8	7.8	40.0	45.1	85	71
A2	B	5.29	0.44	Woodlot	60	73	73	86	72	5	41.2	8.2	38.7	48.9	84	69
	B		4.85	Field	74											
EXT1	B	20.02	20.02	Residential	70	70	70	84	72	5	47.3	9.5	35.6	59.1	81	65
EXT2	B	25.80	25.80	Residential	70	70	70	84	72	5	47.3	9.5	35.6	59.1	81	65
EXT3	B	3.24	3.24	Commercial	75	75	75	87	72	5	36.8	7.4	41.2	42.0	86	72
EXT4	B	1.29	1.29	High-Density	75	75	75	87	72	5	36.8	7.4	41.2	42.0	86	72
EXT5	B	0.72	0.72	Residential	70	70	70	84	72	5	47.3	9.5	35.6	59.1	81	65
EXT6	B	0.49	0.49	ROW	70	70	70	84	72	5	47.3	9.5	35.6	59.1	81	65
EXT7	B	0.89	0.89	Residential	70	70	70	84	72	5	47.3	9.5	35.6	59.1	81	65
EXT8	B	16.26	16.26	Residential	69	69	69	84	72	5	49.6	9.9	34.5	63.1	80	64

Proposed Catchment Conditions - Interim Conditions							CN Calculation									
Catchment	Hydrologic Soil Group	Area		Soil and Landuse	CN	Weighted Average CN	CN II	CN III	P* (mm)	IA Perv (mm)	S (mm)	IA (0.2 S) (mm)	Q (mm)	S* (mm)	CN III*	CN II*
A10	B	1.3	1.3	Residential	70	70	70	84	72	5	47.3	9.5	35.6	59.1	81	65
A20	B	1.6	1.6	Residential	70	70	70	84	72	5	47.3	9.5	35.6	59.1	81	65
A30	B	0.9	0.9	Residential	70	70	70	84	72	5	47.3	9.5	35.6	59.1	81	65
A40	B	1.0	1.0	Residential	70	70	70	84	72	5	47.3	9.5	35.6	59.1	81	65
A50	B	0.9	0.9	Residential	70	70	70	84	72	5	47.3	9.5	35.6	59.1	81	65
A60	B	3.6	3.6	Residential	70	70	70	84	72	5	47.3	9.5	35.6	59.1	81	65
A70	B	2.0	2.0	Residential	70	70	70	84	72	5	47.3	9.5	35.6	59.1	81	65
A80	B	2.1	1.6	Residential	70	70	70	84	72	5	47.3	9.5	35.6	59.1	81	65
A90.1	B	0.6	0.6	Residential	70	70	70	84	72	5	47.3	9.5	35.6	59.1	81	65
A90.2	B	0.3	0.3	Residential	70	70	70	84	72	5	47.3	9.5	35.6	59.1	81	65
B10	B	0.6	0.6	Residential	70	70	70	84	72	5	47.3	9.5	35.6	59.1	81	65
B20	B	0.6	0.6	Residential	70	70	70	84	72	5	47.3	9.5	35.6	59.1	81	65
B30	B	1.1	1.1	Residential	70	70	70	84	72	5	47.3	9.5	35.6	59.1	81	65
B40	B	4.2	2.0	Residential	70	70	70	84	72	5	47.3	9.5	35.6	59.1	81	65
EXT10	B	20.0	20.0	Residential	70	70	70	84	72	5	47.3	9.5	35.6	59.1	81	65
EXT20	B	25.8	25.8	Residential	70	70	70	84	72	5	47.3	9.5	35.6	59.1	81	65
EXT30	B	3.2	3.2	Commercial	75	75	75	87	72	5	36.8	7.4	41.2	42.0	86	72
EXT40	B	1.3	1.3	High-Density	75	75	75	87	72	5	36.8	7.4	41.2	42.0	86	72
EXT50	B	0.7	0.7	Residential	70	70	70	84	72	5	47.3	9.5	35.6	59.1	81	65
EXT60	B	0.5	0.5	ROW	70	70	70	84	72	5	47.3	9.5	35.6	59.1	81	65
EXT70	B	0.9	0.9	Residential	70	70	70	84	72	5	47.3	9.5	35.6	59.1	81	65
EXT80	B	16.3	16.3	Residential	69	69	69	84	72	5	49.6	9.9	34.5	63.1	80	64

1. Curve number based on "Hydrology", suppl. A to Sec 4, Engineering Handbook, USDA, Soil Conservation Service, 1968, and MTO Drainage Manual Design Chart 1.09.
2. Curve number for EXT8 and EXT80 based on calculations from Quail Run Subdivision, Dorchester Stormwater Management Plan (Stantec, 2003).

*100-year 3-hour storm
S = 25400/CN - 254
Q = (P - IA)^2 / (P - IA + S) 0

Catchment Summary

Existing Conditions															
Catchment Number	Area	TIMP	Runoff Coef	Total Imp. Area	CNII*	Length	Width	Pervious			Impervious			Percentage Routed	Routing Type
								IA	Slope	Manning's n	IA	Slope	Manning's n		
	(ha)	(%)	(C)	(ha)		(m)	(m)	(mm)	(%)		(mm)	(%)		(%)	
Subject Site															
A1	15.55	0	0.20	0.00	71	180	864	5	0.8	0.250	2	0.8	0.013	100	Pervious
A2	5.29	0	0.20	0.00	69	75	706	5	1.4	0.250	2	1.4	0.013	100	Pervious
Total Site Area	**20.84**	**0.0**		**0.00**	-	-	-	-	-	-	-	-	-	-	-
External Lands															
EXT1	20.02	55	0.59	11.01	65	370	541	5	2.0	0.250	2	2.0	0.013	50	Pervious
EXT2	25.80	55	0.59	14.19	65	410	629	5	2.0	0.250	2	2.0	0.013	50	Pervious
EXT3	3.24	75	0.73	2.43	72	150	216	5	2.0	0.250	2	2.0	0.013	100	Impervious
EXT4	1.29	88	0.82	1.14	72	90	143	5	2.0	0.250	2	2.0	0.013	100	Impervious
EXT5	0.72	55	0.59	0.40	65	25	288	5	2.0	0.250	2	2.0	0.013	100	Pervious
EXT6	0.49	50	0.55	0.25	65	60	82	5	2.0	0.250	2	2.0	0.013	100	Pervious
EXT7	0.89	55	0.59	0.49	65	20	445	5	2.0	0.250	2	2.0	0.013	100	Pervious
EXT8	16.26	55	0.59	8.94	64	330	493	5	2.0	0.250	2	2.0	0.013	100	Impervious
Total External Lands	**68.71**	**57**		**38.84**	-	-	-	-	-	-	-	-	-	-	-
Total Tributary Area	**89.54**	**43**		**38.84**	-	-	-	-	-	-	-	-	-	-	-

Proposed Conditions															
Catchment Number	Area	TIMP	Runoff Coef	Total Imp. Area	CNII*	Length	Width	Pervious			Impervious			Percentage Routed	Routing Type
								IA	Slope	Manning's n	IA	Slope	Manning's n		
	(ha)	(%)	(C)	(ha)		(m)	(m)	(mm)	(%)		(mm)	(%)		(%)	
Subject Site															
A10	1.34	75	0.73	1.01	65	90	149	5	2	0.250	2	2	0.013	100	Impervious
A20	1.60	65	0.66	1.04	65	100	160	5	2	0.250	2	2	0.013	100	Impervious
A30	0.87	55	0.59	0.48	65	30	292	5	2	0.250	2	2	0.013	100	Pervious
A40	1.04	55	0.59	0.57	65	30	347	5	2	0.250	2	2	0.013	100	Pervious
A50	0.88	59	0.61	0.52	65	30	293	5	2	0.250	2	2	0.013	100	Pervious
A60	3.60	55	0.58	1.97	65	160	225	5	2	0.250	2	2	0.013	30	Pervious
A70	1.97	55	0.59	1.08	65	110	179	5	2	0.250	2	2	0.013	100	Impervious
A80	2.12	0	0.20	0.00	65	45	471	5	2	0.250	2	2	0.013	100	Pervious
A90.1	0.57	65	0.66	0.37	65	60	95	5	2	0.250	2	2	0.013	30	Pervious
A90.2	0.32	50	0.55	0.16	65	50	64	5	2	0.250	2	2	0.013	30	Pervious
B10	0.63	55	0.59	0.35	65	30	210	5	2	0.250	2	2	0.013	100	Pervious
B20	0.62	55	0.59	0.34	65	30	208	5	2	0.250	2	2	0.013	100	Pervious
B30	1.05	55	0.59	0.58	65	30	351	5	2	0.250	2	2	0.013	100	Pervious
B40	4.22	50	0.55	2.11	65	170	248	5	2	0.250	2	2	0.013	30	Impervious
Total Site Area	**20.84**	**51**		**10.58**	-	-	-	-	-	-	-	-	-	-	-
External Lands															
EXT10	20.02	55	0.59	11.01	65	370	541	5	2	0.250	2	2	0.013	50	Pervious
EXT20	25.80	55	0.59	14.19	65	410	629	5	2	0.250	2	2	0.013	50	Pervious
EXT30	3.24	75	0.73	2.43	72	150	216	5	2	0.250	2	2	0.013	31	Impervious
EXT40	1.29	75	0.73	0.97	72	90	143	5	2	0.250	2	2	0.013	27	Impervious
EXT50	0.72	55	0.59	0.40	65	25	288	5	2	0.250	2	2	0.013	100	Pervious
EXT60	0.49	50	0.55	0.25	65	60	82	5	2	0.250	2	2	0.013	100	Pervious
EXT70	0.89	55	0.59	0.49	65	20	445	5	2	0.250	2	2	0.013	100	Pervious
EXT80	16.26	55	0.59	8.94	64	330	493	5	2	0.250	2	2	0.013	100	Impervious
Total External Lands	**68.71**	**56**		**38.67**	-	-	-	-	-	-	-	-	-	-	-
Total Tributary Area	**89.54**	**55**		**49.25**	-	-	-	-	-	-	-	-	-	-	-

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Location	Catchment ID	Tributary Area	Impervious Area	% Imperviousness	Depth	Total Volume	Infiltrated Volume	Infiltration Drawdown Time[1]
		(ha)	(ha)	(%)	(m)	(m^3)	(m^3)	(hrs)
Rear Yard - 1	A40	1.04	0.57	55	0.30	391	391	8
Rear Yard - 2	A50	0.88	0.52	59	0.30	302	302	8
Rear Yard - 3	B10	0.63	0.35	55	0.30	279	279	8
Rear Yard - 4	B20	0.62	0.34	55	0.30	280	280	8
Rear Yard - 5	B30	1.05	0.58	55	0.30	280	280	8
Rear Yard - 6	A30	0.87	0.48	55	0.30	209	209	8
Rear Yard - 7	A70	1.97	1.08	55	0.30	377	377	8

Notes:
1. Drawdown time based on hydraulic conductivity of 36 mm/hr (Golder, 2018).

Overflow Dry-Basin (East)														
Component	Elevation	Overall Basin Depth	Stage Volume	Cumulative Storage Volume	Side Slope	Area	Orifice Plate Flow	Overflow Weir			Total Flow	Drawdown Time		
								Top Width	Average Width	Highflow/ Emergency Outlet Flow		Cumulative	Cumulative	Cumulative
	(m)	(m)	(m^3)	(m^3)	(H:V)	(m^2)	(m^3/s)	(m)	(m)	(m^3/s)	(m^3/s)	(min)	(hr)	(Days)
	256.60	0.00	0	0	4	450	0.00				0.00	0	0	0.0
	256.70	0.10	47	47	4	485	0.06				0.06	24	0	0.0
	256.80	0.20	50	97	4	520	0.09				0.09	35	1	0.0
	256.90	0.30	54	151	4	558	0.11				0.11	44	1	0.0
	257.00	0.40	58	209	4	596	0.13				0.13	52	1	0.0
	257.10	0.50	62	270	4	636	0.14				0.14	59	1	0.0
Overflow	257.10	0.50	0	270	4	636	0.14	3.00	3.00	0.00	0.14	59	1	0.0
	257.20	0.60	66	336	4	677	0.16	3.30	3.15	0.18	0.33	64	1	0.0
	257.30	0.70	70	406	4	719	0.17	3.60	3.30	0.52	0.69	66	1	0.0
	257.40	0.80	74	480	4	762	0.18	3.90	3.45	1.00	1.19	68	1	0.0

Volume		Orifice Size		Overflow Weir	
Total Quality Volume Required (m^3)=	n/a	Dia (m) =	0.30	Inside Width (m) =	3.0
Total Quality Volume Provided (m^3)=	n/a	Area (m^2) =	0.07	Side Slope (x:1) =	3.0
Total Quantity Volume Provided (m^3)=	480	Invert (m) =	256.60	Invert (m) =	257.10
		Discharge Coeff, Cd =	0.65	Weir Coefficient, Cw =	1.77

Overflow Dry-Basin (West)														
Component	Elevation	Overall Basin Depth	Stage Volume	Cumulative Storage Volume	Side Slope	Area	Orifice Plate Flow	Overflow Weir			Total Flow	Drawdown Time		
								Top Width	Average Width	Highflow/ Emergency Outlet Flow		Cumulative	Cumulative	Cumulative
	(m)	(m)	(m^3)	(m^3)	(H:V)	(m^2)	(m^3/s)	(m)	(m)	(m^3/s)	(m^3/s)	(min)	(hr)	(Days)
	255.60	0.00	0	0	4	450	0.00				0.00	0	0	0.0
	255.70	0.10	47	47	4	485	0.06				0.06	24	0	0.0
	255.80	0.20	50	97	4	520	0.09				0.09	35	1	0.0
	255.90	0.30	54	151	4	558	0.11				0.11	44	1	0.0
	256.00	0.40	58	209	4	596	0.13				0.13	52	1	0.0
	256.10	0.50	62	270	4	636	0.14				0.14	59	1	0.0
	256.20	0.60	66	336	4	677	0.16				0.16	67	1	0.0
	256.30	0.70	70	406	4	719	0.17				0.17	74	1	0.1
	256.40	0.80	74	480	4	762	0.18				0.18	81	1	0.1
	256.50	0.90	78	558	4	807	0.19				0.19	88	1	0.1
	256.60	1.00	83	641	4	853	0.20				0.20	95	2	0.1
Overflow	256.60	1.00	0	641	4	853	0.20	10.00	10.00	0.00	0.20	95	2	0.1
	256.70	1.10	88	729	4	901	0.21	10.30	10.15	0.57	0.78	98	2	0.1
	256.80	1.20	93	821	4	949	0.22	10.60	10.30	1.63	1.85	99	2	0.1
	256.90	1.30	97	919	4	999	0.23	10.90	10.45	3.04	3.27	100	2	0.1

Volume		Orifice Size		Overflow Weir	
Total Quality Volume Required (m^3)=	n/a	Dia (m) =	0.30	Inside Width (m) =	10.0
Total Quality Volume Provided (m^3)=	n/a	Area (m^2) =	0.07	Side Slope (x:1) =	3.0
Total Quantity Volume Provided (m^3)=	919	Invert (m) =	255.60	Invert (m) =	256.60
		1.6	0.65	Weir Coefficient, Cw =	1.77

Subdivision Attenuation Summary

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Subdivision Storage and Attenuation Volumes										
Model	Attenuation Location	Peak Attenuation Volume (m^3)								
		25mm 4-hr Chc	2-Year 3-hr Chc	5-Year 3-hr Chc	10-Year 3-hr Chc	25-Year 3-hr Chc	50-Year 3-hr Chc	100-Year 3-hr Chc	250-Year 3-hr Chc	250-Year 24-hr Chc
Proposed Conditions	Rear-Yards	381	1,008	1,050	1,239	1,691	1,996	2,321	2,820	3,369
	East Dry-Basin	0	0	0	20	96	176	285	353	387
	West Dry-Basin	0	0	0	7	71	222	598	776	837

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Internal Subdivision Road Flows - 20 m width

0.25% Slope

ROW Flow Capacity			
Depth of Flow Over Curb (m) =	**0.15**	Curb Height (m) =	0.15
Cross Road Slope =	2.00%	Road "n" =	0.013
Longitudinal Road Slope =	0.25%	Blvd "n" =	0.03
Width of Pavement (m) =	10	ROW Width (m) =	20
Cross Blvd. Slope =	3.00%	**QTOT =**	**3.96**
Flow Width			
Calculated Width of Flow (m) =	20.00	Flow Contained Inside of ROW	
Distance from ROW Boundary =	0.0	m Inside of the ROW	
Road			
Flow Area (m^2) =	2.500	Average Depth (m) =	0.100
Wetted Perimeter (m) =	10.300	Calculated Velocity (m/s) =	1.50
$AR^{2/3}$ =	0.973	Calculated Flow (m^3/s) =	3.74
Velocity * Flow Depth (m/s*m)=	0.45	Safe for Pedestrian Use, less than 0.8 m/s*m	
Boulevard			
Flow Area (m^2) =	0.750	Calculated Velocity (m/s) =	0.30
Wetted Perimeter (m) =	10.004	Calculated Flow (m^3/s) =	0.22
$AR^{2/3}$ =	0.133		
Velocity * Flow Depth (m/s*m)=	0.02	Safe for Pedestrian Use, less than 0.8 m/s*m	

0.50% Slope

1.6

ROW Flow Capacity			
Depth of Flow Over Curb (m) =	**0.15**	Curb Height (m) =	0.15
Cross Road Slope =	2.00%	Road "n" =	0.013
Longitudinal Road Slope =	0.50%	Blvd "n" =	0.03
Width of Pavement (m) =	10	ROW Width (m) =	20
Cross Blvd. Slope =	201.25%	**QTOT =**	**5.29**
Flow Width			
Calculated Width of Flow (m) =	10.15	Flow Contained Inside of ROW	
Distance from ROW Boundary =	-4.9	m Inside of the ROW	
Road			
Flow Area (m^2) =	2.500	Average Depth (m) =	0.100
Wetted Perimeter (m) =	10.300	Calculated Velocity (m/s) =	2.12
$AR^{2/3}$ =	0.973	Calculated Flow (m^3/s) =	5.29
Velocity * Flow Depth (m/s*m)=	0.63	Safe for Pedestrian Use, less than 0.8 m/s*m	
Boulevard			
Flow Area (m^2) =	0.011	Calculated Velocity (m/s) =	0.24
Wetted Perimeter (m) =	0.335	Calculated Flow (m^3/s) =	0.00
$AR^{2/3}$ =	0.001		
Velocity * Flow Depth (m/s*m)=	0.02	Safe for Pedestrian Use, less than 0.8 m/s*m	

0.97

Internal Subdivision Road Flows - 20 m width

0.75% Slope

ROW Flow Capacity			
Depth of Flow Over Curb (m) =	**0.15**	Curb Height (m) =	0.15
Cross Road Slope =	2.00%	Road "n" =	0.013
Longitudinal Road Slope =	0.75%	Blvd "n" =	0.03
Width of Pavement (m) =	10	ROW Width (m) =	20
Cross Blvd. Slope =	3.00%	**QTOT =**	**6.87**
Flow Width			
Calculated Width of Flow (m) =	20.00	Flow Contained Inside of ROW	
Distance from ROW Boundary =	0.0	m Inside of the ROW	
Road			
Flow Area (m^2) =	2.500	Average Depth (m) =	0.100
Wetted Perimeter (m) =	10.300	Calculated Velocity (m/s) =	2.59
$AR^{2/3}$ =	0.973	Calculated Flow (m^3/s) =	6.48
Velocity * Flow Depth (m/s*m)=	0.78	Safe for Pedestrian Use, less than 0.8 m/s*m	
Boulevard			
Flow Area (m^2) =	0.750	Calculated Velocity (m/s) =	0.51
Wetted Perimeter (m) =	10.004	Calculated Flow (m^3/s) =	0.38
$AR^{2/3}$ =	0.133		
Velocity * Flow Depth (m/s*m)=	0.04	Safe for Pedestrian Use, less than 0.8 m/s*m	

1.00% Slope

ROW Flow Capacity			
Depth of Flow Over Curb (m) =	**0.15**	Curb Height (m) =	0.15
Cross Road Slope =	2.00%	Road "n" =	0.013
Longitudinal Road Slope =	1.00%	Blvd "n" =	0.03
Width of Pavement (m) =	10	ROW Width (m) =	20
Cross Blvd. Slope =	3.00%	**QTOT =**	**7.93**
Flow Width			
Calculated Width of Flow (m) =	20.00	Flow Contained Inside of ROW	
Distance from ROW Boundary =	0.0	m Inside of the ROW	
Road			
Flow Area (m^2) =	2.500	Average Depth (m) =	0.100
Wetted Perimeter (m) =	10.300	Calculated Velocity (m/s) =	2.99
$AR^{2/3}$ =	0.973	Calculated Flow (m^3/s) =	7.48
Velocity * Flow Depth (m/s*m)=	0.90	Unsafe for Pedestrian Use, greater than 0.8	
Boulevard			
Flow Area (m^2) =	0.750	Calculated Velocity (m/s) =	0.59
Wetted Perimeter (m) =	10.004	Calculated Flow (m^3/s) =	0.44
$AR^{2/3}$ =	0.133		
Velocity * Flow Depth (m/s*m)=	0.04	Safe for Pedestrian Use, less than 0.8 m/s*m	

Parameters	OGS Unit #1	OGS Unit #2
Tributary Area (ha)	3.60	4.94
Imperviousness (%)	55	51
MOE (2003) Treatment Level	Level 1 "Enhanced" Treatment (80% Annual TSS Removal)	Level 1 "Enhanced" Treatment (80% Annual TSS Removal)
Model	CDS 3030_6	CDS 3035_6ES
Structure Size (mm)	1829	1829
Particle Size Distribution	Fine	Fine
Treatment Flow Rate (L/s)	85	108
Annual Load Removal Efficiency (%)	82.1	80.2
Predicted Annual Rainfall Treated (%)	97.4	96.3
Hydrocarbon Storage (L)	895	994
Sediment Storage (L)	2,402	3,203
Total Holding Capacity (L)	5,284	6,476
Estimated Cleanout Frequency (months)	18-24	18-24

ECHELON ENVIRONMENTAL

505 Hood Road, Unit 26 Markham, ON L3R 5V6
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Transmittal

Project:	187 Dorchester Road, London ON	**ECH No.:**	N/A
Attn:	Jack Brand, M.Eng., P.Eng.	**From:**	Patrick Graham
Email:	jack.brand@aecom.com	**Date:**	July 17, 2019
Reference:	CDS TSS Removal & Grit Loading – OGS 1 PMSU 3030_6 & OGS 2 PMSU 3035_6ES		
No. of Pages:	9 (Including Cover Page)		

Dear Jack,

Please find attached our CDS TSS and Grit Loading Calculations for OGS 1 & 2 for the development at 187 Dorchester Road in Dorchester, ON.

If you have any questions or concerns, please feel free to contact our office at your convenience.

Sincerely,

Patrick Graham
Project Manager

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD
BASED ON A FINE PARTICLE SIZE DISTRIBUTION

Project Name:	187 Dorchester Road Subdivision	**Engineer:**	**AECOM**
Location:	Dorchester, ON	**Contact:**	**Jack Brand**, M.Eng., P.Eng.
OGS #:	1	**Report Date:**	17-Jul-19

Area	3.21	ha	**Rainfall Station #**	195	
Weighted C	0.58		**Particle Size Distribution**	FINE	
CDS Model	3030		**CDS Treatment Capacity**	85	l/s

Rainfall Intensity[1] (mm/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (l/s)	Treated Flowrate (l/s)	Operating Rate (%)	Removal Efficiency (%)	Incremental Removal (%)
1.0	10.3%	20.1%	5.1	5.1	6.0	97.1	10.0
1.5	9.7%	29.7%	7.7	7.7	9.1	96.3	9.3
2.0	8.9%	38.6%	10.3	10.3	12.1	95.4	8.5
2.5	7.7%	46.2%	12.8	12.8	15.1	94.5	7.2
3.0	6.5%	52.7%	15.4	15.4	18.1	93.7	6.0
3.5	4.2%	56.9%	18.0	18.0	21.1	92.8	3.9
4.0	4.7%	61.6%	20.5	20.5	24.2	91.9	4.3
4.5	3.9%	65.4%	23.1	23.1	27.2	91.1	3.5
5.0	3.4%	68.8%	25.7	25.7	30.2	90.2	3.1
6.0	4.7%	73.6%	30.8	30.8	36.2	88.5	4.2
7.0	4.6%	78.2%	35.9	35.9	42.3	86.7	4.0
8.0	3.5%	81.7%	41.0	41.0	48.3	85.0	3.0
9.0	2.3%	84.0%	46.2	46.2	54.4	83.3	1.9
10.0	2.6%	86.6%	51.3	51.3	60.4	81.5	2.1
15.0	6.7%	93.3%	77.0	77.0	90.6	72.9	4.9
20.0	2.7%	96.0%	102.6	85.0	100.0	58.1	1.6
25.0	1.7%	97.7%	128.3	85.0	100.0	46.5	0.8
30.0	1.3%	99.0%	153.9	85.0	100.0	38.7	0.5
35.0	0.6%	99.6%	179.6	85.0	100.0	33.2	0.2
40.0	0.3%	99.8%	205.2	85.0	100.0	29.1	0.1
45.0	0.0%	99.8%	230.9	85.0	100.0	25.8	0.0
50.0	0.2%	100.0%	256.6	85.0	100.0	23.2	0.0
							88.6
						Removal Efficiency Adjustment[2] =	6.5%
						Predicted Net Annual Load Removal Efficiency =	**82.1%**
						Predicted Annual Rainfall Treated =	**97.4%**

1 - Based on 44 years of hourly rainfall data from Canadian Station 6144475, London ON
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.
3 - CDS Efficiency based on testing conducted at the University of Central Florida
4 - CDS design flowrate and scaling based on standard manufacturer model & product specifications

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Estimate of Annual Grit Collection

Engineer:	**AECOM**	**Project:**	187 Dorchester Road Subdivision
Contact:	**Jack Brand**, M.Eng., P.Eng.	**CDS Model:**	30_30_6 OGS 1
Report Date:	17-Jul-19	**OGS Location:**	Dorchester, ON

Area :	3.21	ha
Imperviousness :	0.5	%
Runoff Coefficient :	0.58	

Assumptions:

1. Annual Rainfall	1083	mm	
2. Typical Grit Concentration	150	mg/l	(Residential)
3. Apparent Grit Density	1.6	kg/l	(estimated)
4. Grit Capture Efficiency	80%		

Runoff Volume = Area x Rainfall Depth x Runoff Coefficient = 19,989 cu.m

Grit Collected = Grit Concentration x Runoff Volume x Grit Capture Efficiency = 2,399 kg

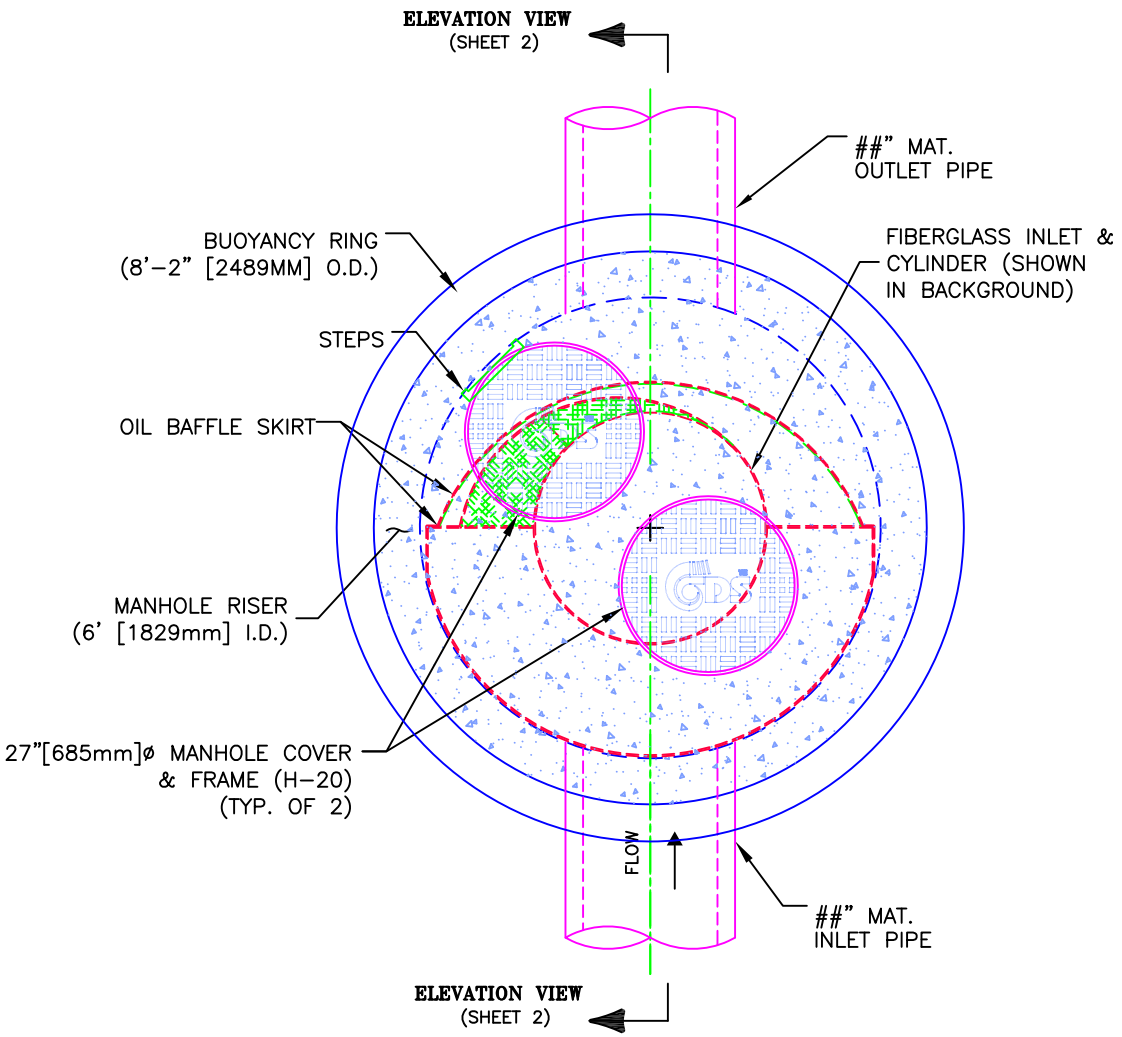
Grit Volume = Mass / Apparent Density = 1,499 litres or 1.499 cu.m

Therefore it can be expected that this site will generate approximately 1.499cu.m of grit annually.

Sump Capacity of CDS unit = 2.402 cu.m

Therefore the design sump capacity will accommodate a cleaning frequency of one time per 18 to 24 months.

PLAN VIEW

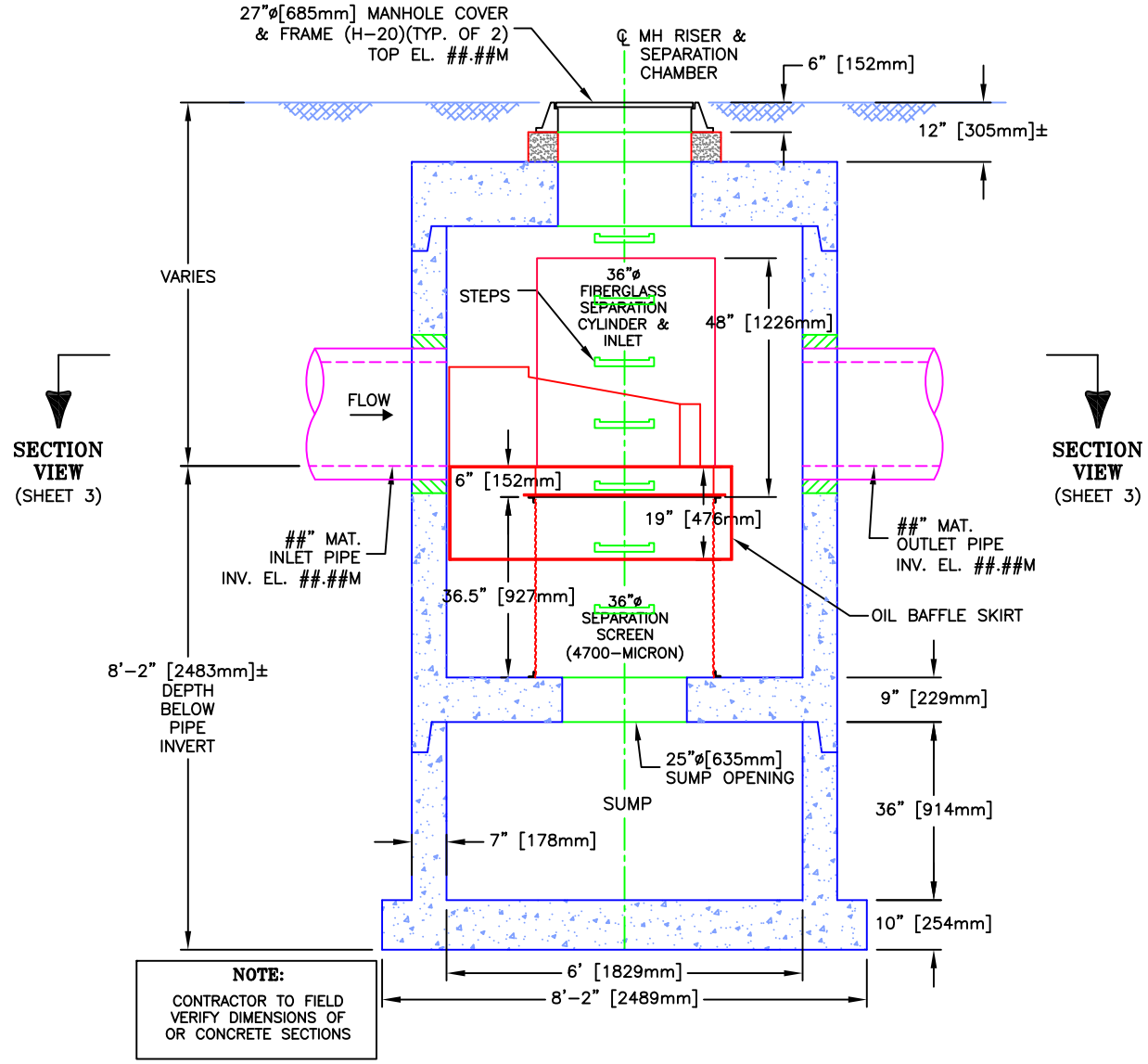


CDS MODEL PMSU30_30m, 85 L/s TREATMENT CAPACITY STORM WATER TREATMENT UNIT

CONTECH STORMWATER SOLUTIONS	PROJECT NAME CITY, STATE	JOB# CAN–##–###	SCALE 1" = 3'
		DATE ##/##/##	SHEET
		DRAWN INITIALS	1
		APPROV.	

Echelon Environmental 505 Hood Road, Unit 26, Markham, Ontario L3R 5V6 Tel: (905) 948–0000 Fax: (905) 948–0577
CONTECH Stormwater Solutions Inc. 930 Woodcock Road, Suite 101, Orlando, Florida 32803 Tel: (800) 848–9955

ELEVATION VIEW



NOTE:
CONTRACTOR TO FIELD VERIFY DIMENSIONS OF OR CONCRETE SECTIONS

CDS MODEL PMSU30_30m, 85 L/s TREATMENT CAPACITY STORM WATER TREATMENT UNIT

CONTECH STORMWATER SOLUTIONS	PROJECT NAME CITY, STATE	JOB# CAN-##-###	SCALE 1" = 3'
		DATE ##/##/##	SHEET
		DRAWN INITIALS	2
		APPROV.	

Echelon Environmental 505 Hood Road, Unit 26, Markham, Ontario L3R 5V6 Tel: (905) 948-0000 Fax: (905) 948-0577
CONTECH Stormwater Solutions Inc. 930 Woodcock Road, Suite 101, Orlando, Florida 32803 Tel: (800) 848-9955

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD
BASED ON A FINE PARTICLE SIZE DISTRIBUTION

Project Name:	187 Dorchester Road Subdivision	**Engineer:**	**AECOM**
Location:	Dorchester, ON	**Contact:**	**Jack Brand**, M.Eng., P.Eng.
OGS #:	2	**Report Date:**	17-Jul-19

Area	4.78	ha	**Rainfall Station #**	195	
Weighted C	0.58		**Particle Size Distribution**	FINE	
CDS Model	3035		**CDS Treatment Capacity**	108	l/s

Rainfall Intensity[1] (mm/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (l/s)	Treated Flowrate (l/s)	Operating Rate (%)	Removal Efficiency (%)	Incremental Removal (%)
1.0	10.3%	20.1%	7.7	7.7	7.2	96.8	9.9
1.5	9.7%	29.7%	11.6	11.6	10.8	95.8	9.3
2.0	8.9%	38.6%	15.5	15.5	14.4	94.7	8.4
2.5	7.7%	46.2%	19.3	19.3	18.0	93.7	7.2
3.0	6.5%	52.7%	23.2	23.2	21.5	92.7	6.0
3.5	4.2%	56.9%	27.0	27.0	25.1	91.7	3.9
4.0	4.7%	61.6%	30.9	30.9	28.7	90.6	4.2
4.5	3.9%	65.4%	34.8	34.8	32.3	89.6	3.5
5.0	3.4%	68.8%	38.6	38.6	35.9	88.6	3.0
6.0	4.7%	73.6%	46.4	46.4	43.1	86.5	4.1
7.0	4.6%	78.2%	54.1	54.1	50.3	84.4	3.9
8.0	3.5%	81.7%	61.8	61.8	57.4	82.4	2.9
9.0	2.3%	84.0%	69.5	69.5	64.6	80.3	1.9
10.0	2.6%	86.6%	77.3	77.3	71.8	78.3	2.0
15.0	6.7%	93.3%	115.9	107.6	100.0	65.2	4.4
20.0	2.7%	96.0%	154.5	107.6	100.0	48.9	1.3
25.0	1.7%	97.7%	193.2	107.6	100.0	39.1	0.7
30.0	1.3%	99.0%	231.8	107.6	100.0	32.6	0.4
35.0	0.6%	99.6%	270.5	107.6	100.0	27.9	0.2
40.0	0.3%	99.8%	309.1	107.6	100.0	24.4	0.1
45.0	0.0%	99.8%	347.7	107.6	100.0	21.7	0.0
50.0	0.2%	100.0%	386.4	107.6	100.0	19.6	0.0
							86.7
						Removal Efficiency Adjustment[2] =	6.5%
						Predicted Net Annual Load Removal Efficiency =	**80.2%**
						Predicted Annual Rainfall Treated =	**96.3%**

1 - Based on 44 years of hourly rainfall data from Canadian Station 6144475, London ON
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.
3 - CDS Efficiency based on testing conducted at the University of Central Florida
4 - CDS design flowrate and scaling based on standard manufacturer model & product specifications

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Estimate of Annual Grit Collection

Engineer:	**AECOM**	**Project:**	187 Dorchester Road Subdivision
Contact:	**Jack Brand**, M.Eng., P.Eng.	**CDS Model:**	30_35_6 OGS 2 (Ext. Sump)
Report Date:	17-Jul-19	**OGS Location:**	Dorchester, ON

Area :	4.78	ha
Imperviousness :	0.51	%
Runoff Coefficient :	0.58	

Assumptions:

1. Annual Rainfall	1083	mm	
2. Typical Grit Concentration	150	mg/l	(Residential)
3. Apparent Grit Density	1.6	kg/l	(estimated)
4. Grit Capture Efficiency	80%		

Runoff Volume = Area x Rainfall Depth x Runoff Coefficient = 29,766 cu.m

Grit Collected = Grit Concentration x Runoff Volume x Grit Capture Efficiency = 3,572 kg

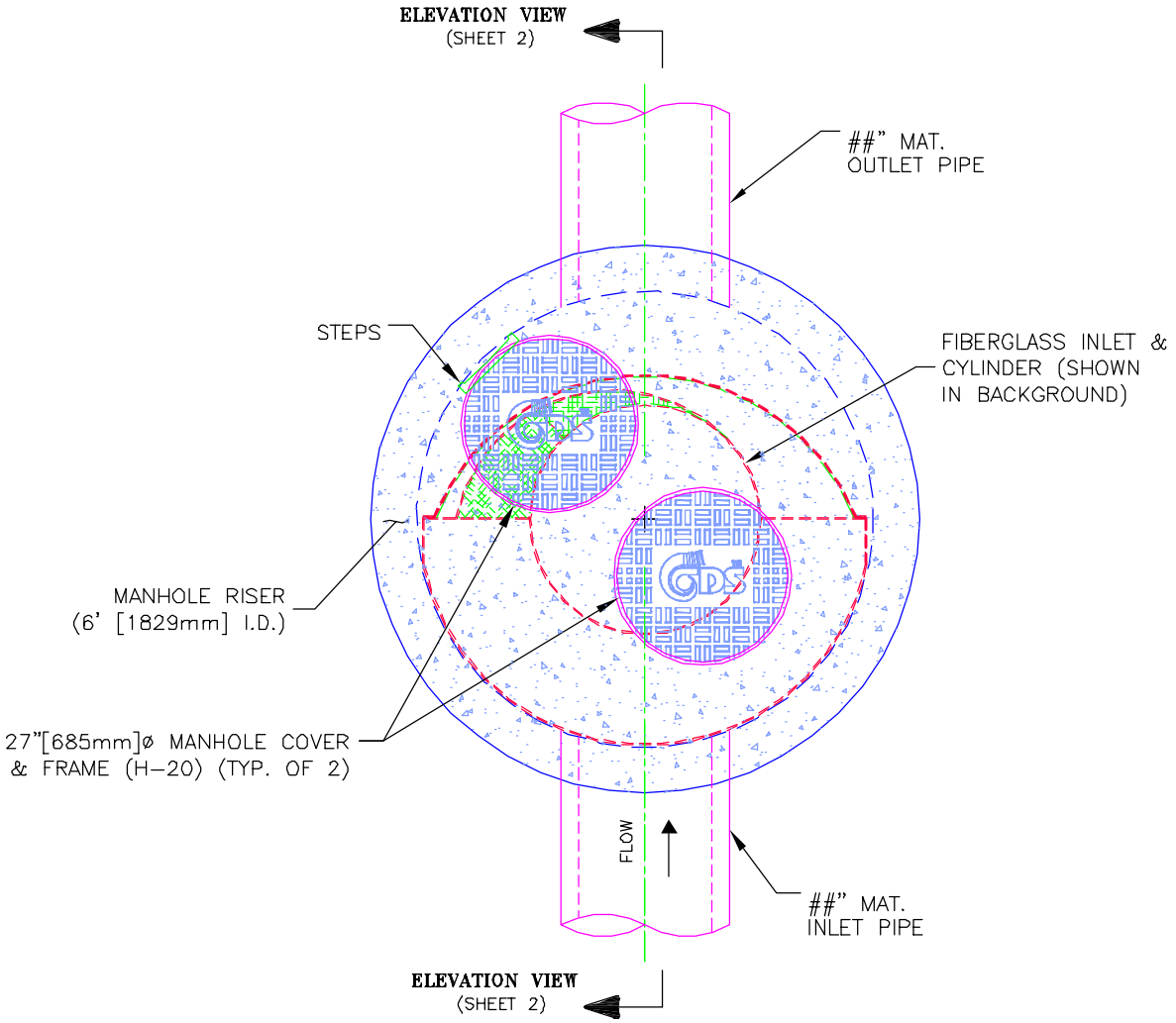
Grit Volume = Mass / Apparent Density = 2,232 litres or 2.232 cu.m

Therefore it can be expected that this site will generate approximately 2.232cu.m of grit annually.

Sump Capacity of CDS unit = 3.203 cu.m

Therefore the design sump capacity will accommodate a cleaning frequency of one time per 18 to 24 months.

PLAN VIEW

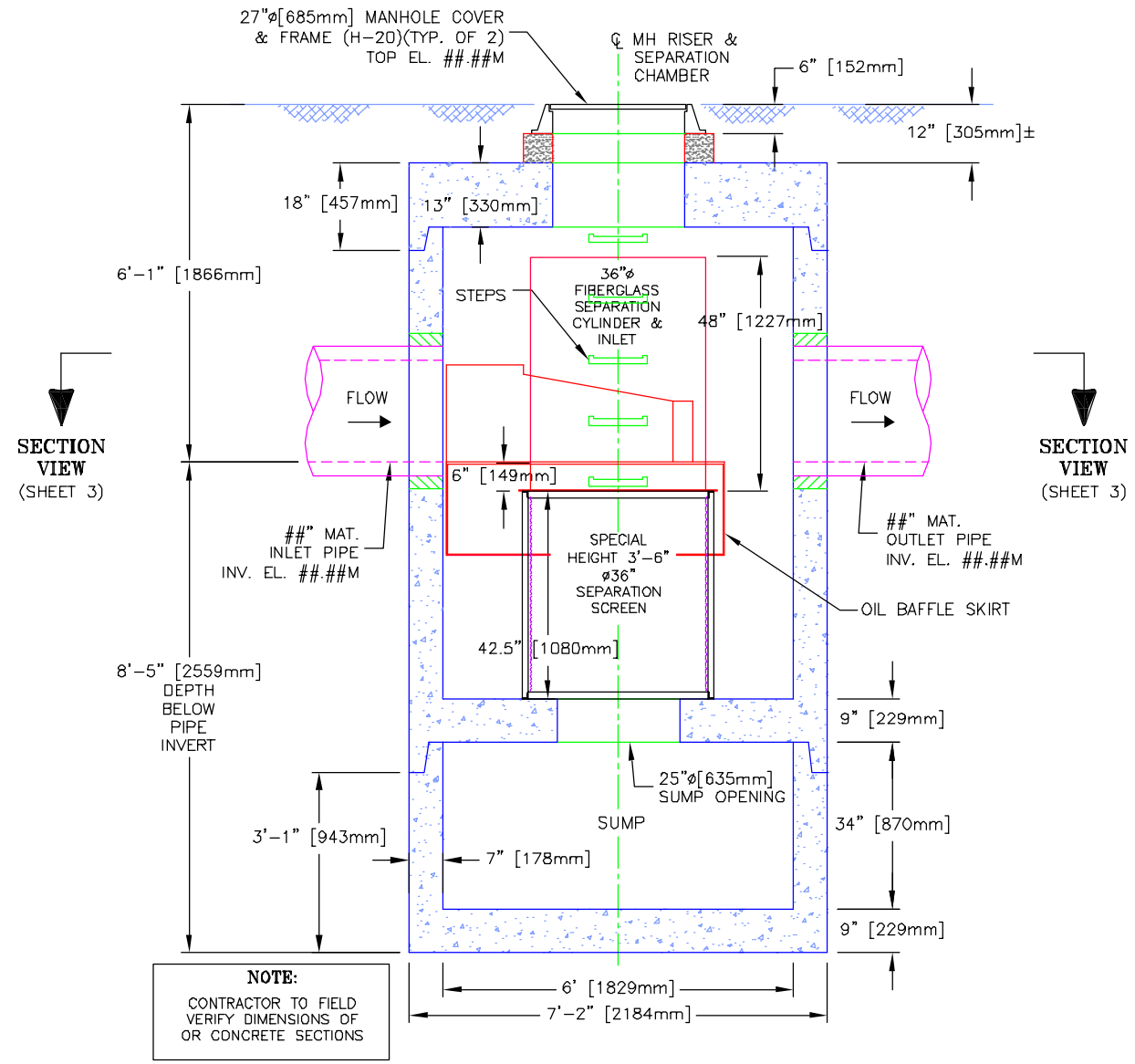


CDS MODEL PMSU30_35m
STORM WATER TREATMENT UNIT
FLOW RATE 106 L/S

CONTECH STORMWATER SOLUTIONS	PROJECT NAME CITY, STATE	JOB# CAN-##-###	SCALE 1" = 2.5'
		DATE ##/##/##	SHEET
		DRAWN INITIALS	1
		APPROV.	

Echelon Environmental 505 Hood Road, Unit 26, Markham, Ontario L3R 5V6 Tel: (905) 948-0000 Fax: (905) 948-0577

ELEVATION VIEW



NOTE:
CONTRACTOR TO FIELD VERIFY DIMENSIONS OF OR CONCRETE SECTIONS

CDS MODEL PMSU30_35m
STORM WATER TREATMENT UNIT
FLOW RATE 106 L/S

PROJECT NAME CITY, STATE	JOB#	CAN-##-###	SCALE 1" = 3'
	DATE	##/##/##	SHEET
	DRAWN	INITIALS	2
	APPROV.		

Echelon Environmental 505 Hood Road, Unit 26, Markham, Ontario L3R 5V6 Tel: (905) 948-0000 Fax: (905) 948-0577

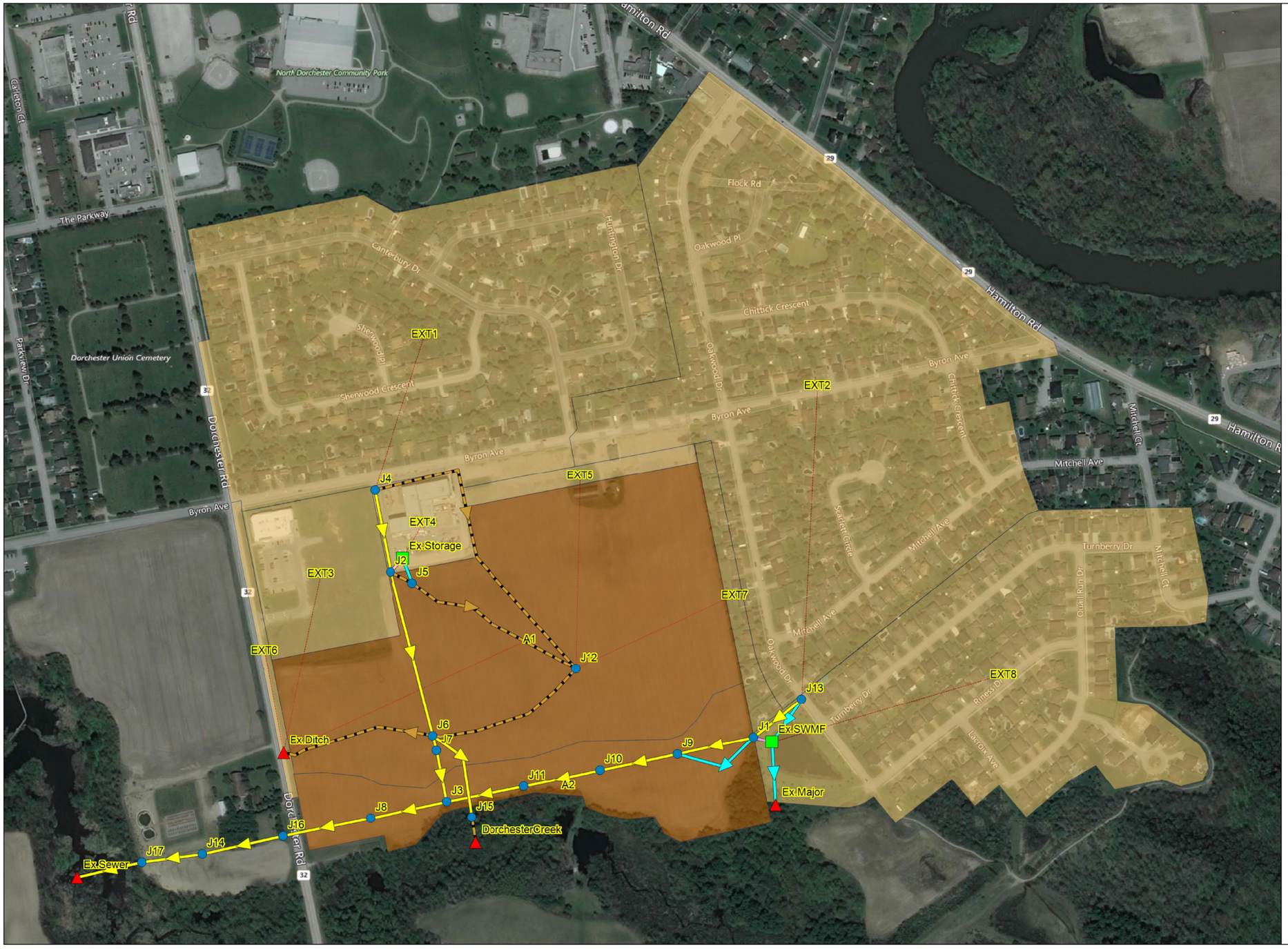
Outfall Peak Discharge										
Model	Outfall ID	Peak Flow (m^3/s)								
		25mm 4-hr SCS	2-Year 3-hr Chc	5-Year 3-hr Chc	10-Year 3-hr Chc	25-Year 3-hr Chc	50-Year 3-hr Chc	100-Year 3-hr Chc	250-Year 3-hr Chc	250-Year 24-hr Chc
Existing Conditions	Dorchester Creek	0.00	0.02	0.02	0.04	0.08	0.18	0.25	0.32	0.40
	Existing Ditch / Culvert	0.34	0.66	0.68	0.82	1.03	1.19	1.37	2.13	2.77
	Existing Sewer	1.67	3.08	3.12	3.28	3.53	3.69	3.80	3.86	3.90
Proposed Conditions	Dorchester Creek	0.00	0.01	0.02	0.03	0.06	0.08	0.12	1.38	2.39
	Existing Ditch / Culvert	0.33	0.64	0.65	0.78	0.94	1.06	1.19	1.43	1.50
	Existing Sewer	1.99	3.58	3.65	4.19	4.50	4.62	4.77	4.94	4.99

Characteristics	Value
Service Catchment Area (ha)	20.83
Level of Water Quality Protection	2 x OGS Units Level 1 - 80% Long-Term S.S. Removal Goss Traps LittaTrap Catchbasin Insert
Impervious Area (ha)	10.58
Total Imperviousness (%)	51
Water Quality Protection	OGS Unit x 2
Minor Storm Sewer Outlet to Dorchester Road	
Service Area (ha) - Total Tributary Area	3.83
Impervious Area (ha)	2.57
Imperviousness (%)	67
2-Year Peak Inflow (m^3/s)	1.52
Minor Storm Sewer Outlet East	
Service Area (ha)	4.22
Impervious Area (ha)	2.11
Imperviousness (%)	50
2-Year Peak Inflow (m^3/s)	0.43
Minor Storm Sewer Outlet West	
Service Area (ha)	3.60
Impervious Area (ha)	1.97
Imperviousness (%)	55
2-Year Peak Inflow (m^3/s)	0.30
Rear-Yards	
Service Area (ha)	7.07
Impervious Area (ha)	3.92
Imperviousness (%)	55
2-Year Peak Inflow (m^3/s)	0.00
Major Overland Flow Attenuation Basin East	
Service Area (ha)	5.56
Impervious Area (ha)	2.85
Imperviousness (%)	51
Depth (m)	0.80
Max. Attenuation Volume (m^3)	480
Outlet Configuration	300 mm Circular Orifice Plate
250-Year 24-hour Major Overland Inflow (m^3/s)	0.92
Major Overland Flow Attenuation Basin West	
Service Area (ha)	28.27
Impervious Area (ha)	15.90
Imperviousness (%)	56
Depth (m)	1.30
Max. Attenuation Volume (m^3)	919
Outlet Configuration	300 mm Circular Orifice Plate
250-Year 24-hour Major Overland Inflow (m^3/s)	2.09

AECOM Imagine it. Delivered.

Appendix D

Existing Conditions SWM Model



187 Dorchester Road (Sifton) - Existing Conditions

- Junctions
- Outfalls
- Storages

Conduits

- Visible
- Overland Flow

- Orifices
- Weirs
- Outlets

Subcatchments

- Rear-Yards
- ROW
- External Areas
- Commercial
- Medium-Density
- Buffer
- Agricultural Field

- Property Line

```
[TITLE]

[OPTIONS]
;;Options             Value
;;------------------- ------------
FLOW_UNITS            CMS
INFILTRATION          CURVE_NUMBER
FLOW_ROUTING          DYNWAVE
LINK_OFFSETS          ELEVATION
MIN_SLOPE             0
ALLOW_PONDING         YES
SKIP_STEADY_STATE     NO
START_DATE            04/01/2005
START_TIME            00:00:00
REPORT_START_DATE     04/01/2005
REPORT_START_TIME     00:00:00
END_DATE              04/04/2005
END_TIME              00:00:00
SWEEP_START           01/01
SWEEP_END             12/31
DRY_DAYS              0
REPORT_STEP           00:01:00
WET_STEP              00:01:00
DRY_STEP              00:01:00
ROUTING_STEP          1
RULE_STEP             00:00:00
INERTIAL_DAMPING      PARTIAL
NORMAL_FLOW_LIMITED   BOTH
FORCE_MAIN_EQUATION   H-W
VARIABLE_STEP         0.75
LENGTHENING_STEP      0
MIN_SURFAREA          1.14
MAX_TRIALS            8
HEAD_TOLERANCE        0.0015
SYS_FLOW_TOL          5
LAT_FLOW_TOL          5
MINIMUM_STEP          0.5
THREADS               1

[EVAPORATION]
;;Type          Parameters
;;-------------- ----------
MONTHLY      0      0      0      0      0      0      0      0      0      0      0      0
DRY_ONLY     NO

[RAINGAGES]
;;               Rain      Time   Snow   Data
;;Name           Type      Intrvl Catch  Source
;;-------------- --------- ------ ------ ----------
London           INTENSITY 0:10   1.0    TIMESERIES London-250yr24hr-10min

[SUBCATCHMENTS]
;;                                                   Total    Pcnt.    Pcnt.    Curb     Snow
;;Name           Raingage         Outlet           Area     Imperv   Width    Slope    Length   Pack
;;-------------- ---------------- ---------------- -------- -------- -------- -------- -------- --------
;Field
A1               London           Ex.Ditch         15.56    0        864.444  0.75     0
;Field
A2               London           J15              5.3      0        278.947  1.4      0
;External
EXT1             London           J4               20.02    55       541.081  2        0
;External
EXT2             London           J13              25.8     55       629.268  2        0
;External
EXT3             London           Ex.Ditch         3.24     65       216      2        0
;External
EXT4             London           Ex.Storage       1.29     88       143.333  2        0
;External
EXT5             London           J12              0.72     55       288      3        0
;External
EXT6             London           Ex.Ditch         0.49     50       81.667   2        0
;External
EXT7             London           J12              0.89     55       445      3        0
;External
EXT8             London           Ex.SWMF          16.26    55       492.727  2        0

[SUBAREAS]
;;Subcatchment   N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-------------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
A1               0.013      0.25       2          5          25         PERVIOUS   100
A2               0.013      0.25       2          5          25         PERVIOUS   100
EXT1             0.013      0.25       2          5          25         PERVIOUS   50
EXT2             0.013      0.25       2          5          25         PERVIOUS   50
EXT3             0.013      0.25       2          5          25         IMPERVIOUS 100
EXT4             0.013      0.25       2          5          25         IMPERVIOUS 100
EXT5             0.013      0.25       2          5          25         PERVIOUS   100
EXT6             0.013      0.25       2          5          25         PERVIOUS   100
EXT7             0.013      0.25       2          5          25         PERVIOUS   100
EXT8             0.013      0.25       2          5          25         IMPERVIOUS 100

[INFILTRATION]
;;Subcatchment   CurveNum   HydCon     DryTime
;;-------------- ---------- ---------- ----------
A1               71         0.5        7
A2               69         0.5        7
EXT1             65         0.5        7
EXT2             65         0.5        7
EXT3             72         0.5        7
EXT4             72         0.5        7
EXT5             65         0.5        7
EXT6             65         0.5        7
EXT7             65         0.5        7
EXT8             64         0.5        7
```



```
[JUNCTIONS]
;;               Invert     Max.       Init.      Surcharge  Ponded
;;Name           Elev.      Depth      Depth      Depth      Area
;;-------------- ---------- ---------- ---------- ---------- ----------
J1               253.055    3.235      0          0          0
J10              252.7      3.57       0          0          0
J11              252.48     3.89       0          0          0
J12              256.197    0.5        0          0          0
J13              253.252    3.688      0          0          0
J14              251.044    2.956      0          0          0
J15              254.3      2          0          0          0
J16              251.183    3.817      0          0          0
J17              250.898    3.102      0          0          0
J2               254.82     3.58       0          0          0
J3               252.275    3.635      0          0          0
J4               255.46     5.14       0          0          0
J5               257        0.5        0          0          0
J6               253.54     3.46       0          0          0
J7               253.52     2.65       0          0          0
J8               251.68     4.71       0          0          0
J9               252.81     3.62       0          0          0

[OUTFALLS]
;;               Invert     Outfall    Stage/Table   Tide
;;Name           Elev.      Type       Time Series   Gate Route To
;;-------------- ---------- ---------- ------------- ---------- ------------------
DorchesterCreek  254.1      FREE                     NO
Ex.Ditch         255.62     FREE                     NO
Ex.Major         255.5      FREE                     NO
Ex.Sewer         250.873    FREE                     NO

[STORAGE]
;;               Invert   Max.     Init.    Storage  Curve                            Evap.
;;Name           Elev.    Depth    Depth    Curve    Params                           Frac.    Infiltration parameters
;;-------------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------
Ex.Storage       254.82   3.18     0        TABULAR  Ex.Storage                0       0        49       100      0.413
Ex.SWMF          254.9    1.4      0        TABULAR  Ex.SWMF                   0       0

[CONDUITS]
;;               Inlet            Outlet           Manning    Inlet      Outlet     Init.      Max.
;;Name           Node             Node             Length     N          Offset     Offset     Flow       Flow
;;-------------- ---------------- ---------------- ---------- ---------- ---------- ---------- ---------- ----------
C1               J4               J2               105.957    0.013      255.46     254.84     0          0
C10              J9               J10              100.042    0.013      252.81     252.72     0          0
C11              J10              J11              100.035    0.013      252.7      252.505    0          0
C12              J11              J3               100.573    0.013      252.48     252.3      0          0
;Overland
C13              J4               J12              239        0.025      259.78     257.39     0          0
;Overland
C14              J5               J12              238.866    0.025      257        256.197    0          0
;Overland
C16              J12              Ex.Ditch         407.907    0.025      256.197    255.62     0          0
;Overland
C17              J15              DorchesterCreek  10         0.013      254.3      254.1      0          0
C18              J13              J1               78.126     0.013      253.252    253.08     0          1.75
C19              J16              J14              99.5       0.013      251.183    251.094    0          0
C2               J1               J9               99.637     0.013      253.055    252.835    0          0
C20              J14              J17              106.5      0.013      251.044    250.948    0          0
C21              J17              Ex.Sewer         28         0.013      250.898    250.873    0          0
C3               J3               J8               99.514     0.013      252.275    251.705    0          0
C4               J2               J6               215.022    0.013      254.82     253.54     0          0
C5               J6               J7               19.363     0.013      253.54     253.52     0          0
C6               J6               J15              124.328    0.013      254.65     254.3      0          0
;Overland
C7               J2               J5               31.018     0.025      257.39     257        0          0
C8               J7               J3               66.387     0.013      253.52     252.99     0          0
C9               J8               J16              113.983    0.013      251.68     251.473    0          0

[ORIFICES]
;;               Inlet            Outlet           Orifice    Crest      Disch.     Flap Open/Close
;;Name           Node             Node             Type       Height     Coeff.     Gate Time
;;-------------- ---------------- ---------------- ---------- ---------- ---------- ---- ----------
OR1              Ex.Storage       J2               SIDE       255.3      0.65       NO   0

[WEIRS]
;;               Inlet            Outlet           Weir       Crest      Disch.     Flap End      End
;;Name           Node             Node             Type       Height     Coeff.     Gate Con.     Coeff.     Surcharge  RoadWidth
RoadSurf    Coeff. Curve
;;-------------- ---------------- ---------------- ---------- ---------- ---------- ---- -------- ---------- ---------- ---------- -------
--- ----------------
C15              Ex.Storage       J5               TRANSVERSE 257.4      1.78       NO   0        0          YES
W1               J13              Ex.SWMF          TRANSVERSE 256.639    1.78       NO   0        0          YES
W2               Ex.SWMF          Ex.Major         TRAPEZOIDAL 256       1.78       NO   0        0          YES
W3               J1               J9               TRANSVERSE 255.99     1.78       NO   0        0          YES

[OUTLETS]
;;               Inlet            Outlet           Outflow    Outlet     Qcoeff/                    Flap
;;Name           Node             Node             Height     Type       QTable     Qexpon          Gate
;;-------------- ---------------- ---------------- ---------- ---------- ---------- ---------- ----
OL1              Ex.SWMF          J1               254.9      TABULAR/HEAD Ex.SWMOutlet             NO

[XSECTIONS]
;;Link           Shape        Geom1            Geom2      Geom3      Geom4      Barrels
;;-------------- ------------ ---------------- ---------- ---------- ---------- ----------
C1               CIRCULAR     0.9              0          0          0          1
C10              CIRCULAR     1.35             0          0          0          1
C11              CIRCULAR     1.35             0          0          0          1
C12              CIRCULAR     1.35             0          0          0          1
C13              TRAPEZOIDAL  0.3              10         3          3          1
C14              TRIANGULAR   0.5              30         0          0          1
C16              TRIANGULAR   0.5              30         0          0          1
C17              TRIANGULAR   1                4          0          0          1
C18              CIRCULAR     1.35             0          0          0          1
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C19              CIRCULAR     1.35            0          0          0          1
C2               CIRCULAR     1.35            0          0          0          1
C20              CIRCULAR     1.35            0          0          0          1
C21              CIRCULAR     1.35            0          0          0          1
C3               CIRCULAR     1.35            0          0          0          1
C4               CIRCULAR     0.825           0          0          0          1
C5               CIRCULAR     0.825           0          0          0          1
C6               CIRCULAR     0.4             0          0          0          1
C7               TRIANGULAR   0.5             15         0          0          1
C8               CIRCULAR     0.825           0          0          0          1
C9               CIRCULAR     1.35            0          0          0          1
OR1              CIRCULAR     0.125           0          0          0
C15              RECT_OPEN    0.45            3          0          0
W1               RECT_OPEN    0.3             15         0          0
W2               TRAPEZOIDAL  0.2             10         0.333      0.333
W3               RECT_OPEN    0.3             10         0          0

[TRANSECTS]

NC 0.035    0.035    0.035
X1 SWMFOutlet      8        2.2      4.5      0.0      0.0      0.0      0.0      0.0
GR 1.75     0.5      1.3      1.85     1.3      2.2      1        3.1      1        3.6
GR 1.3      4.5      1.3      4.85     1.75     6.2

[LOSSES]
;;Link           Inlet      Outlet     Average    Flap Gate  SeepageRate
;;-------------- ---------- ---------- ---------- ---------- ----------

[CURVES]
;;Name           Type       X-Value    Y-Value
;;-------------- ---------- ---------- ----------
Ex.SWMOutlet     Rating     0          0.007
Ex.SWMOutlet                0.1        0.014
Ex.SWMOutlet                0.2        0.124
Ex.SWMOutlet                0.3        0.171
Ex.SWMOutlet                0.4        0.208
Ex.SWMOutlet                0.5        0.239
Ex.SWMOutlet                0.6        0.266
Ex.SWMOutlet                0.7        0.291
Ex.SWMOutlet                0.8        0.314
Ex.SWMOutlet                0.9        0.415
Ex.SWMOutlet                1          0.589
Ex.SWMOutlet                1.1        0.865
Ex.SWMOutlet                1.2        1.248
Ex.SWMOutlet                1.3        1.557

;Sifton Retirement Facility
Ex.Storage       Storage    0          160
Ex.Storage                  0.48       160
Ex.Storage                  0.481      150
Ex.Storage                  2.78       150

Ex.SWMF          Storage    0          4094
Ex.SWMF                     0.1        4375
Ex.SWMF                     0.2        4656
Ex.SWMF                     0.3        4797
Ex.SWMF                     0.4        4939
Ex.SWMF                     0.5        5080
Ex.SWMF                     0.6        5221
Ex.SWMF                     0.7        5362
Ex.SWMF                     0.8        5503
Ex.SWMF                     0.9        5645
Ex.SWMF                     1          5786
Ex.SWMF                     1.1        5927
Ex.SWMF                     1.2        6068
Ex.SWMF                     1.3        6209

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
;Chicago design storm, a = 2619.363, b = 10.5, c = 0.884, Duration = 180 minutes, r = 0.38, rain units = mm/hr.
London-100yr3hr-10min            0:00       4.545
London-100yr3hr-10min            0:10       5.529
London-100yr3hr-10min            0:20       7.042
London-100yr3hr-10min            0:30       9.632
London-100yr3hr-10min            0:40       14.915
London-100yr3hr-10min            0:50       30.154
London-100yr3hr-10min            1:00       181.387
London-100yr3hr-10min            1:10       73.569
London-100yr3hr-10min            1:20       40.376
London-100yr3hr-10min            1:30       22.893
London-100yr3hr-10min            1:40       15.501
London-100yr3hr-10min            1:50       11.556
London-100yr3hr-10min            2:00       9.147
London-100yr3hr-10min            2:10       7.54
London-100yr3hr-10min            2:20       6.401
London-100yr3hr-10min            2:30       5.555
London-100yr3hr-10min            2:40       4.903
London-100yr3hr-10min            2:50       4.387
London-100yr3hr-10min            3:00       0

;Chicago design storm, a = 1574.382, b = 9.025, c = 0.86, Duration = 180 minutes, r = 0.38, rain units = mm/hr.
London-10yr3hr-10min             0:00       3.407
London-10yr3hr-10min             0:10       4.086
London-10yr3hr-10min             0:20       5.115
London-10yr3hr-10min             0:30       6.845
London-10yr3hr-10min             0:40       10.309
London-10yr3hr-10min             0:50       20.166
London-10yr3hr-10min             1:00       124.994
London-10yr3hr-10min             1:10       48.602
London-10yr3hr-10min             1:20       26.78
London-10yr3hr-10min             1:30       15.477
London-10yr3hr-10min             1:40       10.693
London-10yr3hr-10min             1:50       8.115
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London-10yr3hr-10min             2:00       6.524
London-10yr3hr-10min             2:10       5.451
London-10yr3hr-10min             2:20       4.681
London-10yr3hr-10min             2:30       4.104
London-10yr3hr-10min             2:40       3.655
London-10yr3hr-10min             2:50       3.297
London-10yr3hr-10min             3:00       0

;Chicago design storm, a = 3048.22, b = 10.03, c = 0.888, Duration = 1440 minutes, r = 0.38, rain units = mm/hr.
London-250yr24hr-10min           0:00       0.566
London-250yr24hr-10min           0:10       0.576
London-250yr24hr-10min           0:20       0.586
London-250yr24hr-10min           0:30       0.597
London-250yr24hr-10min           0:40       0.608
London-250yr24hr-10min           0:50       0.62
London-250yr24hr-10min           1:00       0.632
London-250yr24hr-10min           1:10       0.644
London-250yr24hr-10min           1:20       0.657
London-250yr24hr-10min           1:30       0.671
London-250yr24hr-10min           1:40       0.685
London-250yr24hr-10min           1:50       0.7
London-250yr24hr-10min           2:00       0.716
London-250yr24hr-10min           2:10       0.733
London-250yr24hr-10min           2:20       0.75
London-250yr24hr-10min           2:30       0.768
London-250yr24hr-10min           2:40       0.787
London-250yr24hr-10min           2:50       0.807
London-250yr24hr-10min           3:00       0.828
London-250yr24hr-10min           3:10       0.851
London-250yr24hr-10min           3:20       0.875
London-250yr24hr-10min           3:30       0.9
London-250yr24hr-10min           3:40       0.927
London-250yr24hr-10min           3:50       0.955
London-250yr24hr-10min           4:00       0.986
London-250yr24hr-10min           4:10       1.018
London-250yr24hr-10min           4:20       1.053
London-250yr24hr-10min           4:30       1.091
London-250yr24hr-10min           4:40       1.131
London-250yr24hr-10min           4:50       1.175
London-250yr24hr-10min           5:00       1.223
London-250yr24hr-10min           5:10       1.275
London-250yr24hr-10min           5:20       1.331
London-250yr24hr-10min           5:30       1.393
London-250yr24hr-10min           5:40       1.462
London-250yr24hr-10min           5:50       1.538
London-250yr24hr-10min           6:00       1.623
London-250yr24hr-10min           6:10       1.718
London-250yr24hr-10min           6:20       1.826
London-250yr24hr-10min           6:30       1.948
London-250yr24hr-10min           6:40       2.089
London-250yr24hr-10min           6:50       2.254
London-250yr24hr-10min           7:00       2.447
London-250yr24hr-10min           7:10       2.677
London-250yr24hr-10min           7:20       2.958
London-250yr24hr-10min           7:30       3.305
London-250yr24hr-10min           7:40       3.747
London-250yr24hr-10min           7:50       4.326
London-250yr24hr-10min           8:00       5.119
London-250yr24hr-10min           8:10       6.263
London-250yr24hr-10min           8:20       8.044
London-250yr24hr-10min           8:30       11.153
London-250yr24hr-10min           8:40       17.716
London-250yr24hr-10min           8:50       38.196
London-250yr24hr-10min           9:00       212.889
London-250yr24hr-10min           9:10       84.17
London-250yr24hr-10min           9:20       41.804
London-250yr24hr-10min           9:30       24.209
London-250yr24hr-10min           9:40       16.564
London-250yr24hr-10min           9:50       12.423
London-250yr24hr-10min           10:00      9.872
London-250yr24hr-10min           10:10      8.16
London-250yr24hr-10min           10:20      6.94
London-250yr24hr-10min           10:30      6.031
London-250yr24hr-10min           10:40      5.33
London-250yr24hr-10min           10:50      4.773
London-250yr24hr-10min           11:00      4.321
London-250yr24hr-10min           11:10      3.947
London-250yr24hr-10min           11:20      3.634
London-250yr24hr-10min           11:30      3.366
London-250yr24hr-10min           11:40      3.136
London-250yr24hr-10min           11:50      2.936
London-250yr24hr-10min           12:00      2.76
London-250yr24hr-10min           12:10      2.605
London-250yr24hr-10min           12:20      2.466
London-250yr24hr-10min           12:30      2.342
London-250yr24hr-10min           12:40      2.23
London-250yr24hr-10min           12:50      2.129
London-250yr24hr-10min           13:00      2.036
London-250yr24hr-10min           13:10      1.952
London-250yr24hr-10min           13:20      1.875
London-250yr24hr-10min           13:30      1.803
London-250yr24hr-10min           13:40      1.737
London-250yr24hr-10min           13:50      1.676
London-250yr24hr-10min           14:00      1.62
London-250yr24hr-10min           14:10      1.567
London-250yr24hr-10min           14:20      1.517
London-250yr24hr-10min           14:30      1.471
London-250yr24hr-10min           14:40      1.428
London-250yr24hr-10min           14:50      1.387
London-250yr24hr-10min           15:00      1.348
London-250yr24hr-10min           15:10      1.312
London-250yr24hr-10min           15:20      1.278
London-250yr24hr-10min           15:30      1.245
London-250yr24hr-10min           15:40      1.215
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London-250yr24hr-10min          15:50      1.185
London-250yr24hr-10min          16:00      1.158
London-250yr24hr-10min          16:10      1.131
London-250yr24hr-10min          16:20      1.106
London-250yr24hr-10min          16:30      1.082
London-250yr24hr-10min          16:40      1.059
London-250yr24hr-10min          16:50      1.037
London-250yr24hr-10min          17:00      1.016
London-250yr24hr-10min          17:10      0.996
London-250yr24hr-10min          17:20      0.977
London-250yr24hr-10min          17:30      0.958
London-250yr24hr-10min          17:40      0.94
London-250yr24hr-10min          17:50      0.923
London-250yr24hr-10min          18:00      0.907
London-250yr24hr-10min          18:10      0.891
London-250yr24hr-10min          18:20      0.875
London-250yr24hr-10min          18:30      0.861
London-250yr24hr-10min          18:40      0.846
London-250yr24hr-10min          18:50      0.833
London-250yr24hr-10min          19:00      0.819
London-250yr24hr-10min          19:10      0.806
London-250yr24hr-10min          19:20      0.794
London-250yr24hr-10min          19:30      0.782
London-250yr24hr-10min          19:40      0.77
London-250yr24hr-10min          19:50      0.759
London-250yr24hr-10min          20:00      0.748
London-250yr24hr-10min          20:10      0.737
London-250yr24hr-10min          20:20      0.727
London-250yr24hr-10min          20:30      0.717
London-250yr24hr-10min          20:40      0.707
London-250yr24hr-10min          20:50      0.698
London-250yr24hr-10min          21:00      0.689
London-250yr24hr-10min          21:10      0.68
London-250yr24hr-10min          21:20      0.671
London-250yr24hr-10min          21:30      0.663
London-250yr24hr-10min          21:40      0.654
London-250yr24hr-10min          21:50      0.646
London-250yr24hr-10min          22:00      0.639
London-250yr24hr-10min          22:10      0.631
London-250yr24hr-10min          22:20      0.624
London-250yr24hr-10min          22:30      0.616
London-250yr24hr-10min          22:40      0.609
London-250yr24hr-10min          22:50      0.602
London-250yr24hr-10min          23:00      0.596
London-250yr24hr-10min          23:10      0.589
London-250yr24hr-10min          23:20      0.583
London-250yr24hr-10min          23:30      0.576
London-250yr24hr-10min          23:40      0.57
London-250yr24hr-10min          23:50      0.564
London-250yr24hr-10min          24:00      0

;Chicago design storm, a = 3048.22, b = 10.03, c = 0.888, Duration = 180 minutes, r = 0.38, rain units = mm/hr.
London-250yr3hr-10min           0:00       5.009
London-250yr3hr-10min           0:10       6.1
London-250yr3hr-10min           0:20       7.78
London-250yr3hr-10min           0:30       10.665
London-250yr3hr-10min           0:40       16.579
London-250yr3hr-10min           0:50       33.816
London-250yr3hr-10min           1:00       212.889
London-250yr3hr-10min           1:10       83.849
London-250yr3hr-10min           1:20       45.471
London-250yr3hr-10min           1:30       25.565
London-250yr3hr-10min           1:40       17.236
London-250yr3hr-10min           1:50       12.814
London-250yr3hr-10min           2:00       10.124
London-250yr3hr-10min           2:10       8.335
London-250yr3hr-10min           2:20       7.068
London-250yr3hr-10min           2:30       6.128
London-250yr3hr-10min           2:40       5.405
London-250yr3hr-10min           2:50       4.833
London-250yr3hr-10min           3:00       0

;Chicago design storm, a = 538.85, b = 6.331, c = 0.809, Duration = 240 minutes, r = 0.38, rain units = mm/hr.
London-25mm4hr-10min            0:00       1.396
London-25mm4hr-10min            0:10       1.558
London-25mm4hr-10min            0:20       1.769
London-25mm4hr-10min            0:30       2.056
London-25mm4hr-10min            0:40       2.468
London-25mm4hr-10min            0:50       3.115
London-25mm4hr-10min            1:00       4.286
London-25mm4hr-10min            1:10       7.08
London-25mm4hr-10min            1:20       18.278
London-25mm4hr-10min            1:30       56.252
London-25mm4hr-10min            1:40       13.841
London-25mm4hr-10min            1:50       7.728
London-25mm4hr-10min            2:00       5.382
London-25mm4hr-10min            2:10       4.151
London-25mm4hr-10min            2:20       3.394
London-25mm4hr-10min            2:30       2.882
London-25mm4hr-10min            2:40       2.511
London-25mm4hr-10min            2:50       2.231
London-25mm4hr-10min            3:00       2.01
London-25mm4hr-10min            3:10       1.832
London-25mm4hr-10min            3:20       1.686
London-25mm4hr-10min            3:30       1.563
London-25mm4hr-10min            3:40       1.458
London-25mm4hr-10min            3:50       1.367
London-25mm4hr-10min            4:00       0

;Chicago design storm, a = 2019.372, b = 9.824, c = 0.875, Duration = 180 minutes, r = 0.38, rain units = mm/hr.
London-25yr3hr-10min            0:00       3.8
London-25yr3hr-10min            0:10       4.595
London-25yr3hr-10min            0:20       5.811
London-25yr3hr-10min            0:30       7.88
```



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London-25yr3hr-10min            0:40       12.072
London-25yr3hr-10min            0:50       24.122
London-25yr3hr-10min            1:00       147.97
London-25yr3hr-10min            1:10       58.745
London-25yr3hr-10min            1:20       32.219
London-25yr3hr-10min            1:30       18.379
London-25yr3hr-10min            1:40       12.537
London-25yr3hr-10min            1:50       9.41
London-25yr3hr-10min            2:00       7.494
London-25yr3hr-10min            2:10       6.211
London-25yr3hr-10min            2:20       5.297
London-25yr3hr-10min            2:30       4.616
London-25yr3hr-10min            2:40       4.089
London-25yr3hr-10min            2:50       3.671
London-25yr3hr-10min            3:00       0

;Chicago design storm, a = 1290, b = 8.5, c = 0.86, Duration = 180 minutes, r = 0.38, rain units = mm/hr.
London-2yr3hr-10min             0:00       2.762
London-2yr3hr-10min             0:10       3.308
London-2yr3hr-10min             0:20       4.135
London-2yr3hr-10min             0:30       5.526
London-2yr3hr-10min             0:40       8.31
London-2yr3hr-10min             0:50       16.271
London-2yr3hr-10min             1:00       104.911
London-2yr3hr-10min             1:10       39.582
London-2yr3hr-10min             1:20       21.641
London-2yr3hr-10min             1:30       12.473
London-2yr3hr-10min             1:40       8.619
London-2yr3hr-10min             1:50       6.547
London-2yr3hr-10min             2:00       5.268
London-2yr3hr-10min             2:10       4.406
London-2yr3hr-10min             2:20       3.787
London-2yr3hr-10min             2:30       3.323
London-2yr3hr-10min             2:40       2.962
London-2yr3hr-10min             2:50       2.673
London-2yr3hr-10min             3:00       0

;Chicago design storm, a = 2270.665, b = 9.984, c = 0.876, Duration = 180 minutes, r = 0.38, rain units = mm/hr.
London-50yr3hr-10min            0:00       4.242
London-50yr3hr-10min            0:10       5.135
London-50yr3hr-10min            0:20       6.5
London-50yr3hr-10min            0:30       8.824
London-50yr3hr-10min            0:40       13.536
London-50yr3hr-10min            0:50       27.075
London-50yr3hr-10min            1:00       164.723
London-50yr3hr-10min            1:10       65.843
London-50yr3hr-10min            1:20       36.161
London-50yr3hr-10min            1:30       20.626
London-50yr3hr-10min            1:40       14.059
London-50yr3hr-10min            1:50       10.544
London-50yr3hr-10min            2:00       8.39
London-50yr3hr-10min            2:10       6.949
London-50yr3hr-10min            2:20       5.923
London-50yr3hr-10min            2:30       5.158
London-50yr3hr-10min            2:40       4.567
London-50yr3hr-10min            2:50       4.098
London-50yr3hr-10min            3:00       0

;Chicago design storm, a = 1183.74, b = 7.641, c = 0.838, Duration = 180 minutes, r = 0.38, rain units = mm/hr.
London-5yr3hr-10min             0:00       3.117
London-5yr3hr-10min             0:10       3.696
London-5yr3hr-10min             0:20       4.56
London-5yr3hr-10min             0:30       5.989
London-5yr3hr-10min             0:40       8.801
London-5yr3hr-10min             0:50       16.675
London-5yr3hr-10min             1:00       106.824
London-5yr3hr-10min             1:10       39.622
London-5yr3hr-10min             1:20       21.953
London-5yr3hr-10min             1:30       12.939
London-5yr3hr-10min             1:40       9.111
London-5yr3hr-10min             1:50       7.028
London-5yr3hr-10min             2:00       5.727
London-5yr3hr-10min             2:10       4.84
London-5yr3hr-10min             2:20       4.198
London-5yr3hr-10min             2:30       3.711
London-5yr3hr-10min             2:40       3.33
London-5yr3hr-10min             2:50       3.023
London-5yr3hr-10min             3:00       0

[REPORT]
INPUT     NO
CONTROLS  NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL
```

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.013)
--------------------------------------------------------------

*******************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*******************************************************

****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 04/01/2005 00:00:00
Ending Date .............. 04/04/2005 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 1
Head Tolerance ........... 0.001500 m


**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         2.244        25.049
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         1.321        14.753
Surface Runoff ...........         0.800         8.930
Final Storage ............         0.123         1.369
Continuity Error (%) .....        -0.013


**************************        Volume        Volume
Flow Routing Continuity        hectare-m     10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.800         7.999
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         0.782         7.824
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.018         0.178
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....        -0.044


***************************
Time-Step Critical Elements
***************************
None


********************************
Highest Flow Instability Indexes
********************************
All links are stable.


*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     1.00 sec
Maximum Time Step           :     1.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.00
Percent Not Converging      :     0.00


***************************
Subcatchment Runoff Summary
***************************

-------------------------------------------------------------------------------------------------------------------------------
                        Total      Total      Total      Total     Imperv      Perv     Total      Total      Peak  Runoff
                       Precip      Runon       Evap      Infil     Runoff    Runoff    Runoff     Runoff    Runoff   Coeff
Subcatchment               mm         mm         mm         mm         mm        mm        mm   10^6 ltr       CMS
-------------------------------------------------------------------------------------------------------------------------------
A1                        25.05       0.00       0.00      23.78       0.00      0.00      0.00       0.00      0.00   0.000
A2                        25.05       0.00       0.00      23.79       0.00      0.00      0.00       0.00      0.00   0.000
EXT1                      25.05       0.00       0.00      12.94      12.95      4.24     10.71       2.14      0.74   0.428
EXT2                      25.05       0.00       0.00      13.04      12.95      4.13     10.61       2.74      0.93   0.423
EXT3                      25.05       0.00       0.00       8.32      15.31      0.00     15.31       0.50      0.32   0.611
EXT4                      25.05       0.00       0.00       2.85      20.73      0.00     20.73       0.27      0.17   0.828
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EXT5                      25.05       0.00       0.00      11.53      12.97     12.15     12.15       0.09      0.06   0.485
EXT6                      25.05       0.00       0.00      13.16      11.78     10.52     10.52       0.05      0.02   0.420
EXT7                      25.05       0.00       0.00      11.49      12.97     12.19     12.19       0.11      0.08   0.487
EXT8                      25.05       0.00       0.00      10.70      12.95      0.00     12.95       2.11      1.22   0.517


******************
Node Depth Summary
******************

-----------------------------------------------------------------------------
                            Average  Maximum  Maximum  Time of Max   Reported
                              Depth    Depth      HGL   Occurrence   Max Depth
Node               Type       Meters   Meters   Meters  days hr:min      Meters
-----------------------------------------------------------------------------
J1                 JUNCTION     0.03     0.60   253.66    0  01:40        0.60
J10                JUNCTION     0.03     0.60   253.30    0  01:42        0.60
J11                JUNCTION     0.03     0.62   253.10    0  01:42        0.62
J12                JUNCTION     0.01     0.11   256.30    0  02:00        0.11
J13                JUNCTION     0.02     0.57   253.82    0  01:40        0.57
J14                JUNCTION     0.05     0.88   251.92    0  01:44        0.88
J15                JUNCTION     0.00     0.00   254.30    0  00:00        0.00
J16                JUNCTION     0.05     0.93   252.11    0  01:43        0.93
J17                JUNCTION     0.04     0.75   251.65    0  01:44        0.75
J2                 JUNCTION     0.01     0.49   255.31    0  01:40        0.48
J3                 JUNCTION     0.03     0.63   252.90    0  01:42        0.63
J4                 JUNCTION     0.01     0.47   255.93    0  01:40        0.47
J5                 JUNCTION     0.00     0.00   257.00    0  00:00        0.00
J6                 JUNCTION     0.02     0.52   254.06    0  01:41        0.52
J7                 JUNCTION     0.01     0.44   253.96    0  01:41        0.44
J8                 JUNCTION     0.04     0.80   252.48    0  01:43        0.80
J9                 JUNCTION     0.04     0.68   253.49    0  01:41        0.68
DorchesterCreek    OUTFALL      0.00     0.00   254.10    0  00:00        0.00
Ex.Ditch           OUTFALL      0.00     0.05   255.67    0  02:00        0.05
Ex.Major           OUTFALL      0.00     0.00   255.50    0  00:00        0.00
Ex.Sewer           OUTFALL      0.03     0.68   251.55    0  01:44        0.68
Ex.Storage         STORAGE      0.04     0.86   255.68    0  01:56        0.86
Ex.SWMF            STORAGE      0.02     0.28   255.18    0  02:13        0.28


******************
Node Inflow Summary
******************

-------------------------------------------------------------------------------------------------------------------------------
                            Maximum  Maximum                    Lateral       Total        Flow
                            Lateral    Total  Time of Max       Inflow      Inflow     Balance
                             Inflow    Inflow   Occurrence       Volume      Volume       Error
Node               Type         CMS      CMS  days hr:min   10^6 ltr    10^6 ltr     Percent
-------------------------------------------------------------------------------------------------------------------------------
J1                 JUNCTION   0.000    1.008    0  01:40          0        4.84      -0.202
J10                JUNCTION   0.000    0.978    0  01:41          0        4.85       0.102
J11                JUNCTION   0.000    0.973    0  01:42          0        4.84      -0.117
J12                JUNCTION   0.134    0.134    0  01:41      0.196       0.196      -0.004
J13                JUNCTION   0.928    0.928    0  01:40       2.74        2.74       0.133
J14                JUNCTION   0.000    1.665    0  01:43          0        7.08       0.104
J15                JUNCTION   0.000    0.000    0  00:00          0           0       0.000 ltr
J16                JUNCTION   0.000    1.666    0  01:43          0        7.09       0.057
J17                JUNCTION   0.000    1.666    0  01:44          0        7.07      -0.084
J2                 JUNCTION   0.000    0.744    0  01:40          0        2.22      -0.310
J3                 JUNCTION   0.000    1.668    0  01:42          0        7.08      -0.001
J4                 JUNCTION   0.740    0.740    0  01:40       2.14        2.14       0.495
J5                 JUNCTION   0.000    0.000    0  00:00          0           0       0.000 ltr
J6                 JUNCTION   0.000    0.727    0  01:40          0        2.23       0.008
J7                 JUNCTION   0.000    0.716    0  01:41          0        2.23      -0.000
J8                 JUNCTION   0.000    1.674    0  01:42          0        7.08      -0.109
J9                 JUNCTION   0.000    0.991    0  01:40          0        4.85       0.046
DorchesterCreek    OUTFALL    0.000    0.000    0  00:00          0           0       0.000 ltr
Ex.Ditch           OUTFALL    0.329    0.339    0  01:40      0.548       0.744       0.000
Ex.Major           OUTFALL    0.000    0.000    0  00:00          0           0       0.000 ltr
Ex.Sewer           OUTFALL    0.000    1.667    0  01:44          0        7.08       0.000
Ex.Storage         STORAGE    0.173    0.173    0  01:40      0.267       0.267      -0.001
Ex.SWMF            STORAGE    1.223    1.223    0  01:40       2.11        2.11      -0.013


**********************
Node Surcharge Summary
**********************

No nodes were surcharged.


*********************
Node Flooding Summary
*********************

No nodes were flooded.


**********************
Storage Volume Summary
**********************

-------------------------------------------------------------------------------------------------------------------------------
                        Average     Avg  Evap Exfil        Maximum     Max   Time of Max   Maximum
                         Volume    Pcnt  Pcnt  Pcnt         Volume    Pcnt    Occurrence    Outflow
Storage Unit           1000 m3    Full  Loss  Loss        1000 m3    Full   days hr:min       CMS
-------------------------------------------------------------------------------------------------------------------------------
Ex.Storage               0.006       1     0    67          0.134      28     0  01:56      0.033
Ex.SWMF                  0.087       1     0     0          1.240      17     0  02:13      0.160


************************
Outfall Loading Summary
```

****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
DorchesterCreek	0.00	0.000	0.000	0.000
Ex.Ditch	22.26	0.013	0.339	0.744
Ex.Major	0.00	0.000	0.000	0.000
Ex.Sewer	35.66	0.077	1.667	7.080
System	14.48	0.089	1.667	7.824

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	0.733	0 01:40	2.20	0.53	0.52
C10	CONDUIT	0.978	0 01:41	1.49	0.61	0.47
C11	CONDUIT	0.973	0 01:42	1.59	0.41	0.44
C12	CONDUIT	0.976	0 01:42	1.58	0.43	0.45
C13	CONDUIT	0.000	0 00:00	0.00	0.00	0.00
C14	CONDUIT	0.000	0 00:00	0.00	0.00	0.11
C16	CONDUIT	0.031	0 02:00	0.18	0.01	0.15
C17	CONDUIT	0.000	0 00:00	0.00	0.00	0.00
C18	CONDUIT	0.922	0 01:40	1.60	0.37	0.42
C19	CONDUIT	1.665	0 01:43	1.69	1.04	0.65
C2	CONDUIT	0.991	0 01:40	1.53	0.39	0.46
C20	CONDUIT	1.666	0 01:44	1.92	1.04	0.58
C21	CONDUIT	1.667	0 01:44	2.16	1.04	0.53
C3	CONDUIT	1.674	0 01:42	2.25	0.41	0.52
C4	CONDUIT	0.727	0 01:40	2.13	0.66	0.61
C5	CONDUIT	0.716	0 01:41	2.21	1.55	0.58
C6	CONDUIT	0.000	0 00:00	0.00	0.00	0.00
C7	CONDUIT	0.000	0 00:00	0.00	0.00	0.00
C8	CONDUIT	0.716	0 01:41	2.47	0.56	0.53
C9	CONDUIT	1.666	0 01:43	2.08	0.73	0.55
OR1	ORIFICE	0.020	0 01:56			1.00
C15	WEIR	0.000	0 00:00			0.00
W1	WEIR	0.000	0 00:00			0.00
W2	WEIR	0.000	0 00:00			0.00
W3	WEIR	0.000	0 00:00			0.00
OL1	DUMMY	0.160	0 02:13			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
		---------- Fraction of Time in Flow Class ----------								
C1	1.00	0.00	0.00	0.00	0.00	0.01	0.00	0.99	0.01	0.00
C10	1.00	0.00	0.00	0.00	0.24	0.00	0.00	0.76	0.00	0.00
C11	1.00	0.00	0.00	0.00	0.19	0.00	0.00	0.81	0.00	0.00
C12	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.00	0.00
C13	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C14	1.00	0.02	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C16	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
C17	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C18	1.00	0.00	0.00	0.00	0.25	0.00	0.00	0.75	0.23	0.00
C19	1.00	0.00	0.00	0.00	0.14	0.00	0.00	0.85	0.00	0.00
C2	1.00	0.00	0.00	0.00	0.25	0.00	0.00	0.75	0.24	0.00
C20	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.00	0.00
C21	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C3	1.00	0.00	0.00	0.00	0.04	0.16	0.00	0.80	0.09	0.00
C4	1.00	0.00	0.00	0.00	0.97	0.03	0.00	0.00	0.95	0.00
C5	1.00	0.00	0.00	0.00	0.96	0.04	0.00	0.00	0.17	0.00
C6	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C7	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C8	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C9	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00

****
Conduit Surcharge Summary
****

Conduit	Hours Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C19	0.01	0.01	0.01	0.05	0.01
C20	0.01	0.01	0.01	0.04	0.01
C21	0.01	0.01	0.01	0.05	0.01
C5	0.01	0.01	0.01	0.20	0.01

Analysis begun on: Thu Jul 11 16:27:01 2019
Analysis ended on: Thu Jul 11 16:27:09 2019
Total elapsed time: 00:00:08

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.013)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Surcharge Method ..... EXTRAN
Starting Date 04/01/2005 00:00:00
Ending Date 04/04/2005 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:01:00
Wet Time Step 00:01:00
Dry Time Step 00:01:00
Routing Time Step ..... 1.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Number of Threads 1
Head Tolerance ..... 0.001500 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	3.829	42.751
Evaporation Loss	0.000	0.000
Infiltration Loss	2.046	22.837
Surface Runoff	1.662	18.555
Final Storage	0.122	1.367
Continuity Error (%)	-0.021	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	1.662	16.620
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	1.641	16.407
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.021	0.211
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	0.009	

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
All links are stable.

****
Routing Time Step Summary
****
Minimum Time Step : 0.50 sec
Average Time Step : 1.00 sec
Maximum Time Step : 1.00 sec
Percent in Steady State : 0.00
Average Iterations per Step : 2.00
Percent Not Converging : 0.00

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
A1	42.75	0.00	0.00	38.43	0.00	3.06	3.06	0.48	0.06	0.072
A2	42.75	0.00	0.00	38.67	0.00	2.83	2.83	0.15	0.02	0.066
EXT1	42.75	0.00	0.00	18.93	22.70	11.08	22.43	4.49	1.48	0.525
EXT2	42.75	0.00	0.00	19.10	22.70	10.91	22.26	5.74	1.86	0.521
EXT3	42.75	0.00	0.00	12.42	28.93	2.11	28.93	0.94	0.60	0.677
EXT4	42.75	0.00	0.00	4.11	37.19	0.87	37.19	0.48	0.33	0.870

EXT5	42.75	0.00	0.00	16.80	22.73	24.62	24.62	0.18	0.12	0.576
EXT6	42.75	0.00	0.00	19.16	20.65	22.25	22.25	0.11	0.04	0.520
EXT7	42.75	0.00	0.00	16.74	22.73	24.68	24.68	0.22	0.16	0.577
EXT8	42.75	0.00	0.00	17.77	23.60	0.91	23.60	3.84	2.37	0.552

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.04	0.92	253.97	0 01:11	0.91
J10	JUNCTION	0.04	0.91	253.61	0 01:12	0.91
J11	JUNCTION	0.05	0.94	253.42	0 01:12	0.94
J12	JUNCTION	0.01	0.15	256.35	0 01:28	0.15
J13	JUNCTION	0.02	0.96	254.21	0 01:10	0.94
J14	JUNCTION	0.06	1.32	252.36	0 01:14	1.32
J15	JUNCTION	0.01	0.09	254.39	0 02:50	0.09
J16	JUNCTION	0.06	1.49	252.67	0 01:14	1.48
J17	JUNCTION	0.05	1.04	251.94	0 01:14	1.04
J2	JUNCTION	0.02	1.20	256.02	0 01:11	1.19
J3	JUNCTION	0.04	0.97	253.25	0 01:13	0.97
J4	JUNCTION	0.02	1.11	256.57	0 01:10	1.07
J5	JUNCTION	0.00	0.00	257.00	0 00:00	0.00
J6	JUNCTION	0.02	0.83	254.37	0 01:11	0.83
J7	JUNCTION	0.02	0.66	254.18	0 01:12	0.66
J8	JUNCTION	0.05	1.35	253.03	0 01:14	1.35
J9	JUNCTION	0.05	1.01	253.82	0 01:12	1.01
DorchesterCreek	OUTFALL	0.00	0.09	254.19	0 02:50	0.09
Ex.Ditch	OUTFALL	0.00	0.07	255.69	0 01:28	0.07
Ex.Major	OUTFALL	0.00	0.00	255.50	0 00:00	0.00
Ex.Sewer	OUTFALL	0.04	0.94	251.81	0 01:15	0.94
Ex.Storage	STORAGE	0.07	1.76	256.58	0 01:34	1.76
Ex.SWMF	STORAGE	0.03	0.52	255.42	0 01:53	0.52

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
J1	JUNCTION	0.000	1.913	0 01:11	0	9.57	-0.173
J10	JUNCTION	0.000	1.882	0 01:12	0	9.59	0.036
J11	JUNCTION	0.000	1.877	0 01:12	0	9.59	-0.166
J12	JUNCTION	0.279	0.279	0 01:11	0.397	0.397	-0.004
J13	JUNCTION	1.859	1.859	0 01:10	5.74	5.74	0.140
J14	JUNCTION	0.000	3.079	0 01:14	0	14.3	0.091
J15	JUNCTION	0.019	0.019	0 02:50	0.15	0.15	0.003
J16	JUNCTION	0.000	3.078	0 01:14	0	14.3	0.035
J17	JUNCTION	0.000	3.078	0 01:14	0	14.3	-0.080
J2	JUNCTION	0.000	1.406	0 01:10	0	4.74	-0.287
J3	JUNCTION	0.000	3.125	0 01:12	0	14.4	0.131
J4	JUNCTION	1.483	1.483	0 01:10	4.49	4.49	0.426
J5	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
J6	JUNCTION	0.000	1.270	0 01:10	0	4.75	-0.018
J7	JUNCTION	0.000	1.258	0 01:11	0	4.75	0.000
J8	JUNCTION	0.000	3.102	0 01:12	0	14.3	-0.041
J9	JUNCTION	0.000	1.898	0 01:11	0	9.59	-0.013
DorchesterCreek	OUTFALL	0.000	0.019	0 02:50	0	0.15	0.000
Ex.Ditch	OUTFALL	0.636	0.663	0 01:10	1.52	1.92	0.000
Ex.Major	OUTFALL	0.000	0.000	0 00:00	0	0	0.000 ltr
Ex.Sewer	OUTFALL	0.000	3.077	0 01:15	0	14.3	0.000
Ex.Storage	STORAGE	0.326	0.326	0 01:10	0.48	0.48	-0.000
Ex.SWMF	STORAGE	2.369	2.369	0 01:10	3.84	3.84	-0.006

****
Node Surcharge Summary
****

No nodes were surcharged.

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Ex.Storage	0.010	2	0	44	0.268	56	0 01:34	0.055
Ex.SWMF	0.152	2	0	0	2.446	33	0 01:53	0.245

****
Outfall Loading Summary

****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
DorchesterCreek	6.30	0.009	0.019	0.150
Ex.Ditch	21.74	0.034	0.663	1.919
Ex.Major	0.00	0.000	0.000	0.000
Ex.Sewer	34.98	0.158	3.077	14.338
System	15.75	0.201	3.077	16.407

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	1.401	0 01:10	2.40	1.01	1.00
C10	CONDUIT	1.882	0 01:12	1.76	1.18	0.70
C11	CONDUIT	1.877	0 01:12	1.83	0.80	0.67
C12	CONDUIT	1.869	0 01:12	1.77	0.83	0.70
C13	CONDUIT	0.000	0 00:00	0.00	0.00	0.00
C14	CONDUIT	0.000	0 00:00	0.00	0.00	0.15
C16	CONDUIT	0.081	0 01:28	0.23	0.02	0.22
C17	CONDUIT	0.019	0 02:50	1.25	0.00	0.09
C18	CONDUIT	1.750	0 01:09	1.84	0.70	0.68
C19	CONDUIT	3.079	0 01:14	2.17	1.93	0.97
C2	CONDUIT	1.898	0 01:11	1.79	0.76	0.70
C20	CONDUIT	3.078	0 01:14	2.36	1.92	0.86
C21	CONDUIT	3.077	0 01:15	2.74	1.93	0.73
C3	CONDUIT	3.102	0 01:12	2.54	0.77	0.85
C4	CONDUIT	1.270	0 01:10	2.39	1.15	1.00
C5	CONDUIT	1.258	0 01:11	2.51	2.73	0.90
C6	CONDUIT	0.000	0 00:00	0.00	0.00	0.11
C7	CONDUIT	0.000	0 00:00	0.00	0.00	0.00
C8	CONDUIT	1.258	0 01:12	2.74	0.98	0.80
C9	CONDUIT	3.078	0 01:14	2.33	1.35	0.94
OR1	ORIFICE	0.039	0 01:34			1.00
C15	WEIR	0.000	0 00:00			0.00
W1	WEIR	0.000	0 00:00			0.00
W2	WEIR	0.000	0 00:00			0.00
W3	WEIR	0.000	0 00:00			0.00
OL1	DUMMY	0.245	0 01:53			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
		---------- Fraction of Time in Flow Class ----------								
C1	1.00	0.00	0.00	0.00	0.00	0.03	0.00	0.97	0.03	0.00
C10	1.00	0.00	0.00	0.00	0.26	0.00	0.00	0.74	0.00	0.00
C11	1.00	0.00	0.00	0.00	0.20	0.00	0.00	0.80	0.00	0.00
C12	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.97	0.00	0.00
C13	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C14	1.00	0.01	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C16	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
C17	1.00	0.02	0.00	0.00	0.91	0.08	0.00	0.00	0.96	0.00
C18	1.00	0.00	0.00	0.00	0.27	0.00	0.00	0.73	0.23	0.00
C19	1.00	0.00	0.00	0.00	0.15	0.00	0.00	0.85	0.00	0.00
C2	1.00	0.00	0.00	0.00	0.27	0.00	0.00	0.73	0.24	0.00
C20	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.96	0.00	0.00
C21	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C3	1.00	0.00	0.00	0.00	0.05	0.16	0.00	0.79	0.08	0.00
C4	1.00	0.00	0.00	0.00	0.96	0.04	0.00	0.00	0.95	0.00
C5	1.00	0.00	0.00	0.00	0.96	0.04	0.00	0.00	0.18	0.00
C6	1.00	0.02	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C7	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C8	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C9	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00

****
Conduit Surcharge Summary
****

Conduit	Both Ends	Upstream	Dnstream	Both Ends	Hours Above Full Normal Flow	Hours Capacity Limited
	--------- Hours Full --------					
C1	0.06	0.06	0.10	0.01		0.01
C10	0.01	0.01	0.01	0.01	0.11	0.01
C19	0.01	0.12	0.01	0.60		0.01
C20	0.01	0.01	0.01	0.59		0.01
C21	0.01	0.01	0.01	0.60		0.01
C4	0.01	0.12	0.01	0.17		0.01
C5	0.01	0.01	0.01	0.98		0.01
C9	0.01	0.01	0.01	0.26		0.01

Analysis begun on: Thu Jul 11 16:27:38 2019
Analysis ended on: Thu Jul 11 16:27:46 2019

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Total elapsed time: 00:00:08
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EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.013)
--------------------------------------------------------------

*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 04/01/2005 00:00:00
Ending Date .............. 04/04/2005 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 1
Head Tolerance ........... 0.001500 m

**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         3.958        44.191
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         2.102        23.463
Surface Runoff ...........         1.735        19.370
Final Storage ............         0.122         1.367
Continuity Error (%) .....        -0.020

**************************        Volume       Volume
Flow Routing Continuity        hectare-m     10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         1.735        17.350
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         1.713        17.132
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.022         0.215
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....         0.013

****************************
Time-Step Critical Elements
****************************
None

*********************************
Highest Flow Instability Indexes
*********************************
All links are stable.

**************************
Routing Time Step Summary
**************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     1.00 sec
Maximum Time Step           :     1.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.00
Percent Not Converging      :     0.00

****************************
Subcatchment Runoff Summary
****************************

-------------------------------------------------------------------------------------------------------------------------------
                          Total      Total      Total      Total     Imperv      Perv     Total     Total      Peak  Runoff
                         Precip      Runon       Evap      Infil     Runoff    Runoff    Runoff    Runoff    Runoff   Coeff
Subcatchment                 mm         mm         mm         mm         mm        mm        mm  10^6 ltr       CMS
-------------------------------------------------------------------------------------------------------------------------------
A1                          44.19       0.00       0.00      39.49       0.00      3.44      3.44      0.54      0.06   0.078
A2                          44.19       0.00       0.00      39.74       0.00      3.21      3.21      0.17      0.02   0.073
EXT1                        44.19       0.00       0.00      19.45      23.49     11.61     23.35      4.67      1.52   0.528
EXT2                        44.19       0.00       0.00      19.63      23.49     11.42     23.17      5.98      1.91   0.524
EXT3                        44.19       0.00       0.00      12.70      30.09      2.33     30.09      0.97      0.61   0.681
EXT4                        44.19       0.00       0.00       4.20      38.55      0.95     38.55      0.50      0.33   0.872
```

EXT5	44.19	0.00	0.00	17.19	23.52	25.66	25.66	0.18	0.13	0.581
EXT6	44.19	0.00	0.00	19.64	21.37	23.21	23.21	0.11	0.05	0.525
EXT7	44.19	0.00	0.00	17.14	23.52	25.72	25.72	0.23	0.16	0.582
EXT8	44.19	0.00	0.00	18.26	24.55	1.06	24.55	3.99	2.42	0.556

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.04	0.93	253.98	0 01:12	0.93
J10	JUNCTION	0.04	0.92	253.62	0 01:13	0.92
J11	JUNCTION	0.05	0.95	253.43	0 01:13	0.95
J12	JUNCTION	0.01	0.15	256.35	0 01:27	0.15
J13	JUNCTION	0.02	1.09	254.34	0 01:10	1.08
J14	JUNCTION	0.06	1.34	252.38	0 01:14	1.34
J15	JUNCTION	0.01	0.09	254.39	0 02:50	0.09
J16	JUNCTION	0.06	1.51	252.69	0 01:14	1.51
J17	JUNCTION	0.05	1.05	251.95	0 01:14	1.05
J2	JUNCTION	0.02	1.30	256.12	0 01:11	1.29
J3	JUNCTION	0.04	1.00	253.27	0 01:14	1.00
J4	JUNCTION	0.02	1.22	256.68	0 01:10	1.18
J5	JUNCTION	0.00	0.00	257.00	0 00:00	0.00
J6	JUNCTION	0.02	0.84	254.38	0 01:12	0.84
J7	JUNCTION	0.02	0.68	254.20	0 01:12	0.68
J8	JUNCTION	0.05	1.37	253.05	0 01:14	1.37
J9	JUNCTION	0.05	1.01	253.82	0 01:12	1.01
DorchesterCreek	OUTFALL	0.00	0.09	254.19	0 02:50	0.09
Ex.Ditch	OUTFALL	0.00	0.07	255.69	0 01:27	0.07
Ex.Major	OUTFALL	0.00	0.00	255.50	0 00:00	0.00
Ex.Sewer	OUTFALL	0.04	0.94	251.82	0 01:15	0.94
Ex.Storage	STORAGE	0.07	1.82	256.64	0 01:34	1.82
Ex.SWMF	STORAGE	0.04	0.54	255.44	0 01:54	0.54

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
J1	JUNCTION	0.000	1.925	0 01:12	0	9.96	-0.161
J10	JUNCTION	0.000	1.906	0 01:12	0	9.98	0.040
J11	JUNCTION	0.000	1.900	0 01:13	0	9.98	-0.155
J12	JUNCTION	0.287	0.287	0 01:10	0.414	0.414	-0.004
J13	JUNCTION	1.910	1.910	0 01:10	5.98	5.98	0.117
J14	JUNCTION	0.000	3.118	0 01:14	0	14.9	0.093
J15	JUNCTION	0.022	0.022	0 02:50	0.17	0.17	0.003
J16	JUNCTION	0.000	3.118	0 01:14	0	14.9	0.022
J17	JUNCTION	0.000	3.115	0 01:14	0	14.9	-0.079
J2	JUNCTION	0.000	1.470	0 01:10	0	4.94	-0.286
J3	JUNCTION	0.000	3.162	0 01:12	0	14.9	0.127
J4	JUNCTION	1.524	1.524	0 01:10	4.67	4.67	0.418
J5	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
J6	JUNCTION	0.000	1.289	0 01:11	0	4.95	-0.018
J7	JUNCTION	0.000	1.286	0 01:12	0	4.95	0.000
J8	JUNCTION	0.000	3.128	0 01:13	0	14.9	-0.023
J9	JUNCTION	0.000	1.914	0 01:12	0	9.98	-0.022
DorchesterCreek	OUTFALL	0.000	0.022	0 02:50	0	0.17	0.000
Ex.Ditch	OUTFALL	0.650	0.680	0 01:10	1.62	2.04	0.000
Ex.Major	OUTFALL	0.000	0.000	0 00:00	0	0	0.000 ltr
Ex.Sewer	OUTFALL	0.000	3.117	0 01:15	0	14.9	0.000
Ex.Storage	STORAGE	0.332	0.332	0 01:10	0.497	0.498	0.000
Ex.SWMF	STORAGE	2.419	2.419	0 01:10	3.99	3.99	-0.005

****
Node Surcharge Summary
****

No nodes were surcharged.

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Ex.Storage	0.011	2	0	43	0.277	58	0 01:34	0.056
Ex.SWMF	0.159	2	0	0	2.518	34	0 01:54	0.249

****
Outfall Loading Summary

****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
DorchesterCreek	6.24	0.011	0.022	0.170
Ex.Ditch	21.79	0.036	0.680	2.038
Ex.Major	0.00	0.000	0.000	0.000
Ex.Sewer	35.04	0.164	3.117	14.924
System	15.77	0.211	3.117	17.132

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	1.470	0 01:10	2.40	1.06	1.00
C10	CONDUIT	1.906	0 01:12	1.77	1.19	0.71
C11	CONDUIT	1.900	0 01:13	1.83	0.81	0.68
C12	CONDUIT	1.877	0 01:12	1.77	0.83	0.71
C13	CONDUIT	0.000	0 00:00	0.00	0.00	0.00
C14	CONDUIT	0.000	0 00:00	0.00	0.00	0.15
C16	CONDUIT	0.084	0 01:27	0.23	0.02	0.22
C17	CONDUIT	0.022	0 02:50	1.29	0.00	0.09
C18	CONDUIT	1.750	0 01:08	1.84	0.70	0.73
C19	CONDUIT	3.118	0 01:14	2.19	1.95	0.98
C2	CONDUIT	1.914	0 01:12	1.79	0.76	0.71
C20	CONDUIT	3.115	0 01:14	2.37	1.94	0.87
C21	CONDUIT	3.117	0 01:15	2.75	1.95	0.74
C3	CONDUIT	3.128	0 01:13	2.55	0.77	0.87
C4	CONDUIT	1.289	0 01:11	2.41	1.16	1.00
C5	CONDUIT	1.286	0 01:12	2.52	2.79	0.91
C6	CONDUIT	0.000	0 00:00	0.00	0.00	0.11
C7	CONDUIT	0.000	0 00:00	0.00	0.00	0.00
C8	CONDUIT	1.285	0 01:12	2.74	1.00	0.82
C9	CONDUIT	3.118	0 01:14	2.33	1.37	0.95
OR1	ORIFICE	0.040	0 01:34			1.00
C15	WEIR	0.000	0 00:00			0.00
W1	WEIR	0.000	0 00:00			0.00
W2	WEIR	0.000	0 00:00			0.00
W3	WEIR	0.000	0 00:00			0.00
OL1	DUMMY	0.249	0 01:54			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
		---------- Fraction of Time in Flow Class ----------								
C1	1.00	0.00	0.00	0.00	0.00	0.03	0.00	0.97	0.03	0.00
C10	1.00	0.00	0.00	0.00	0.26	0.00	0.00	0.74	0.00	0.00
C11	1.00	0.00	0.00	0.00	0.20	0.00	0.00	0.80	0.00	0.00
C12	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.97	0.00	0.00
C13	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C14	1.00	0.01	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C16	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
C17	1.00	0.02	0.00	0.00	0.91	0.07	0.00	0.00	0.96	0.00
C18	1.00	0.00	0.00	0.00	0.27	0.00	0.00	0.73	0.23	0.00
C19	1.00	0.00	0.00	0.00	0.15	0.00	0.00	0.85	0.00	0.00
C2	1.00	0.00	0.00	0.00	0.27	0.00	0.00	0.73	0.24	0.00
C20	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.96	0.00	0.00
C21	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C3	1.00	0.00	0.00	0.00	0.05	0.16	0.00	0.79	0.09	0.00
C4	1.00	0.00	0.00	0.00	0.96	0.04	0.00	0.00	0.95	0.00
C5	1.00	0.00	0.00	0.00	0.95	0.04	0.00	0.00	0.18	0.00
C6	1.00	0.02	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C7	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C8	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C9	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00

****
Conduit Surcharge Summary
****

Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C1	0.08	0.08	0.12	0.02	0.02
C10	0.01	0.01	0.01	0.12	0.01
C19	0.01	0.14	0.01	0.64	0.01
C20	0.01	0.01	0.01	0.64	0.01
C21	0.01	0.01	0.01	0.64	0.01
C4	0.06	0.14	0.06	0.19	0.06
C5	0.01	0.06	0.01	1.04	0.01
C8	0.01	0.01	0.01	0.02	0.01
C9	0.01	0.04	0.01	0.27	0.01

Analysis begun on: Thu Jul 11 16:59:41 2019

```
Analysis ended on:  Thu Jul 11 16:59:48 2019
Total elapsed time: 00:00:07
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EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.013)
--------------------------------------------------------------

*******************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*******************************************************

****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 04/01/2005 00:00:00
Ending Date .............. 04/04/2005 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 1
Head Tolerance ........... 0.001500 m

**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         4.662        52.050
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         2.339        26.111
Surface Runoff ...........         2.202        24.579
Final Storage ............         0.123         1.370
Continuity Error (%) .....        -0.021

**************************        Volume       Volume
Flow Routing Continuity        hectare-m     10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         2.202        22.016
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         2.177        21.772
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.024         0.237
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....         0.033

****************************
Time-Step Critical Elements
****************************
None

********************************
Highest Flow Instability Indexes
********************************
All links are stable.

*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     0.45 sec
Average Time Step           :     1.00 sec
Maximum Time Step           :     1.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.00
Percent Not Converging      :     0.00

***************************
Subcatchment Runoff Summary
***************************
```

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
A1	52.05	0.00	0.00	44.12	0.00	6.67	6.67	1.04	0.11	0.128
A2	52.05	0.00	0.00	44.48	0.00	6.32	6.32	0.34	0.04	0.121
EXT1	52.05	0.00	0.00	21.48	27.81	15.27	29.17	5.84	1.87	0.560
EXT2	52.05	0.00	0.00	21.68	27.81	15.07	28.98	7.48	2.34	0.557
EXT3	52.05	0.00	0.00	13.99	36.66	3.78	36.66	1.19	0.72	0.704
EXT4	52.05	0.00	0.00	4.63	45.98	1.47	45.98	0.59	0.39	0.883

EXT5	52.05	0.00	0.00	19.15	27.85	31.58	31.58	0.23	0.15	0.607
EXT6	52.05	0.00	0.00	21.81	25.30	28.89	28.89	0.14	0.06	0.555
EXT7	52.05	0.00	0.00	19.08	27.85	31.64	31.64	0.28	0.20	0.608
EXT8	52.05	0.00	0.00	20.57	30.10	2.28	30.10	4.89	2.88	0.578

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.05	1.02	254.08	0 01:21	1.02
J10	JUNCTION	0.05	1.11	253.81	0 01:21	1.11
J11	JUNCTION	0.05	1.22	253.70	0 01:22	1.22
J12	JUNCTION	0.01	0.17	256.36	0 01:26	0.17
J13	JUNCTION	0.03	3.46	256.71	0 01:10	3.44
J14	JUNCTION	0.07	1.40	252.44	0 01:19	1.40
J15	JUNCTION	0.01	0.11	254.41	0 02:20	0.11
J16	JUNCTION	0.07	1.63	252.82	0 01:18	1.63
J17	JUNCTION	0.06	1.08	251.98	0 01:19	1.08
J2	JUNCTION	0.03	2.18	257.00	0 01:12	2.18
J3	JUNCTION	0.04	1.31	253.59	0 01:21	1.31
J4	JUNCTION	0.02	2.33	257.79	0 01:10	2.33
J5	JUNCTION	0.00	0.00	257.00	0 00:00	0.00
J6	JUNCTION	0.03	1.10	254.64	0 01:12	1.10
J7	JUNCTION	0.02	0.91	254.43	0 01:12	0.91
J8	JUNCTION	0.06	1.56	253.24	0 01:21	1.56
J9	JUNCTION	0.06	1.15	253.96	0 01:21	1.15
DorchesterCreek	OUTFALL	0.01	0.11	254.21	0 02:20	0.11
Ex.Ditch	OUTFALL	0.00	0.08	255.70	0 01:26	0.08
Ex.Major	OUTFALL	0.00	0.00	255.50	0 00:00	0.00
Ex.Sewer	OUTFALL	0.05	0.97	251.84	0 01:22	0.97
Ex.Storage	STORAGE	0.09	2.39	257.21	0 01:35	2.39
Ex.SWMF	STORAGE	0.04	0.66	255.56	0 02:00	0.66

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
J1	JUNCTION	0.000	1.997	0 01:21	0	12.4	-0.147
J10	JUNCTION	0.000	1.971	0 01:21	0	12.4	0.045
J11	JUNCTION	0.000	1.969	0 01:21	0	12.4	-0.103
J12	JUNCTION	0.354	0.354	0 01:10	0.509	0.509	-0.005
J13	JUNCTION	2.339	2.339	0 01:10	7.48	7.48	0.127
J14	JUNCTION	0.000	3.283	0 01:22	0	18.6	0.069
J15	JUNCTION	0.039	0.039	0 02:20	0.335	0.335	0.002
J16	JUNCTION	0.000	3.283	0 01:21	0	18.6	0.013
J17	JUNCTION	0.000	3.283	0 01:21	0	18.5	-0.065
J2	JUNCTION	0.000	1.755	0 01:10	0	6.18	-0.268
J3	JUNCTION	0.000	3.320	0 01:12	0	18.6	0.114
J4	JUNCTION	1.866	1.866	0 01:10	5.84	5.84	0.392
J5	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
J6	JUNCTION	0.000	1.524	0 01:11	0	6.19	-0.018
J7	JUNCTION	0.000	1.500	0 01:13	0	6.19	0.001
J8	JUNCTION	0.000	3.284	0 01:18	0	18.6	-0.012
J9	JUNCTION	0.000	1.978	0 01:19	0	12.4	-0.031
DorchesterCreek	OUTFALL	0.000	0.039	0 02:20	0	0.335	0.000
Ex.Ditch	OUTFALL	0.779	0.824	0 01:10	2.37	2.88	0.000
Ex.Major	OUTFALL	0.000	0.000	0 00:00	0	0	0.000 ltr
Ex.Sewer	OUTFALL	0.000	3.283	0 01:22	0	18.6	0.000
Ex.Storage	STORAGE	0.391	0.415	0 01:10	0.593	0.604	-0.001
Ex.SWMF	STORAGE	2.881	3.303	0 01:10	4.89	4.94	-0.004

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
J7	JUNCTION	0.09	0.086	1.739
J8	JUNCTION	0.27	0.189	3.146

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS

Ex.Storage	0.014	3	0	39	0.364	76	0	01:35	0.065
Ex.SWMF	0.204	3	0	0	3.152	42	0	02:00	0.280

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
DorchesterCreek	7.15	0.018	0.039	0.335
Ex.Ditch	21.91	0.051	0.824	2.876
Ex.Major	0.00	0.000	0.000	0.000
Ex.Sewer	35.28	0.203	3.283	18.560
System	16.09	0.272	3.283	21.772

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	1.755	0 01:10	2.76	1.27	1.00
C10	CONDUIT	1.971	0 01:21	1.77	1.23	0.83
C11	CONDUIT	1.969	0 01:21	1.83	0.84	0.86
C12	CONDUIT	1.972	0 01:22	1.76	0.87	0.93
C13	CONDUIT	0.000	0 00:00	0.00	0.00	0.00
C14	CONDUIT	0.000	0 00:00	0.00	0.00	0.17
C16	CONDUIT	0.110	0 01:26	0.25	0.02	0.24
C17	CONDUIT	0.039	0 02:20	1.50	0.00	0.11
C18	CONDUIT	1.750	0 01:06	1.87	0.70	0.87
C19	CONDUIT	3.283	0 01:22	2.29	2.06	1.00
C2	CONDUIT	1.978	0 01:19	1.82	0.79	0.79
C20	CONDUIT	3.283	0 01:21	2.46	2.05	0.88
C21	CONDUIT	3.283	0 01:22	2.81	2.06	0.76
C3	CONDUIT	3.284	0 01:18	2.61	0.81	0.99
C4	CONDUIT	1.524	0 01:11	2.85	1.38	1.00
C5	CONDUIT	1.500	0 01:13	2.81	3.25	1.00
C6	CONDUIT	0.000	0 00:00	0.00	0.00	0.14
C7	CONDUIT	0.000	0 00:00	0.00	0.00	0.00
C8	CONDUIT	1.500	0 01:13	2.88	1.17	0.94
C9	CONDUIT	3.283	0 01:21	2.38	1.44	1.00
OR1	ORIFICE	0.048	0 01:40			1.00
C15	WEIR	0.000	0 00:00			0.00
W1	WEIR	0.527	0 01:10			0.24
W2	WEIR	0.000	0 00:00			0.00
W3	WEIR	0.000	0 00:00			0.00
OL1	DUMMY	0.280	0 02:00			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
C1	1.00	0.00	0.00	0.00	0.01	0.03	0.00	0.96	0.03	0.00
C10	1.00	0.00	0.00	0.00	0.27	0.00	0.00	0.73	0.00	0.00
C11	1.00	0.00	0.00	0.00	0.21	0.00	0.00	0.79	0.00	0.00
C12	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.96	0.00	0.00
C13	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C14	1.00	0.01	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C16	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
C17	1.00	0.02	0.00	0.00	0.90	0.08	0.00	0.00	0.97	0.00
C18	1.00	0.00	0.00	0.00	0.28	0.00	0.00	0.72	0.24	0.00
C19	1.00	0.00	0.00	0.00	0.16	0.00	0.00	0.84	0.00	0.00
C2	1.00	0.00	0.00	0.00	0.28	0.00	0.00	0.72	0.24	0.00
C20	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.96	0.00	0.00
C21	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C3	1.00	0.00	0.00	0.00	0.06	0.16	0.00	0.78	0.09	0.00
C4	1.00	0.00	0.00	0.00	0.96	0.04	0.00	0.00	0.94	0.00
C5	1.00	0.00	0.00	0.00	0.95	0.05	0.00	0.00	0.18	0.00
C6	1.00	0.02	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C7	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C8	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C9	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00

****
Conduit Surcharge Summary
****

Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C1	0.27	0.27	0.32	0.14	0.12
C10	0.01	0.01	0.01	0.36	0.01
C18	0.01	0.21	0.01	0.01	0.01
C19	0.01	0.36	0.01	0.98	0.01
C20	0.01	0.26	0.01	0.98	0.01

C21	0.01	0.01	0.01	0.98	0.01
C3	0.01	0.01	0.27	0.01	0.01
C4	0.26	0.34	0.26	0.38	0.26
C5	0.09	0.26	0.09	1.35	0.09
C8	0.01	0.09	0.01	0.23	0.01
C9	0.01	0.29	0.01	0.51	0.01

```
Analysis begun on:  Thu Jul 11 17:00:20 2019
Analysis ended on:  Thu Jul 11 17:00:28 2019
Total elapsed time: 00:00:08
```



```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.013)
--------------------------------------------------------------

*******************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*******************************************************

****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 04/01/2005 00:00:00
Ending Date .............. 04/04/2005 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 1
Head Tolerance ........... 0.001500 m

**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         5.507        61.486
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         2.590        28.920
Surface Runoff ...........         2.796        31.212
Final Storage ............         0.123         1.368
Continuity Error (%) .....        -0.022

**************************        Volume       Volume
Flow Routing Continuity        hectare-m     10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         2.796        27.957
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         2.769        27.687
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.025         0.248
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....         0.080

****************************
Time-Step Critical Elements
****************************
None

********************************
Highest Flow Instability Indexes
********************************
All links are stable.

*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     0.37 sec
Average Time Step           :     1.00 sec
Maximum Time Step           :     1.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.00
Percent Not Converging      :     0.01

***************************
Subcatchment Runoff Summary
***************************
```

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
A1	61.49	0.00	0.00	48.86	0.00	11.38	11.38	1.77	0.19	0.185
A2	61.49	0.00	0.00	49.37	0.00	10.85	10.85	0.58	0.07	0.177
EXT1	61.49	0.00	0.00	23.71	33.01	19.88	36.39	7.28	2.32	0.592
EXT2	61.49	0.00	0.00	23.91	33.00	19.68	36.18	9.34	2.91	0.588
EXT3	61.49	0.00	0.00	15.37	44.72	5.71	44.72	1.45	0.86	0.727
EXT4	61.49	0.00	0.00	5.09	54.96	2.14	54.96	0.71	0.47	0.894

EXT5	61.49	0.00	0.00	21.29	33.05	38.89	38.89	0.28	0.19	0.632
EXT6	61.49	0.00	0.00	24.21	30.03	35.95	35.95	0.18	0.08	0.585
EXT7	61.49	0.00	0.00	21.22	33.05	38.96	38.96	0.35	0.25	0.634
EXT8	61.49	0.00	0.00	23.02	37.09	4.08	37.09	6.03	3.46	0.603

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.06	1.44	254.49	0 01:25	1.44
J10	JUNCTION	0.06	1.49	254.19	0 01:25	1.49
J11	JUNCTION	0.06	1.57	254.05	0 01:24	1.57
J12	JUNCTION	0.01	0.21	256.40	0 01:31	0.21
J13	JUNCTION	0.04	3.51	256.76	0 01:10	3.51
J14	JUNCTION	0.08	1.49	252.53	0 01:24	1.48
J15	JUNCTION	0.01	0.15	254.45	0 01:23	0.15
J16	JUNCTION	0.08	1.78	252.96	0 01:24	1.78
J17	JUNCTION	0.07	1.13	252.03	0 01:24	1.13
J2	JUNCTION	0.03	2.79	257.61	0 01:10	2.79
J3	JUNCTION	0.05	1.62	253.90	0 01:24	1.62
J4	JUNCTION	0.03	3.80	259.26	0 01:10	3.74
J5	JUNCTION	0.00	0.12	257.12	0 01:14	0.12
J6	JUNCTION	0.03	1.29	254.83	0 01:22	1.29
J7	JUNCTION	0.02	1.10	254.62	0 01:22	1.10
J8	JUNCTION	0.07	1.78	253.46	0 01:24	1.78
J9	JUNCTION	0.07	1.53	254.34	0 01:25	1.53
DorchesterCreek	OUTFALL	0.01	0.15	254.25	0 01:23	0.15
Ex.Ditch	OUTFALL	0.00	0.10	255.72	0 01:31	0.10
Ex.Major	OUTFALL	0.00	0.00	255.50	0 00:00	0.00
Ex.Sewer	OUTFALL	0.05	1.00	251.88	0 01:25	1.00
Ex.Storage	STORAGE	0.10	2.67	257.49	0 01:20	2.67
Ex.SWMF	STORAGE	0.06	0.85	255.75	0 01:58	0.85

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
J1	JUNCTION	0.000	2.061	0 01:30	0	15.3	-0.131
J10	JUNCTION	0.000	2.078	0 01:30	0	15.4	0.028
J11	JUNCTION	0.000	2.079	0 01:30	0	15.4	-0.063
J12	JUNCTION	0.438	0.465	0 01:11	0.627	0.827	0.367
J13	JUNCTION	2.909	2.909	0 01:10	9.34	9.34	0.305
J14	JUNCTION	0.000	3.528	0 01:24	0	22.9	0.047
J15	JUNCTION	0.068	0.083	0 01:23	0.575	0.604	0.054
J16	JUNCTION	0.000	3.528	0 01:24	0	22.9	0.008
J17	JUNCTION	0.000	3.528	0 01:24	0	22.9	-0.053
J2	JUNCTION	0.000	2.253	0 01:10	0	7.65	-0.282
J3	JUNCTION	0.000	3.527	0 01:24	0	22.9	0.098
J4	JUNCTION	2.321	2.321	0 01:10	7.28	7.28	0.347
J5	JUNCTION	0.000	0.564	0 01:10	0	0.2	-0.234
J6	JUNCTION	0.000	1.649	0 01:10	0	7.54	-0.024
J7	JUNCTION	0.000	1.611	0 01:11	0	7.52	0.021
J8	JUNCTION	0.000	3.528	0 01:24	0	22.9	-0.013
J9	JUNCTION	0.000	2.069	0 01:30	0	15.4	-0.042
DorchesterCreek	OUTFALL	0.000	0.083	0 01:23	0	0.604	0.000
Ex.Ditch	OUTFALL	0.959	1.026	0 01:10	3.4	4.22	0.000
Ex.Major	OUTFALL	0.000	0.000	0 00:00	0	0	0.000 ltr
Ex.Sewer	OUTFALL	0.000	3.528	0 01:25	0	22.9	0.000
Ex.Storage	STORAGE	0.466	0.501	0 01:10	0.709	0.728	-0.000
Ex.SWMF	STORAGE	3.464	4.617	0 01:10	6.03	6.47	-0.002

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
J10	JUNCTION	0.21	0.124	2.076
J11	JUNCTION	0.29	0.190	2.325
J14	JUNCTION	0.38	0.085	1.471
J16	JUNCTION	0.37	0.141	2.036
J3	JUNCTION	0.19	0.081	2.014
J7	JUNCTION	0.40	0.272	1.553
J8	JUNCTION	0.56	0.407	2.928

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Ex.Storage	0.016	3	0	34	0.405	84	0 01:20	0.178
Ex.SWMF	0.280	4	0	0	4.204	56	0 01:58	0.365

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
DorchesterCreek	7.83	0.030	0.083	0.604
Ex.Ditch	22.79	0.071	1.026	4.219
Ex.Major	0.00	0.000	0.000	0.000
Ex.Sewer	35.67	0.248	3.528	22.863
System	16.57	0.349	3.528	27.687

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	2.253	0 01:10	3.54	1.63	1.00
C10	CONDUIT	2.078	0 01:30	1.81	1.30	1.00
C11	CONDUIT	2.079	0 01:30	1.83	0.88	1.00
C12	CONDUIT	2.081	0 01:30	1.79	0.92	1.00
C13	CONDUIT	0.000	0 00:00	0.00	0.00	0.00
C14	CONDUIT	0.146	0 01:14	0.23	0.02	0.31
C16	CONDUIT	0.200	0 01:31	0.29	0.04	0.30
C17	CONDUIT	0.083	0 01:23	1.81	0.01	0.15
C18	CONDUIT	1.750	0 01:04	1.86	0.70	1.00
C19	CONDUIT	3.528	0 01:24	2.46	2.21	1.00
C2	CONDUIT	2.069	0 01:30	1.86	0.82	1.00
C20	CONDUIT	3.528	0 01:24	2.60	2.20	0.90
C21	CONDUIT	3.528	0 01:25	2.91	2.21	0.79
C3	CONDUIT	3.528	0 01:24	2.68	0.87	1.00
C4	CONDUIT	1.649	0 01:10	3.08	1.49	1.00
C5	CONDUIT	1.611	0 01:11	3.01	3.49	1.00
C6	CONDUIT	0.043	0 01:22	0.88	0.39	0.41
C7	CONDUIT	0.564	0 01:10	2.02	0.08	0.29
C8	CONDUIT	1.611	0 01:11	3.07	1.26	1.00
C9	CONDUIT	3.528	0 01:24	2.46	1.55	1.00
OR1	ORIFICE	0.050	0 01:48			1.00
C15	WEIR	0.145	0 01:20			0.20
W1	WEIR	1.156	0 01:10			0.41
W2	WEIR	0.000	0 00:00			0.00
W3	WEIR	0.000	0 00:00			0.00
OL1	DUMMY	0.365	0 01:58			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
C1	1.00	0.00	0.00	0.00	0.01	0.03	0.00	0.96	0.03	0.00
C10	1.00	0.00	0.00	0.00	0.29	0.00	0.00	0.71	0.00	0.00
C11	1.00	0.00	0.00	0.00	0.23	0.00	0.00	0.77	0.00	0.00
C12	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.96	0.00	0.00
C13	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C14	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.98	0.00
C16	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
C17	1.00	0.02	0.00	0.00	0.89	0.09	0.00	0.00	0.97	0.00
C18	1.00	0.00	0.00	0.00	0.29	0.00	0.00	0.71	0.25	0.00
C19	1.00	0.00	0.00	0.00	0.18	0.00	0.00	0.82	0.00	0.00
C2	1.00	0.00	0.00	0.00	0.30	0.00	0.00	0.70	0.25	0.00
C20	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.95	0.00	0.00
C21	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C3	1.00	0.00	0.00	0.00	0.06	0.17	0.00	0.76	0.10	0.00
C4	1.00	0.00	0.00	0.00	0.96	0.04	0.00	0.00	0.94	0.00
C5	1.00	0.00	0.00	0.00	0.95	0.04	0.00	0.00	0.18	0.00
C6	1.00	0.02	0.98	0.00	0.01	0.00	0.00	0.00	0.98	0.00
C7	1.00	0.02	0.98	0.00	0.00	0.00	0.00	0.00	0.98	0.00
C8	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
C9	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.98	0.00	0.00

****
Conduit Surcharge Summary
****

Conduit	Hours Full: Both Ends	Upstream	Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited

C1	0.53	0.53	0.58	0.34	0.33
C10	0.21	0.24	0.21	0.67	0.21
C11	0.23	0.23	0.29	0.01	0.01
C12	0.31	0.31	0.36	0.01	0.01
C18	0.15	0.41	0.15	0.01	0.15
C19	0.38	0.64	0.38	1.32	0.38
C2	0.17	0.17	0.22	0.01	0.01
C20	0.01	0.55	0.01	1.31	0.01
C21	0.01	0.01	0.01	1.32	0.01
C3	0.38	0.38	0.56	0.01	0.01
C4	0.51	0.60	0.51	0.64	0.51
C5	0.40	0.51	0.40	1.60	0.40
C8	0.19	0.40	0.19	0.49	0.19
C9	0.37	0.58	0.37	0.82	0.37

```
Analysis begun on:  Thu Jul 11 17:00:52 2019
Analysis ended on:  Thu Jul 11 17:01:00 2019
Total elapsed time: 00:00:08
```



```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.013)
--------------------------------------------------------------

*******************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*******************************************************

****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 04/01/2005 00:00:00
Ending Date .............. 04/04/2005 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 1
Head Tolerance ........... 0.001500 m

**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         6.156        68.725
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         2.767        30.895
Surface Runoff ...........         3.267        36.477
Final Storage ............         0.123         1.369
Continuity Error (%) .....        -0.023

**************************        Volume       Volume
Flow Routing Continuity        hectare-m     10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         3.267        32.672
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         3.240        32.398
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.025         0.252
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....         0.068

*************************
Highest Continuity Errors
*************************
Node J5 (-2.54%)
Node J12 (1.47%)

***************************
Time-Step Critical Elements
***************************
None

**********************************
Highest Flow Instability Indexes
**********************************
All links are stable.

*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     1.00 sec
Maximum Time Step           :     1.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.00
Percent Not Converging      :     0.02

****************************
Subcatchment Runoff Summary
****************************

-------------------------------------------------------------------------------------------------------------------------------
                        Total      Total      Total      Total     Imperv      Perv     Total      Total      Peak  Runoff
                       Precip      Runon       Evap      Infil     Runoff    Runoff    Runoff     Runoff    Runoff   Coeff
Subcatchment               mm         mm         mm         mm         mm        mm        mm   10^6 ltr       CMS
```

A1	68.73	0.00	0.00	52.09	0.00	15.37	15.37	2.39	0.26	0.224
A2	68.73	0.00	0.00	52.77	0.00	14.70	14.70	0.78	0.10	0.214
EXT1	68.73	0.00	0.00	25.32	36.99	23.53	42.02	8.41	2.68	0.611
EXT2	68.73	0.00	0.00	25.53	36.99	23.31	41.81	10.79	3.35	0.608
EXT3	68.73	0.00	0.00	16.33	51.01	7.28	51.01	1.65	0.96	0.742
EXT4	68.73	0.00	0.00	5.41	61.88	2.68	61.88	0.80	0.52	0.900
EXT5	68.73	0.00	0.00	22.80	37.04	44.62	44.62	0.32	0.22	0.649
EXT6	68.73	0.00	0.00	25.91	33.65	41.49	41.49	0.20	0.10	0.604
EXT7	68.73	0.00	0.00	22.74	37.04	44.69	44.69	0.40	0.28	0.650
EXT8	68.73	0.00	0.00	24.74	42.62	5.63	42.62	6.93	3.89	0.620

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.06	1.77	254.82	0 01:35	1.77
J10	JUNCTION	0.07	1.75	254.45	0 01:34	1.75
J11	JUNCTION	0.07	1.79	254.27	0 01:34	1.79
J12	JUNCTION	0.01	0.26	256.46	0 01:27	0.26
J13	JUNCTION	0.05	3.54	256.79	0 01:10	3.54
J14	JUNCTION	0.08	1.55	252.59	0 01:33	1.55
J15	JUNCTION	0.01	0.20	254.50	0 01:32	0.20
J16	JUNCTION	0.09	1.88	253.07	0 01:33	1.88
J17	JUNCTION	0.07	1.16	252.06	0 01:34	1.16
J2	JUNCTION	0.04	2.82	257.64	0 01:09	2.82
J3	JUNCTION	0.06	1.81	254.09	0 01:33	1.81
J4	JUNCTION	0.04	4.32	259.78	0 01:10	4.32
J5	JUNCTION	0.00	0.18	257.18	0 01:13	0.18
J6	JUNCTION	0.03	1.40	254.94	0 01:31	1.40
J7	JUNCTION	0.03	1.23	254.75	0 01:31	1.23
J8	JUNCTION	0.08	1.93	253.61	0 01:33	1.93
J9	JUNCTION	0.08	1.83	254.64	0 01:35	1.83
DorchesterCreek	OUTFALL	0.01	0.20	254.30	0 01:32	0.20
Ex.Ditch	OUTFALL	0.00	0.13	255.75	0 01:27	0.13
Ex.Major	OUTFALL	0.00	0.00	255.50	0 00:00	0.00
Ex.Sewer	OUTFALL	0.06	1.03	251.90	0 01:34	1.03
Ex.Storage	STORAGE	0.11	2.70	257.52	0 01:18	2.70
Ex.SWMF	STORAGE	0.07	0.99	255.89	0 01:46	0.99

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
J1	JUNCTION	0.000	2.304	0 01:38	0	17.7	-0.100
J10	JUNCTION	0.000	2.315	0 01:38	0	17.7	0.019
J11	JUNCTION	0.000	2.315	0 01:38	0	17.7	-0.042
J12	JUNCTION	0.501	0.830	0 01:12	0.719	1.32	1.496
J13	JUNCTION	3.351	3.351	0 01:10	10.8	10.8	0.250
J14	JUNCTION	0.000	3.691	0 01:34	0	26	0.038
J15	JUNCTION	0.096	0.175	0 01:32	0.779	0.891	0.047
J16	JUNCTION	0.000	3.691	0 01:34	0	26	0.006
J17	JUNCTION	0.000	3.691	0 01:34	0	25.9	-0.048
J2	JUNCTION	0.000	2.575	0 01:11	0	8.76	-0.262
J3	JUNCTION	0.000	3.691	0 01:34	0	26	0.084
J4	JUNCTION	2.675	2.675	0 01:10	8.41	8.41	0.295
J5	JUNCTION	0.000	0.911	0 01:11	0	0.589	-2.481
J6	JUNCTION	0.000	1.656	0 01:08	0	8.37	-0.026
J7	JUNCTION	0.000	1.617	0 01:11	0	8.26	0.037
J8	JUNCTION	0.000	3.691	0 01:34	0	26	-0.011
J9	JUNCTION	0.000	2.308	0 01:38	0	17.7	-0.045
DorchesterCreek	OUTFALL	0.000	0.175	0 01:32	0	0.89	0.000
Ex.Ditch	OUTFALL	1.103	1.190	0 01:10	4.25	5.55	0.000
Ex.Major	OUTFALL	0.000	0.000	0 00:00	0	0	0.000 ltr
Ex.Sewer	OUTFALL	0.000	3.691	0 01:34	0	26	0.000
Ex.Storage	STORAGE	0.522	0.554	0 01:10	0.798	0.818	-0.000
Ex.SWMF	STORAGE	3.892	5.487	0 01:10	6.93	7.87	-0.002

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
J10	JUNCTION	0.46	0.385	1.815
J11	JUNCTION	0.53	0.416	2.099
J14	JUNCTION	0.63	0.146	1.410
J16	JUNCTION	0.62	0.242	1.935
J3	JUNCTION	0.43	0.271	1.824
J7	JUNCTION	0.62	0.401	1.424
J8	JUNCTION	0.79	0.555	2.780

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Ex.Storage	0.016	3	0	31	0.409	85	0 01:18	0.233
Ex.SWMF	0.321	4	0	0	4.973	66	0 01:46	0.565

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
DorchesterCreek	8.12	0.042	0.175	0.890
Ex.Ditch	22.94	0.093	1.190	5.551
Ex.Major	0.00	0.000	0.000	0.000
Ex.Sewer	35.95	0.279	3.691	25.957
System	16.75	0.415	3.691	32.398

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	2.575	0 01:11	4.05	1.86	1.00
C10	CONDUIT	2.315	0 01:38	1.82	1.45	1.00
C11	CONDUIT	2.315	0 01:38	1.87	0.98	1.00
C12	CONDUIT	2.315	0 01:38	1.86	1.03	1.00
C13	CONDUIT	0.001	0 01:09	0.00	0.00	0.00
C14	CONDUIT	0.469	0 01:13	0.45	0.07	0.43
C16	CONDUIT	0.403	0 01:27	0.35	0.09	0.39
C17	CONDUIT	0.175	0 01:32	2.18	0.01	0.20
C18	CONDUIT	1.750	0 01:03	1.85	0.70	1.00
C19	CONDUIT	3.691	0 01:34	2.58	2.31	1.00
C2	CONDUIT	2.308	0 01:38	1.86	0.92	1.00
C20	CONDUIT	3.691	0 01:34	2.70	2.30	0.91
C21	CONDUIT	3.691	0 01:34	2.97	2.31	0.81
C3	CONDUIT	3.691	0 01:34	2.69	0.91	1.00
C4	CONDUIT	1.656	0 01:08	3.10	1.49	1.00
C5	CONDUIT	1.617	0 01:11	3.02	3.50	1.00
C6	CONDUIT	0.091	0 01:31	1.13	0.82	0.61
C7	CONDUIT	0.911	0 01:11	2.12	0.14	0.40
C8	CONDUIT	1.617	0 01:11	3.08	1.26	1.00
C9	CONDUIT	3.691	0 01:34	2.58	1.62	1.00
OR1	ORIFICE	0.049	0 01:56			1.00
C15	WEIR	0.210	0 01:18			0.26
W1	WEIR	1.598	0 01:10			0.51
W2	WEIR	0.000	0 00:00			0.00
W3	WEIR	0.000	0 00:00			0.00
OL1	DUMMY	0.565	0 01:46			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
		Fraction of Time in Flow Class								
C1	1.00	0.00	0.00	0.00	0.01	0.03	0.00	0.95	0.03	0.00
C10	1.00	0.00	0.00	0.00	0.29	0.00	0.00	0.71	0.00	0.00
C11	1.00	0.00	0.00	0.00	0.23	0.00	0.00	0.77	0.00	0.00
C12	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.96	0.00	0.00
C13	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C14	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.98	0.00
C16	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
C17	1.00	0.02	0.00	0.00	0.89	0.09	0.00	0.00	0.97	0.00
C18	1.00	0.00	0.00	0.00	0.30	0.00	0.00	0.70	0.22	0.00
C19	1.00	0.00	0.00	0.00	0.18	0.00	0.00	0.82	0.00	0.00
C2	1.00	0.00	0.00	0.00	0.30	0.00	0.00	0.70	0.26	0.00
C20	1.00	0.00	0.00	0.00	0.05	0.00	0.00	0.95	0.00	0.00
C21	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C3	1.00	0.00	0.00	0.00	0.07	0.18	0.00	0.76	0.10	0.00
C4	1.00	0.00	0.00	0.00	0.96	0.04	0.00	0.00	0.94	0.00
C5	1.00	0.00	0.00	0.00	0.96	0.04	0.00	0.00	0.18	0.00
C6	1.00	0.02	0.98	0.00	0.01	0.00	0.00	0.00	0.98	0.00
C7	1.00	0.02	0.98	0.00	0.00	0.00	0.00	0.00	0.98	0.00
C8	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
C9	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.00	0.00

****
Conduit Surcharge Summary

****

Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C1	0.71	0.71	0.75	0.51	0.49
C10	0.46	0.50	0.46	0.98	0.46
C11	0.48	0.48	0.53	0.01	0.01
C12	0.56	0.56	0.61	0.12	0.12
C18	0.38	0.62	0.41	0.01	0.32
C19	0.63	0.87	0.63	1.57	0.63
C2	0.42	0.42	0.48	0.01	0.01
C20	0.01	0.78	0.01	1.56	0.01
C21	0.01	0.01	0.01	1.57	0.01
C3	0.63	0.63	0.79	0.01	0.01
C4	0.70	0.77	0.70	0.80	0.70
C5	0.62	0.70	0.62	1.76	0.62
C8	0.43	0.62	0.43	0.67	0.43
C9	0.62	0.80	0.62	1.08	0.62

Analysis begun on: Thu Jul 11 17:01:18 2019
Analysis ended on: Thu Jul 11 17:01:27 2019
Total elapsed time: 00:00:09

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.013)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

```
****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 04/01/2005 00:00:00
Ending Date .............. 04/04/2005 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 1
Head Tolerance ........... 0.001500 m
```

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	6.793	75.839
Evaporation Loss	0.000	0.000
Infiltration Loss	2.923	32.629
Surface Runoff	3.749	41.860
Final Storage	0.123	1.368
Continuity Error (%)	-0.023	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	3.749	37.494
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	3.721	37.208
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.026	0.256
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	0.081	

```
*************************
Highest Continuity Errors
*************************
Node J5 (-2.79%)
Node J12 (1.85%)

***************************
Time-Step Critical Elements
***************************
None

*********************************
Highest Flow Instability Indexes
*********************************
All links are stable.

*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     0.23 sec
Average Time Step           :     1.00 sec
Maximum Time Step           :     1.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.00
Percent Not Converging      :     0.02

****************************
Subcatchment Runoff Summary
****************************
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Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff

A1	75.84	0.00	0.00	54.89	0.00	19.69	19.69	3.06	0.35	0.260
A2	75.84	0.00	0.00	55.72	0.00	18.86	18.86	1.00	0.13	0.249
EXT1	75.84	0.00	0.00	26.73	40.90	27.27	47.72	9.55	3.04	0.629
EXT2	75.84	0.00	0.00	26.95	40.90	27.05	47.50	12.26	3.81	0.626
EXT3	75.84	0.00	0.00	17.18	57.27	8.92	57.27	1.86	1.07	0.755
EXT4	75.84	0.00	0.00	5.70	68.72	3.25	68.72	0.89	0.58	0.906
EXT5	75.84	0.00	0.00	24.17	40.95	50.36	50.36	0.36	0.25	0.664
EXT6	75.84	0.00	0.00	27.45	37.21	47.06	47.06	0.23	0.12	0.621
EXT7	75.84	0.00	0.00	24.11	40.96	50.44	50.44	0.45	0.32	0.665
EXT8	75.84	0.00	0.00	26.27	48.20	7.30	48.20	7.84	4.32	0.636

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.07	1.97	255.03	0 01:38	1.97
J10	JUNCTION	0.07	1.92	254.62	0 01:37	1.92
J11	JUNCTION	0.08	1.94	254.42	0 01:36	1.94
J12	JUNCTION	0.01	0.32	256.51	0 01:28	0.32
J13	JUNCTION	0.06	3.57	256.82	0 01:10	3.57
J14	JUNCTION	0.09	1.59	252.63	0 01:35	1.59
J15	JUNCTION	0.01	0.23	254.53	0 01:38	0.23
J16	JUNCTION	0.09	1.95	253.13	0 01:35	1.95
J17	JUNCTION	0.07	1.18	252.08	0 01:36	1.18
J2	JUNCTION	0.05	2.83	257.65	0 01:08	2.82
J3	JUNCTION	0.07	1.94	254.22	0 01:35	1.94
J4	JUNCTION	0.05	4.34	259.80	0 01:11	4.34
J5	JUNCTION	0.00	0.24	257.24	0 01:15	0.24
J6	JUNCTION	0.04	1.51	255.05	0 01:32	1.51
J7	JUNCTION	0.03	1.34	254.86	0 01:32	1.34
J8	JUNCTION	0.08	2.03	253.71	0 01:35	2.03
J9	JUNCTION	0.08	2.01	254.82	0 01:38	2.01
DorchesterCreek	OUTFALL	0.01	0.23	254.33	0 01:38	0.23
Ex.Ditch	OUTFALL	0.01	0.16	255.78	0 01:28	0.16
Ex.Major	OUTFALL	0.00	0.00	255.50	0 00:00	0.00
Ex.Sewer	OUTFALL	0.06	1.04	251.91	0 01:36	1.04
Ex.Storage	STORAGE	0.11	2.72	257.54	0 01:14	2.72
Ex.SWMF	STORAGE	0.07	1.15	256.05	0 01:40	1.15

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
J1	JUNCTION	0.000	2.433	0 01:46	0	19.9	-0.082
J10	JUNCTION	0.000	2.443	0 01:46	0	19.9	0.017
J11	JUNCTION	0.000	2.443	0 01:46	0	19.9	-0.031
J12	JUNCTION	0.565	1.292	0 01:15	0.811	2.01	1.886
J13	JUNCTION	3.807	3.807	0 01:10	12.3	12.3	0.212
J14	JUNCTION	0.000	3.801	0 01:36	0	28.7	0.029
J15	JUNCTION	0.128	0.245	0 01:38	1	1.22	0.035
J16	JUNCTION	0.000	3.801	0 01:36	0	28.7	0.007
J17	JUNCTION	0.000	3.801	0 01:36	0	28.7	-0.038
J2	JUNCTION	0.000	2.591	0 01:11	0	9.88	-0.222
J3	JUNCTION	0.000	3.801	0 01:36	0	28.7	0.065
J4	JUNCTION	3.041	3.041	0 01:10	9.55	9.55	0.289
J5	JUNCTION	0.000	1.198	0 01:14	0	1.16	-2.711
J6	JUNCTION	0.000	1.662	0 01:07	0	9.01	-0.029
J7	JUNCTION	0.000	1.617	0 01:09	0	8.79	0.070
J8	JUNCTION	0.000	3.801	0 01:36	0	28.7	-0.002
J9	JUNCTION	0.000	2.436	0 01:46	0	19.9	-0.042
DorchesterCreek	OUTFALL	0.000	0.245	0 01:38	0	1.22	0.000
Ex.Ditch	OUTFALL	1.257	1.371	0 01:10	5.15	7.12	0.000
Ex.Major	OUTFALL	0.000	0.197	0 01:40	0	0.193	0.000
Ex.Sewer	OUTFALL	0.000	3.801	0 01:36	0	28.7	0.000
Ex.Storage	STORAGE	0.578	0.605	0 01:09	0.886	0.912	-0.000
Ex.SWMF	STORAGE	4.320	6.370	0 01:10	7.84	9.48	-0.002

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
J10	JUNCTION	0.74	0.552	1.648
J11	JUNCTION	0.80	0.565	1.950
J14	JUNCTION	0.86	0.186	1.370
J16	JUNCTION	0.85	0.311	1.866
J3	JUNCTION	0.70	0.402	1.693
J7	JUNCTION	0.84	0.513	1.312
J8	JUNCTION	1.01	0.657	2.678

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Ex.Storage	0.017	4	0	28	0.412	86	0 01:14	0.294
Ex.SWMF	0.351	5	0	0	5.933	79	0 01:40	1.023

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
DorchesterCreek	8.43	0.056	0.245	1.221
Ex.Ditch	23.05	0.119	1.371	7.124
Ex.Major	0.65	0.114	0.197	0.193
Ex.Sewer	36.15	0.306	3.801	28.670
System	17.07	0.596	3.801	37.208

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	2.591	0 01:11	4.07	1.87	1.00
C10	CONDUIT	2.443	0 01:46	1.84	1.53	1.00
C11	CONDUIT	2.443	0 01:46	1.91	1.04	1.00
C12	CONDUIT	2.443	0 01:46	1.93	1.08	1.00
C13	CONDUIT	0.059	0 01:11	0.31	0.01	0.06
C14	CONDUIT	0.992	0 01:15	0.55	0.14	0.53
C16	CONDUIT	0.684	0 01:28	0.40	0.15	0.48
C17	CONDUIT	0.245	0 01:38	2.37	0.02	0.23
C18	CONDUIT	1.750	0 01:03	1.85	0.70	1.00
C19	CONDUIT	3.801	0 01:36	2.65	2.38	1.00
C2	CONDUIT	2.436	0 01:46	1.87	0.97	1.00
C20	CONDUIT	3.801	0 01:36	2.76	2.37	0.92
C21	CONDUIT	3.801	0 01:36	3.02	2.38	0.82
C3	CONDUIT	3.801	0 01:36	2.69	0.94	1.00
C4	CONDUIT	1.662	0 01:07	3.11	1.50	1.00
C5	CONDUIT	1.617	0 01:09	3.02	3.50	1.00
C6	CONDUIT	0.122	0 01:31	1.19	1.11	0.78
C7	CONDUIT	0.933	0 01:13	2.21	0.14	0.48
C8	CONDUIT	1.617	0 01:09	3.08	1.26	1.00
C9	CONDUIT	3.801	0 01:36	2.65	1.67	1.00
OR1	ORIFICE	0.049	0 02:04			1.00
C15	WEIR	0.269	0 01:14			0.30
W1	WEIR	2.054	0 01:10			0.60
W2	WEIR	0.197	0 01:40			0.25
W3	WEIR	0.000	0 00:00			0.00
OL1	DUMMY	0.957	0 01:51			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
		---------- Fraction of Time in Flow Class ----------								
C1	1.00	0.00	0.00	0.00	0.01	0.03	0.00	0.95	0.03	0.00
C10	1.00	0.00	0.00	0.00	0.30	0.00	0.00	0.70	0.00	0.00
C11	1.00	0.00	0.00	0.00	0.24	0.00	0.00	0.76	0.00	0.00
C12	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.96	0.00	0.00
C13	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C14	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.98	0.00
C16	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
C17	1.00	0.01	0.00	0.00	0.89	0.10	0.00	0.00	0.98	0.00
C18	1.00	0.00	0.00	0.00	0.30	0.00	0.00	0.70	0.22	0.00
C19	1.00	0.00	0.00	0.00	0.18	0.00	0.00	0.81	0.00	0.00
C2	1.00	0.00	0.00	0.00	0.30	0.00	0.00	0.70	0.26	0.00
C20	1.00	0.00	0.00	0.00	0.05	0.00	0.00	0.95	0.00	0.00
C21	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C3	1.00	0.00	0.00	0.00	0.07	0.18	0.00	0.75	0.11	0.00
C4	1.00	0.00	0.00	0.00	0.97	0.03	0.00	0.00	0.94	0.00
C5	1.00	0.00	0.00	0.00	0.96	0.04	0.00	0.00	0.18	0.00
C6	1.00	0.01	0.97	0.00	0.01	0.00	0.00	0.00	0.98	0.00
C7	1.00	0.02	0.98	0.00	0.01	0.00	0.00	0.00	0.98	0.00
C8	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
C9	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.00	0.00

****
Conduit Surcharge Summary

****

Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C1	0.87	0.87	0.92	0.64	0.63
C10	0.74	0.77	0.74	1.25	0.74
C11	0.76	0.76	0.80	0.45	0.44
C12	0.82	0.82	0.84	0.59	0.59
C18	0.67	0.89	0.71	0.01	0.48
C19	0.86	1.09	0.86	1.77	0.86
C2	0.72	0.72	0.76	0.01	0.01
C20	0.01	1.01	0.01	1.77	0.01
C21	0.01	0.01	0.01	1.77	0.01
C3	0.86	0.86	1.01	0.01	0.01
C4	0.90	0.94	0.90	0.96	0.90
C5	0.84	0.90	0.84	1.88	0.84
C6	0.01	0.01	0.01	0.31	0.01
C8	0.67	0.84	0.70	0.75	0.56
C9	0.85	1.03	0.85	1.29	0.85

Analysis begun on: Thu Jul 11 17:01:57 2019
Analysis ended on: Thu Jul 11 17:02:05 2019
Total elapsed time: 00:00:08

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.013)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

```
****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 04/01/2005 00:00:00
Ending Date .............. 04/04/2005 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 1
Head Tolerance ........... 0.001500 m
```

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	7.758	86.611
Evaporation Loss	0.000	0.000
Infiltration Loss	3.134	34.994
Surface Runoff	4.503	50.270
Final Storage	0.123	1.370
Continuity Error (%)	-0.026	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	4.503	45.027
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	4.474	44.739
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.026	0.260
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	0.064	

```
*************************
Highest Continuity Errors
*************************
Node J5 (-2.38%)
Node J12 (1.63%)

***************************
Time-Step Critical Elements
***************************
None

*********************************
Highest Flow Instability Indexes
*********************************
All links are stable.

*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     0.38 sec
Average Time Step           :     1.00 sec
Maximum Time Step           :     1.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.00
Percent Not Converging      :     0.03

****************************
Subcatchment Runoff Summary
****************************
```

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff

A1	86.61	0.00	0.00	58.62	0.00	26.73	26.73	4.16	0.51	0.309
A2	86.61	0.00	0.00	59.71	0.00	25.64	25.64	1.36	0.19	0.296
EXT1	86.61	0.00	0.00	28.70	46.83	33.11	56.53	11.32	3.74	0.653
EXT2	86.61	0.00	0.00	28.92	46.83	32.89	56.31	14.53	4.68	0.650
EXT3	86.61	0.00	0.00	18.34	66.90	11.54	66.90	2.17	1.27	0.772
EXT4	86.61	0.00	0.00	6.09	79.11	4.15	79.11	1.02	0.69	0.913
EXT5	86.61	0.00	0.00	26.11	46.89	59.24	59.24	0.43	0.30	0.684
EXT6	86.61	0.00	0.00	29.60	42.61	55.71	55.71	0.27	0.15	0.643
EXT7	86.61	0.00	0.00	26.02	46.90	59.31	59.31	0.53	0.38	0.685
EXT8	86.61	0.00	0.00	28.37	56.88	10.04	56.88	9.25	5.13	0.657

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.08	2.09	255.14	0 01:31	2.09
J10	JUNCTION	0.08	2.02	254.72	0 01:31	2.02
J11	JUNCTION	0.08	2.03	254.51	0 01:31	2.03
J12	JUNCTION	0.01	0.39	256.58	0 01:28	0.39
J13	JUNCTION	0.07	3.62	256.87	0 01:10	3.62
J14	JUNCTION	0.09	1.61	252.65	0 01:31	1.61
J15	JUNCTION	0.01	0.25	254.55	0 01:40	0.25
J16	JUNCTION	0.10	1.99	253.18	0 01:31	1.99
J17	JUNCTION	0.08	1.19	252.09	0 01:31	1.19
J2	JUNCTION	0.05	2.83	257.65	0 01:06	2.83
J3	JUNCTION	0.07	2.02	254.29	0 01:31	2.02
J4	JUNCTION	0.06	4.40	259.86	0 01:11	4.40
J5	JUNCTION	0.00	0.27	257.27	0 01:21	0.27
J6	JUNCTION	0.04	1.59	255.13	0 01:26	1.59
J7	JUNCTION	0.03	1.42	254.94	0 01:26	1.42
J8	JUNCTION	0.09	2.41	254.09	0 01:07	2.09
J9	JUNCTION	0.09	2.12	254.93	0 01:31	2.12
DorchesterCreek	OUTFALL	0.01	0.25	254.35	0 01:40	0.25
Ex.Ditch	OUTFALL	0.01	0.20	255.82	0 01:28	0.20
Ex.Major	OUTFALL	0.00	0.00	255.50	0 00:00	0.00
Ex.Sewer	OUTFALL	0.06	1.05	251.92	0 01:31	1.05
Ex.Storage	STORAGE	0.11	2.77	257.59	0 01:11	2.77
Ex.SWMF	STORAGE	0.08	1.29	256.19	0 01:31	1.29

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
J1	JUNCTION	0.000	2.514	0 01:16	0	21.5	-0.073
J10	JUNCTION	0.000	2.467	0 01:55	0	21.5	0.007
J11	JUNCTION	0.000	2.467	0 01:55	0	21.5	-0.035
J12	JUNCTION	0.685	1.998	0 01:12	0.954	3.33	1.657
J13	JUNCTION	4.678	4.678	0 01:10	14.5	14.5	0.179
J14	JUNCTION	0.000	3.864	0 01:31	0	30.9	0.021
J15	JUNCTION	0.187	0.316	0 01:40	1.36	1.68	0.024
J16	JUNCTION	0.000	3.864	0 01:31	0	30.9	0.008
J17	JUNCTION	0.000	3.864	0 01:31	0	30.9	-0.031
J2	JUNCTION	0.000	2.622	0 01:12	0	11.4	-0.188
J3	JUNCTION	0.000	3.864	0 01:31	0	31	0.053
J4	JUNCTION	3.741	3.741	0 01:10	11.3	11.3	0.276
J5	JUNCTION	0.000	1.425	0 01:11	0	2.07	-2.329
J6	JUNCTION	0.000	1.673	0 01:06	0	9.74	-0.028
J7	JUNCTION	0.000	1.617	0 01:08	0	9.42	0.068
J8	JUNCTION	0.000	3.864	0 01:31	0	30.9	0.003
J9	JUNCTION	0.000	2.459	0 01:55	0	21.5	-0.051
DorchesterCreek	OUTFALL	0.000	0.316	0 01:40	0	1.68	0.000
Ex.Ditch	OUTFALL	1.562	2.131	0 01:30	6.6	9.88	0.000
Ex.Major	OUTFALL	0.000	1.437	0 01:31	0	2.23	0.000
Ex.Sewer	OUTFALL	0.000	3.864	0 01:31	0	30.9	0.000
Ex.Storage	STORAGE	0.686	0.702	0 01:09	1.02	1.05	-0.000
Ex.SWMF	STORAGE	5.132	8.053	0 01:10	9.25	12.3	-0.001

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
J10	JUNCTION	0.94	0.650	1.550
J11	JUNCTION	0.98	0.653	1.862
J14	JUNCTION	1.03	0.211	1.345
J16	JUNCTION	1.02	0.353	1.824
J3	JUNCTION	0.90	0.480	1.615
J6	JUNCTION	0.48	0.076	1.874
J7	JUNCTION	1.02	0.592	1.233
J8	JUNCTION	1.18	1.033	2.302

****
Node Flooding Summary

****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Ex.Storage	0.018	4	0	25	0.421	87	0 01:11	0.482
Ex.SWMF	0.375	5	0	0	6.769	91	0 01:31	2.145

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
DorchesterCreek	8.81	0.074	0.316	1.683
Ex.Ditch	23.19	0.164	2.131	9.880
Ex.Major	1.22	0.708	1.437	2.235
Ex.Sewer	36.31	0.329	3.864	30.941
System	17.38	1.276	3.864	44.739

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	2.622	0 01:12	4.12	1.89	1.00
C10	CONDUIT	2.467	0 01:55	1.88	1.54	1.00
C11	CONDUIT	2.467	0 01:55	1.95	1.05	1.00
C12	CONDUIT	2.467	0 01:55	1.95	1.09	1.00
C13	CONDUIT	0.515	0 01:11	0.72	0.09	0.23
C14	CONDUIT	1.286	0 01:21	0.53	0.19	0.65
C16	CONDUIT	1.229	0 01:28	0.47	0.27	0.59
C17	CONDUIT	0.316	0 01:40	2.53	0.02	0.25
C18	CONDUIT	1.750	0 01:02	1.89	0.70	1.00
C19	CONDUIT	3.864	0 01:31	2.70	2.42	1.00
C2	CONDUIT	2.459	0 01:55	1.88	0.98	1.00
C20	CONDUIT	3.864	0 01:31	2.80	2.41	0.92
C21	CONDUIT	3.864	0 01:31	3.04	2.42	0.83
C3	CONDUIT	3.864	0 01:31	2.71	0.96	1.00
C4	CONDUIT	1.673	0 01:06	3.13	1.51	1.00
C5	CONDUIT	1.617	0 01:08	3.02	3.50	1.00
C6	CONDUIT	0.133	0 01:27	1.23	1.21	0.81
C7	CONDUIT	1.025	0 01:21	2.31	0.15	0.51
C8	CONDUIT	1.617	0 01:08	3.08	1.26	1.00
C9	CONDUIT	3.864	0 01:31	2.70	1.70	1.00
OR1	ORIFICE	0.049	0 02:13			1.00
C15	WEIR	0.454	0 01:11			0.43
W1	WEIR	2.924	0 01:10			0.76
W2	WEIR	1.437	0 01:31			0.93
W3	WEIR	0.000	0 00:00			0.00
OL1	DUMMY	1.022	0 02:01			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
		Fraction of Time in Flow Class								
C1	1.00	0.00	0.00	0.00	0.02	0.03	0.00	0.95	0.03	0.00
C10	1.00	0.00	0.00	0.00	0.30	0.00	0.00	0.70	0.00	0.00
C11	1.00	0.00	0.00	0.00	0.24	0.00	0.00	0.76	0.00	0.00
C12	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.96	0.00	0.00
C13	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C14	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.98	0.00
C16	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
C17	1.00	0.01	0.00	0.00	0.88	0.10	0.00	0.00	0.98	0.00
C18	1.00	0.00	0.00	0.00	0.30	0.00	0.00	0.70	0.21	0.00
C19	1.00	0.00	0.00	0.00	0.19	0.00	0.00	0.81	0.00	0.00
C2	1.00	0.00	0.00	0.00	0.31	0.00	0.00	0.69	0.26	0.00
C20	1.00	0.00	0.00	0.00	0.05	0.00	0.00	0.95	0.00	0.00
C21	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C3	1.00	0.00	0.00	0.00	0.07	0.18	0.00	0.75	0.11	0.00
C4	1.00	0.00	0.00	0.00	0.97	0.03	0.00	0.00	0.93	0.00
C5	1.00	0.00	0.00	0.00	0.96	0.04	0.00	0.00	0.18	0.00
C6	1.00	0.01	0.97	0.00	0.01	0.00	0.00	0.00	0.97	0.00
C7	1.00	0.02	0.98	0.00	0.01	0.00	0.00	0.00	0.98	0.00
C8	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.98	0.00	0.00
C9	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.00	0.00

****

Conduit Surcharge Summary
****

Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C1	1.02	1.03	1.08	0.80	0.78
C10	0.94	0.97	0.94	1.43	0.94
C11	0.95	0.95	0.98	0.79	0.81
C12	0.99	0.99	1.01	0.90	0.86
C18	0.88	1.07	0.92	0.01	0.68
C19	1.03	1.26	1.03	1.95	1.03
C2	0.93	0.93	0.96	0.01	0.01
C20	0.01	1.18	0.01	1.94	0.01
C21	0.01	0.01	0.01	1.95	0.01
C3	1.03	1.03	1.18	0.01	0.01
C4	1.07	1.09	1.07	1.12	1.07
C5	1.02	1.07	1.02	2.02	1.02
C6	0.01	0.48	0.01	0.56	0.01
C8	0.87	1.02	0.90	0.90	0.74
C9	1.02	1.19	1.02	1.46	1.02

Analysis begun on: Thu Jul 11 17:02:35 2019
Analysis ended on: Thu Jul 11 17:02:44 2019
Total elapsed time: 00:00:09

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.013)
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****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Surcharge Method ..... EXTRAN
Starting Date 04/01/2005 00:00:00
Ending Date 04/04/2005 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:01:00
Wet Time Step 00:01:00
Dry Time Step 00:01:00
Routing Time Step ..... 1.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Number of Threads 1
Head Tolerance ..... 0.001500 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	10.212	114.013
Evaporation Loss	0.000	0.000
Infiltration Loss	3.292	36.757
Surface Runoff	6.799	75.907
Final Storage	0.123	1.369
Continuity Error (%)	-0.019	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	6.799	67.991
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	6.754	67.541
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.043	0.432
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	0.026	

****
Highest Continuity Errors
****
Node J5 (-1.92%)
Node J12 (1.15%)

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
Link OL1 (1)

****
Routing Time Step Summary
****
Minimum Time Step : 0.09 sec
Average Time Step : 1.00 sec
Maximum Time Step : 1.00 sec
Percent in Steady State : -0.00
Average Iterations per Step : 2.00
Percent Not Converging : 0.03

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff

A1	114.01	0.00	0.00	59.82	0.00	52.93	52.93	8.24	0.70	0.464
A2	114.01	0.00	0.00	62.30	0.00	50.44	50.44	2.67	0.26	0.442
EXT1	114.01	0.00	0.00	30.38	61.90	51.31	82.26	16.47	4.23	0.722
EXT2	114.01	0.00	0.00	30.42	61.90	51.26	82.21	21.21	5.26	0.721
EXT3	114.01	0.00	0.00	20.03	92.60	19.43	92.60	3.00	1.32	0.812
EXT4	114.01	0.00	0.00	6.83	105.77	6.71	105.77	1.36	0.70	0.928
EXT5	114.01	0.00	0.00	29.80	61.96	82.93	82.93	0.60	0.32	0.727
EXT6	114.01	0.00	0.00	33.25	56.31	79.44	79.44	0.39	0.16	0.697
EXT7	114.01	0.00	0.00	29.78	61.96	82.95	82.95	0.74	0.40	0.728
EXT8	114.01	0.00	0.00	30.77	81.87	19.97	81.87	13.31	5.21	0.718

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.12	2.16	255.22	0 09:29	2.16
J10	JUNCTION	0.12	2.08	254.78	0 09:29	2.08
J11	JUNCTION	0.13	2.08	254.56	0 09:29	2.08
J12	JUNCTION	0.02	0.43	256.62	0 09:26	0.43
J13	JUNCTION	0.11	3.65	256.90	0 09:10	3.65
J14	JUNCTION	0.16	1.62	252.67	0 09:29	1.62
J15	JUNCTION	0.03	0.27	254.57	0 09:30	0.27
J16	JUNCTION	0.16	2.02	253.20	0 09:29	2.02
J17	JUNCTION	0.13	1.20	252.10	0 09:30	1.20
J2	JUNCTION	0.09	2.83	257.65	0 09:05	2.83
J3	JUNCTION	0.11	2.06	254.34	0 09:29	2.06
J4	JUNCTION	0.10	4.43	259.89	0 09:11	4.43
J5	JUNCTION	0.00	0.27	257.27	0 09:20	0.27
J6	JUNCTION	0.08	1.62	255.16	0 09:29	1.62
J7	JUNCTION	0.06	1.45	254.97	0 09:29	1.45
J8	JUNCTION	0.14	2.20	253.88	0 09:06	2.13
J9	JUNCTION	0.15	2.19	255.00	0 09:29	2.19
DorchesterCreek	OUTFALL	0.03	0.27	254.37	0 09:30	0.27
Ex.Ditch	OUTFALL	0.01	0.23	255.85	0 09:26	0.23
Ex.Major	OUTFALL	0.00	0.00	255.50	0 00:00	0.00
Ex.Sewer	OUTFALL	0.11	1.05	251.93	0 09:30	1.05
Ex.Storage	STORAGE	0.17	2.82	257.64	0 09:10	2.82
Ex.SWMF	STORAGE	0.11	1.37	256.27	0 09:29	1.37

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
J1	JUNCTION	0.000	2.659	0 09:14	0	30.5	-0.050
J10	JUNCTION	0.000	2.497	0 09:30	0	30.6	0.012
J11	JUNCTION	0.000	2.497	0 09:30	0	30.6	-0.018
J12	JUNCTION	0.718	2.716	0 09:11	1.34	4.67	1.165
J13	JUNCTION	5.260	5.260	0 09:10	21.2	21.2	0.116
J14	JUNCTION	0.000	3.900	0 09:30	0	44.3	0.005
J15	JUNCTION	0.259	0.398	0 09:30	2.67	3.05	0.007
J16	JUNCTION	0.000	3.900	0 09:30	0	44.3	-0.007
J17	JUNCTION	0.000	3.900	0 09:30	0	44.3	-0.005
J2	JUNCTION	0.000	2.642	0 09:11	0	16.1	-0.123
J3	JUNCTION	0.000	3.900	0 09:30	0	44.3	0.015
J4	JUNCTION	4.228	4.228	0 09:10	16.5	16.5	0.067
J5	JUNCTION	0.000	1.624	0 09:10	0	2.54	-1.881
J6	JUNCTION	0.000	1.677	0 09:05	0	14.1	-0.018
J7	JUNCTION	0.000	1.617	0 09:11	0	13.8	0.048
J8	JUNCTION	0.000	3.900	0 09:30	0	44.3	0.030
J9	JUNCTION	0.000	2.497	0 09:29	0	30.6	-0.023
DorchesterCreek	OUTFALL	0.000	0.398	0 09:30	0	3.05	0.000
Ex.Ditch	OUTFALL	1.809	2.773	0 09:25	11.6	16.2	0.000
Ex.Major	OUTFALL	0.000	2.093	0 09:29	0	3.96	0.000
Ex.Sewer	OUTFALL	0.000	3.900	0 09:30	0	44.3	0.000
Ex.Storage	STORAGE	0.702	0.707	0 09:08	1.36	1.4	-0.001
Ex.SWMF	STORAGE	5.207	8.710	0 09:10	13.3	17.5	0.003

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
J10	JUNCTION	1.02	0.708	1.492
J11	JUNCTION	1.05	0.704	1.811
J14	JUNCTION	1.10	0.225	1.331
J16	JUNCTION	1.09	0.377	1.800
J3	JUNCTION	0.99	0.524	1.571
J6	JUNCTION	0.59	0.108	1.842
J7	JUNCTION	1.08	0.628	1.197
J8	JUNCTION	1.24	0.828	2.507

****
Node Flooding Summary

****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Ex.Storage	0.026	5	0	31	0.428	89	0 09:10	0.648
Ex.SWMF	0.522	7	0	0	7.307	98	0 09:29	2.840

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
DorchesterCreek	35.17	0.033	0.398	3.048
Ex.Ditch	52.07	0.120	2.773	16.242
Ex.Major	1.41	1.082	2.093	3.961
Ex.Sewer	64.48	0.265	3.900	44.289
System	38.28	1.501	3.900	67.541

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	2.642	0 09:11	4.15	1.91	1.00
C10	CONDUIT	2.497	0 09:30	1.87	1.56	1.00
C11	CONDUIT	2.497	0 09:30	1.91	1.06	1.00
C12	CONDUIT	2.497	0 09:30	1.95	1.11	1.00
C13	CONDUIT	0.999	0 09:11	0.92	0.18	0.35
C14	CONDUIT	1.355	0 09:20	0.52	0.20	0.69
C16	CONDUIT	1.641	0 09:26	0.51	0.37	0.65
C17	CONDUIT	0.398	0 09:30	2.68	0.03	0.27
C18	CONDUIT	1.750	0 09:01	1.83	0.70	1.00
C19	CONDUIT	3.900	0 09:30	2.72	2.44	1.00
C2	CONDUIT	2.497	0 09:29	1.88	1.00	1.00
C20	CONDUIT	3.900	0 09:30	2.82	2.43	0.93
C21	CONDUIT	3.900	0 09:30	3.06	2.45	0.83
C3	CONDUIT	3.900	0 09:30	2.74	0.97	1.00
C4	CONDUIT	1.677	0 09:05	3.14	1.51	1.00
C5	CONDUIT	1.617	0 09:11	3.02	3.50	1.00
C6	CONDUIT	0.139	0 09:30	1.24	1.26	0.84
C7	CONDUIT	1.060	0 09:20	2.37	0.16	0.52
C8	CONDUIT	1.617	0 09:11	3.08	1.26	1.00
C9	CONDUIT	3.900	0 09:30	2.72	1.71	1.00
OR1	ORIFICE	0.049	0 10:15			1.00
C15	WEIR	0.632	0 09:10			0.54
W1	WEIR	3.506	0 09:10			0.86
W2	WEIR	2.093	0 09:29			1.00
W3	WEIR	0.000	0 00:00			0.00
OL1	DUMMY	1.040	0 10:05			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
		---------- Fraction of Time in Flow Class ----------								
C1	1.00	0.00	0.00	0.00	0.02	0.03	0.00	0.95	0.03	0.00
C10	1.00	0.00	0.00	0.00	0.53	0.00	0.00	0.47	0.00	0.00
C11	1.00	0.00	0.00	0.00	0.49	0.00	0.00	0.51	0.00	0.00
C12	1.00	0.00	0.00	0.00	0.05	0.00	0.00	0.95	0.00	0.00
C13	1.00	0.99	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
C14	1.00	0.09	0.04	0.00	0.87	0.00	0.00	0.00	0.87	0.00
C16	1.00	0.09	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00
C17	1.00	0.13	0.00	0.00	0.51	0.37	0.00	0.00	0.81	0.00
C18	1.00	0.00	0.00	0.00	0.53	0.00	0.00	0.47	0.37	0.00
C19	1.00	0.00	0.00	0.00	0.42	0.00	0.00	0.57	0.00	0.00
C2	1.00	0.00	0.00	0.00	0.53	0.00	0.00	0.47	0.46	0.00
C20	1.00	0.00	0.00	0.00	0.08	0.00	0.00	0.92	0.00	0.00
C21	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C3	1.00	0.00	0.00	0.00	0.08	0.41	0.00	0.51	0.32	0.00
C4	1.00	0.00	0.00	0.00	0.94	0.06	0.00	0.00	0.98	0.00
C5	1.00	0.00	0.00	0.00	0.88	0.12	0.00	0.00	0.00	0.00
C6	1.00	0.13	0.86	0.00	0.01	0.00	0.00	0.00	0.86	0.00
C7	1.00	0.13	0.86	0.00	0.01	0.00	0.00	0.00	0.87	0.00
C8	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.98	0.00	0.00
C9	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.97	0.00	0.00

****

Conduit Surcharge Summary
****

Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C1	1.07	1.08	1.13	0.85	0.84
C10	1.02	1.05	1.02	1.50	1.02
C11	1.04	1.04	1.05	0.91	0.92
C12	1.06	1.07	1.08	1.01	0.97
C18	0.97	1.14	1.01	0.01	0.77
C19	1.10	1.32	1.10	2.01	1.10
C2	1.02	1.02	1.04	0.01	0.02
C20	0.01	1.24	0.01	2.01	0.01
C21	0.01	0.01	0.01	2.02	0.01
C3	1.10	1.10	1.24	0.01	0.01
C4	1.13	1.15	1.13	1.17	1.13
C5	1.08	1.13	1.08	2.15	1.08
C6	0.01	0.59	0.01	0.66	0.01
C8	0.95	1.08	0.99	0.96	0.81
C9	1.09	1.26	1.09	1.52	1.09

Analysis begun on: Thu Jul 11 17:03:09 2019
Analysis ended on: Thu Jul 11 17:03:18 2019
Total elapsed time: 00:00:09

AECOM Imagine it. Delivered.

Appendix E

Proposed Conditions SWM Model

187 Dorchester Road (Sifton) - Proposed Conditions
Junctions
Outfalls
Storages
Weirs
Conduits
Visible
Overland Flow
Orifices
Outlets
Subcatchments
Rear-Yards
ROW
External Areas
Commercial
Medium-Density
Buffer
Agricultural Field
Property Line
EXT10
EXT20
EXT30
EXT40
EXT50
EXT60
EXT70
EXT80
J4
J2
Ex.Storage
A30
RY-6
B10
B40
A40
J5
J23
A60
RY-2
RY-4
RY-5
J13
A10
A90.1
A50
J18
B20
J6
J1
Ex.SWMF
J19
J14
J21
A90.2
MedDensStorage
RY-7
A70
J10
ROW1
J9
ROW2
Ex.Major
A20
J3
J11
J15
A80
J8
J12
Dorchester Creek
J16
J17
Ex.Sewer
N
350 m

```
[TITLE]


[OPTIONS]
;;Options             Value
;;------------------ ------------
FLOW_UNITS           CMS
INFILTRATION         CURVE_NUMBER
FLOW_ROUTING         DYNWAVE
LINK_OFFSETS         ELEVATION
MIN_SLOPE            0
ALLOW_PONDING        YES
SKIP_STEADY_STATE    NO
START_DATE           04/01/2005
START_TIME           00:00:00
REPORT_START_DATE    04/01/2005
REPORT_START_TIME    00:00:00
END_DATE             04/04/2005
END_TIME             00:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          00:01:00
WET_STEP             00:01:00
DRY_STEP             00:01:00
ROUTING_STEP         1
RULE_STEP            00:00:00
INERTIAL_DAMPING     PARTIAL
NORMAL_FLOW_LIMITED  BOTH
FORCE_MAIN_EQUATION  H-W
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         1.14
MAX_TRIALS           8
HEAD_TOLERANCE       0.0015
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.5
THREADS              1

[EVAPORATION]
;;Type          Parameters
;;-------------- ----------
CONSTANT     0
DRY_ONLY     NO

[RAINGAGES]
;;               Rain      Time   Snow   Data
;;Name           Type      Intrvl Catch  Source
;;-------------- --------- ------ ------ ----------
London           INTENSITY 0:10   1.0    TIMESERIES London-100yr3hr-10min

[SUBCATCHMENTS]
;;                                                   Total    Pcnt.                Pcnt.    Curb     Snow
;;Name           Raingage         Outlet              Area     Imperv   Width       Slope    Length   Pack
;;-------------- ---------------- ------------------- -------- -------- --------- -------- -------- --------
;Commercial
A10              London           Comm.Storage        1.34     75       148.889   2        0
;Medium-Density
A20              London           MedDensStorage      1.6      65       160       2        0
;Rear Yard
A30              London           RY-6                0.87     55       290       2        0
;Rear Yard
A40              London           RY-1                1.04     55       346.667   2        0
;Rear Yard
A50              London           RY-2                0.88     59       293.333   2        0
;ROW
A60              London           J18                 3.6      55       225       1        0
;Rear Yard
A70              London           RY-7                1.97     55       179.091   2        0
;Buffer
A80              London           DorchesterCreek     2.12     0        471.111   2        0
;ROW
A90.1            London           J23                 0.57     65       95        1        0
;ROW
A90.2            London           J20                 0.32     50       64        1        0
;Rear Yard
B10              London           RY-3                0.63     55       210       2        0
;Rear Yard
B20              London           RY-4                0.62     55       206.667   2        0
;Rear Yard
B30              London           RY-5                1.05     55       350       2        0
;ROW
B40              London           J6                  4.22     50       248.235   1        0
;External
EXT10            London           J4                  20.02    55       541.081   2        0
;External
EXT20            London           J13                 25.8     55       629.268   2        0
;External
EXT30            London           Ex.Ditch            3.24     65       216       2        0
;External
EXT40            London           Ex.Storage          1.29     75       143.333   2        0
;External
EXT50            London           J6                  0.72     55       288       3        0
;External
EXT60            London           Ex.Ditch            0.49     50       81.667    2        0
;External
EXT70            London           RY-5                0.89     55       445       3        0
;External
EXT80            London           Ex.SWMF             16.26    55       492.727   2        0

[SUBAREAS]
;;Subcatchment   N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-------------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
```



```
A10              0.013      0.25       2          5          25         IMPERVIOUS 100
A20              0.013      0.25       2          5          25         IMPERVIOUS 100
A30              0.013      0.25       2          5          25         PERVIOUS   100
A40              0.013      0.25       2          5          25         PERVIOUS   100
A50              0.013      0.25       2          5          25         PERVIOUS   100
A60              0.013      0.25       2          5          25         PERVIOUS   50
A70              0.013      0.25       2          5          25         PERVIOUS   100
A80              0.013      0.25       2          5          25         PERVIOUS   100
A90.1            0.013      0.25       2          5          25         PERVIOUS   50
A90.2            0.013      0.25       2          5          25         PERVIOUS   50
B10              0.013      0.25       2          5          25         PERVIOUS   100
B20              0.013      0.25       2          5          25         PERVIOUS   100
B30              0.013      0.25       2          5          25         PERVIOUS   100
B40              0.013      0.25       2          5          25         PERVIOUS   50
EXT10            0.013      0.25       2          5          25         PERVIOUS   50
EXT20            0.013      0.25       2          5          25         PERVIOUS   50
EXT30            0.013      0.25       2          5          25         IMPERVIOUS 31
EXT40            0.013      0.25       2          5          25         IMPERVIOUS 27
EXT50            0.013      0.25       2          5          25         PERVIOUS   100
EXT60            0.013      0.25       2          5          25         PERVIOUS   100
EXT70            0.013      0.25       2          5          25         PERVIOUS   100
EXT80            0.013      0.25       2          5          25         IMPERVIOUS 100

[INFILTRATION]
;;Subcatchment   CurveNum   HydCon     DryTime
;;-------------- ---------- ---------- ----------
A10              65         0.5        7
A20              65         0.5        7
A30              65         0.5        7
A40              65         0.5        7
A50              65         0.5        7
A60              65         0.5        7
A70              65         0.5        7
A80              65         0.5        7
A90.1            65         0.5        7
A90.2            65         0.5        7
B10              65         0.5        7
B20              65         0.5        7
B30              65         0.5        7
B40              65         0.5        7
EXT10            65         0.5        7
EXT20            65         0.5        7
EXT30            72         0.5        7
EXT40            72         0.5        7
EXT50            65         0.5        7
EXT60            65         0.5        7
EXT70            65         0.5        7
EXT80            64         0.5        7

[JUNCTIONS]
;;               Invert     Max.       Init.      Surcharge  Ponded
;;Name           Elev.      Depth      Depth      Depth      Area
;;-------------- ---------- ---------- ---------- ---------- ----------
J1               253.06     3.23       0          0          0
J10              252.7      3.57       0          0          0
J11              252.48     3.89       0          0          0
J12              251.18     3.82       0          0          0
J13              253.25     3.69       0          0          0
J14              253        3.8        0          0          0
J15              254        1.5        0          0          0
J16              251.04     2.96       0          0          0
J17              250.9      3.1        0          0          0
J18              253.25     4.05       0          0          0
J19              256.5      0.3        0          0          0
J2               254.82     3.58       0          0          0
J20              252.6      3.91       0          0          0
J21              253.46     4.07       0          0          0
J22              253.63     4.07       0          0          0
J23              253.65     4.15       0          0          0
J3               252.28     3.93       0          0          0
J4               255.46     5.14       0          0          0
J5               254.31     3.49       0          0          0
J6               253.01     3          0          0          0
J7               253.97     3.81       0          0          0
J8               251.68     4.71       0          0          0
J9               252.81     3.62       0          0          0

[OUTFALLS]
;;               Invert     Outfall    Stage/Table   Tide
;;Name           Elev.      Type       Time Series   Gate Route To
;;-------------- ---------- ---------- ------------- ---- ----------------
DorchesterCreek  253.9      FREE                     NO
Ex.Ditch         255.3      FREE                     NO
Ex.Major         255.5      FREE                     NO
Ex.Sewer         250.873    FREE                     NO

[STORAGE]
;;               Invert   Max.     Init.    Storage  Curve                                  Evap.
;;Name           Elev.    Depth    Depth    Curve    Params                                 Frac.   Infiltration parameters
;;-------------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------
Comm.Storage     254.61   3.7      0        TABULAR  Comm.Storage                0        0
Ex.Storage       254.82   3.18     0        TABULAR  Ex.Storage                  0        0        49       100      0.413
Ex.SWMF          254.9    1.4      0        TABULAR  Ex.SWMF                     0        0
MedDensStorage   254.61   2.8      0        TABULAR  MedDensStorage              0        0
ROW1             255.6    1.3      0        TABULAR  ROW1(2)                     0        0
ROW2             256.6    0.8      0        TABULAR  ROW2(2)                     0        0
RY-1             257      0.6      0        TABULAR  RY-1                        0        0        60.96    36       0.39
RY-2             257      0.6      0        TABULAR  RY-2                        0        0        60.96    36       0.39
RY-3             0        0.3      0        TABULAR  RY-3                        0        0        60.96    36       0.4
RY-4             257.88   0.6      0        TABULAR  RY-4                        0        0        60.96    36       0.39
RY-5             256      0.6      0        TABULAR  RY-5                        0        0        60.96    36       0.39
RY-6             257.11   0.6      0        TABULAR  RY-6                        0        0        60.96    36       0.39
RY-7             257      0.6      0        TABULAR  RY-7                        0        0        60.96    36       0.39
```

```
[CONDUITS]
;;              Inlet            Outlet                      Manning    Inlet      Outlet     Init.      Max.
;;Name          Node             Node             Length     N          Offset     Offset     Flow       Flow
;;-------------- ---------------- ---------------- ---------- ---------- ---------- ---------- ---------- ----------
C1              J4               J2               105.957    0.013      255.46     254.84     0          0
C10             J9               J10              100.042    0.013      252.81     252.72     0          0
C11             J10              J11              100.035    0.013      252.7      252.505    0          0
C12             J11              J3               100.573    0.013      252.48     252.3      0          0
C14             J12              J16              105.028    0.013      251.183    251.094    0          0
C16             J13              J1               78.115     0.013      253.252    253.08     0          1.75
C17             J16              J17              78.067     0.013      251.044    250.948    0          0
C18             J17              Ex.Sewer         84.632     0.013      250.898    250.873    0          0
C19             J20              J12              99.37      0.013      252.603    251.196    0          0
C2              J1               J9               99.637     0.013      253.055    252.835    0          0
C20             J14              J20              102.504    0.013      253.002    252.653    0          0
C21             J21              J14              43.173     0.013      253.455    253.027    0          0
C22             J22              J21              29.383     0.013      253.626    253.505    0          0
C23             J23              J22              2          0.013      253.646    253.626    0          0.08
;Overland
C24             J23              J18              200        0.013      257.7      257        0          0
C3              J3               J8               99.514     0.013      252.275    251.705    0          0
C4              J7               J22              86.489     0.013      254.07     253.971    253.651    0
C5              J2               J5               81.009     0.013      254.82     254.337    0          0
C6              J5               J7               20.346     0.013      254.312    254.046    0          0
C9              J8               J12              113.981    0.013      251.68     251.473    0          0
;Overland
W1              J4               RY-6             241.947    0.025      259.78     257.98     0          0
;Overland
W9              RY-6             J18              250        0.013      257.41     257        0          0

[ORIFICES]
;;              Inlet            Outlet           Orifice    Crest      Disch.     Flap Open/Close
;;Name          Node             Node             Type       Height     Coeff.     Gate Time
;;-------------- ---------------- ---------- ---------- ---------- ---------- ---- ----------
OL1             Comm.Storage     J14              SIDE       254.61     0.65       NO   0
OL2             MedDensStorage   J14              SIDE       254.61     0.65       NO   0
OR1             Ex.Storage       J2               SIDE       255.3      0.65       NO   0
OR2             ROW1             J10              SIDE       255.6      0.65       NO   0
OR3             ROW2             J10              SIDE       256.6      0.65       NO   0

[WEIRS]
;;              Inlet            Outlet           Weir       Crest      Disch.     Flap End      End
;;Name          Node             Node             Type       Height     Coeff.     Gate Con.     Coeff.     Surcharge  RoadWidth
RoadSurf   Coeff. Curve
;;-------------- ---------- ---------- ---------- ---------- ---------- ---- -------- ---------- ---------- ---------- -------
--- ----------
C15             Ex.Storage       RY-6             TRANSVERSE 257.4      1.78       NO   0        0          YES
;Overland
C7              J2               RY-6             TRANSVERSE 257.39     1.78       NO   0        0          YES
W10             RY-7             J15              TRANSVERSE 257.45     1.78       NO   0        0          YES
W11             J13              Ex.SWMF          TRANSVERSE 256.639    1.78       NO   0        0          YES
W12             RY-4             J6               TRANSVERSE 258.18     1.78       NO   0        0          YES
W13             J6               ROW2             TRANSVERSE 257.51     1.78       NO   0        0          YES
W14             Comm.Storage     J19              TRANSVERSE 258.01     1.78       NO   0        0          YES
W15             MedDensStorage   J19              TRANSVERSE 257.11     1.78       NO   0        0          YES
W16             J19              Ex.Ditch         TRANSVERSE 256.5      1.78       NO   0        0          YES
W17             RY-1             J18              TRANSVERSE 257.3      1.78       NO   0        0          YES
W18             RY-2             J18              TRANSVERSE 257.3      1.78       NO   0        0          YES
W2              Ex.SWMF          Ex.Major         TRAPEZOIDAL 256       1.78       NO   0        0          YES
W3              RY-5             J1               TRANSVERSE 256.3      1.78       NO   0        0          YES
W4              J15              DorchesterCreek  TRANSVERSE 254        1.78       NO   0        0          YES
W5              J18              ROW1             TRANSVERSE 257        1.78       NO   0        0          YES
W6              J1               J15              TRANSVERSE 255.99     1.78       NO   0        0          YES
W7              ROW2             J15              TRANSVERSE 257.1      1.78       NO   0        0          YES
W8              ROW1             J15              TRANSVERSE 256.6      1.78       NO   0        0          YES

[OUTLETS]
;;              Inlet            Outlet           Outflow    Outlet           Qcoeff/                    Flap
;;Name          Node             Node             Height     Type             QTable             Qexpon  Gate
;;-------------- ---------- ---------- ---------- ---------- ---------- ----
;Flow limited to 0.433 m3/s > equivalent to 333 mm orifice plate at 3.0 m of head.
C13             J6               J9               253.01     TABULAR/HEAD     East                       NO
;Flow limited to 0.298 m3/s > equivalent to 264 mm orifice plate at 3.6 m of head.
C8              J18              J10              253.25     TABULAR/HEAD     West                       NO
Ex.SWMOutlet    Ex.SWMF          J1               254.9      TABULAR/HEAD     Ex.SWMOutlet               NO

[XSECTIONS]
;;Link          Shape        Geom1            Geom2      Geom3      Geom4      Barrels
;;-------------- ---------- ---------- ---------- ---------- ---------- ----------
C1              CIRCULAR     0.9              0          0          0          1
C10             CIRCULAR     1.35             0          0          0          1
C11             CIRCULAR     1.35             0          0          0          1
C12             CIRCULAR     1.35             0          0          0          1
C14             CIRCULAR     1.35             0          0          0          1
C16             CIRCULAR     1.35             0          0          0          1
C17             CIRCULAR     1.35             0          0          0          1
C18             CIRCULAR     1.35             0          0          0          1
C19             CIRCULAR     0.975            0          0          0          1
C2              CIRCULAR     1.35             0          0          0          1
C20             CIRCULAR     0.975            0          0          0          1
C21             CIRCULAR     0.975            0          0          0          1
C22             CIRCULAR     0.975            0          0          0          1
C23             CIRCULAR     0.525            0          0          0          1
C24             RECT_OPEN    0.3              10         0          0          1
C3              CIRCULAR     1.35             0          0          0          1
C4              CIRCULAR     0.975            0          0          0          1
C5              CIRCULAR     0.9              0          0          0          1
C6              CIRCULAR     0.9              0          0          0          1
C9              CIRCULAR     1.35             0          0          0          1
W1              TRIANGULAR   0.45             4          0          0          1
W9              RECT_OPEN    0.3              10         0          0          1
OL1             CIRCULAR     0.075            0          0          0
OL2             CIRCULAR     0.075            0          0          0
OR1             CIRCULAR     0.125            0          0          0
```



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OR2             CIRCULAR     0.3              0          0          0
OR3             CIRCULAR     0.3              0          0          0
C15             RECT_OPEN    0.45             3          0          0
C7              RECT_OPEN    3                0.3        0          0
W10             RECT_OPEN    0.3              20         0          0
W11             RECT_OPEN    0.3              15         0          0
W12             RECT_OPEN    0.3              6          0          0
W13             RECT_OPEN    0.3              5          0          0
W14             RECT_OPEN    0.3              5          0          0
W15             RECT_OPEN    0.3              5          0          0
W16             RECT_OPEN    0.3              10         0          0
W17             RECT_OPEN    0.3              5          0          0
W18             RECT_OPEN    0.3              5          0          0
W2              TRAPEZOIDAL  0.3              10         0.333      0.333
W3              RECT_OPEN    0.3              7          0          0
W4              RECT_OPEN    1                10         0          0
W5              RECT_OPEN    0.3              8          0          0
W6              RECT_OPEN    0.3              5          0          0
W7              RECT_OPEN    0.3              3          0          0
W8              RECT_OPEN    0.3              10         0          0

[TRANSECTS]

NC 0.035    0.035    0.035
X1 SWMFOutlet       8        2.2      4.5      0.0      0.0      0.0      0.0      0.0
GR 1.75     0.5      1.3      1.85     1.3      2.2      1        3.1      1        3.6
GR 1.3      4.5      1.3      4.85     1.75     6.2

[LOSSES]
;;Link          Inlet        Outlet       Average    Flap Gate  SeepageRate
;;-------------- ---------- ---------- ---------- ---------- ----------

[CURVES]
;;Name          Type         X-Value      Y-Value
;;-------------- ---------- ---------- ----------
Comm.Block      Rating       0            0
Comm.Block                   0.1          0.001
Comm.Block                   0.2          0.002
Comm.Block                   0.3          0.003
Comm.Block                   0.4          0.005
Comm.Block                   0.5          0.007
Comm.Block                   0.6          0.009
Comm.Block                   0.7          0.011
Comm.Block                   0.8          0.013
Comm.Block                   0.9          0.015
Comm.Block                   1            0.019

Comm.Block2     Rating       0            0
Comm.Block2                  1            0.012

East            Rating       0            0
East                         3            0.433

Ex.SWMOutlet    Rating       0            0.007
Ex.SWMOutlet                 0.1          0.014
Ex.SWMOutlet                 0.2          0.124
Ex.SWMOutlet                 0.3          0.171
Ex.SWMOutlet                 0.4          0.208
Ex.SWMOutlet                 0.5          0.239
Ex.SWMOutlet                 0.6          0.266
Ex.SWMOutlet                 0.7          0.291
Ex.SWMOutlet                 0.8          0.314
Ex.SWMOutlet                 0.9          0.415
Ex.SWMOutlet                 1            0.589
Ex.SWMOutlet                 1.1          0.865
Ex.SWMOutlet                 1.2          1.248
Ex.SWMOutlet                 1.3          1.557

Med.Block       Rating       0            0
Med.Block                    0.1          0.001
Med.Block                    0.2          0.002
Med.Block                    0.3          0.003
Med.Block                    0.4          0.005
Med.Block                    0.5          0.007
Med.Block                    0.6          0.009
Med.Block                    0.7          0.011
Med.Block                    0.8          0.013
Med.Block                    0.9          0.015
Med.Block                    1            0.015

Med.Block2      Rating       0            0
Med.Block2                   1            0.012

West            Rating       0            0
West                         2.5          0.298

Comm.Storage    Storage      0            850
Comm.Storage                 1            850
Comm.Storage                 1.00001      0.36
Comm.Storage                 3.7          0.36

;Sifton Retirement Facility
Ex.Storage      Storage      0            160
Ex.Storage                   0.48         160
Ex.Storage                   0.481        150
Ex.Storage                   2.78         150

Ex.SWMF         Storage      0            4094
Ex.SWMF                      0.1          4375
Ex.SWMF                      0.2          4656
Ex.SWMF                      0.3          4797
Ex.SWMF                      0.4          4939
Ex.SWMF                      0.5          5080
Ex.SWMF                      0.6          5221
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Ex.SWMF                     0.7        5362
Ex.SWMF                     0.8        5503
Ex.SWMF                     0.9        5645
Ex.SWMF                     1          5786
Ex.SWMF                     1.1        5927
Ex.SWMF                     1.2        6068
Ex.SWMF                     1.3        6209

MedDensStorage   Storage    0          800
MedDensStorage              1          800
MedDensStorage              1.000001   0.36
MedDensStorage              2.8        0.36

ROW1             Storage    0          1000
ROW1                        0.5        1300
ROW1                        0.8        1500

;02-25-2019
ROW1(2)          Storage    0          450
ROW1(2)                     0.1        485
ROW1(2)                     0.2        520
ROW1(2)                     0.3        558
ROW1(2)                     0.4        596
ROW1(2)                     0.5        636
ROW1(2)                     0.6        677
ROW1(2)                     0.7        719
ROW1(2)                     0.8        762
ROW1(2)                     0.9        807
ROW1(2)                     1          853
ROW1(2)                     1.1        901
ROW1(2)                     1.2        949
ROW1(2)                     1.3        999

ROW2             Storage    0          450
ROW2                        0.5        750
ROW2                        0.8        950

;02-25-2019
ROW2(2)          Storage    0          450
ROW2(2)                     0.1        485
ROW2(2)                     0.2        520
ROW2(2)                     0.3        558
ROW2(2)                     0.4        596
ROW2(2)                     0.5        636
ROW2(2)                     0.6        677
ROW2(2)                     0.7        719
ROW2(2)                     0.8        762

RY-1             Storage    0          0
RY-1                        0.3        2800
RY-1                        0.6        2800

RY-2             Storage    0          0
RY-2                        0.3        2160
RY-2                        0.6        2160

RY-3             Storage    0          0
RY-3                        0.3        2000

RY-4             Storage    0          0
RY-4                        0.3        2000

RY-5             Storage    0          0
RY-5                        0.3        2000

RY-6             Storage    0          0
RY-6                        0.3        1500

RY-7             Storage    0          0
RY-7                        0.3        2700

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
;Chicago design storm, a = 2619.363, b = 10.5, c = 0.884, Duration = 180 minutes, r = 0.38, rain units = mm/hr.
London-100yr3hr-10min            0:00       4.545
London-100yr3hr-10min            0:10       5.529
London-100yr3hr-10min            0:20       7.042
London-100yr3hr-10min            0:30       9.632
London-100yr3hr-10min            0:40       14.915
London-100yr3hr-10min            0:50       30.154
London-100yr3hr-10min            1:00       181.387
London-100yr3hr-10min            1:10       73.569
London-100yr3hr-10min            1:20       40.376
London-100yr3hr-10min            1:30       22.893
London-100yr3hr-10min            1:40       15.501
London-100yr3hr-10min            1:50       11.556
London-100yr3hr-10min            2:00       9.147
London-100yr3hr-10min            2:10       7.54
London-100yr3hr-10min            2:20       6.401
London-100yr3hr-10min            2:30       5.555
London-100yr3hr-10min            2:40       4.903
London-100yr3hr-10min            2:50       4.387
London-100yr3hr-10min            3:00       0

;Chicago design storm, a = 1574.382, b = 9.025, c = 0.86, Duration = 180 minutes, r = 0.38, rain units = mm/hr.
London-10yr3hr-10min             0:00       3.407
London-10yr3hr-10min             0:10       4.086
London-10yr3hr-10min             0:20       5.115
London-10yr3hr-10min             0:30       6.845
London-10yr3hr-10min             0:40       10.309
London-10yr3hr-10min             0:50       20.166
London-10yr3hr-10min             1:00       124.994
London-10yr3hr-10min             1:10       48.602
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London-10yr3hr-10min             1:20       26.78
London-10yr3hr-10min             1:30       15.477
London-10yr3hr-10min             1:40       10.693
London-10yr3hr-10min             1:50       8.115
London-10yr3hr-10min             2:00       6.524
London-10yr3hr-10min             2:10       5.451
London-10yr3hr-10min             2:20       4.681
London-10yr3hr-10min             2:30       4.104
London-10yr3hr-10min             2:40       3.655
London-10yr3hr-10min             2:50       3.297
London-10yr3hr-10min             3:00       0

;Chicago design storm, a = 3048.22, b = 10.03, c = 0.888, Duration = 1440 minutes, r = 0.38, rain units = mm/hr.
London-250yr24hr-10min           0:00       0.566
London-250yr24hr-10min           0:10       0.576
London-250yr24hr-10min           0:20       0.586
London-250yr24hr-10min           0:30       0.597
London-250yr24hr-10min           0:40       0.608
London-250yr24hr-10min           0:50       0.62
London-250yr24hr-10min           1:00       0.632
London-250yr24hr-10min           1:10       0.644
London-250yr24hr-10min           1:20       0.657
London-250yr24hr-10min           1:30       0.671
London-250yr24hr-10min           1:40       0.685
London-250yr24hr-10min           1:50       0.7
London-250yr24hr-10min           2:00       0.716
London-250yr24hr-10min           2:10       0.733
London-250yr24hr-10min           2:20       0.75
London-250yr24hr-10min           2:30       0.768
London-250yr24hr-10min           2:40       0.787
London-250yr24hr-10min           2:50       0.807
London-250yr24hr-10min           3:00       0.828
London-250yr24hr-10min           3:10       0.851
London-250yr24hr-10min           3:20       0.875
London-250yr24hr-10min           3:30       0.9
London-250yr24hr-10min           3:40       0.927
London-250yr24hr-10min           3:50       0.955
London-250yr24hr-10min           4:00       0.986
London-250yr24hr-10min           4:10       1.018
London-250yr24hr-10min           4:20       1.053
London-250yr24hr-10min           4:30       1.091
London-250yr24hr-10min           4:40       1.131
London-250yr24hr-10min           4:50       1.175
London-250yr24hr-10min           5:00       1.223
London-250yr24hr-10min           5:10       1.275
London-250yr24hr-10min           5:20       1.331
London-250yr24hr-10min           5:30       1.393
London-250yr24hr-10min           5:40       1.462
London-250yr24hr-10min           5:50       1.538
London-250yr24hr-10min           6:00       1.623
London-250yr24hr-10min           6:10       1.718
London-250yr24hr-10min           6:20       1.826
London-250yr24hr-10min           6:30       1.948
London-250yr24hr-10min           6:40       2.089
London-250yr24hr-10min           6:50       2.254
London-250yr24hr-10min           7:00       2.447
London-250yr24hr-10min           7:10       2.677
London-250yr24hr-10min           7:20       2.958
London-250yr24hr-10min           7:30       3.305
London-250yr24hr-10min           7:40       3.747
London-250yr24hr-10min           7:50       4.326
London-250yr24hr-10min           8:00       5.119
London-250yr24hr-10min           8:10       6.263
London-250yr24hr-10min           8:20       8.044
London-250yr24hr-10min           8:30       11.153
London-250yr24hr-10min           8:40       17.716
London-250yr24hr-10min           8:50       38.196
London-250yr24hr-10min           9:00       212.889
London-250yr24hr-10min           9:10       84.17
London-250yr24hr-10min           9:20       41.804
London-250yr24hr-10min           9:30       24.209
London-250yr24hr-10min           9:40       16.564
London-250yr24hr-10min           9:50       12.423
London-250yr24hr-10min           10:00      9.872
London-250yr24hr-10min           10:10      8.16
London-250yr24hr-10min           10:20      6.94
London-250yr24hr-10min           10:30      6.031
London-250yr24hr-10min           10:40      5.33
London-250yr24hr-10min           10:50      4.773
London-250yr24hr-10min           11:00      4.321
London-250yr24hr-10min           11:10      3.947
London-250yr24hr-10min           11:20      3.634
London-250yr24hr-10min           11:30      3.366
London-250yr24hr-10min           11:40      3.136
London-250yr24hr-10min           11:50      2.936
London-250yr24hr-10min           12:00      2.76
London-250yr24hr-10min           12:10      2.605
London-250yr24hr-10min           12:20      2.466
London-250yr24hr-10min           12:30      2.342
London-250yr24hr-10min           12:40      2.23
London-250yr24hr-10min           12:50      2.129
London-250yr24hr-10min           13:00      2.036
London-250yr24hr-10min           13:10      1.952
London-250yr24hr-10min           13:20      1.875
London-250yr24hr-10min           13:30      1.803
London-250yr24hr-10min           13:40      1.737
London-250yr24hr-10min           13:50      1.676
London-250yr24hr-10min           14:00      1.62
London-250yr24hr-10min           14:10      1.567
London-250yr24hr-10min           14:20      1.517
London-250yr24hr-10min           14:30      1.471
London-250yr24hr-10min           14:40      1.428
London-250yr24hr-10min           14:50      1.387
London-250yr24hr-10min           15:00      1.348
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London-250yr24hr-10min          15:10     1.312
London-250yr24hr-10min          15:20     1.278
London-250yr24hr-10min          15:30     1.245
London-250yr24hr-10min          15:40     1.215
London-250yr24hr-10min          15:50     1.185
London-250yr24hr-10min          16:00     1.158
London-250yr24hr-10min          16:10     1.131
London-250yr24hr-10min          16:20     1.106
London-250yr24hr-10min          16:30     1.082
London-250yr24hr-10min          16:40     1.059
London-250yr24hr-10min          16:50     1.037
London-250yr24hr-10min          17:00     1.016
London-250yr24hr-10min          17:10     0.996
London-250yr24hr-10min          17:20     0.977
London-250yr24hr-10min          17:30     0.958
London-250yr24hr-10min          17:40     0.94
London-250yr24hr-10min          17:50     0.923
London-250yr24hr-10min          18:00     0.907
London-250yr24hr-10min          18:10     0.891
London-250yr24hr-10min          18:20     0.875
London-250yr24hr-10min          18:30     0.861
London-250yr24hr-10min          18:40     0.846
London-250yr24hr-10min          18:50     0.833
London-250yr24hr-10min          19:00     0.819
London-250yr24hr-10min          19:10     0.806
London-250yr24hr-10min          19:20     0.794
London-250yr24hr-10min          19:30     0.782
London-250yr24hr-10min          19:40     0.77
London-250yr24hr-10min          19:50     0.759
London-250yr24hr-10min          20:00     0.748
London-250yr24hr-10min          20:10     0.737
London-250yr24hr-10min          20:20     0.727
London-250yr24hr-10min          20:30     0.717
London-250yr24hr-10min          20:40     0.707
London-250yr24hr-10min          20:50     0.698
London-250yr24hr-10min          21:00     0.689
London-250yr24hr-10min          21:10     0.68
London-250yr24hr-10min          21:20     0.671
London-250yr24hr-10min          21:30     0.663
London-250yr24hr-10min          21:40     0.654
London-250yr24hr-10min          21:50     0.646
London-250yr24hr-10min          22:00     0.639
London-250yr24hr-10min          22:10     0.631
London-250yr24hr-10min          22:20     0.624
London-250yr24hr-10min          22:30     0.616
London-250yr24hr-10min          22:40     0.609
London-250yr24hr-10min          22:50     0.602
London-250yr24hr-10min          23:00     0.596
London-250yr24hr-10min          23:10     0.589
London-250yr24hr-10min          23:20     0.583
London-250yr24hr-10min          23:30     0.576
London-250yr24hr-10min          23:40     0.57
London-250yr24hr-10min          23:50     0.564
London-250yr24hr-10min          24:00     0

;Chicago design storm, a = 3048.22, b = 10.03, c = 0.888, Duration = 180 minutes, r = 0.38, rain units = mm/hr.
London-250yr3hr-10min           0:00      5.009
London-250yr3hr-10min           0:10      6.1
London-250yr3hr-10min           0:20      7.78
London-250yr3hr-10min           0:30      10.665
London-250yr3hr-10min           0:40      16.579
London-250yr3hr-10min           0:50      33.816
London-250yr3hr-10min           1:00      212.889
London-250yr3hr-10min           1:10      83.849
London-250yr3hr-10min           1:20      45.471
London-250yr3hr-10min           1:30      25.565
London-250yr3hr-10min           1:40      17.236
London-250yr3hr-10min           1:50      12.814
London-250yr3hr-10min           2:00      10.124
London-250yr3hr-10min           2:10      8.335
London-250yr3hr-10min           2:20      7.068
London-250yr3hr-10min           2:30      6.128
London-250yr3hr-10min           2:40      5.405
London-250yr3hr-10min           2:50      4.833
London-250yr3hr-10min           3:00      0

;Chicago design storm, a = 538.85, b = 6.331, c = 0.809, Duration = 240 minutes, r = 0.38, rain units = mm/hr.
London-25mm4hr-10min            0:00      1.396
London-25mm4hr-10min            0:10      1.558
London-25mm4hr-10min            0:20      1.769
London-25mm4hr-10min            0:30      2.056
London-25mm4hr-10min            0:40      2.468
London-25mm4hr-10min            0:50      3.115
London-25mm4hr-10min            1:00      4.286
London-25mm4hr-10min            1:10      7.08
London-25mm4hr-10min            1:20      18.278
London-25mm4hr-10min            1:30      56.252
London-25mm4hr-10min            1:40      13.841
London-25mm4hr-10min            1:50      7.728
London-25mm4hr-10min            2:00      5.382
London-25mm4hr-10min            2:10      4.151
London-25mm4hr-10min            2:20      3.394
London-25mm4hr-10min            2:30      2.882
London-25mm4hr-10min            2:40      2.511
London-25mm4hr-10min            2:50      2.231
London-25mm4hr-10min            3:00      2.01
London-25mm4hr-10min            3:10      1.832
London-25mm4hr-10min            3:20      1.686
London-25mm4hr-10min            3:30      1.563
London-25mm4hr-10min            3:40      1.458
London-25mm4hr-10min            3:50      1.367
London-25mm4hr-10min            4:00      0

;Chicago design storm, a = 2019.372, b = 9.824, c = 0.875, Duration = 180 minutes, r = 0.38, rain units = mm/hr.
```



```
London-25yr3hr-10min            0:00      3.8
London-25yr3hr-10min            0:10      4.595
London-25yr3hr-10min            0:20      5.811
London-25yr3hr-10min            0:30      7.88
London-25yr3hr-10min            0:40      12.072
London-25yr3hr-10min            0:50      24.122
London-25yr3hr-10min            1:00      147.97
London-25yr3hr-10min            1:10      58.745
London-25yr3hr-10min            1:20      32.219
London-25yr3hr-10min            1:30      18.379
London-25yr3hr-10min            1:40      12.537
London-25yr3hr-10min            1:50      9.41
London-25yr3hr-10min            2:00      7.494
London-25yr3hr-10min            2:10      6.211
London-25yr3hr-10min            2:20      5.297
London-25yr3hr-10min            2:30      4.616
London-25yr3hr-10min            2:40      4.089
London-25yr3hr-10min            2:50      3.671
London-25yr3hr-10min            3:00      0

;Chicago design storm, a = 1290, b = 8.5, c = 0.86, Duration = 180 minutes, r = 0.38, rain units = mm/hr.
London-2yr3hr-10min             0:00      2.762
London-2yr3hr-10min             0:10      3.308
London-2yr3hr-10min             0:20      4.135
London-2yr3hr-10min             0:30      5.526
London-2yr3hr-10min             0:40      8.31
London-2yr3hr-10min             0:50      16.271
London-2yr3hr-10min             1:00      104.911
London-2yr3hr-10min             1:10      39.582
London-2yr3hr-10min             1:20      21.641
London-2yr3hr-10min             1:30      12.473
London-2yr3hr-10min             1:40      8.619
London-2yr3hr-10min             1:50      6.547
London-2yr3hr-10min             2:00      5.268
London-2yr3hr-10min             2:10      4.406
London-2yr3hr-10min             2:20      3.787
London-2yr3hr-10min             2:30      3.323
London-2yr3hr-10min             2:40      2.962
London-2yr3hr-10min             2:50      2.673
London-2yr3hr-10min             3:00      0

;Chicago design storm, a = 2270.665, b = 9.984, c = 0.876, Duration = 180 minutes, r = 0.38, rain units = mm/hr.
London-50yr3hr-10min            0:00      4.242
London-50yr3hr-10min            0:10      5.135
London-50yr3hr-10min            0:20      6.5
London-50yr3hr-10min            0:30      8.824
London-50yr3hr-10min            0:40      13.536
London-50yr3hr-10min            0:50      27.075
London-50yr3hr-10min            1:00      164.723
London-50yr3hr-10min            1:10      65.843
London-50yr3hr-10min            1:20      36.161
London-50yr3hr-10min            1:30      20.626
London-50yr3hr-10min            1:40      14.059
London-50yr3hr-10min            1:50      10.544
London-50yr3hr-10min            2:00      8.39
London-50yr3hr-10min            2:10      6.949
London-50yr3hr-10min            2:20      5.923
London-50yr3hr-10min            2:30      5.158
London-50yr3hr-10min            2:40      4.567
London-50yr3hr-10min            2:50      4.098
London-50yr3hr-10min            3:00      0

;Chicago design storm, a = 1183.74, b = 7.641, c = 0.838, Duration = 180 minutes, r = 0.38, rain units = mm/hr.
London-5yr3hr-10min             0:00      3.117
London-5yr3hr-10min             0:10      3.696
London-5yr3hr-10min             0:20      4.56
London-5yr3hr-10min             0:30      5.989
London-5yr3hr-10min             0:40      8.801
London-5yr3hr-10min             0:50      16.675
London-5yr3hr-10min             1:00      106.824
London-5yr3hr-10min             1:10      39.622
London-5yr3hr-10min             1:20      21.953
London-5yr3hr-10min             1:30      12.939
London-5yr3hr-10min             1:40      9.111
London-5yr3hr-10min             1:50      7.028
London-5yr3hr-10min             2:00      5.727
London-5yr3hr-10min             2:10      4.84
London-5yr3hr-10min             2:20      4.198
London-5yr3hr-10min             2:30      3.711
London-5yr3hr-10min             2:40      3.33
London-5yr3hr-10min             2:50      3.023
London-5yr3hr-10min             3:00      0

[REPORT]
INPUT      NO
CONTROLS   NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]

[MAP]
DIMENSIONS       495141.869781639 4758124.00729807 496730.299084276 4759250.55933552
UNITS            Meters
```

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.013)
--------------------------------------------------------------

*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 04/01/2005 00:00:00
Ending Date .............. 04/04/2005 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 1
Head Tolerance ........... 0.001500 m


**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------        -------
Total Precipitation ......         2.243        25.049
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         1.096        12.244
Surface Runoff ...........         1.022        11.414
Final Storage ............         0.125         1.397
Continuity Error (%) .....        -0.020


**************************        Volume         Volume
Flow Routing Continuity        hectare-m       10^6 ltr
**************************     ---------       ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         1.022        10.219
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         0.915         9.148
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.113         1.129
Initial Stored Volume ....         0.007         0.070
Final Stored Volume ......         0.001         0.005
Continuity Error (%) .....         0.071


*************************
Highest Continuity Errors
*************************
Node J7 (-3.27%)


***************************
Time-Step Critical Elements
***************************
Link C23 (1.08%)


********************************
Highest Flow Instability Indexes
********************************
All links are stable.


*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     0.14 sec
Average Time Step           :     1.00 sec
Maximum Time Step           :     1.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.00
Percent Not Converging      :     0.00


***************************
Subcatchment Runoff Summary
***************************

-------------------------------------------------------------------------------------------------------------------------
                          Total      Total      Total      Total     Imperv      Perv     Total     Total     Peak  Runoff
                         Precip      Runon     Evap      Infil     Runoff    Runoff    Runoff    Runoff    Runoff   Coeff
Subcatchment                 mm         mm       mm         mm         mm        mm        mm  10^6 ltr       CMS
-------------------------------------------------------------------------------------------------------------------------
A10                         25.05       0.00     0.00       5.95      17.67      0.00     17.67      0.24     0.15   0.705
```



```
A20                         25.05       0.00     0.00       8.33      15.31      0.00     15.31      0.25     0.16   0.611
A30                         25.05       0.00     0.00      11.61      12.96     12.06     12.06      0.10     0.06   0.481
A40                         25.05       0.00     0.00      11.61      12.96     12.06     12.06      0.13     0.07   0.481
A50                         25.05       0.00     0.00      10.58      13.91     13.08     13.08      0.12     0.07   0.522
A60                         25.05       0.00     0.00      12.49      12.96      4.69     11.17      0.40     0.15   0.446
A70                         25.05       0.00     0.00      12.14      12.96     11.52     11.52      0.23     0.06   0.460
A80                         25.05       0.00     0.00      23.79       0.00      0.00      0.00      0.00     0.00   0.000
A90.1                       25.05       0.00     0.00       9.22      15.31      6.76     14.42      0.08     0.04   0.576
A90.2                       25.05       0.00     0.00      13.12      11.78      4.67     10.56      0.03     0.01   0.421
B10                         25.05       0.00     0.00      11.61      12.96     12.06     12.06      0.08     0.04   0.481
B20                         25.05       0.00     0.00      11.61      12.96     12.06     12.06      0.07     0.04   0.481
B30                         25.05       0.00     0.00      11.61      12.96     12.06     12.06      0.13     0.07   0.481
B40                         25.05       0.00     0.00      13.93      11.78      3.85      9.74      0.41     0.16   0.389
EXT10                       25.05       0.00     0.00      12.94      12.95      4.24     10.71      2.14     0.74   0.428
EXT20                       25.05       0.00     0.00      13.04      12.95      4.13     10.61      2.74     0.93   0.423
EXT30                       25.05       0.00     0.00       8.32      15.31      0.00     15.31      0.50     0.32   0.611
EXT40                       25.05       0.00     0.00       5.95      17.67      0.00     17.67      0.23     0.15   0.705
EXT50                       25.05       0.00     0.00      11.53      12.97     12.15     12.15      0.09     0.06   0.485
EXT60                       25.05       0.00     0.00      13.16      11.78     10.52     10.52      0.05     0.02   0.420
EXT70                       25.05       0.00     0.00      11.49      12.97     12.19     12.19      0.11     0.08   0.487
EXT80                       25.05       0.00     0.00      10.70      12.95      0.00     12.95      2.11     1.22   0.517


******************
Node Depth Summary
******************

-----------------------------------------------------------------------------------------
                                Average  Maximum  Maximum  Time of Max    Reported
                                  Depth    Depth      HGL   Occurrence   Max Depth
Node                 Type        Meters   Meters   Meters  days hr:min      Meters
-----------------------------------------------------------------------------------------
J1                   JUNCTION      0.03     0.62   253.68    0  01:40        0.62
J10                  JUNCTION      0.04     0.70   253.40    0  01:41        0.69
J11                  JUNCTION      0.04     0.69   253.17    0  01:42        0.69
J12                  JUNCTION      0.07     1.07   252.25    0  01:44        1.07
J13                  JUNCTION      0.02     0.58   253.83    0  01:40        0.57
J14                  JUNCTION      0.04     0.55   253.55    0  00:00        0.53
J15                  JUNCTION      0.00     0.00   254.00    0  00:00        0.00
J16                  JUNCTION      0.07     1.00   252.04    0  01:44        1.00
J17                  JUNCTION      0.08     0.98   251.88    0  01:44        0.98
J18                  JUNCTION      0.02     1.36   254.61    0  01:40        1.35
J19                  JUNCTION      0.00     0.00   256.50    0  00:00        0.00
J2                   JUNCTION      0.01     0.46   255.28    0  01:40        0.46
J20                  JUNCTION      0.02     0.36   252.96    0  01:42        0.36
J21                  JUNCTION      0.01     0.78   254.24    0  00:00        0.40
J22                  JUNCTION      0.02     1.09   254.72    0  00:00        0.50
J23                  JUNCTION      0.01     0.87   254.52    0  00:00        0.48
J3                   JUNCTION      0.03     0.53   252.81    0  01:42        0.53
J4                   JUNCTION      0.01     0.47   255.93    0  01:40        0.46
J5                   JUNCTION      0.01     0.44   254.75    0  01:40        0.44
J6                   JUNCTION      0.03     2.01   255.02    0  01:40        2.00
J7                   JUNCTION      0.12     0.73   254.70    0  01:41        0.73
J8                   JUNCTION      0.04     0.73   252.41    0  01:43        0.73
J9                   JUNCTION      0.04     0.76   253.57    0  01:41        0.76
DorchesterCreek      OUTFALL       0.00     0.00   253.90    0  00:00        0.00
Ex.Ditch             OUTFALL       0.00     0.00   255.30    0  00:00        0.00
Ex.Major             OUTFALL       0.00     0.00   255.50    0  00:00        0.00
Ex.Sewer             OUTFALL       0.04     0.75   251.62    0  01:44        0.75
Comm.Storage         STORAGE       0.04     0.22   254.83    0  03:18        0.22
Ex.Storage           STORAGE       0.04     0.73   255.55    0  01:55        0.73
Ex.SWMF              STORAGE       0.02     0.28   255.18    0  02:13        0.28
MedDensStorage       STORAGE       0.04     0.24   254.85    0  03:15        0.24
ROW1                 STORAGE       0.00     0.00   255.60    0  00:00        0.00
ROW2                 STORAGE       0.00     0.00   256.60    0  00:00        0.00
RY-1                 STORAGE       0.00     0.10   257.10    0  02:08        0.10
RY-2                 STORAGE       0.00     0.11   257.11    0  02:07        0.11
RY-3                 STORAGE       0.00     0.09     0.09    0  02:06        0.09
RY-4                 STORAGE       0.00     0.09   257.97    0  02:06        0.09
RY-5                 STORAGE       0.01     0.18   256.18    0  02:16        0.18
RY-6                 STORAGE       0.01     0.13   257.24    0  02:13        0.13
RY-7                 STORAGE       0.01     0.14   257.14    0  02:45        0.14


*******************
Node Inflow Summary
*******************

-----------------------------------------------------------------------------------------------------------
                                Maximum  Maximum                    Lateral       Total        Flow
                                  Lateral    Total  Time of Max     Inflow      Inflow     Balance
                                   Inflow   Inflow   Occurrence     Volume      Volume       Error
Node                 Type             CMS      CMS  days hr:min   10^6 ltr    10^6 ltr     Percent
-----------------------------------------------------------------------------------------------------------
J1                   JUNCTION       0.000    1.006    0  01:40          0        4.84      -0.155
J10                  JUNCTION       0.000    1.291    0  01:41          0        5.75       0.093
J11                  JUNCTION       0.000    1.290    0  01:41          0        5.74       0.134
J12                  JUNCTION       0.000    2.027    0  01:43          0        8.61       0.060
J13                  JUNCTION       0.928    0.928    0  01:40       2.74        2.74       0.055
J14                  JUNCTION       0.000    1.657    0  00:00          0        2.83      -0.363
J15                  JUNCTION       0.000    0.000    0  00:00          0           0       0.000 ltr
J16                  JUNCTION       0.000    1.994    0  01:44          0         8.6       0.076
J17                  JUNCTION       0.000    1.989    0  01:44          0         8.6      -0.038
J18                  JUNCTION       0.148    0.148    0  01:40      0.402       0.402      -0.003
J19                  JUNCTION       0.000    0.000    0  00:00          0           0       0.000 ltr
J2                   JUNCTION       0.000    0.734    0  01:40          0         2.2      -0.002
J20                  JUNCTION       0.014    0.768    0  01:42     0.0338        2.87       0.274
J21                  JUNCTION       0.000    1.849    0  00:00          0        2.35      -0.121
J22                  JUNCTION       0.000    0.755    0  01:41          0        2.36       0.326
J23                  JUNCTION       0.037    0.080    0  00:00     0.0822      0.0842       0.037
J3                   JUNCTION       0.000    1.287    0  01:42          0        5.74       0.013
J4                   JUNCTION       0.740    0.740    0  01:40       2.14        2.14      -0.002
J5                   JUNCTION       0.000    0.732    0  01:40          0         2.2      -0.000
J6                   JUNCTION       0.212    0.212    0  01:40      0.498       0.498      -0.003
```

J7	JUNCTION	0.000	0.732	0	01:40	0	2.2	-3.170	
J8	JUNCTION	0.000	1.292	0	01:42	0	5.73	-0.166	
J9	JUNCTION	0.000	1.181	0	01:40	0	5.35	0.019	
DorchesterCreek	OUTFALL	0.000	0.000	0	00:00	0	0	0.000	ltr
Ex.Ditch	OUTFALL	0.329	0.329	0	01:40	0.548	0.548	0.000	
Ex.Major	OUTFALL	0.000	0.000	0	00:00	0	0	0.000	ltr
Ex.Sewer	OUTFALL	0.000	1.994	0	01:44	0	8.6	0.000	
Comm.Storage	STORAGE	0.154	0.154	0	01:40	0.237	0.237	0.000	
Ex.Storage	STORAGE	0.148	0.148	0	01:40	0.228	0.228	-0.001	
Ex.SWMF	STORAGE	1.223	1.223	0	01:40	2.11	2.11	-0.012	
MedDensStorage	STORAGE	0.160	0.160	0	01:40	0.245	0.245	0.000	
ROW1	STORAGE	0.000	0.000	0	00:00	0	0	0.000	ltr
ROW2	STORAGE	0.000	0.000	0	00:00	0	0	0.000	ltr
RY-1	STORAGE	0.072	0.072	0	01:41	0.125	0.125	0.000	
RY-2	STORAGE	0.071	0.071	0	01:41	0.115	0.115	0.000	
RY-3	STORAGE	0.044	0.044	0	01:41	0.076	0.076	0.000	
RY-4	STORAGE	0.043	0.043	0	01:41	0.0748	0.0748	0.000	
RY-5	STORAGE	0.149	0.149	0	01:41	0.235	0.235	0.000	
RY-6	STORAGE	0.060	0.060	0	01:41	0.105	0.105	0.000	
RY-7	STORAGE	0.059	0.059	0	01:49	0.227	0.227	0.000	

****
Node Surcharge Summary
****

No nodes were surcharged.

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Comm.Storage	0.031	4	0	0	0.188	22	0 03:18	0.005
Ex.Storage	0.006	1	0	75	0.115	24	0 01:55	0.027
Ex.SWMF	0.088	1	0	0	1.240	17	0 02:13	0.160
MedDensStorage	0.031	4	0	0	0.194	24	0 03:15	0.006
ROW1	0.000	0	0	0	0.000	0	0 00:00	0.000
ROW2	0.000	0	0	0	0.000	0	0 00:00	0.000
RY-1	0.001	0	0	100	0.048	4	0 02:08	0.018
RY-2	0.001	0	0	100	0.047	5	0 02:07	0.016
RY-3	0.001	0	0	100	0.028	9	0 02:06	0.011
RY-4	0.001	0	0	100	0.027	2	0 02:06	0.011
RY-5	0.004	0	0	100	0.110	9	0 02:16	0.025
RY-6	0.001	0	0	100	0.044	5	0 02:13	0.013
RY-7	0.003	0	0	100	0.084	5	0 02:45	0.020

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
DorchesterCreek	0.00	0.000	0.000	0.000
Ex.Ditch	12.56	0.021	0.329	0.548
Ex.Major	0.00	0.000	0.000	0.000
Ex.Sewer	99.95	0.036	1.994	8.601
System	28.13	0.057	1.994	9.148

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	0.729	0 01:40	2.21	0.53	0.52
C10	CONDUIT	1.169	0 01:41	1.51	0.73	0.53
C11	CONDUIT	1.290	0 01:41	1.79	0.55	0.50
C12	CONDUIT	1.287	0 01:42	1.93	0.57	0.47
C14	CONDUIT	1.994	0 01:44	1.74	1.28	0.75
C16	CONDUIT	0.919	0 01:40	1.56	0.37	0.43
C17	CONDUIT	1.989	0 01:44	1.82	1.06	0.71
C18	CONDUIT	1.994	0 01:44	2.07	2.09	0.64
C19	CONDUIT	0.767	0 01:42	2.88	0.29	0.68
C2	CONDUIT	0.985	0 01:40	1.37	0.39	0.50
C20	CONDUIT	0.760	0 01:42	1.91	0.58	0.53
C21	CONDUIT	1.657	0 00:00	3.88	0.74	0.68
C22	CONDUIT	1.849	0 00:00	2.94	1.26	0.90
C23	CONDUIT	0.080	0 00:00	0.71	0.19	1.00
C24	CONDUIT	0.000	0 00:00	0.00	0.00	0.00
C3	CONDUIT	1.292	0 01:42	2.03	0.32	0.46
C4	CONDUIT	0.726	0 01:41	1.64	0.96	0.57
C5	CONDUIT	0.732	0 01:40	2.23	0.52	0.51

C6	CONDUIT	0.732	0	01:40	1.83	0.35	0.60	
C9	CONDUIT	1.270	0	01:43	1.58	0.56	0.56	
W1	CONDUIT	0.000	0	00:00	0.00	0.00	0.00	
W9	CONDUIT	0.000	0	00:00	0.00	0.00	0.00	
OL1	ORIFICE	0.005	0	03:18			1.00	
OL2	ORIFICE	0.006	0	03:15			1.00	
OR1	ORIFICE	0.015	0	01:55			1.00	
OR2	ORIFICE	0.000	0	00:00			0.00	
OR3	ORIFICE	0.000	0	00:00			0.00	
C15	WEIR	0.000	0	00:00			0.00	
C7	WEIR	0.000	0	00:00			0.00	
W10	WEIR	0.000	0	00:00			0.00	
W11	WEIR	0.000	0	00:00			0.00	
W12	WEIR	0.000	0	00:00			0.00	
W13	WEIR	0.000	0	00:00			0.00	
W14	WEIR	0.000	0	00:00			0.00	
W15	WEIR	0.000	0	00:00			0.00	
W16	WEIR	0.000	0	00:00			0.00	
W17	WEIR	0.000	0	00:00			0.00	
W18	WEIR	0.000	0	00:00			0.00	
W2	WEIR	0.000	0	00:00			0.00	
W3	WEIR	0.000	0	00:00			0.00	
W4	WEIR	0.000	0	00:00			0.00	
W5	WEIR	0.000	0	00:00			0.00	
W6	WEIR	0.000	0	00:00			0.00	
W7	WEIR	0.000	0	00:00			0.00	
W8	WEIR	0.000	0	00:00			0.00	
C13	DUMMY	0.211	0	01:40				
C8	DUMMY	0.147	0	01:40				
Ex.SWMOutlet	DUMMY	0.160	0	02:13				

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
		Fraction of Time in Flow Class								
C1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C10	1.00	0.00	0.00	0.00	0.25	0.00	0.00	0.75	0.00	0.00
C11	1.00	0.00	0.00	0.00	0.19	0.00	0.00	0.81	0.00	0.00
C12	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C14	1.00	0.00	0.00	0.00	0.07	0.00	0.00	0.93	0.00	0.00
C16	1.00	0.00	0.00	0.00	0.25	0.00	0.00	0.74	0.23	0.00
C17	1.00	0.00	0.00	0.00	0.30	0.00	0.00	0.70	0.00	0.00
C18	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C19	1.00	0.00	0.00	0.00	0.62	0.09	0.00	0.30	0.61	0.00
C2	1.00	0.00	0.00	0.00	0.26	0.00	0.00	0.74	0.25	0.00
C20	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C21	1.00	0.00	0.00	0.00	0.22	0.07	0.00	0.71	0.27	0.00
C22	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C23	1.00	0.00	0.25	0.00	0.75	0.00	0.00	0.00	0.65	0.00
C24	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C3	1.00	0.00	0.00	0.00	0.04	0.16	0.00	0.80	0.10	0.00
C4	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C5	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C6	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.99	0.00
C9	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
W1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W9	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

****
Conduit Surcharge Summary
****

Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C14	0.01	0.01	0.01	0.15	0.01
C17	0.01	0.01	0.01	0.06	0.01
C18	0.01	0.01	0.01	0.39	0.01
C19	0.01	0.01	0.09	0.01	0.01
C22	0.01	0.01	0.01	0.01	0.01
C23	0.01	0.01	0.01	0.01	0.01

Analysis begun on: Tue Jun 16 15:43:19 2020
Analysis ended on: Tue Jun 16 15:43:36 2020
Total elapsed time: 00:00:17

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.013)
--------------------------------------------------------------

*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 04/01/2005 00:00:00
Ending Date .............. 04/04/2005 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 1
Head Tolerance ........... 0.001500 m


**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------        -------
Total Precipitation ......         3.828        42.751
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         1.648        18.400
Surface Runoff ...........         2.057        22.969
Final Storage ............         0.125         1.396
Continuity Error (%) .....        -0.033


**************************        Volume         Volume
Flow Routing Continuity        hectare-m       10^6 ltr
**************************     ---------       --------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         2.057        20.567
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         1.845        18.454
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.215         2.146
Initial Stored Volume ....         0.007         0.070
Final Stored Volume ......         0.001         0.006
Continuity Error (%) .....         0.150


*************************
Highest Continuity Errors
*************************
Node J7 (-1.52%)


***************************
Time-Step Critical Elements
***************************
Link C23 (2.77%)


********************************
Highest Flow Instability Indexes
********************************
All links are stable.


*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     0.99 sec
Maximum Time Step           :     1.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.00
Percent Not Converging      :     0.03


***************************
Subcatchment Runoff Summary
***************************

-------------------------------------------------------------------------------------------------------------------
                          Total      Total      Total      Total     Imperv      Perv     Total      Total     Peak  Runoff
                         Precip      Runon       Evap      Infil     Runoff    Runoff    Runoff     Runoff    Runoff   Coeff
Subcatchment                 mm         mm         mm         mm         mm        mm        mm   10^6 ltr      CMS
-------------------------------------------------------------------------------------------------------------------
A10                         42.75       0.00       0.00       9.34      31.99      1.03     31.99       0.43     0.29   0.748
```



```
A20                         42.75       0.00       0.00      13.20      28.16      1.33     28.16       0.45     0.30   0.659
A30                         42.75       0.00       0.00      16.91      22.72     24.49     24.49       0.21     0.13   0.573
A40                         42.75       0.00       0.00      16.91      22.72     24.49     24.49       0.25     0.16   0.573
A50                         42.75       0.00       0.00      15.41      24.37     25.99     25.99       0.23     0.15   0.608
A60                         42.75       0.00       0.00      18.23      22.70     11.79     23.14       0.83     0.30   0.541
A70                         42.75       0.00       0.00      17.65      22.70     23.73     23.73       0.47     0.15   0.555
A80                         42.75       0.00       0.00      37.92       0.00      3.56      3.56       0.08     0.01   0.083
A90.1                       42.75       0.00       0.00      13.43      26.83     14.52     27.93       0.16     0.08   0.653
A90.2                       42.75       0.00       0.00      19.14      20.65     11.93     22.26       0.07     0.03   0.521
B10                         42.75       0.00       0.00      16.91      22.72     24.49     24.49       0.15     0.10   0.573
B20                         42.75       0.00       0.00      16.91      22.72     24.49     24.49       0.15     0.09   0.573
B30                         42.75       0.00       0.00      16.91      22.72     24.49     24.49       0.26     0.16   0.573
B40                         42.75       0.00       0.00      20.40      20.64     10.67     20.98       0.89     0.31   0.491
EXT10                       42.75       0.00       0.00      18.93      22.70     11.08     22.43       4.49     1.48   0.525
EXT20                       42.75       0.00       0.00      19.10      22.70     10.91     22.26       5.74     1.86   0.521
EXT30                       42.75       0.00       0.00      12.42      27.48      2.11     28.93       0.94     0.60   0.677
EXT40                       42.75       0.00       0.00       8.66      31.42      1.71     32.67       0.42     0.28   0.764
EXT50                       42.75       0.00       0.00      16.80      22.73     24.62     24.62       0.18     0.12   0.576
EXT60                       42.75       0.00       0.00      19.16      20.65     22.25     22.25       0.11     0.04   0.520
EXT70                       42.75       0.00       0.00      16.74      22.73     24.68     24.68       0.22     0.16   0.577
EXT80                       42.75       0.00       0.00      17.77      23.60      0.91     23.60       3.84     2.37   0.552


******************
Node Depth Summary
******************

-------------------------------------------------------------------------------
                              Average  Maximum  Maximum  Time of Max   Reported
                                Depth    Depth      HGL   Occurrence  Max Depth
Node                 Type      Meters   Meters   Meters  days hr:min     Meters
-------------------------------------------------------------------------------
J1                   JUNCTION    0.05     1.03   254.09    0  01:11       1.02
J10                  JUNCTION    0.05     1.10   253.80    0  01:12       1.10
J11                  JUNCTION    0.05     1.17   253.65    0  01:14       1.17
J12                  JUNCTION    0.10     2.63   253.81    0  01:11       1.99
J13                  JUNCTION    0.03     0.99   254.24    0  01:10       0.97
J14                  JUNCTION    0.05     0.86   253.86    0  01:11       0.85
J15                  JUNCTION    0.00     0.00   254.00    0  00:00       0.00
J16                  JUNCTION    0.09     1.92   252.96    0  01:11       1.66
J17                  JUNCTION    0.10     1.48   252.38    0  01:11       1.44
J18                  JUNCTION    0.04     2.98   256.23    0  01:10       2.97
J19                  JUNCTION    0.00     0.00   256.50    0  00:00       0.00
J2                   JUNCTION    0.02     0.79   255.61    0  01:10       0.78
J20                  JUNCTION    0.03     0.88   253.48    0  01:13       0.88
J21                  JUNCTION    0.02     0.78   254.24    0  00:00       0.65
J22                  JUNCTION    0.02     1.09   254.72    0  00:00       0.76
J23                  JUNCTION    0.02     0.87   254.52    0  00:00       0.74
J3                   JUNCTION    0.04     1.25   253.53    0  01:13       1.22
J4                   JUNCTION    0.02     0.79   256.25    0  01:10       0.78
J5                   JUNCTION    0.02     1.00   255.31    0  01:10       0.90
J6                   JUNCTION    0.06     3.93   256.94    0  01:10       3.92
J7                   JUNCTION    0.13     1.18   255.15    0  01:10       1.09
J8                   JUNCTION    0.05     3.73   255.41    0  01:11       1.69
J9                   JUNCTION    0.06     1.17   253.98    0  01:11       1.17
DorchesterCreek      OUTFALL     0.00     0.00   253.90    0  00:00       0.00
Ex.Ditch             OUTFALL     0.00     0.00   255.30    0  00:00       0.00
Ex.Major             OUTFALL     0.00     0.00   255.50    0  00:00       0.00
Ex.Sewer             OUTFALL     0.05     1.01   251.89    0  01:14       1.01
Comm.Storage         STORAGE     0.08     0.43   255.04    0  03:01       0.43
Ex.Storage           STORAGE     0.06     1.46   256.28    0  01:34       1.46
Ex.SWMF              STORAGE     0.04     0.52   255.42    0  01:53       0.52
MedDensStorage       STORAGE     0.08     0.48   255.09    0  03:02       0.48
ROW1                 STORAGE     0.00     0.00   255.60    0  00:00       0.00
ROW2                 STORAGE     0.00     0.00   256.60    0  00:00       0.00
RY-1                 STORAGE     0.01     0.16   257.16    0  01:45       0.16
RY-2                 STORAGE     0.01     0.18   257.18    0  01:45       0.18
RY-3                 STORAGE     0.01     0.15     0.15    0  01:43       0.15
RY-4                 STORAGE     0.01     0.15   258.03    0  01:43       0.15
RY-5                 STORAGE     0.02     0.29   256.29    0  01:54       0.29
RY-6                 STORAGE     0.01     0.21   257.32    0  01:50       0.21
RY-7                 STORAGE     0.01     0.23   257.23    0  02:16       0.23


*******************
Node Inflow Summary
*******************

-----------------------------------------------------------------------------------------------------------
                              Maximum  Maximum                    Lateral       Total        Flow
                               Lateral    Total  Time of Max       Inflow      Inflow     Balance
                               Inflow   Inflow   Occurrence       Volume      Volume       Error
Node                 Type         CMS      CMS  days hr:min   10^6 ltr   10^6 ltr     Percent
-----------------------------------------------------------------------------------------------------------
J1                   JUNCTION   0.000    1.911    0  01:11            0       9.57      -0.130
J10                  JUNCTION   0.000    2.511    0  01:11            0       11.5       0.246
J11                  JUNCTION   0.000    2.512    0  01:12            0       11.5       0.075
J12                  JUNCTION   0.000    3.582    0  01:14            0       17.3       0.022
J13                  JUNCTION   1.859    1.859    0  01:10         5.74       5.74       0.103
J14                  JUNCTION   0.000    1.657    0  00:00            0       5.81      -0.045
J15                  JUNCTION   0.000    0.000    0  00:00            0          0       0.000 ltr
J16                  JUNCTION   0.000    3.583    0  01:14            0       17.3       0.055
J17                  JUNCTION   0.000    3.583    0  01:14            0       17.3      -0.002
J18                  JUNCTION   0.299    0.299    0  01:10        0.833      0.833      -0.002
J19                  JUNCTION   0.000    0.000    0  00:00            0          0       0.000 ltr
J2                   JUNCTION   0.000    1.481    0  01:10            0       4.71      -0.009
J20                  JUNCTION   0.030    1.515    0  01:11       0.0712       5.89       0.124
J21                  JUNCTION   0.000    1.849    0  00:00            0       4.93      -0.057
J22                  JUNCTION   0.000    1.519    0  01:10            0       4.95       0.155
J23                  JUNCTION   0.078    0.080    0  00:00        0.159      0.161       0.017
J3                   JUNCTION   0.000    2.504    0  01:11            0       11.4      -0.035
J4                   JUNCTION   1.483    1.483    0  01:10         4.49       4.49       0.120
J5                   JUNCTION   0.000    1.458    0  01:10            0       4.71      -0.086
J6                   JUNCTION   0.433    0.433    0  01:10         1.06       1.06      -0.002
```

J7	JUNCTION	0.000	1.451	0	01:11	0	4.71	-1.497	
J8	JUNCTION	0.000	2.416	0	01:11	0	11.4	-0.158	
J9	JUNCTION	0.000	2.265	0	01:10	0	10.7	0.012	
DorchesterCreek	OUTFALL	0.013	0.013	0	02:00	0.0755	0.0755	0.000	
Ex.Ditch	OUTFALL	0.636	0.636	0	01:10	1.05	1.05	0.000	
Ex.Major	OUTFALL	0.000	0.000	0	00:00	0	0	0.000	ltr
Ex.Sewer	OUTFALL	0.000	3.584	0	01:14	0	17.3	0.000	
Comm.Storage	STORAGE	0.290	0.290	0	01:10	0.429	0.429	0.000	
Ex.Storage	STORAGE	0.280	0.280	0	01:10	0.421	0.422	-0.000	
Ex.SWMF	STORAGE	2.369	2.369	0	01:10	3.84	3.84	-0.006	
MedDensStorage	STORAGE	0.301	0.301	0	01:10	0.451	0.451	0.000	
ROW1	STORAGE	0.000	0.000	0	00:00	0	0	0.000	ltr
ROW2	STORAGE	0.000	0.000	0	00:00	0	0	0.000	ltr
RY-1	STORAGE	0.159	0.159	0	01:11	0.255	0.255	0.003	
RY-2	STORAGE	0.150	0.150	0	01:11	0.229	0.229	0.003	
RY-3	STORAGE	0.096	0.096	0	01:11	0.154	0.154	0.003	
RY-4	STORAGE	0.095	0.095	0	01:11	0.152	0.152	0.003	
RY-5	STORAGE	0.317	0.317	0	01:11	0.477	0.477	0.003	
RY-6	STORAGE	0.133	0.133	0	01:11	0.213	0.213	0.003	
RY-7	STORAGE	0.154	0.154	0	01:20	0.467	0.467	0.002	

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
J12	JUNCTION	0.18	0.982	1.195
J16	JUNCTION	0.20	0.520	1.036
J17	JUNCTION	0.09	0.084	1.618
J5	JUNCTION	0.01	0.070	2.493
J7	JUNCTION	0.03	0.109	2.626
J8	JUNCTION	0.15	2.358	0.977

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Comm.Storage	0.064	8	0	0	0.368	43	0 03:01	0.008
Ex.Storage	0.010	2	0	47	0.224	46	0 01:34	0.049
Ex.SWMF	0.166	2	0	0	2.446	33	0 01:53	0.245
MedDensStorage	0.066	8	0	0	0.385	48	0 03:02	0.008
ROW1	0.000	0	0	0	0.000	0	0 00:00	0.000
ROW2	0.000	0	0	0	0.000	0	0 00:00	0.000
RY-1	0.005	0	0	100	0.126	10	0 01:45	0.030
RY-2	0.005	0	0	100	0.118	12	0 01:45	0.026
RY-3	0.003	1	0	100	0.074	25	0 01:43	0.020
RY-4	0.003	0	0	100	0.072	6	0 01:43	0.019
RY-5	0.014	1	0	100	0.275	23	0 01:54	0.042
RY-6	0.005	1	0	100	0.113	13	0 01:50	0.022
RY-7	0.012	1	0	100	0.236	15	0 02:16	0.038

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
DorchesterCreek	4.38	0.008	0.013	0.076
Ex.Ditch	12.09	0.041	0.636	1.047
Ex.Major	0.00	0.000	0.000	0.000
Ex.Sewer	99.95	0.079	3.584	17.332
System	29.10	0.128	3.584	18.454

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	1.466	0 01:10	2.54	1.06	0.86
C10	CONDUIT	2.266	0 01:11	1.80	1.42	0.82
C11	CONDUIT	2.512	0 01:12	2.16	1.07	0.82
C12	CONDUIT	2.504	0 01:11	2.38	1.11	0.88
C14	CONDUIT	3.583	0 01:14	2.50	2.31	1.00
C16	CONDUIT	1.750	0 01:09	1.76	0.70	0.73
C17	CONDUIT	3.583	0 01:14	2.50	1.91	1.00

C18	CONDUIT	3.584	0 01:14	2.70	3.76	0.87	
C19	CONDUIT	1.435	0 01:12	2.88	0.54	0.95	
C2	CONDUIT	1.892	0 01:11	1.54	0.75	0.80	
C20	CONDUIT	1.493	0 01:11	2.32	1.14	0.85	
C21	CONDUIT	1.657	0 00:00	3.88	0.74	0.75	
C22	CONDUIT	1.849	0 00:00	2.94	1.26	0.90	
C23	CONDUIT	0.080	0 00:00	0.71	0.19	1.00	
C24	CONDUIT	0.000	0 00:00	0.00	0.00	0.00	
C3	CONDUIT	2.416	0 01:11	2.25	0.60	0.96	
C4	CONDUIT	1.452	0 01:10	2.13	1.91	0.86	
C5	CONDUIT	1.458	0 01:10	2.52	1.04	0.94	
C6	CONDUIT	1.451	0 01:11	2.28	0.70	1.00	
C9	CONDUIT	2.201	0 01:14	1.64	0.97	1.00	
W1	CONDUIT	0.000	0 00:00	0.00	0.00	0.00	
W9	CONDUIT	0.000	0 00:00	0.00	0.00	0.00	
OL1	ORIFICE	0.008	0 03:01			1.00	
OL2	ORIFICE	0.008	0 03:02			1.00	
OR1	ORIFICE	0.034	0 01:34			1.00	
OR2	ORIFICE	0.000	0 00:00			0.00	
OR3	ORIFICE	0.000	0 00:00			0.00	
C15	WEIR	0.000	0 00:00			0.00	
C7	WEIR	0.000	0 00:00			0.00	
W10	WEIR	0.000	0 00:00			0.00	
W11	WEIR	0.000	0 00:00			0.00	
W12	WEIR	0.000	0 00:00			0.00	
W13	WEIR	0.000	0 00:00			0.00	
W14	WEIR	0.000	0 00:00			0.00	
W15	WEIR	0.000	0 00:00			0.00	
W16	WEIR	0.000	0 00:00			0.00	
W17	WEIR	0.000	0 00:00			0.00	
W18	WEIR	0.000	0 00:00			0.00	
W2	WEIR	0.000	0 00:00			0.00	
W3	WEIR	0.000	0 00:00			0.00	
W4	WEIR	0.000	0 00:00			0.00	
W5	WEIR	0.000	0 00:00			0.00	
W6	WEIR	0.000	0 00:00			0.00	
W7	WEIR	0.000	0 00:00			0.00	
W8	WEIR	0.000	0 00:00			0.00	
C13	DUMMY	0.431	0 01:10				
C8	DUMMY	0.296	0 01:10				
Ex.SWMOutlet	DUMMY	0.245	0 01:53				

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
		Fraction of Time in Flow Class								
C1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C10	1.00	0.00	0.00	0.00	0.27	0.00	0.00	0.73	0.00	0.00
C11	1.00	0.00	0.00	0.00	0.21	0.00	0.00	0.79	0.00	0.00
C12	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C14	1.00	0.00	0.00	0.00	0.08	0.00	0.00	0.92	0.00	0.00
C16	1.00	0.00	0.00	0.00	0.27	0.00	0.00	0.73	0.23	0.00
C17	1.00	0.00	0.00	0.00	0.39	0.00	0.00	0.61	0.00	0.00
C18	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C19	1.00	0.00	0.00	0.00	0.70	0.09	0.00	0.21	0.69	0.00
C2	1.00	0.00	0.00	0.00	0.27	0.00	0.00	0.72	0.24	0.00
C20	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C21	1.00	0.00	0.00	0.00	0.32	0.07	0.00	0.61	0.36	0.00
C22	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C23	1.00	0.00	0.25	0.00	0.75	0.00	0.00	0.00	0.66	0.00
C24	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C3	1.00	0.00	0.00	0.00	0.06	0.16	0.00	0.78	0.09	0.00
C4	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C5	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C6	1.00	0.00	0.01	0.00	0.99	0.00	0.00	0.00	0.97	0.00
C9	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.97	0.00	0.00
W1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W9	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

****
Conduit Surcharge Summary
****

Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C1	0.01	0.01	0.01	0.03	0.01
C10	0.01	0.01	0.01	0.26	0.01
C11	0.01	0.01	0.01	0.04	0.01
C12	0.01	0.01	0.01	0.04	0.01
C14	0.20	0.29	0.20	0.86	0.20
C17	0.09	0.23	0.09	0.63	0.09
C18	0.01	0.14	0.01	1.72	0.01
C19	0.01	0.01	0.69	0.01	0.01
C20	0.01	0.01	0.01	0.09	0.01
C22	0.01	0.01	0.01	0.02	0.01
C23	0.32	0.32	0.37	0.01	0.01
C3	0.01	0.01	0.15	0.01	0.01
C4	0.01	0.03	0.01	0.42	0.01
C5	0.01	0.01	0.01	0.02	0.01
C6	0.01	0.01	0.10	0.01	0.01
C9	0.16	0.16	0.18	0.01	0.01

Analysis begun on: Tue Jun 16 15:44:28 2020

```
Analysis ended on:  Tue Jun 16 15:44:41 2020
Total elapsed time: 00:00:13
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EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.013)
--------------------------------------------------------------

*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 04/01/2005 00:00:00
Ending Date .............. 04/04/2005 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 1
Head Tolerance ........... 0.001500 m

**************************        Volume         Depth
Runoff Quantity Continuity    hectare-m            mm
**************************    ---------       --------
Total Precipitation ......        3.957        44.191
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        1.692        18.892
Surface Runoff ...........        2.141        23.915
Final Storage ............        0.125         1.398
Continuity Error (%) .....       -0.032

**************************        Volume       Volume
Flow Routing Continuity       hectare-m     10^6 ltr
**************************    ---------     ---------
Dry Weather Inflow .......        0.000         0.000
Wet Weather Inflow .......        2.141        21.414
Groundwater Inflow .......        0.000         0.000
RDII Inflow ..............        0.000         0.000
External Inflow ..........        0.000         0.000
External Outflow .........        1.922        19.224
Flooding Loss ............        0.000         0.000
Evaporation Loss .........        0.000         0.000
Exfiltration Loss ........        0.223         2.231
Initial Stored Volume ....        0.007         0.070
Final Stored Volume ......        0.001         0.006
Continuity Error (%) .....        0.108

*************************
Highest Continuity Errors
*************************
Node J7 (-1.46%)

***************************
Time-Step Critical Elements
***************************
Link C23 (2.95%)

********************************
Highest Flow Instability Indexes
********************************
All links are stable.

*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     0.99 sec
Maximum Time Step           :     1.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.00
Percent Not Converging      :     0.03

***************************
Subcatchment Runoff Summary
***************************

-----------------------------------------------------------------------------------------------------------------------------
                          Total      Total      Total      Total     Imperv      Perv     Total      Total      Peak  Runoff
                         Precip      Runon       Evap      Infil     Runoff    Runoff    Runoff     Runoff    Runoff   Coeff
Subcatchment                 mm         mm         mm         mm         mm        mm        mm   10^6 ltr       CMS
-----------------------------------------------------------------------------------------------------------------------------
A10                         44.19       0.00       0.00       9.57      33.21      1.17     33.21       0.44      0.30   0.751
```

A20	44.19	0.00	0.00	13.52	29.27	1.51	29.27	0.47	0.31	0.662
A30	44.19	0.00	0.00	17.32	23.51	25.52	25.52	0.22	0.14	0.577
A40	44.19	0.00	0.00	17.32	23.51	25.52	25.52	0.27	0.16	0.577
A50	44.19	0.00	0.00	15.78	25.22	27.05	27.05	0.24	0.15	0.612
A60	44.19	0.00	0.00	18.71	23.49	12.35	24.10	0.87	0.31	0.545
A70	44.19	0.00	0.00	18.10	23.50	24.71	24.71	0.49	0.16	0.559
A80	44.19	0.00	0.00	38.87	0.00	4.06	4.06	0.09	0.01	0.092
A90.1	44.19	0.00	0.00	13.77	27.77	15.15	29.04	0.17	0.08	0.657
A90.2	44.19	0.00	0.00	19.61	21.37	12.54	23.22	0.07	0.03	0.525
B10	44.19	0.00	0.00	17.32	23.51	25.52	25.52	0.16	0.10	0.577
B20	44.19	0.00	0.00	17.32	23.51	25.52	25.52	0.16	0.10	0.577
B30	44.19	0.00	0.00	17.32	23.51	25.52	25.52	0.27	0.17	0.577
B40	44.19	0.00	0.00	20.93	21.36	11.21	21.88	0.92	0.32	0.495
EXT10	44.19	0.00	0.00	19.45	23.49	11.61	23.35	4.67	1.52	0.528
EXT20	44.19	0.00	0.00	19.63	23.49	11.42	23.17	5.98	1.91	0.524
EXT30	44.19	0.00	0.00	12.70	28.49	2.33	30.09	0.97	0.61	0.681
EXT40	44.19	0.00	0.00	8.86	32.55	1.88	33.92	0.44	0.28	0.767
EXT50	44.19	0.00	0.00	17.19	23.52	25.66	25.66	0.18	0.13	0.581
EXT60	44.19	0.00	0.00	19.64	21.37	23.21	23.21	0.11	0.05	0.525
EXT70	44.19	0.00	0.00	17.14	23.52	25.72	25.72	0.23	0.16	0.582
EXT80	44.19	0.00	0.00	18.26	24.55	1.06	24.55	3.99	2.42	0.556

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.05	1.04	254.10	0 01:11	1.04
J10	JUNCTION	0.05	1.16	253.86	0 01:13	1.14
J11	JUNCTION	0.05	1.28	253.76	0 01:13	1.25
J12	JUNCTION	0.10	2.20	253.38	0 01:10	2.05
J13	JUNCTION	0.03	1.13	254.38	0 01:10	1.13
J14	JUNCTION	0.05	0.92	253.92	0 01:14	0.91
J15	JUNCTION	0.00	0.00	254.00	0 00:00	0.00
J16	JUNCTION	0.09	1.79	252.83	0 01:10	1.69
J17	JUNCTION	0.10	1.52	252.42	0 01:11	1.47
J18	JUNCTION	0.04	3.20	256.45	0 01:10	3.14
J19	JUNCTION	0.00	0.00	256.50	0 00:00	0.00
J2	JUNCTION	0.02	0.87	255.69	0 01:10	0.86
J20	JUNCTION	0.04	1.02	253.62	0 01:14	1.02
J21	JUNCTION	0.02	0.78	254.24	0 00:00	0.65
J22	JUNCTION	0.02	1.09	254.72	0 00:00	0.75
J23	JUNCTION	0.02	0.87	254.52	0 00:00	0.73
J3	JUNCTION	0.04	1.32	253.60	0 01:13	1.31
J4	JUNCTION	0.02	0.82	256.28	0 01:10	0.81
J5	JUNCTION	0.02	1.07	255.38	0 01:10	0.94
J6	JUNCTION	0.06	4.25	257.26	0 01:10	4.15
J7	JUNCTION	0.13	1.23	255.20	0 01:10	1.14
J8	JUNCTION	0.06	4.08	255.76	0 01:10	1.75
J9	JUNCTION	0.06	1.18	253.99	0 01:11	1.18
DorchesterCreek	OUTFALL	0.00	0.00	253.90	0 00:00	0.00
Ex.Ditch	OUTFALL	0.00	0.00	255.30	0 00:00	0.00
Ex.Major	OUTFALL	0.00	0.00	255.50	0 00:00	0.00
Ex.Sewer	OUTFALL	0.05	1.02	251.90	0 01:14	1.02
Comm.Storage	STORAGE	0.08	0.45	255.06	0 03:02	0.45
Ex.Storage	STORAGE	0.07	1.50	256.32	0 01:34	1.50
Ex.SWMF	STORAGE	0.04	0.54	255.44	0 01:54	0.54
MedDensStorage	STORAGE	0.09	0.50	255.11	0 03:03	0.50
ROW1	STORAGE	0.00	0.00	255.60	0 00:00	0.00
ROW2	STORAGE	0.00	0.00	256.60	0 00:00	0.00
RY-1	STORAGE	0.01	0.17	257.17	0 01:45	0.17
RY-2	STORAGE	0.01	0.18	257.18	0 01:45	0.18
RY-3	STORAGE	0.01	0.15	0.15	0 01:44	0.15
RY-4	STORAGE	0.01	0.15	258.03	0 01:44	0.15
RY-5	STORAGE	0.02	0.29	256.29	0 01:55	0.29
RY-6	STORAGE	0.01	0.22	257.33	0 01:51	0.22
RY-7	STORAGE	0.02	0.23	257.23	0 02:17	0.23

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
J1	JUNCTION	0.000	1.924	0 01:11	0	9.96	-0.115
J10	JUNCTION	0.000	2.552	0 01:10	0	12	0.223
J11	JUNCTION	0.000	2.550	0 01:11	0	11.9	0.063
J12	JUNCTION	0.000	3.651	0 01:14	0	18.1	0.019
J13	JUNCTION	1.910	1.910	0 01:10	5.98	5.98	0.090
J14	JUNCTION	0.000	1.657	0 00:00	0	6.05	-0.034
J15	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
J16	JUNCTION	0.000	3.651	0 01:14	0	18.1	0.052
J17	JUNCTION	0.000	3.651	0 01:14	0	18	-0.005
J18	JUNCTION	0.307	0.307	0 01:10	0.868	0.868	-0.002
J19	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
J2	JUNCTION	0.000	1.515	0 01:10	0	4.9	-0.027
J20	JUNCTION	0.031	1.541	0 01:11	0.0743	6.13	0.076
J21	JUNCTION	0.000	1.849	0 00:00	0	5.14	-0.054
J22	JUNCTION	0.000	1.541	0 01:10	0	5.15	0.149
J23	JUNCTION	0.081	0.081	0 01:10	0.166	0.167	0.017
J3	JUNCTION	0.000	2.528	0 01:11	0	11.9	-0.058
J4	JUNCTION	1.524	1.524	0 01:10	4.67	4.67	0.120
J5	JUNCTION	0.000	1.476	0 01:10	0	4.91	-0.073
J6	JUNCTION	0.446	0.446	0 01:10	1.11	1.11	-0.002

J7	JUNCTION	0.000	1.462	0 01:10	0	4.91	-1.442		
J8	JUNCTION	0.000	2.444	0 01:10	0	11.9	-0.140		
J9	JUNCTION	0.000	2.304	0 01:10	0	11.1	0.012		
DorchesterCreek	OUTFALL	0.015	0.015	0 02:00	0.086	0.086	0.000		
Ex.Ditch	OUTFALL	0.650	0.650	0 01:10	1.09	1.09	0.000		
Ex.Major	OUTFALL	0.000	0.000	0 00:00	0	0	0.000	ltr	
Ex.Sewer	OUTFALL	0.000	3.655	0 01:14	0	18	0.000		
Comm.Storage	STORAGE	0.296	0.296	0 01:10	0.445	0.445	0.000		
Ex.Storage	STORAGE	0.285	0.285	0 01:10	0.438	0.438	0.000		
Ex.SWMF	STORAGE	2.419	2.419	0 01:10	3.99	3.99	-0.006		
MedDensStorage	STORAGE	0.306	0.306	0 01:10	0.468	0.468	0.000		
ROW1	STORAGE	0.000	0.000	0 00:00	0	0	0.000	ltr	
ROW2	STORAGE	0.000	0.000	0 00:00	0	0	0.000	ltr	
RY-1	STORAGE	0.165	0.165	0 01:11	0.265	0.265	0.003		
RY-2	STORAGE	0.155	0.155	0 01:11	0.238	0.238	0.003		
RY-3	STORAGE	0.100	0.100	0 01:11	0.161	0.161	0.003		
RY-4	STORAGE	0.098	0.098	0 01:11	0.158	0.158	0.003		
RY-5	STORAGE	0.327	0.327	0 01:11	0.497	0.497	0.003		
RY-6	STORAGE	0.138	0.138	0 01:11	0.222	0.222	0.004		
RY-7	STORAGE	0.159	0.159	0 01:18	0.487	0.487	0.003		

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
J12	JUNCTION	0.21	0.555	1.622
J16	JUNCTION	0.22	0.388	1.168
J17	JUNCTION	0.11	0.118	1.584
J5	JUNCTION	0.01	0.148	2.415
J7	JUNCTION	0.05	0.157	2.578
J8	JUNCTION	0.18	2.707	0.628

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Comm.Storage	0.068	8	0	0	0.383	45	0 03:02	0.008
Ex.Storage	0.011	2	0	46	0.230	48	0 01:34	0.050
Ex.SWMF	0.174	2	0	0	2.518	34	0 01:54	0.249
MedDensStorage	0.069	9	0	0	0.401	50	0 03:03	0.009
ROW1	0.000	0	0	0	0.000	0	0 00:00	0.000
ROW2	0.000	0	0	0	0.000	0	0 00:00	0.000
RY-1	0.005	0	0	100	0.131	10	0 01:45	0.031
RY-2	0.005	1	0	100	0.122	13	0 01:45	0.027
RY-3	0.003	1	0	100	0.077	26	0 01:44	0.020
RY-4	0.003	0	0	100	0.075	6	0 01:44	0.020
RY-5	0.015	1	0	100	0.286	24	0 01:55	0.043
RY-6	0.005	1	0	100	0.118	13	0 01:51	0.022
RY-7	0.013	1	0	100	0.246	15	0 02:17	0.039

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
DorchesterCreek	4.39	0.009	0.015	0.086
Ex.Ditch	12.14	0.042	0.650	1.089
Ex.Major	0.00	0.000	0.000	0.000
Ex.Sewer	99.95	0.083	3.655	18.049
System	29.12	0.135	3.655	19.224

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	1.501	0 01:10	2.54	1.08	0.91
C10	CONDUIT	2.302	0 01:12	1.81	1.44	0.85
C11	CONDUIT	2.550	0 01:11	2.16	1.08	0.89
C12	CONDUIT	2.528	0 01:11	2.38	1.12	0.96
C14	CONDUIT	3.651	0 01:14	2.55	2.35	1.00
C16	CONDUIT	1.750	0 01:08	1.76	0.70	0.79
C17	CONDUIT	3.651	0 01:14	2.55	1.95	1.00

C18	CONDUIT	3.655	0	01:14	2.74	3.83	0.88
C19	CONDUIT	1.450	0	01:12	2.88	0.54	1.00
C2	CONDUIT	1.932	0	01:12	1.55	0.76	0.81
C20	CONDUIT	1.518	0	01:11	2.32	1.16	0.97
C21	CONDUIT	1.657	0	00:00	3.88	0.74	0.77
C22	CONDUIT	1.849	0	00:00	2.94	1.26	0.90
C23	CONDUIT	0.080	0	00:00	0.71	0.19	1.00
C24	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
C3	CONDUIT	2.444	0	01:10	2.26	0.60	0.99
C4	CONDUIT	1.466	0	01:10	2.15	1.93	0.86
C5	CONDUIT	1.476	0	01:10	2.52	1.06	0.98
C6	CONDUIT	1.462	0	01:10	2.30	0.71	1.00
C9	CONDUIT	2.261	0	01:13	1.65	0.99	1.00
W1	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
W9	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
OL1	ORIFICE	0.008	0	03:02			1.00
OL2	ORIFICE	0.009	0	03:03			1.00
OR1	ORIFICE	0.035	0	01:34			1.00
OR2	ORIFICE	0.000	0	00:00			0.00
OR3	ORIFICE	0.000	0	00:00			0.00
C15	WEIR	0.000	0	00:00			0.00
C7	WEIR	0.000	0	00:00			0.00
W10	WEIR	0.000	0	00:00			0.00
W11	WEIR	0.000	0	00:00			0.00
W12	WEIR	0.000	0	00:00			0.00
W13	WEIR	0.000	0	00:00			0.00
W14	WEIR	0.000	0	00:00			0.00
W15	WEIR	0.000	0	00:00			0.00
W16	WEIR	0.000	0	00:00			0.00
W17	WEIR	0.000	0	00:00			0.00
W18	WEIR	0.000	0	00:00			0.00
W2	WEIR	0.000	0	00:00			0.00
W3	WEIR	0.000	0	00:00			0.00
W4	WEIR	0.000	0	00:00			0.00
W5	WEIR	0.000	0	00:00			0.00
W6	WEIR	0.000	0	00:00			0.00
W7	WEIR	0.000	0	00:00			0.00
W8	WEIR	0.000	0	00:00			0.00
C13	DUMMY	0.433	0	01:09			
C8	DUMMY	0.298	0	01:09			
Ex.SWMOutlet	DUMMY	0.249	0	01:54			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
		---------- Fraction of Time in Flow Class ----------								
C1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C10	1.00	0.00	0.00	0.00	0.27	0.00	0.00	0.73	0.00	0.00
C11	1.00	0.00	0.00	0.00	0.21	0.00	0.00	0.79	0.00	0.00
C12	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C14	1.00	0.00	0.00	0.00	0.09	0.00	0.00	0.91	0.00	0.00
C16	1.00	0.00	0.00	0.00	0.28	0.00	0.00	0.72	0.23	0.00
C17	1.00	0.00	0.00	0.00	0.40	0.00	0.00	0.60	0.00	0.00
C18	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C19	1.00	0.00	0.00	0.00	0.71	0.09	0.00	0.20	0.70	0.00
C2	1.00	0.00	0.00	0.00	0.28	0.00	0.00	0.72	0.24	0.00
C20	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C21	1.00	0.00	0.00	0.00	0.33	0.07	0.00	0.60	0.37	0.00
C22	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C23	1.00	0.00	0.25	0.00	0.75	0.00	0.00	0.00	0.65	0.00
C24	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C3	1.00	0.00	0.00	0.00	0.06	0.16	0.00	0.78	0.09	0.00
C4	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C5	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C6	1.00	0.00	0.01	0.00	0.99	0.00	0.00	0.00	0.97	0.00
C9	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.97	0.00	0.00
W1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W9	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

****
Conduit Surcharge Summary
****

Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C1	0.01	0.01	0.01	0.04	0.01
C10	0.01	0.01	0.01	0.28	0.01
C11	0.01	0.01	0.01	0.06	0.01
C12	0.01	0.01	0.01	0.05	0.01
C14	0.22	0.31	0.22	0.92	0.22
C17	0.11	0.26	0.11	0.67	0.11
C18	0.01	0.17	0.01	1.84	0.01
C19	0.02	0.02	0.74	0.01	0.01
C20	0.01	0.01	0.01	0.11	0.01
C22	0.01	0.01	0.01	0.05	0.01
C23	0.34	0.34	0.40	0.01	0.01
C3	0.01	0.01	0.18	0.01	0.01
C4	0.01	0.05	0.01	0.46	0.01
C5	0.01	0.01	0.01	0.05	0.01
C6	0.02	0.02	0.11	0.01	0.01
C9	0.20	0.20	0.21	0.01	0.02

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.013)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Surcharge Method ..... EXTRAN
Starting Date 04/01/2005 00:00:00
Ending Date 04/04/2005 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:01:00
Wet Time Step 00:01:00
Dry Time Step 00:01:00
Routing Time Step ..... 1.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Number of Threads 1
Head Tolerance ..... 0.001500 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	4.661	52.050
Evaporation Loss	0.000	0.000
Infiltration Loss	1.878	20.971
Surface Runoff	2.659	29.696
Final Storage	0.125	1.400
Continuity Error (%)	-0.033	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	2.659	26.591
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	2.398	23.978
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.266	2.658
Initial Stored Volume	0.007	0.070
Final Stored Volume	0.001	0.007
Continuity Error (%)	0.065	

****
Highest Continuity Errors
****
Node J18 (-1.25%)
Node J7 (-1.18%)

****
Time-Step Critical Elements
****
Link C23 (2.84%)

****
Highest Flow Instability Indexes
****
All links are stable.

****
Routing Time Step Summary
****
Minimum Time Step : 0.16 sec
Average Time Step : 0.99 sec
Maximum Time Step : 1.00 sec
Percent in Steady State : 0.00
Average Iterations per Step : 2.01
Percent Not Converging : 0.09

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff

A10	52.05	0.00	0.00	10.67	39.97	2.03	39.97	0.54	0.35	0.768
A20	52.05	0.00	0.00	15.08	35.58	2.70	35.58	0.57	0.36	0.684
A30	52.05	0.00	0.00	19.28	27.84	31.44	31.44	0.27	0.17	0.604
A40	52.05	0.00	0.00	19.28	27.84	31.44	31.44	0.33	0.21	0.604
A50	52.05	0.00	0.00	17.56	29.87	33.15	33.15	0.29	0.19	0.637
A60	52.05	0.00	0.00	20.70	27.82	16.05	29.96	1.08	0.38	0.576
A70	52.05	0.00	0.00	20.07	27.82	30.61	30.61	0.60	0.21	0.588
A80	52.05	0.00	0.00	43.38	0.00	7.41	7.41	0.16	0.03	0.142
A90.1	52.05	0.00	0.00	15.29	32.88	18.93	35.38	0.20	0.10	0.680
A90.2	52.05	0.00	0.00	21.81	25.30	16.25	28.90	0.09	0.04	0.555
B10	52.05	0.00	0.00	19.28	27.84	31.44	31.44	0.20	0.12	0.604
B20	52.05	0.00	0.00	19.28	27.84	31.44	31.44	0.19	0.12	0.604
B30	52.05	0.00	0.00	19.28	27.84	31.44	31.44	0.33	0.21	0.604
B40	52.05	0.00	0.00	23.18	25.29	14.86	27.50	1.16	0.39	0.528
EXT10	52.05	0.00	0.00	21.48	27.81	15.27	29.17	5.84	1.87	0.560
EXT20	52.05	0.00	0.00	21.68	27.81	15.07	28.98	7.48	2.34	0.557
EXT30	52.05	0.00	0.00	13.99	34.05	3.78	36.66	1.19	0.72	0.704
EXT40	52.05	0.00	0.00	9.77	38.73	2.94	40.87	0.53	0.34	0.785
EXT50	52.05	0.00	0.00	19.15	27.85	31.58	31.58	0.23	0.15	0.607
EXT60	52.05	0.00	0.00	21.81	25.30	28.89	28.89	0.14	0.06	0.555
EXT70	52.05	0.00	0.00	19.08	27.85	31.64	31.64	0.28	0.20	0.608
EXT80	52.05	0.00	0.00	20.57	30.10	2.28	30.10	4.89	2.88	0.578

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.05	1.96	255.02	0 01:14	1.95
J10	JUNCTION	0.06	2.26	254.96	0 01:11	1.97
J11	JUNCTION	0.06	2.65	255.13	0 01:11	1.95
J12	JUNCTION	0.12	3.55	254.73	0 01:09	2.48
J13	JUNCTION	0.04	3.47	256.72	0 01:10	3.45
J14	JUNCTION	0.06	2.51	255.51	0 01:11	2.27
J15	JUNCTION	0.00	0.00	254.00	0 00:00	0.00
J16	JUNCTION	0.10	2.12	253.16	0 01:09	1.97
J17	JUNCTION	0.11	1.64	252.54	0 01:09	1.63
J18	JUNCTION	0.05	3.76	257.01	0 01:11	3.76
J19	JUNCTION	0.00	0.00	256.50	0 00:00	0.00
J2	JUNCTION	0.02	1.47	256.29	0 01:11	1.44
J20	JUNCTION	0.04	2.69	255.29	0 01:10	1.78
J21	JUNCTION	0.02	2.45	255.91	0 01:11	2.29
J22	JUNCTION	0.03	2.54	256.17	0 01:11	2.38
J23	JUNCTION	0.03	3.77	257.42	0 01:12	3.76
J3	JUNCTION	0.05	2.69	254.97	0 01:10	1.90
J4	JUNCTION	0.02	1.79	257.25	0 01:10	1.74
J5	JUNCTION	0.02	2.02	256.33	0 01:11	1.84
J6	JUNCTION	0.08	4.55	257.56	0 01:10	4.55
J7	JUNCTION	0.14	2.34	256.31	0 01:11	2.19
J8	JUNCTION	0.07	4.71	256.39	0 01:09	2.26
J9	JUNCTION	0.07	2.06	254.87	0 01:14	2.06
DorchesterCreek	OUTFALL	0.00	0.00	253.90	0 00:00	0.00
Ex.Ditch	OUTFALL	0.00	0.00	255.30	0 00:00	0.00
Ex.Major	OUTFALL	0.00	0.00	255.50	0 00:00	0.00
Ex.Sewer	OUTFALL	0.06	1.09	251.96	0 01:14	1.09
Comm.Storage	STORAGE	0.10	0.55	255.16	0 03:02	0.55
Ex.Storage	STORAGE	0.09	1.95	256.77	0 01:35	1.95
Ex.SWMF	STORAGE	0.05	0.66	255.56	0 02:00	0.66
MedDensStorage	STORAGE	0.11	0.62	255.23	0 03:03	0.62
ROW1	STORAGE	0.00	0.02	255.62	0 01:20	0.02
ROW2	STORAGE	0.00	0.04	256.64	0 01:12	0.04
RY-1	STORAGE	0.01	0.19	257.19	0 01:46	0.19
RY-2	STORAGE	0.01	0.21	257.21	0 01:46	0.21
RY-3	STORAGE	0.01	0.17	0.17	0 01:44	0.17
RY-4	STORAGE	0.01	0.17	258.05	0 01:44	0.17
RY-5	STORAGE	0.02	0.32	256.32	0 01:39	0.32
RY-6	STORAGE	0.02	0.25	257.36	0 01:52	0.25
RY-7	STORAGE	0.02	0.27	257.27	0 02:16	0.27

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
J1	JUNCTION	0.000	1.984	0 01:18	0	12.4	-0.110
J10	JUNCTION	0.000	2.646	0 01:10	0	14.9	0.152
J11	JUNCTION	0.000	2.622	0 01:15	0	14.9	0.042
J12	JUNCTION	0.000	4.193	0 01:14	0	22.5	0.023
J13	JUNCTION	2.339	2.339	0 01:10	7.48	7.48	0.289
J14	JUNCTION	0.000	1.734	0 01:10	0	7.52	-0.012
J15	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
J16	JUNCTION	0.000	4.194	0 01:14	0	22.5	0.038
J17	JUNCTION	0.000	4.194	0 01:14	0	22.5	-0.007
J18	JUNCTION	0.378	0.378	0 01:10	1.08	1.08	-1.232
J19	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
J2	JUNCTION	0.000	1.797	0 01:10	0	6.14	-0.057
J20	JUNCTION	0.040	1.768	0 01:11	0.0925	7.61	0.010
J21	JUNCTION	0.000	1.849	0 00:00	0	6.41	-0.071
J22	JUNCTION	0.000	1.851	0 01:10	0	6.42	0.120
J23	JUNCTION	0.102	0.102	0 01:10	0.202	0.203	0.013
J3	JUNCTION	0.000	2.622	0 01:15	0	14.9	-0.018
J4	JUNCTION	1.866	1.866	0 01:10	5.84	5.84	0.132
J5	JUNCTION	0.000	1.763	0 01:10	0	6.14	-0.067

J6	JUNCTION	0.548	0.548	0 01:10	1.39	1.39	-0.001		
J7	JUNCTION	0.000	1.761	0 01:10	0	6.15	-1.166		
J8	JUNCTION	0.000	2.622	0 01:15	0	14.9	-0.103		
J9	JUNCTION	0.000	2.371	0 01:11	0	13.8	-0.001		
DorchesterCreek	OUTFALL	0.030	0.030	0 01:40	0.157	0.157	0.000		
Ex.Ditch	OUTFALL	0.776	0.776	0 01:10	1.33	1.33	0.000		
Ex.Major	OUTFALL	0.000	0.000	0 00:00	0	0	0.000	ltr	
Ex.Sewer	OUTFALL	0.000	4.194	0 01:14	0	22.5	0.000		
Comm.Storage	STORAGE	0.347	0.347	0 01:10	0.536	0.536	0.000		
Ex.Storage	STORAGE	0.335	0.349	0 01:10	0.527	0.531	-0.000		
Ex.SWMF	STORAGE	2.881	3.411	0 01:10	4.89	4.95	-0.003		
MedDensStorage	STORAGE	0.359	0.359	0 01:10	0.569	0.569	0.000		
ROW1	STORAGE	0.000	0.016	0 01:11	0	0.0079	-0.019		
ROW2	STORAGE	0.000	0.115	0 01:10	0	0.0212	0.058		
RY-1	STORAGE	0.206	0.206	0 01:11	0.327	0.327	0.010		
RY-2	STORAGE	0.191	0.191	0 01:11	0.292	0.292	0.010		
RY-3	STORAGE	0.125	0.125	0 01:11	0.198	0.198	0.010		
RY-4	STORAGE	0.123	0.123	0 01:11	0.195	0.195	0.010		
RY-5	STORAGE	0.403	0.403	0 01:11	0.612	0.612	0.009		
RY-6	STORAGE	0.173	0.173	0 01:11	0.273	0.273	0.010		
RY-7	STORAGE	0.210	0.210	0 01:15	0.603	0.603	0.007		

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
J10	JUNCTION	0.19	0.885	1.315
J11	JUNCTION	0.21	1.276	1.239
J12	JUNCTION	0.44	1.909	0.268
J14	JUNCTION	0.22	1.505	1.293
J16	JUNCTION	0.45	0.713	0.843
J17	JUNCTION	0.34	0.240	1.462
J20	JUNCTION	0.22	1.667	1.215
J21	JUNCTION	0.16	1.427	1.623
J22	JUNCTION	0.06	1.225	1.529
J3	JUNCTION	0.22	1.324	1.236
J5	JUNCTION	0.17	1.094	1.469
J7	JUNCTION	0.21	1.266	1.469
J8	JUNCTION	0.41	3.335	0.000
J9	JUNCTION	0.20	0.689	1.556

****
Node Flooding Summary
****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate CMS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
J8	0.01	0.351	0 01:09	0.000	0.000

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Comm.Storage	0.086	10	0	0	0.467	55	0 03:02	0.009
Ex.Storage	0.013	3	0	42	0.297	62	0 01:35	0.058
Ex.SWMF	0.225	3	0	0	3.162	42	0 02:00	0.281
MedDensStorage	0.090	11	0	0	0.494	62	0 03:03	0.010
ROW1	0.000	0	0	0	0.007	1	0 01:20	0.001
ROW2	0.001	0	0	0	0.021	4	0 01:12	0.005
RY-1	0.007	1	0	100	0.171	14	0 01:46	0.035
RY-2	0.007	1	0	100	0.158	16	0 01:46	0.030
RY-3	0.004	1	0	100	0.101	34	0 01:44	0.023
RY-4	0.004	0	0	100	0.099	8	0 01:44	0.022
RY-5	0.018	2	0	90	0.339	28	0 01:39	0.076
RY-6	0.007	1	0	100	0.153	17	0 01:52	0.026
RY-7	0.018	1	0	100	0.324	20	0 02:16	0.046

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
DorchesterCreek	4.74	0.017	0.030	0.157
Ex.Ditch	12.27	0.048	0.776	1.329
Ex.Major	0.00	0.000	0.000	0.000
Ex.Sewer	99.95	0.101	4.194	22.491
System	29.24	0.166	4.194	23.978

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days	hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	1.797	0	01:10	2.82	1.30	1.00
C10	CONDUIT	2.345	0	01:10	1.80	1.46	1.00
C11	CONDUIT	2.622	0	01:15	2.17	1.11	1.00
C12	CONDUIT	2.622	0	01:15	2.40	1.16	1.00
C14	CONDUIT	4.194	0	01:14	2.93	2.70	1.00
C16	CONDUIT	1.750	0	01:06	1.81	0.70	1.00
C17	CONDUIT	4.194	0	01:14	2.93	2.24	1.00
C18	CONDUIT	4.194	0	01:14	3.08	4.40	0.90
C19	CONDUIT	1.770	0	01:11	2.88	0.66	1.00
C2	CONDUIT	1.989	0	01:18	1.56	0.78	1.00
C20	CONDUIT	1.736	0	01:11	2.34	1.33	1.00
C21	CONDUIT	1.734	0	01:11	3.88	0.77	1.00
C22	CONDUIT	1.849	0	00:00	2.94	1.26	1.00
C23	CONDUIT	0.080	0	00:00	0.71	0.19	1.00
C24	CONDUIT	0.000	0	00:00	0.00	0.00	0.02
C3	CONDUIT	2.622	0	01:15	2.32	0.65	1.00
C4	CONDUIT	1.771	0	01:10	2.47	2.34	1.00
C5	CONDUIT	1.763	0	01:10	2.77	1.26	1.00
C6	CONDUIT	1.761	0	01:10	2.77	0.85	1.00
C9	CONDUIT	2.622	0	01:15	1.83	1.15	1.00
W1	CONDUIT	0.000	0	00:00	0.00	0.00	0.00
W9	CONDUIT	0.000	0	00:00	0.00	0.00	0.02
OL1	ORIFICE	0.010	0	01:11			1.00
OL2	ORIFICE	0.010	0	01:11			1.00
OR1	ORIFICE	0.042	0	01:35			1.00
OR2	ORIFICE	0.001	0	01:20			0.05
OR3	ORIFICE	0.005	0	01:12			0.15
C15	WEIR	0.000	0	00:00			0.00
C7	WEIR	0.000	0	00:00			0.00
W10	WEIR	0.000	0	00:00			0.00
W11	WEIR	0.567	0	01:10			0.26
W12	WEIR	0.000	0	00:00			0.00
W13	WEIR	0.115	0	01:10			0.18
W14	WEIR	0.000	0	00:00			0.00
W15	WEIR	0.000	0	00:00			0.00
W16	WEIR	0.000	0	00:00			0.00
W17	WEIR	0.000	0	00:00			0.00
W18	WEIR	0.000	0	00:00			0.00
W2	WEIR	0.000	0	00:00			0.00
W3	WEIR	0.032	0	01:39			0.06
W4	WEIR	0.000	0	00:00			0.00
W5	WEIR	0.016	0	01:11			0.04
W6	WEIR	0.000	0	00:00			0.00
W7	WEIR	0.000	0	00:00			0.00
W8	WEIR	0.000	0	00:00			0.00
C13	DUMMY	0.433	0	01:06			
C8	DUMMY	0.298	0	01:06			
Ex.SWMOutlet	DUMMY	0.281	0	02:00			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
		---------- Fraction of Time in Flow Class ----------								
C1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C10	1.00	0.00	0.00	0.00	0.29	0.00	0.00	0.71	0.00	0.00
C11	1.00	0.00	0.00	0.00	0.22	0.00	0.00	0.78	0.00	0.00
C12	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
C14	1.00	0.00	0.00	0.00	0.10	0.00	0.00	0.90	0.00	0.00
C16	1.00	0.00	0.00	0.00	0.29	0.00	0.00	0.71	0.24	0.00
C17	1.00	0.00	0.00	0.00	0.44	0.00	0.00	0.56	0.00	0.00
C18	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C19	1.00	0.00	0.00	0.00	0.75	0.09	0.00	0.16	0.73	0.00
C2	1.00	0.00	0.00	0.00	0.29	0.00	0.00	0.71	0.25	0.00
C20	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C21	1.00	0.00	0.00	0.00	0.37	0.07	0.00	0.56	0.40	0.00
C22	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C23	1.00	0.00	0.25	0.00	0.75	0.00	0.00	0.00	0.64	0.00
C24	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C3	1.00	0.00	0.00	0.00	0.07	0.17	0.00	0.77	0.10	0.00
C4	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C5	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C6	1.00	0.00	0.01	0.00	0.99	0.00	0.00	0.00	0.97	0.00
C9	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.96	0.00	0.00
W1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W9	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

****
Conduit Surcharge Summary
****

Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C1	0.14	0.14	0.15	0.14	0.10
C10	0.19	0.21	0.19	0.53	0.19
C11	0.20	0.20	0.21	0.22	0.16

C12	0.22	0.23	0.22	0.31	0.20
C14	0.45	0.56	0.45	1.26	0.45
C16	0.15	0.22	0.17	0.01	0.10
C17	0.34	0.49	0.34	1.00	0.34
C18	0.01	0.40	0.01	2.08	0.01
C19	0.24	0.24	1.08	0.01	0.01
C2	0.17	0.17	0.20	0.01	0.01
C20	0.22	0.23	0.22	0.28	0.22
C21	0.17	0.17	0.22	0.01	0.01
C22	0.16	0.17	0.16	0.19	0.13
C23	0.59	0.59	0.66	0.01	0.19
C3	0.24	0.24	0.41	0.01	0.01
C4	0.06	0.21	0.06	0.71	0.06
C5	0.15	0.16	0.17	0.16	0.13
C6	0.19	0.19	0.28	0.01	0.01
C9	0.43	0.43	0.44	0.29	0.29

Analysis begun on: Tue Jun 16 15:47:12 2020
Analysis ended on: Tue Jun 16 15:47:26 2020
Total elapsed time: 00:00:14

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.013)
--------------------------------------------------------------

*******************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*******************************************************

****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 04/01/2005 00:00:00
Ending Date .............. 04/04/2005 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 1
Head Tolerance ........... 0.001500 m


**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         5.505        61.486
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         2.080        23.229
Surface Runoff ...........         3.302        36.881
Final Storage ............         0.125         1.398
Continuity Error (%) .....        -0.035


**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------      ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         3.302        33.024
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         2.992        29.919
Flooding Loss ............         0.000         0.001
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.316         3.160
Initial Stored Volume ....         0.007         0.070
Final Stored Volume ......         0.001         0.007
Continuity Error (%) .....         0.020


*************************
Highest Continuity Errors
*************************
Node J18 (-1.63%)


***************************
Time-Step Critical Elements
***************************
Link C23 (2.70%)


********************************
Highest Flow Instability Indexes
********************************
All links are stable.


*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     0.39 sec
Average Time Step           :     0.99 sec
Maximum Time Step           :     1.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.01
Percent Not Converging      :     0.08


**************************
Subcatchment Runoff Summary
**************************

-------------------------------------------------------------------------------------------------------------------
                          Total      Total      Total      Total     Imperv      Perv     Total      Total     Peak  Runoff
                         Precip      Runon       Evap      Infil    Runoff    Runoff    Runoff     Runoff    Runoff   Coeff
Subcatchment                 mm         mm         mm         mm         mm        mm        mm  10^6 ltr       CMS
-------------------------------------------------------------------------------------------------------------------
A10                         61.49       0.00       0.00      11.86      48.21      3.19     48.21       0.65     0.41   0.784
```



```
A20                         61.49       0.00       0.00      16.77      43.33      4.31     43.33       0.69     0.43   0.705
A30                         61.49       0.00       0.00      21.42      33.04     38.74     38.74       0.34     0.22   0.630
A40                         61.49       0.00       0.00      21.42      33.04     38.74     38.74       0.40     0.26   0.630
A50                         61.49       0.00       0.00      19.50      35.44     40.65     40.65       0.36     0.24   0.661
A60                         61.49       0.00       0.00      22.90      33.01     20.71     37.21       1.34     0.47   0.605
A70                         61.49       0.00       0.00      22.23      33.02     37.89     37.89       0.75     0.28   0.616
A80                         61.49       0.00       0.00      48.27       0.00     11.97     11.97       0.25     0.06   0.195
A90.1                       61.49       0.00       0.00      16.97      39.02     23.63     43.15       0.25     0.13   0.702
A90.2                       61.49       0.00       0.00      24.19      30.02     20.93     35.94       0.12     0.05   0.585
B10                         61.49       0.00       0.00      21.42      33.04     38.74     38.74       0.24     0.16   0.630
B20                         61.49       0.00       0.00      21.42      33.04     38.74     38.74       0.24     0.15   0.630
B30                         61.49       0.00       0.00      21.42      33.04     38.74     38.74       0.41     0.26   0.630
B40                         61.49       0.00       0.00      25.64      30.01     19.48     34.49       1.46     0.49   0.561
EXT10                       61.49       0.00       0.00      23.71      33.01     19.88     36.39       7.28     2.32   0.592
EXT20                       61.49       0.00       0.00      23.91      33.00     19.68     36.18       9.34     2.91   0.588
EXT30                       61.49       0.00       0.00      15.37      40.78      5.71     44.72       1.45     0.86   0.727
EXT40                       61.49       0.00       0.00      10.73      46.19      4.33     49.35       0.64     0.40   0.803
EXT50                       61.49       0.00       0.00      21.29      33.05     38.89     38.89       0.28     0.19   0.632
EXT60                       61.49       0.00       0.00      24.21      30.03     35.95     35.95       0.18     0.08   0.585
EXT70                       61.49       0.00       0.00      21.22      33.05     38.96     38.96       0.35     0.25   0.634
EXT80                       61.49       0.00       0.00      23.02      37.09      4.08     37.09       6.03     3.46   0.603


******************
Node Depth Summary
******************

-----------------------------------------------------------------------------------------
                                Average  Maximum  Maximum  Time of Max    Reported
                                  Depth    Depth      HGL   Occurrence   Max Depth
Node                 Type        Meters   Meters   Meters  days hr:min      Meters
-----------------------------------------------------------------------------------------
J1                   JUNCTION      0.07     2.17   255.23    0  01:22        2.17
J10                  JUNCTION      0.07     2.46   255.16    0  01:10        2.20
J11                  JUNCTION      0.07     3.53   256.01    0  01:09        2.18
J12                  JUNCTION      0.13     3.82   255.00    0  01:07        2.75
J13                  JUNCTION      0.05     3.51   256.76    0  01:10        3.51
J14                  JUNCTION      0.07     2.84   255.84    0  01:08        2.42
J15                  JUNCTION      0.00     0.00   254.00    0  00:00        0.00
J16                  JUNCTION      0.12     2.52   253.56    0  01:08        2.14
J17                  JUNCTION      0.13     1.85   252.75    0  01:09        1.73
J18                  JUNCTION      0.06     3.78   257.03    0  01:20        3.78
J19                  JUNCTION      0.00     0.00   256.50    0  00:00        0.00
J2                   JUNCTION      0.03     2.81   257.63    0  01:11        2.81
J20                  JUNCTION      0.05     3.91   256.51    0  01:08        2.07
J21                  JUNCTION      0.03     2.86   256.32    0  01:08        2.28
J22                  JUNCTION      0.03     2.97   256.60    0  01:08        2.33
J23                  JUNCTION      0.04     4.06   257.71    0  01:11        4.06
J3                   JUNCTION      0.06     3.73   256.01    0  01:09        2.15
J4                   JUNCTION      0.03     3.46   258.92    0  01:11        3.46
J5                   JUNCTION      0.03     2.47   256.78    0  01:12        2.47
J6                   JUNCTION      0.09     4.61   257.62    0  01:09        4.60
J7                   JUNCTION      0.14     2.67   256.64    0  01:08        2.59
J8                   JUNCTION      0.08     4.71   256.39    0  01:08        2.52
J9                   JUNCTION      0.08     3.06   255.87    0  01:09        2.28
DorchesterCreek      OUTFALL       0.00     0.00   253.90    0  00:00        0.00
Ex.Ditch             OUTFALL       0.00     0.00   255.30    0  00:00        0.00
Ex.Major             OUTFALL       0.00     0.00   255.50    0  00:00        0.00
Ex.Sewer             OUTFALL       0.07     1.12   252.00    0  01:13        1.12
Comm.Storage         STORAGE       0.13     0.68   255.29    0  03:02        0.68
Ex.Storage           STORAGE       0.11     2.61   257.43    0  01:31        2.61
Ex.SWMF              STORAGE       0.07     0.86   255.76    0  01:56        0.86
MedDensStorage       STORAGE       0.15     0.77   255.38    0  03:03        0.77
ROW1                 STORAGE       0.00     0.16   255.76    0  01:32        0.16
ROW2                 STORAGE       0.00     0.20   256.80    0  01:21        0.20
RY-1                 STORAGE       0.01     0.22   257.22    0  01:47        0.22
RY-2                 STORAGE       0.01     0.24   257.24    0  01:47        0.24
RY-3                 STORAGE       0.01     0.20     0.20    0  01:45        0.20
RY-4                 STORAGE       0.01     0.20   258.08    0  01:45        0.20
RY-5                 STORAGE       0.02     0.34   256.34    0  01:31        0.34
RY-6                 STORAGE       0.02     0.29   257.40    0  01:50        0.29
RY-7                 STORAGE       0.02     0.31   257.31    0  02:16        0.31


*******************
Node Inflow Summary
*******************

-------------------------------------------------------------------------------------------------------------
                                Maximum  Maximum                    Lateral       Total        Flow
                                  Lateral    Total  Time of Max     Inflow      Inflow     Balance
                                   Inflow   Inflow   Occurrence     Volume      Volume       Error
Node                 Type             CMS      CMS  days hr:min  10^6 ltr     10^6 ltr     Percent
-------------------------------------------------------------------------------------------------------------
J1                   JUNCTION       0.000    2.083    0  01:28          0         15.5      -0.090
J10                  JUNCTION       0.000    2.748    0  01:28          0         18.7       0.103
J11                  JUNCTION       0.000    2.748    0  01:28          0         18.6       0.038
J12                  JUNCTION       0.000    4.498    0  01:13          0         28.1       0.015
J13                  JUNCTION       2.909    2.909    0  01:10       9.34         9.34       0.247
J14                  JUNCTION       0.000    1.967    0  01:11          0          9.3       0.012
J15                  JUNCTION       0.000    0.000    0  00:00          0            0       0.000 ltr
J16                  JUNCTION       0.000    4.498    0  01:13          0           28       0.025
J17                  JUNCTION       0.000    4.498    0  01:13          0           28      -0.005
J18                  JUNCTION       0.474    0.495    0  01:10       1.34         1.36      -1.603
J19                  JUNCTION       0.000    0.000    0  00:00          0            0       0.000 ltr
J2                   JUNCTION       0.000    2.139    0  01:10          0         7.68      -0.041
J20                  JUNCTION       0.052    1.995    0  01:11      0.115         9.41      -0.018
J21                  JUNCTION       0.000    1.968    0  01:11          0         7.96      -0.064
J22                  JUNCTION       0.000    2.000    0  01:08          0         7.97       0.090
J23                  JUNCTION       0.129    0.129    0  01:10      0.246        0.248      -2.593
J3                   JUNCTION       0.000    2.748    0  01:28          0         18.6       0.017
J4                   JUNCTION       2.321    2.321    0  01:10       7.28         7.28       0.128
J5                   JUNCTION       0.000    1.920    0  01:08          0         7.65      -0.054
J6                   JUNCTION       0.683    0.683    0  01:10       1.74         1.74       0.001
```

J7	JUNCTION	0.000	1.915	0	01:08	0	7.66	-0.941	
J8	JUNCTION	0.000	2.748	0	01:28	0	18.6	-0.073	
J9	JUNCTION	0.000	2.421	0	01:28	0	17.2	-0.002	
DorchesterCreek	OUTFALL	0.055	0.055	0	01:30	0.254	0.254	0.000	
Ex.Ditch	OUTFALL	0.940	0.940	0	01:10	1.63	1.63	0.000	
Ex.Major	OUTFALL	0.000	0.000	0	00:00	0	0	0.000	ltr
Ex.Sewer	OUTFALL	0.000	4.498	0	01:13	0	28	0.000	
Comm.Storage	STORAGE	0.412	0.422	0	01:08	0.646	0.65	0.000	
Ex.Storage	STORAGE	0.402	0.435	0	01:10	0.637	0.655	-0.001	
Ex.SWMF	STORAGE	3.464	4.618	0	01:10	6.03	6.47	-0.002	
MedDensStorage	STORAGE	0.426	0.436	0	01:08	0.693	0.696	0.000	
ROW1	STORAGE	0.000	0.082	0	01:20	0	0.105	-0.007	
ROW2	STORAGE	0.000	0.307	0	01:10	0	0.126	-0.007	
RY-1	STORAGE	0.259	0.259	0	01:11	0.403	0.403	0.012	
RY-2	STORAGE	0.236	0.236	0	01:10	0.358	0.358	0.012	
RY-3	STORAGE	0.157	0.157	0	01:11	0.244	0.244	0.012	
RY-4	STORAGE	0.154	0.154	0	01:11	0.24	0.24	0.012	
RY-5	STORAGE	0.505	0.505	0	01:10	0.754	0.754	0.012	
RY-6	STORAGE	0.216	0.268	0	01:11	0.337	0.355	0.010	
RY-7	STORAGE	0.280	0.280	0	01:14	0.746	0.746	0.008	

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
J10	JUNCTION	0.50	1.090	1.110
J11	JUNCTION	0.51	2.155	0.360
J12	JUNCTION	0.74	2.177	0.000
J14	JUNCTION	0.49	1.836	0.962
J16	JUNCTION	0.76	1.111	0.445
J17	JUNCTION	0.64	0.448	1.254
J20	JUNCTION	0.49	2.882	0.000
J21	JUNCTION	0.42	1.842	1.208
J22	JUNCTION	0.32	1.656	1.098
J3	JUNCTION	0.52	2.357	0.203
J5	JUNCTION	0.43	1.538	1.025
J7	JUNCTION	0.46	1.592	1.143
J8	JUNCTION	0.72	3.335	0.000
J9	JUNCTION	0.52	1.683	0.562

****
Node Flooding Summary
****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate CMS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
J12	0.01	0.264	0 01:08	0.001	0.000
J20	0.01	0.233	0 01:08	0.000	0.000
J8	0.01	0.499	0 01:08	0.000	0.000

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Comm.Storage	0.113	13	0	0	0.578	68	0 03:02	0.010
Ex.Storage	0.017	4	0	37	0.396	82	0 01:31	0.090
Ex.SWMF	0.310	4	0	0	4.278	57	0 01:56	0.379
MedDensStorage	0.119	15	0	0	0.617	77	0 03:03	0.011
ROW1	0.002	0	0	0	0.076	8	0 01:32	0.030
ROW2	0.002	0	0	0	0.097	20	0 01:21	0.043
RY-1	0.010	1	0	100	0.222	18	0 01:47	0.041
RY-2	0.009	1	0	100	0.203	21	0 01:47	0.035
RY-3	0.005	2	0	100	0.131	44	0 01:45	0.026
RY-4	0.005	0	0	100	0.129	11	0 01:45	0.026
RY-5	0.019	2	0	76	0.379	32	0 01:31	0.138
RY-6	0.011	1	0	100	0.211	23	0 01:50	0.030
RY-7	0.025	2	0	100	0.423	26	0 02:16	0.054

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
DorchesterCreek	4.89	0.025	0.055	0.254
Ex.Ditch	12.35	0.056	0.940	1.625
Ex.Major	0.00	0.000	0.000	0.000
Ex.Sewer	99.95	0.123	4.498	28.040
System	29.30	0.204	4.498	29.919

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	2.139	0 01:10	3.36	1.54	1.00
C10	CONDUIT	2.421	0 01:28	1.81	1.51	1.00
C11	CONDUIT	2.748	0 01:28	2.19	1.17	1.00
C12	CONDUIT	2.748	0 01:28	2.40	1.22	1.00
C14	CONDUIT	4.498	0 01:13	3.14	2.89	1.00
C16	CONDUIT	1.750	0 01:04	1.86	0.70	1.00
C17	CONDUIT	4.498	0 01:13	3.14	2.40	1.00
C18	CONDUIT	4.498	0 01:13	3.27	4.72	0.92
C19	CONDUIT	1.995	0 01:11	2.88	0.75	1.00
C2	CONDUIT	2.094	0 01:28	1.60	0.83	1.00
C20	CONDUIT	1.952	0 01:11	2.61	1.49	1.00
C21	CONDUIT	1.967	0 01:11	3.88	0.88	1.00
C22	CONDUIT	1.968	0 01:11	2.94	1.35	1.00
C23	CONDUIT	0.080	0 00:00	0.71	0.19	1.00
C24	CONDUIT	0.026	0 01:11	0.13	0.00	0.07
C3	CONDUIT	2.748	0 01:28	2.38	0.68	1.00
C4	CONDUIT	1.920	0 01:08	2.62	2.53	1.00
C5	CONDUIT	1.920	0 01:08	3.02	1.37	1.00
C6	CONDUIT	1.915	0 01:08	3.01	0.92	1.00
C9	CONDUIT	2.748	0 01:28	1.92	1.21	1.00
W1	CONDUIT	0.000	0 00:00	0.00	0.00	0.00
W9	CONDUIT	0.000	0 00:00	0.00	0.00	0.05
OL1	ORIFICE	0.012	0 01:08			1.00
OL2	ORIFICE	0.012	0 01:08			1.00
OR1	ORIFICE	0.050	0 01:45			1.00
OR2	ORIFICE	0.030	0 01:32			0.53
OR3	ORIFICE	0.043	0 01:21			0.67
C15	WEIR	0.024	0 01:31			0.06
C7	WEIR	0.065	0 01:11			0.08
W10	WEIR	0.000	0 00:00			0.00
W11	WEIR	1.156	0 01:10			0.41
W12	WEIR	0.000	0 00:00			0.00
W13	WEIR	0.307	0 01:10			0.37
W14	WEIR	0.000	0 00:00			0.00
W15	WEIR	0.000	0 00:00			0.00
W16	WEIR	0.000	0 00:00			0.00
W17	WEIR	0.000	0 00:00			0.00
W18	WEIR	0.000	0 00:00			0.00
W2	WEIR	0.000	0 00:00			0.00
W3	WEIR	0.090	0 01:31			0.12
W4	WEIR	0.000	0 00:00			0.00
W5	WEIR	0.082	0 01:20			0.11
W6	WEIR	0.000	0 00:00			0.00
W7	WEIR	0.000	0 00:00			0.00
W8	WEIR	0.000	0 00:00			0.00
C13	DUMMY	0.433	0 01:04			
C8	DUMMY	0.298	0 01:04			
Ex.SWMOutlet	DUMMY	0.379	0 01:56			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
		Fraction of Time in Flow Class								
C1	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
C10	1.00	0.00	0.00	0.00	0.30	0.00	0.00	0.70	0.00	0.00
C11	1.00	0.00	0.00	0.00	0.23	0.00	0.00	0.77	0.00	0.00
C12	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
C14	1.00	0.00	0.00	0.00	0.11	0.00	0.00	0.89	0.00	0.00
C16	1.00	0.00	0.00	0.00	0.30	0.00	0.00	0.70	0.25	0.00
C17	1.00	0.00	0.00	0.00	0.48	0.00	0.00	0.51	0.00	0.00
C18	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C19	1.00	0.00	0.00	0.00	0.79	0.09	0.00	0.12	0.78	0.00
C2	1.00	0.00	0.00	0.00	0.30	0.00	0.00	0.70	0.26	0.00
C20	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
C21	1.00	0.00	0.00	0.00	0.42	0.06	0.00	0.52	0.45	0.00
C22	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
C23	1.00	0.00	0.25	0.00	0.75	0.00	0.00	0.00	0.65	0.00
C24	1.00	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.00
C3	1.00	0.00	0.00	0.00	0.07	0.18	0.00	0.75	0.11	0.00
C4	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
C5	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
C6	1.00	0.00	0.01	0.00	0.99	0.00	0.00	0.00	0.97	0.00
C9	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.96	0.00	0.00
W1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W9	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00

****
Conduit Surcharge Summary
****

Conduit	Hours Both Ends	Hours Upstream	Hours Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C1	0.39	0.40	0.41	0.34	0.32
C10	0.50	0.52	0.50	0.87	0.50

C11	0.51	0.51	0.51	0.57	0.49
C12	0.52	0.54	0.52	0.64	0.50
C14	0.76	0.87	0.76	1.60	0.76
C16	0.44	0.51	0.46	0.01	0.30
C17	0.64	0.79	0.64	1.33	0.64
C18	0.01	0.70	0.01	2.26	0.01
C19	0.51	0.51	1.41	0.01	0.01
C2	0.47	0.47	0.52	0.01	0.01
C20	0.48	0.50	0.49	0.52	0.47
C21	0.43	0.43	0.49	0.01	0.01
C22	0.42	0.43	0.42	0.40	0.34
C23	0.85	0.85	0.92	0.01	0.40
C3	0.54	0.54	0.72	0.01	0.01
C4	0.32	0.46	0.32	0.99	0.32
C5	0.41	0.42	0.43	0.41	0.39
C6	0.44	0.44	0.51	0.01	0.01
C9	0.73	0.73	0.74	0.62	0.63

```
Analysis begun on:  Tue Jun 16 15:48:13 2020
Analysis ended on:  Tue Jun 16 15:48:25 2020
Total elapsed time: 00:00:12
```



```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.013)
--------------------------------------------------------------

*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 04/01/2005 00:00:00
Ending Date .............. 04/04/2005 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 1
Head Tolerance ........... 0.001500 m

**************************        Volume         Depth
Runoff Quantity Continuity    hectare-m            mm
**************************    ---------       -------
Total Precipitation ......        6.154        68.726
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        2.224        24.842
Surface Runoff ...........        3.806        42.510
Final Storage ............        0.125         1.397
Continuity Error (%) .....       -0.035

**************************        Volume        Volume
Flow Routing Continuity       hectare-m      10^6 ltr
**************************    ---------      ---------
Dry Weather Inflow .......        0.000         0.000
Wet Weather Inflow .......        3.807        38.066
Groundwater Inflow .......        0.000         0.000
RDII Inflow ..............        0.000         0.000
External Inflow ..........        0.000         0.000
External Outflow .........        3.456        34.565
Flooding Loss ............        0.000         0.002
Evaporation Loss .........        0.000         0.000
Exfiltration Loss ........        0.353         3.528
Initial Stored Volume ....        0.007         0.070
Final Stored Volume ......        0.001         0.008
Continuity Error (%) .....        0.085

*************************
Highest Continuity Errors
*************************
Node RY-6 (-2.88%)

***************************
Time-Step Critical Elements
***************************
Link C23 (2.61%)

********************************
Highest Flow Instability Indexes
********************************
All links are stable.

*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     0.99 sec
Maximum Time Step           :     1.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.01
Percent Not Converging      :     0.09

****************************
Subcatchment Runoff Summary
****************************

-------------------------------------------------------------------------------------------------------------------------
                          Total      Total      Total      Total     Imperv      Perv     Total      Total      Peak  Runoff
                         Precip      Runon       Evap      Infil     Runoff    Runoff    Runoff     Runoff    Runoff   Coeff
Subcatchment                 mm         mm         mm         mm         mm        mm        mm   10^6 ltr       CMS
-------------------------------------------------------------------------------------------------------------------------
A10                       68.73       0.00       0.00      12.72      54.61      4.15     54.61       0.73      0.46   0.795
```

A20	68.73	0.00	0.00	17.98	49.37	5.64	49.37	0.79	0.48	0.718
A30	68.73	0.00	0.00	22.94	37.03	44.47	44.47	0.39	0.25	0.647
A40	68.73	0.00	0.00	22.94	37.03	44.47	44.47	0.46	0.30	0.647
A50	68.73	0.00	0.00	20.90	39.72	46.51	46.51	0.41	0.27	0.677
A60	68.73	0.00	0.00	24.48	36.99	24.38	42.88	1.54	0.55	0.624
A70	68.73	0.00	0.00	23.78	37.00	43.59	43.59	0.86	0.34	0.634
A80	68.73	0.00	0.00	51.70	0.00	15.76	15.76	0.33	0.08	0.229
A90.1	68.73	0.00	0.00	18.16	43.73	27.33	49.20	0.28	0.15	0.716
A90.2	68.73	0.00	0.00	25.91	33.65	24.65	41.48	0.13	0.06	0.604
B10	68.73	0.00	0.00	22.94	37.03	44.47	44.47	0.28	0.18	0.647
B20	68.73	0.00	0.00	22.94	37.03	44.47	44.47	0.28	0.18	0.647
B30	68.73	0.00	0.00	22.94	37.03	44.47	44.47	0.47	0.30	0.647
B40	68.73	0.00	0.00	27.40	33.63	23.15	39.97	1.69	0.57	0.582
EXT10	68.73	0.00	0.00	25.32	36.99	23.53	42.02	8.41	2.68	0.611
EXT20	68.73	0.00	0.00	25.53	36.99	23.31	41.81	10.79	3.35	0.608
EXT30	68.73	0.00	0.00	16.33	45.98	7.28	51.01	1.65	0.97	0.742
EXT40	68.73	0.00	0.00	11.40	51.93	5.46	55.92	0.72	0.45	0.814
EXT50	68.73	0.00	0.00	22.80	37.04	44.62	44.62	0.32	0.22	0.649
EXT60	68.73	0.00	0.00	25.91	33.65	41.49	41.49	0.20	0.10	0.604
EXT70	68.73	0.00	0.00	22.74	37.04	44.69	44.69	0.40	0.28	0.650
EXT80	68.73	0.00	0.00	24.74	42.62	5.63	42.62	6.93	3.89	0.620

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.08	2.42	255.48	0 01:25	2.42
J10	JUNCTION	0.08	2.63	255.33	0 01:09	2.43
J11	JUNCTION	0.08	3.89	256.37	0 01:08	2.38
J12	JUNCTION	0.15	3.82	255.00	0 01:07	2.86
J13	JUNCTION	0.06	3.54	256.79	0 01:10	3.54
J14	JUNCTION	0.08	3.02	256.02	0 01:07	2.69
J15	JUNCTION	0.00	0.00	254.00	0 00:00	0.00
J16	JUNCTION	0.13	2.55	253.59	0 01:09	2.21
J17	JUNCTION	0.14	2.19	253.09	0 01:07	1.77
J18	JUNCTION	0.08	3.81	257.06	0 01:29	3.81
J19	JUNCTION	0.00	0.00	256.50	0 00:00	0.00
J2	JUNCTION	0.04	3.30	258.12	0 01:11	3.30
J20	JUNCTION	0.06	3.91	256.51	0 01:07	2.26
J21	JUNCTION	0.03	3.06	256.52	0 01:07	2.59
J22	JUNCTION	0.04	3.16	256.79	0 01:07	2.66
J23	JUNCTION	0.05	4.06	257.71	0 01:12	4.06
J3	JUNCTION	0.07	3.93	256.21	0 01:08	2.32
J4	JUNCTION	0.04	4.43	259.89	0 01:11	4.43
J5	JUNCTION	0.04	2.87	257.18	0 01:12	2.87
J6	JUNCTION	0.10	4.63	257.64	0 01:09	4.62
J7	JUNCTION	0.15	2.97	256.94	0 01:12	2.97
J8	JUNCTION	0.09	4.71	256.39	0 01:07	2.65
J9	JUNCTION	0.09	3.48	256.29	0 01:09	2.52
DorchesterCreek	OUTFALL	0.00	0.00	253.90	0 00:00	0.00
Ex.Ditch	OUTFALL	0.00	0.00	255.30	0 00:00	0.00
Ex.Major	OUTFALL	0.00	0.00	255.50	0 00:00	0.00
Ex.Sewer	OUTFALL	0.08	1.14	252.01	0 01:21	1.14
Comm.Storage	STORAGE	0.16	0.79	255.40	0 03:02	0.79
Ex.Storage	STORAGE	0.13	2.68	257.50	0 01:20	2.68
Ex.SWMF	STORAGE	0.08	1.06	255.96	0 01:45	1.06
MedDensStorage	STORAGE	0.18	0.90	255.51	0 03:04	0.90
ROW1	STORAGE	0.01	0.39	255.99	0 01:42	0.39
ROW2	STORAGE	0.01	0.35	256.95	0 01:24	0.35
RY-1	STORAGE	0.01	0.24	257.24	0 01:48	0.24
RY-2	STORAGE	0.02	0.26	257.26	0 01:48	0.26
RY-3	STORAGE	0.01	0.22	0.22	0 01:46	0.22
RY-4	STORAGE	0.01	0.21	258.09	0 01:46	0.21
RY-5	STORAGE	0.02	0.35	256.35	0 01:26	0.35
RY-6	STORAGE	0.02	0.34	257.45	0 01:28	0.34
RY-7	STORAGE	0.03	0.34	257.34	0 02:19	0.34

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
J1	JUNCTION	0.000	2.118	0 01:37	0	18	-0.076
J10	JUNCTION	0.000	2.862	0 01:36	0	21.7	0.077
J11	JUNCTION	0.000	2.863	0 01:36	0	21.7	0.064
J12	JUNCTION	0.000	4.618	0 01:21	0	32.4	0.024
J13	JUNCTION	3.351	3.351	0 01:10	10.8	10.8	0.209
J14	JUNCTION	0.000	2.061	0 01:10	0	10.6	0.016
J15	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
J16	JUNCTION	0.000	4.618	0 01:21	0	32.4	0.021
J17	JUNCTION	0.000	4.618	0 01:21	0	32.4	-0.005
J18	JUNCTION	0.550	0.576	0 01:10	1.54	1.74	0.684
J19	JUNCTION	0.000	0.000	0 00:00	0	0	0.000 ltr
J2	JUNCTION	0.000	2.415	0 01:09	0	8.84	-0.043
J20	JUNCTION	0.061	2.102	0 01:10	0.133	10.7	-0.049
J21	JUNCTION	0.000	2.061	0 01:10	0	9.03	-0.060
J22	JUNCTION	0.000	2.065	0 01:07	0	9.04	0.079
J23	JUNCTION	0.151	0.151	0 01:10	0.28	0.282	-0.681
J3	JUNCTION	0.000	2.863	0 01:36	0	21.7	0.006
J4	JUNCTION	2.675	2.675	0 01:10	8.41	8.41	0.139
J5	JUNCTION	0.000	1.983	0 01:10	0	8.7	-0.050
J6	JUNCTION	0.788	0.788	0 01:10	2.01	2.01	0.004

J7	JUNCTION	0.000	1.983	0 01:10	0	8.71	-0.823		
J8	JUNCTION	0.000	2.863	0 01:36	0	21.7	-0.056		
J9	JUNCTION	0.000	2.448	0 01:35	0	19.7	-0.003		
DorchesterCreek	OUTFALL	0.079	0.079	0 01:30	0.334	0.334	0.000		
Ex.Ditch	OUTFALL	1.064	1.064	0 01:10	1.86	1.86	0.000		
Ex.Major	OUTFALL	0.000	0.000	0 00:00	0	0	0.000	ltr	
Ex.Sewer	OUTFALL	0.000	4.618	0 01:21	0	32.4	0.000		
Comm.Storage	STORAGE	0.460	0.470	0 01:10	0.732	0.74	-0.000		
Ex.Storage	STORAGE	0.452	0.495	0 01:10	0.721	0.783	-0.001		
Ex.SWMF	STORAGE	3.892	5.488	0 01:10	6.93	7.88	-0.001		
MedDensStorage	STORAGE	0.477	0.486	0 01:10	0.79	0.798	-0.000		
ROW1	STORAGE	0.000	0.200	0 01:29	0	0.347	-0.003		
ROW2	STORAGE	0.000	0.431	0 01:09	0	0.277	-0.011		
RY-1	STORAGE	0.299	0.299	0 01:10	0.462	0.462	0.013		
RY-2	STORAGE	0.272	0.272	0 01:10	0.409	0.409	0.013		
RY-3	STORAGE	0.181	0.181	0 01:10	0.28	0.28	0.013		
RY-4	STORAGE	0.178	0.178	0 01:10	0.276	0.276	0.013		
RY-5	STORAGE	0.582	0.582	0 01:10	0.865	0.865	0.013		
RY-6	STORAGE	0.250	0.592	0 01:11	0.387	0.609	-2.802		
RY-7	STORAGE	0.336	0.336	0 01:13	0.859	0.859	0.008		

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
J10	JUNCTION	0.80	1.261	0.939
J11	JUNCTION	0.80	2.515	0.000
J12	JUNCTION	1.02	2.177	0.000
J14	JUNCTION	0.71	2.015	0.783
J16	JUNCTION	1.04	1.147	0.409
J17	JUNCTION	0.91	0.791	0.911
J20	JUNCTION	0.75	2.882	0.000
J21	JUNCTION	0.61	2.035	1.015
J22	JUNCTION	0.50	1.848	0.906
J3	JUNCTION	0.80	2.560	0.000
J5	JUNCTION	0.60	1.944	0.619
J7	JUNCTION	0.63	1.900	0.835
J8	JUNCTION	1.00	3.335	0.000
J9	JUNCTION	0.81	2.103	0.142

****
Node Flooding Summary
****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate CMS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
J11	0.01	0.429	0 01:08	0.000	0.000
J12	0.01	0.330	0 01:07	0.001	0.000
J20	0.01	0.376	0 01:07	0.001	0.000
J3	0.01	0.296	0 01:08	0.000	0.000
J8	0.01	0.543	0 01:07	0.001	0.000

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Comm.Storage	0.136	16	0	0	0.668	79	0 03:02	0.011
Ex.Storage	0.019	4	0	33	0.407	85	0 01:20	0.188
Ex.SWMF	0.361	5	0	0	5.393	72	0 01:45	0.737
MedDensStorage	0.145	18	0	0	0.717	90	0 03:04	0.012
ROW1	0.004	0	0	0	0.205	22	0 01:42	0.101
ROW2	0.003	1	0	0	0.177	37	0 01:24	0.090
RY-1	0.012	1	0	100	0.261	21	0 01:48	0.044
RY-2	0.011	1	0	100	0.238	24	0 01:48	0.037
RY-3	0.007	2	0	100	0.154	51	0 01:46	0.029
RY-4	0.007	1	0	100	0.152	13	0 01:46	0.028
RY-5	0.020	2	0	67	0.406	34	0 01:26	0.186
RY-6	0.013	1	0	66	0.281	31	0 01:28	0.162
RY-7	0.032	2	0	100	0.507	31	0 02:19	0.059

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
DorchesterCreek	4.94	0.031	0.079	0.334
Ex.Ditch	12.40	0.063	1.064	1.856
Ex.Major	0.00	0.000	0.000	0.000
Ex.Sewer	99.95	0.141	4.618	32.375

System	29.32	0.235	4.618	34.565

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	2.415	0 01:09	3.80	1.74	1.00
C10	CONDUIT	2.448	0 01:35	1.83	1.53	1.00
C11	CONDUIT	2.863	0 01:36	2.22	1.21	1.00
C12	CONDUIT	2.863	0 01:36	2.40	1.27	1.00
C14	CONDUIT	4.618	0 01:21	3.23	2.97	1.00
C16	CONDUIT	1.750	0 01:03	1.85	0.70	1.00
C17	CONDUIT	4.618	0 01:21	3.23	2.47	1.00
C18	CONDUIT	4.618	0 01:21	3.35	4.84	0.92
C19	CONDUIT	2.102	0 01:10	2.88	0.79	1.00
C2	CONDUIT	2.140	0 01:37	1.60	0.84	1.00
C20	CONDUIT	2.042	0 01:10	2.73	1.56	1.00
C21	CONDUIT	2.061	0 01:10	3.88	0.92	1.00
C22	CONDUIT	2.061	0 01:10	2.94	1.41	1.00
C23	CONDUIT	0.080	0 00:00	0.71	0.19	1.00
C24	CONDUIT	0.037	0 01:12	0.15	0.01	0.10
C3	CONDUIT	2.863	0 01:36	2.40	0.71	1.00
C4	CONDUIT	1.985	0 01:07	2.68	2.62	1.00
C5	CONDUIT	1.983	0 01:10	3.12	1.42	1.00
C6	CONDUIT	1.983	0 01:10	3.12	0.96	1.00
C9	CONDUIT	2.863	0 01:36	2.00	1.26	1.00
W1	CONDUIT	0.020	0 01:11	0.49	0.02	0.21
W9	CONDUIT	0.119	0 01:28	0.25	0.03	0.16
OL1	ORIFICE	0.014	0 01:07			1.00
OL2	ORIFICE	0.013	0 01:07			1.00
OR1	ORIFICE	0.051	0 01:56			1.00
OR2	ORIFICE	0.101	0 01:42			1.00
OR3	ORIFICE	0.090	0 01:24			1.00
C15	WEIR	0.165	0 01:20			0.23
C7	WEIR	0.336	0 01:12			0.24
W10	WEIR	0.000	0 00:00			0.00
W11	WEIR	1.599	0 01:10			0.51
W12	WEIR	0.000	0 00:00			0.00
W13	WEIR	0.431	0 01:09			0.44
W14	WEIR	0.000	0 00:00			0.00
W15	WEIR	0.000	0 00:00			0.00
W16	WEIR	0.000	0 00:00			0.00
W17	WEIR	0.000	0 00:00			0.00
W18	WEIR	0.000	0 00:00			0.00
W2	WEIR	0.000	0 00:00			0.00
W3	WEIR	0.136	0 01:26			0.16
W4	WEIR	0.000	0 00:00			0.00
W5	WEIR	0.200	0 01:29			0.19
W6	WEIR	0.000	0 00:00			0.00
W7	WEIR	0.000	0 00:00			0.00
W8	WEIR	0.000	0 00:00			0.00
C13	DUMMY	0.433	0 01:03			
C8	DUMMY	0.298	0 01:03			
Ex.SWMOutlet	DUMMY	0.737	0 01:49			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
		---------- Fraction of Time in Flow Class ----------								
C1	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
C10	1.00	0.00	0.00	0.00	0.31	0.00	0.00	0.69	0.00	0.00
C11	1.00	0.00	0.00	0.00	0.24	0.00	0.00	0.76	0.00	0.00
C12	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.98	0.00	0.00
C14	1.00	0.00	0.00	0.00	0.12	0.00	0.00	0.88	0.00	0.00
C16	1.00	0.00	0.00	0.00	0.31	0.00	0.00	0.69	0.21	0.00
C17	1.00	0.00	0.00	0.00	0.52	0.00	0.00	0.48	0.00	0.00
C18	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C19	1.00	0.00	0.00	0.00	0.83	0.09	0.00	0.09	0.81	0.00
C2	1.00	0.00	0.00	0.00	0.31	0.00	0.00	0.69	0.26	0.00
C20	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
C21	1.00	0.00	0.00	0.00	0.46	0.06	0.00	0.48	0.48	0.00
C22	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
C23	1.00	0.00	0.25	0.00	0.75	0.00	0.00	0.00	0.65	0.00
C24	1.00	0.99	0.01	0.00	0.01	0.00	0.00	0.00	0.98	0.00
C3	1.00	0.00	0.00	0.00	0.07	0.18	0.00	0.75	0.11	0.00
C4	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
C5	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
C6	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.96	0.00
C9	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.96	0.00	0.00
W1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W9	1.00	0.98	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.00

****
Conduit Surcharge Summary
****

Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited

C1	0.56	0.57	0.58	0.51	0.49
C10	0.80	0.82	0.80	1.20	0.79
C11	0.80	0.81	0.80	0.92	0.79
C12	0.80	0.82	0.80	0.95	0.79
C14	1.04	1.15	1.04	1.87	1.03
C16	0.75	0.83	0.77	0.01	0.46
C17	0.91	1.07	0.91	1.60	0.91
C18	0.01	0.98	0.01	2.40	0.01
C19	0.77	0.77	1.67	0.01	0.01
C2	0.77	0.77	0.81	0.01	0.01
C20	0.71	0.72	0.75	0.67	0.62
C21	0.62	0.62	0.71	0.01	0.01
C22	0.61	0.61	0.61	0.54	0.49
C23	1.00	1.00	1.07	0.01	0.46
C3	0.82	0.82	1.00	0.01	0.01
C4	0.50	0.63	0.50	1.14	0.50
C5	0.58	0.58	0.60	0.56	0.54
C6	0.61	0.61	0.68	0.01	0.01
C9	1.01	1.01	1.02	0.96	0.97

Analysis begun on: Tue Jun 16 15:49:18 2020
Analysis ended on: Tue Jun 16 15:49:31 2020
Total elapsed time: 00:00:13

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.013)
--------------------------------------------------------------

*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 04/01/2005 00:00:00
Ending Date .............. 04/04/2005 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 1
Head Tolerance ........... 0.001500 m


**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         6.791        75.839
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         2.353        26.275
Surface Runoff ...........         4.315        48.193
Final Storage ............         0.125         1.398
Continuity Error (%) .....        -0.036


**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         4.315        43.154
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         3.937        39.373
Flooding Loss ............         0.000         0.004
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.385         3.846
Initial Stored Volume ....         0.007         0.070
Final Stored Volume ......         0.001         0.009
Continuity Error (%) .....        -0.016


*************************
Highest Continuity Errors
*************************
Node RY-6 (-1.39%)


***************************
Time-Step Critical Elements
***************************
Link C23 (2.51%)


********************************
Highest Flow Instability Indexes
********************************
All links are stable.


*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     0.09 sec
Average Time Step           :     0.99 sec
Maximum Time Step           :     1.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.01
Percent Not Converging      :     0.08


***************************
Subcatchment Runoff Summary
***************************

-------------------------------------------------------------------------------------------------------------------
                          Total      Total      Total      Total     Imperv      Perv     Total     Total     Peak  Runoff
                         Precip      Runon       Evap      Infil     Runoff    Runoff    Runoff    Runoff    Runoff   Coeff
Subcatchment                 mm         mm         mm         mm         mm        mm        mm  10^6 ltr       CMS
-------------------------------------------------------------------------------------------------------------------
A10                       75.84       0.00       0.00      13.49      60.95      5.15     60.95      0.82      0.51   0.804
```



```
A20                       75.84       0.00       0.00      19.07      55.40      7.04     55.40      0.89      0.53   0.730
A30                       75.84       0.00       0.00      24.32      40.95     50.21     50.21      0.44      0.28   0.662
A40                       75.84       0.00       0.00      24.32      40.95     50.21     50.21      0.52      0.34   0.662
A50                       75.84       0.00       0.00      22.15      43.92     52.37     52.37      0.46      0.31   0.691
A60                       75.84       0.00       0.00      25.88      40.91     28.14     48.59      1.75      0.63   0.641
A70                       75.84       0.00       0.00      25.17      40.92     49.32     49.32      0.97      0.39   0.650
A80                       75.84       0.00       0.00      54.84       0.00     19.75     19.75      0.42      0.11   0.260
A90.1                     75.84       0.00       0.00      19.24      48.36     31.05     55.24      0.31      0.17   0.728
A90.2                     75.84       0.00       0.00      27.45      37.21     28.45     47.05      0.15      0.07   0.620
B10                       75.84       0.00       0.00      24.32      40.95     50.21     50.21      0.32      0.21   0.662
B20                       75.84       0.00       0.00      24.32      40.95     50.21     50.21      0.31      0.20   0.662
B30                       75.84       0.00       0.00      24.32      40.95     50.21     50.21      0.53      0.34   0.662
B40                       75.84       0.00       0.00      28.96      37.19     26.92     45.52      1.92      0.65   0.600
EXT10                     75.84       0.00       0.00      26.73      40.90     27.27     47.72      9.55      3.04   0.629
EXT20                     75.84       0.00       0.00      26.95      40.90     27.05     47.50     12.26      3.81   0.626
EXT30                     75.84       0.00       0.00      17.18      51.12      8.92     57.27      1.86      1.08   0.755
EXT40                     75.84       0.00       0.00      12.01      57.59      6.64     62.44      0.81      0.50   0.823
EXT50                     75.84       0.00       0.00      24.17      40.95     50.36     50.36      0.36      0.25   0.664
EXT60                     75.84       0.00       0.00      27.45      37.21     47.06     47.06      0.23      0.12   0.621
EXT70                     75.84       0.00       0.00      24.11      40.96     50.44     50.44      0.45      0.32   0.665
EXT80                     75.84       0.00       0.00      26.27      48.20      7.30     48.20      7.84      4.32   0.636


******************
Node Depth Summary
******************

-----------------------------------------------------------------------------------------------
                                Average  Maximum  Maximum  Time of Max    Reported
                                  Depth    Depth      HGL   Occurrence   Max Depth
Node                 Type        Meters   Meters   Meters  days hr:min      Meters
-----------------------------------------------------------------------------------------------
J1                   JUNCTION      0.09     2.67   255.73    0  01:30        2.67
J10                  JUNCTION      0.09     2.67   255.37    0  01:30        2.67
J11                  JUNCTION      0.09     3.89   256.37    0  01:08        2.60
J12                  JUNCTION      0.16     3.82   255.00    0  01:06        3.01
J13                  JUNCTION      0.07     3.57   256.82    0  01:10        3.57
J14                  JUNCTION      0.08     2.98   255.98    0  01:07        2.96
J15                  JUNCTION      0.00     0.01   254.01    0  01:30        0.01
J16                  JUNCTION      0.14     2.96   254.00    0  01:06        2.31
J17                  JUNCTION      0.15     2.74   253.64    0  01:06        1.82
J18                  JUNCTION      0.08     3.87   257.12    0  01:25        3.87
J19                  JUNCTION      0.00     0.00   256.50    0  02:35        0.00
J2                   JUNCTION      0.05     3.38   258.20    0  01:12        3.38
J20                  JUNCTION      0.07     3.91   256.51    0  01:06        2.38
J21                  JUNCTION      0.04     3.03   256.49    0  01:07        3.03
J22                  JUNCTION      0.04     3.14   256.77    0  01:07        3.14
J23                  JUNCTION      0.05     4.07   257.72    0  01:11        4.07
J3                   JUNCTION      0.08     3.93   256.21    0  01:07        2.51
J4                   JUNCTION      0.05     4.57   260.03    0  01:11        4.57
J5                   JUNCTION      0.04     2.94   257.25    0  01:12        2.94
J6                   JUNCTION      0.11     4.66   257.67    0  01:08        4.65
J7                   JUNCTION      0.15     3.04   257.01    0  01:14        3.04
J8                   JUNCTION      0.10     4.71   256.39    0  01:06        2.82
J9                   JUNCTION      0.10     3.62   256.43    0  01:08        2.76
DorchesterCreek      OUTFALL       0.00     0.00   253.90    0  00:00        0.00
Ex.Ditch             OUTFALL       0.00     0.00   255.30    0  00:00        0.00
Ex.Major             OUTFALL       0.00     0.00   255.50    0  00:00        0.00
Ex.Sewer             OUTFALL       0.08     1.15   252.03    0  01:21        1.15
Comm.Storage         STORAGE       0.19     0.89   255.50    0  03:02        0.89
Ex.Storage           STORAGE       0.13     2.72   257.54    0  01:20        2.72
Ex.SWMF              STORAGE       0.08     1.21   256.11    0  01:39        1.21
MedDensStorage       STORAGE       0.22     2.51   257.12    0  02:35        2.51
ROW1                 STORAGE       0.02     0.99   256.59    0  01:47        0.99
ROW2                 STORAGE       0.01     0.53   257.13    0  01:30        0.53
RY-1                 STORAGE       0.02     0.25   257.25    0  01:49        0.25
RY-2                 STORAGE       0.02     0.28   257.28    0  01:49        0.28
RY-3                 STORAGE       0.01     0.23     0.23    0  01:46        0.23
RY-4                 STORAGE       0.01     0.23   258.11    0  01:46        0.23
RY-5                 STORAGE       0.03     0.36   256.36    0  01:23        0.36
RY-6                 STORAGE       0.02     0.38   257.49    0  01:22        0.38
RY-7                 STORAGE       0.03     0.36   257.36    0  02:22        0.36


*******************
Node Inflow Summary
*******************

-----------------------------------------------------------------------------------------------------------
                                Maximum  Maximum                    Lateral     Total      Flow
                                  Lateral    Total  Time of Max     Inflow    Inflow   Balance
                                   Inflow   Inflow   Occurrence     Volume    Volume     Error
Node                 Type             CMS      CMS  days hr:min  10^6 ltr  10^6 ltr   Percent
-----------------------------------------------------------------------------------------------------------
J1                   JUNCTION       0.000    2.181    0  02:02          0      19.5    -0.069
J10                  JUNCTION       0.000    2.953    0  01:44          0      24.2     0.064
J11                  JUNCTION       0.000    2.953    0  01:44          0      24.2     0.067
J12                  JUNCTION       0.000    4.777    0  01:21          0      35.9     0.027
J13                  JUNCTION       3.807    3.807    0  01:10       12.3      12.3     0.179
J14                  JUNCTION       0.000    2.101    0  01:09          0      11.6     0.011
J15                  JUNCTION       0.000    0.022    0  01:30          0    0.0111     0.001
J16                  JUNCTION       0.000    4.777    0  01:21          0      35.9     0.017
J17                  JUNCTION       0.000    4.777    0  01:21          0      35.9    -0.006
J18                  JUNCTION       0.628    0.931    0  01:20       1.75      2.38    -0.815
J19                  JUNCTION       0.000    0.006    0  02:35          0   0.00337    -0.000
J2                   JUNCTION       0.000    2.463    0  01:08          0      9.91    -0.035
J20                  JUNCTION       0.071    2.155    0  01:06      0.151      11.7    -0.058
J21                  JUNCTION       0.000    2.101    0  01:09          0      9.89    -0.057
J22                  JUNCTION       0.000    2.104    0  01:09          0       9.9     0.069
J23                  JUNCTION       0.173    0.173    0  01:10      0.315     0.317    -3.787
J3                   JUNCTION       0.000    2.953    0  01:44          0      24.2    -0.002
J4                   JUNCTION       3.041    3.041    0  01:10       9.55      9.55     0.135
J5                   JUNCTION       0.000    2.024    0  01:09          0      9.55    -0.049
J6                   JUNCTION       0.896    0.896    0  01:10       2.28      2.28     0.002
```

J7	JUNCTION	0.000	2.024	0	01:09	0	9.55	-0.745
J8	JUNCTION	0.000	2.953	0	01:44	0	24.2	-0.050
J9	JUNCTION	0.000	2.430	0	01:43	0	21.3	-0.003
DorchesterCreek	OUTFALL	0.106	0.127	0	01:30	0.419	0.43	0.000
Ex.Ditch	OUTFALL	1.190	1.190	0	01:10	2.09	2.09	0.000
Ex.Major	OUTFALL	0.000	0.645	0	01:39	0	0.961	0.000
Ex.Sewer	OUTFALL	0.000	4.777	0	01:21	0	35.9	0.000
Comm.Storage	STORAGE	0.510	0.520	0	01:10	0.817	0.83	0.000
Ex.Storage	STORAGE	0.504	0.545	0	01:10	0.806	0.882	-0.001
Ex.SWMF	STORAGE	4.320	6.373	0	01:10	7.84	9.48	-0.001
MedDensStorage	STORAGE	0.528	0.538	0	01:10	0.886	0.899	0.048
ROW1	STORAGE	0.000	0.597	0	01:25	0	0.983	-0.002
ROW2	STORAGE	0.000	0.540	0	01:08	0	0.484	-0.000
RY-1	STORAGE	0.340	0.340	0	01:10	0.522	0.522	0.015
RY-2	STORAGE	0.307	0.307	0	01:10	0.461	0.461	0.015
RY-3	STORAGE	0.206	0.206	0	01:10	0.316	0.316	0.015
RY-4	STORAGE	0.203	0.203	0	01:10	0.311	0.311	0.015
RY-5	STORAGE	0.658	0.658	0	01:10	0.976	0.976	0.015
RY-6	STORAGE	0.284	0.870	0	01:11	0.437	1.03	-1.374
RY-7	STORAGE	0.395	0.395	0	01:13	0.972	0.972	0.010

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
J10	JUNCTION	1.04	1.303	0.897
J11	JUNCTION	1.04	2.515	0.000
J12	JUNCTION	1.24	2.177	0.000
J14	JUNCTION	0.87	1.980	0.818
J16	JUNCTION	1.26	1.556	0.000
J17	JUNCTION	1.13	1.346	0.356
J20	JUNCTION	0.93	2.882	0.000
J21	JUNCTION	0.76	2.010	1.040
J22	JUNCTION	0.65	1.824	0.930
J3	JUNCTION	1.04	2.560	0.000
J5	JUNCTION	0.74	2.013	0.550
J7	JUNCTION	0.77	1.968	0.767
J8	JUNCTION	1.23	3.335	0.000
J9	JUNCTION	1.05	2.245	0.000

****
Node Flooding Summary
****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate CMS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
J11	0.01	0.576	0 01:08	0.001	0.000
J12	0.01	0.294	0 01:06	0.000	0.000
J16	0.01	0.220	0 01:06	0.000	0.000
J20	0.01	0.456	0 01:06	0.001	0.000
J3	0.01	0.597	0 01:07	0.001	0.000
J8	0.01	0.718	0 01:06	0.001	0.000
J9	0.01	0.298	0 01:08	0.000	0.000

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Comm.Storage	0.160	19	0	0	0.758	89	0 03:02	0.012
Ex.Storage	0.020	4	0	29	0.413	86	0 01:20	0.251
Ex.SWMF	0.391	5	0	0	6.295	84	0 01:39	1.073
MedDensStorage	0.168	21	0	0	0.801	100	0 02:35	0.026
ROW1	0.013	1	0	0	0.629	68	0 01:47	0.186
ROW2	0.005	1	0	0	0.287	60	0 01:30	0.147
RY-1	0.014	1	0	100	0.303	24	0 01:49	0.048
RY-2	0.014	1	0	100	0.274	28	0 01:49	0.040
RY-3	0.008	3	0	100	0.179	60	0 01:46	0.031
RY-4	0.008	1	0	100	0.176	15	0 01:46	0.030
RY-5	0.021	2	0	60	0.434	36	0 01:23	0.239
RY-6	0.014	2	0	40	0.364	40	0 01:22	0.515
RY-7	0.040	2	0	100	0.597	37	0 02:22	0.063

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
DorchesterCreek	5.00	0.038	0.127	0.430
Ex.Ditch	12.44	0.070	1.190	2.090
Ex.Major	1.00	0.368	0.645	0.961

Ex.Sewer	99.95	0.156	4.777	35.893
System	29.60	0.631	4.777	39.373

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	2.463	0 01:08	3.87	1.78	1.00
C10	CONDUIT	2.430	0 01:43	1.85	1.52	1.00
C11	CONDUIT	2.953	0 01:44	2.25	1.25	1.00
C12	CONDUIT	2.953	0 01:44	2.40	1.31	1.00
C14	CONDUIT	4.777	0 01:21	3.34	3.07	1.00
C16	CONDUIT	1.750	0 01:03	1.84	0.70	1.00
C17	CONDUIT	4.777	0 01:21	3.34	2.55	1.00
C18	CONDUIT	4.777	0 01:21	3.45	5.01	0.93
C19	CONDUIT	2.149	0 01:09	2.88	0.81	1.00
C2	CONDUIT	2.202	0 02:03	1.63	0.87	1.00
C20	CONDUIT	2.098	0 01:06	2.88	1.60	1.00
C21	CONDUIT	2.101	0 01:09	3.88	0.94	1.00
C22	CONDUIT	2.101	0 01:09	2.94	1.44	1.00
C23	CONDUIT	0.080	0 00:00	0.71	0.19	1.00
C24	CONDUIT	0.069	0 01:11	0.20	0.01	0.21
C3	CONDUIT	2.953	0 01:44	2.42	0.73	1.00
C4	CONDUIT	2.024	0 01:09	2.71	2.67	1.00
C5	CONDUIT	2.024	0 01:09	3.18	1.45	1.00
C6	CONDUIT	2.024	0 01:09	3.18	0.98	1.00
C9	CONDUIT	2.953	0 01:44	2.06	1.30	1.00
W1	CONDUIT	0.219	0 01:11	0.89	0.19	0.52
W9	CONDUIT	0.473	0 01:22	0.49	0.12	0.33
OL1	ORIFICE	0.013	0 01:07			1.00
OL2	ORIFICE	0.020	0 02:35			1.00
OR1	ORIFICE	0.050	0 02:04			1.00
OR2	ORIFICE	0.186	0 01:47			1.00
OR3	ORIFICE	0.125	0 01:30			1.00
C15	WEIR	0.228	0 01:20			0.32
C7	WEIR	0.386	0 01:12			0.27
W10	WEIR	0.000	0 00:00			0.00
W11	WEIR	2.054	0 01:10			0.60
W12	WEIR	0.000	0 00:00			0.00
W13	WEIR	0.540	0 01:08			0.56
W14	WEIR	0.000	0 00:00			0.00
W15	WEIR	0.006	0 02:35			0.03
W16	WEIR	0.006	0 02:35			0.02
W17	WEIR	0.000	0 00:00			0.00
W18	WEIR	0.000	0 00:00			0.00
W2	WEIR	0.645	0 01:39			0.36
W3	WEIR	0.187	0 01:23			0.20
W4	WEIR	0.022	0 01:30			0.01
W5	WEIR	0.597	0 01:25			0.40
W6	WEIR	0.000	0 00:00			0.00
W7	WEIR	0.022	0 01:30			0.09
W8	WEIR	0.000	0 00:00			0.00
C13	DUMMY	0.433	0 01:02			
C8	DUMMY	0.298	0 01:02			
Ex.SWMOutlet	DUMMY	0.980	0 02:03			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
		Fraction of Time in Flow Class								
C1	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
C10	1.00	0.00	0.00	0.00	0.31	0.00	0.00	0.69	0.00	0.00
C11	1.00	0.00	0.00	0.00	0.24	0.00	0.00	0.76	0.00	0.00
C12	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.00	0.00
C14	1.00	0.00	0.00	0.00	0.12	0.00	0.00	0.88	0.00	0.00
C16	1.00	0.00	0.00	0.00	0.31	0.00	0.00	0.69	0.21	0.00
C17	1.00	0.00	0.00	0.00	0.55	0.00	0.00	0.45	0.00	0.00
C18	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C19	1.00	0.00	0.00	0.00	0.85	0.09	0.00	0.06	0.83	0.00
C2	1.00	0.00	0.00	0.00	0.31	0.00	0.00	0.69	0.27	0.00
C20	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.00	0.00
C21	1.00	0.00	0.00	0.00	0.49	0.06	0.00	0.46	0.51	0.00
C22	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
C23	1.00	0.00	0.25	0.00	0.75	0.00	0.00	0.00	0.65	0.00
C24	1.00	0.99	0.01	0.00	0.01	0.00	0.00	0.00	0.98	0.00
C3	1.00	0.00	0.00	0.00	0.07	0.18	0.00	0.75	0.12	0.00
C4	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
C5	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
C6	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.96	0.00
C9	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.96	0.00	0.00
W1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W9	1.00	0.97	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.00

****
Conduit Surcharge Summary
****

	Hours Full	Hours Above Full	Capacity

Conduit	Both Ends	Upstream	Dnstream	Normal Flow	Limited
C1	0.70	0.71	0.72	0.65	0.63
C10	1.04	1.06	1.04	1.43	1.03
C11	1.03	1.04	1.04	1.17	1.02
C12	1.03	1.05	1.04	1.21	1.02
C14	1.26	1.38	1.26	2.05	1.26
C16	0.98	1.06	1.01	0.01	0.60
C17	1.13	1.30	1.13	1.83	1.13
C18	0.01	1.20	0.01	2.54	0.01
C19	0.96	0.96	1.91	0.01	0.01
C2	1.01	1.01	1.05	0.01	0.01
C20	0.87	0.89	0.93	0.80	0.76
C21	0.77	0.77	0.87	0.01	0.01
C22	0.76	0.76	0.76	0.67	0.63
C23	1.12	1.12	1.19	0.01	0.51
C3	1.04	1.04	1.23	0.01	0.01
C4	0.65	0.77	0.65	1.26	0.65
C5	0.72	0.73	0.74	0.70	0.68
C6	0.75	0.75	0.82	0.01	0.01
C9	1.24	1.24	1.24	1.21	1.20

```
Analysis begun on:  Tue Jun 16 15:50:11 2020
Analysis ended on:  Tue Jun 16 15:50:24 2020
Total elapsed time: 00:00:13
```



```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.013)
--------------------------------------------------------------

*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Surcharge Method ........ EXTRAN
Starting Date ........... 04/01/2005 00:00:00
Ending Date ............. 04/04/2005 00:00:00
Antecedent Dry Days ..... 0.0
Report Time Step ........ 00:01:00
Wet Time Step ........... 00:01:00
Dry Time Step ........... 00:01:00
Routing Time Step ....... 1.00 sec
Variable Time Step ...... YES
Maximum Trials .......... 8
Number of Threads ....... 1
Head Tolerance .......... 0.001500 m

**************************        Volume         Depth
Runoff Quantity Continuity    hectare-m            mm
**************************    ---------       --------
Total Precipitation ......        7.755        86.611
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        2.530        28.258
Surface Runoff ...........        5.103        56.990
Final Storage ............        0.125         1.399
Continuity Error (%) .....       -0.040

**************************        Volume        Volume
Flow Routing Continuity       hectare-m      10^6 ltr
**************************    ---------      ---------
Dry Weather Inflow .......        0.000         0.000
Wet Weather Inflow .......        5.103        51.032
Groundwater Inflow .......        0.000         0.000
RDII Inflow ..............        0.000         0.000
External Inflow ..........        0.000         0.000
External Outflow .........        4.674        46.743
Flooding Loss ............        0.000         0.004
Evaporation Loss .........        0.000         0.000
Exfiltration Loss ........        0.433         4.330
Initial Stored Volume ....        0.007         0.070
Final Stored Volume ......        0.001         0.009
Continuity Error (%) .....        0.029

***************************
Time-Step Critical Elements
***************************
Link C23 (2.44%)

********************************
Highest Flow Instability Indexes
********************************
Link W4 (1)

*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     0.37 sec
Average Time Step           :     0.99 sec
Maximum Time Step           :     1.00 sec
Percent in Steady State     :    -0.00
Average Iterations per Step :     2.02
Percent Not Converging      :     0.09

****************************
Subcatchment Runoff Summary
****************************
```

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
A10	86.61	0.00	0.00	14.57	70.66	6.77	70.66	0.95	0.60	0.816
A20	86.61	0.00	0.00	20.58	64.67	9.30	64.67	1.03	0.63	0.747
A30	86.61	0.00	0.00	26.24	46.89	59.08	59.08	0.51	0.35	0.682
A40	86.61	0.00	0.00	26.24	46.89	59.08	59.08	0.61	0.42	0.682
A50	86.61	0.00	0.00	23.90	50.30	61.42	61.42	0.54	0.37	0.709
A60	86.61	0.00	0.00	27.83	46.84	34.00	57.42	2.07	0.78	0.663
A70	86.61	0.00	0.00	27.10	46.85	58.17	58.17	1.15	0.51	0.672

A80	86.61	0.00	0.00	59.19	0.00	26.18	26.18	0.56	0.15	0.302
A90.1	86.61	0.00	0.00	20.74	55.38	36.83	64.52	0.37	0.21	0.745
A90.2	86.61	0.00	0.00	29.61	42.61	34.38	55.68	0.18	0.09	0.643
B10	86.61	0.00	0.00	26.24	46.89	59.08	59.08	0.37	0.25	0.682
B20	86.61	0.00	0.00	26.24	46.89	59.08	59.08	0.37	0.25	0.682
B30	86.61	0.00	0.00	26.24	46.89	59.08	59.08	0.62	0.42	0.682
B40	86.61	0.00	0.00	31.14	42.58	32.83	54.12	2.28	0.80	0.625
EXT10	86.61	0.00	0.00	28.70	46.83	33.11	56.53	11.32	3.74	0.653
EXT20	86.61	0.00	0.00	28.92	46.83	32.89	56.31	14.53	4.68	0.650
EXT30	86.61	0.00	0.00	18.34	58.94	11.54	66.90	2.17	1.29	0.772
EXT40	86.61	0.00	0.00	12.83	66.19	8.51	72.40	0.93	0.60	0.836
EXT50	86.61	0.00	0.00	26.11	46.89	59.24	59.24	0.43	0.30	0.684
EXT60	86.61	0.00	0.00	29.60	42.61	55.71	55.71	0.27	0.15	0.643
EXT70	86.61	0.00	0.00	26.02	46.90	59.31	59.31	0.53	0.38	0.685
EXT80	86.61	0.00	0.00	28.37	56.88	10.04	56.88	9.25	5.13	0.657

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Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.09	2.91	255.97	0 01:25	2.91
J10	JUNCTION	0.10	2.90	255.60	0 01:25	2.90
J11	JUNCTION	0.10	3.89	256.37	0 01:07	2.82
J12	JUNCTION	0.17	3.82	255.00	0 01:05	3.17
J13	JUNCTION	0.08	3.62	256.87	0 01:10	3.62
J14	JUNCTION	0.09	2.99	255.99	0 01:06	2.94
J15	JUNCTION	0.00	0.17	254.17	0 01:28	0.17
J16	JUNCTION	0.15	2.96	254.00	0 01:05	2.41
J17	JUNCTION	0.15	2.99	253.89	0 01:06	1.88
J18	JUNCTION	0.09	3.96	257.21	0 01:24	3.96
J19	JUNCTION	0.00	0.03	256.53	0 01:38	0.03
J2	JUNCTION	0.05	3.46	258.28	0 01:12	3.46
J20	JUNCTION	0.07	3.91	256.51	0 01:06	2.55
J21	JUNCTION	0.05	2.82	256.28	0 01:22	2.82
J22	JUNCTION	0.05	2.88	256.51	0 01:21	2.88
J23	JUNCTION	0.06	4.07	257.72	0 01:11	4.07
J3	JUNCTION	0.08	3.93	256.21	0 01:07	2.72
J4	JUNCTION	0.06	4.72	260.18	0 01:11	4.72
J5	JUNCTION	0.05	3.05	257.36	0 01:21	3.05
J6	JUNCTION	0.12	4.69	257.70	0 01:10	4.69
J7	JUNCTION	0.16	3.17	257.14	0 01:21	3.17
J8	JUNCTION	0.11	4.71	256.39	0 01:06	3.01
J9	JUNCTION	0.11	3.62	256.43	0 01:07	3.00
DorchesterCreek	OUTFALL	0.00	0.00	253.90	0 00:00	0.00
Ex.Ditch	OUTFALL	0.00	0.00	255.30	0 00:00	0.00
Ex.Major	OUTFALL	0.00	0.00	255.50	0 00:00	0.00
Ex.Sewer	OUTFALL	0.08	1.17	252.04	0 01:25	1.17
Comm.Storage	STORAGE	0.26	3.41	258.02	0 02:10	3.41
Ex.Storage	STORAGE	0.13	2.77	257.59	0 01:20	2.77
Ex.SWMF	STORAGE	0.09	1.33	256.23	0 01:31	1.33
MedDensStorage	STORAGE	0.25	2.55	257.16	0 01:38	2.55
ROW1	STORAGE	0.03	1.15	256.75	0 01:28	1.15
ROW2	STORAGE	0.01	0.63	257.23	0 01:22	0.63
RY-1	STORAGE	0.02	0.28	257.28	0 01:49	0.28
RY-2	STORAGE	0.02	0.30	257.30	0 01:48	0.30
RY-3	STORAGE	0.02	0.26	0.26	0 01:46	0.26
RY-4	STORAGE	0.02	0.25	258.13	0 01:46	0.25
RY-5	STORAGE	0.03	0.38	256.38	0 01:21	0.38
RY-6	STORAGE	0.02	0.44	257.55	0 01:21	0.44
RY-7	STORAGE	0.04	0.41	257.41	0 02:26	0.41

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Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
J1	JUNCTION	0.000	2.200	0 02:11	0	20.7	-0.069
J10	JUNCTION	0.000	2.948	0 01:51	0	25.8	0.049
J11	JUNCTION	0.000	2.948	0 01:51	0	25.8	0.066
J12	JUNCTION	0.000	4.945	0 01:25	0	38.7	0.024
J13	JUNCTION	4.678	4.678	0 01:10	14.5	14.5	0.152
J14	JUNCTION	0.000	2.174	0 01:06	0	12.8	0.001
J15	JUNCTION	0.000	1.233	0 01:28	0	1.32	0.010
J16	JUNCTION	0.000	4.945	0 01:25	0	38.7	0.012
J17	JUNCTION	0.000	4.945	0 01:25	0	38.7	-0.005
J18	JUNCTION	0.779	1.740	0 01:20	2.07	3.7	-0.248
J19	JUNCTION	0.000	0.097	0 01:38	0	0.139	-0.001
J2	JUNCTION	0.000	2.582	0 01:06	0	11.2	-0.022
J20	JUNCTION	0.090	2.240	0 01:06	0.178	12.9	-0.056
J21	JUNCTION	0.000	2.162	0 01:06	0	10.9	-0.052
J22	JUNCTION	0.000	2.174	0 01:06	0	10.9	0.068
J23	JUNCTION	0.213	0.213	0 01:10	0.368	0.37	0.035
J3	JUNCTION	0.000	2.948	0 01:51	0	25.8	0.003
J4	JUNCTION	3.741	3.741	0 01:10	11.3	11.3	0.126
J5	JUNCTION	0.000	2.097	0 01:06	0	10.5	-0.048
J6	JUNCTION	1.104	1.104	0 01:10	2.71	2.71	0.003
J7	JUNCTION	0.000	2.095	0 01:06	0	10.5	-0.674
J8	JUNCTION	0.000	2.948	0 01:51	0	25.8	-0.049
J9	JUNCTION	0.000	2.418	0 01:50	0	22.6	-0.006
DorchesterCreek	OUTFALL	0.149	1.385	0 01:28	0.555	1.87	0.000
Ex.Ditch	OUTFALL	1.431	1.431	0 01:10	2.44	2.58	0.000
Ex.Major	OUTFALL	0.000	1.980	0 01:31	0	3.57	0.000

Ex.Sewer	OUTFALL	0.000	4.945	0 01:25	0	38.7	0.000
Comm.Storage	STORAGE	0.605	0.616	0 01:10	0.947	0.964	0.026
Ex.Storage	STORAGE	0.602	0.649	0 01:10	0.934	1.03	-0.001
Ex.SWMF	STORAGE	5.132	8.055	0 01:10	9.25	12.3	0.001
MedDensStorage	STORAGE	0.627	0.638	0 01:10	1.03	1.05	0.073
ROW1	STORAGE	0.000	1.377	0 01:24	0	2.24	0.005
ROW2	STORAGE	0.000	0.759	0 01:09	0	0.836	0.004
RY-1	STORAGE	0.418	0.418	0 01:10	0.614	0.614	0.020
RY-2	STORAGE	0.374	0.374	0 01:10	0.541	0.541	0.019
RY-3	STORAGE	0.253	0.253	0 01:10	0.372	0.372	0.019
RY-4	STORAGE	0.249	0.249	0 01:10	0.366	0.366	0.019
RY-5	STORAGE	0.803	0.803	0 01:10	1.15	1.15	0.018
RY-6	STORAGE	0.349	1.748	0 01:12	0.514	2.02	-0.687
RY-7	STORAGE	0.505	0.505	0 01:12	1.15	1.15	0.015

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
J10	JUNCTION	1.20	1.535	0.665
J11	JUNCTION	1.20	2.515	0.000
J12	JUNCTION	1.40	2.177	0.000
J14	JUNCTION	1.03	1.984	0.814
J16	JUNCTION	1.42	1.556	0.000
J17	JUNCTION	1.29	1.588	0.114
J20	JUNCTION	1.09	2.882	0.000
J21	JUNCTION	0.92	1.798	1.252
J22	JUNCTION	0.82	1.563	1.191
J3	JUNCTION	1.19	2.560	0.000
J5	JUNCTION	0.89	2.127	0.436
J7	JUNCTION	0.92	2.092	0.643
J8	JUNCTION	1.39	3.335	0.000
J9	JUNCTION	1.21	2.245	0.000

****
Node Flooding Summary
****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate CMS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
J11	0.01	0.528	0 01:07	0.001	0.000
J12	0.01	0.602	0 01:05	0.001	0.000
J16	0.01	0.394	0 01:05	0.000	0.000
J20	0.01	0.313	0 01:06	0.000	0.000
J3	0.01	0.530	0 01:07	0.001	0.000
J8	0.01	1.044	0 01:06	0.002	0.000
J9	0.01	0.391	0 01:07	0.000	0.000

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Comm.Storage	0.187	22	0	0	0.851	100	0 02:10	0.038
Ex.Storage	0.020	4	0	26	0.420	87	0 01:20	0.320
Ex.SWMF	0.413	6	0	0	7.046	94	0 01:31	2.150
MedDensStorage	0.170	21	0	0	0.801	100	0 01:38	0.113
ROW1	0.016	2	0	0	0.776	84	0 01:28	1.253
ROW2	0.006	1	0	0	0.354	74	0 01:22	0.380
RY-1	0.018	1	0	100	0.368	29	0 01:49	0.054
RY-2	0.017	2	0	100	0.330	34	0 01:48	0.045
RY-3	0.010	3	0	100	0.218	73	0 01:46	0.034
RY-4	0.010	1	0	100	0.214	18	0 01:46	0.034
RY-5	0.021	2	0	52	0.476	40	0 01:21	0.325
RY-6	0.015	2	0	21	0.479	53	0 01:21	1.171
RY-7	0.055	3	0	100	0.740	46	0 02:26	0.067

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
DorchesterCreek	5.08	0.146	1.385	1.874
Ex.Ditch	12.50	0.085	1.431	2.579
Ex.Major	1.42	0.968	1.980	3.575
Ex.Sewer	99.95	0.167	4.945	38.716
System	29.74	1.366	4.945	46.743

****

Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	2.582	0 01:06	4.06	1.86	1.00
C10	CONDUIT	2.418	0 01:51	1.89	1.51	1.00
C11	CONDUIT	2.948	0 01:51	2.27	1.25	1.00
C12	CONDUIT	2.948	0 01:51	2.40	1.31	1.00
C14	CONDUIT	4.945	0 01:25	3.45	3.18	1.00
C16	CONDUIT	1.750	0 01:02	1.88	0.70	1.00
C17	CONDUIT	4.945	0 01:25	3.45	2.64	1.00
C18	CONDUIT	4.945	0 01:25	3.56	5.19	0.93
C19	CONDUIT	2.197	0 01:07	2.94	0.82	1.00
C2	CONDUIT	2.214	0 02:12	1.69	0.87	1.00
C20	CONDUIT	2.174	0 01:06	2.96	1.66	1.00
C21	CONDUIT	2.161	0 01:06	3.88	0.96	1.00
C22	CONDUIT	2.162	0 01:06	2.94	1.48	1.00
C23	CONDUIT	0.080	0 00:00	0.71	0.19	1.00
C24	CONDUIT	0.094	0 01:11	0.20	0.02	0.37
C3	CONDUIT	2.948	0 01:51	2.43	0.73	1.00
C4	CONDUIT	2.094	0 01:06	2.80	2.76	1.00
C5	CONDUIT	2.097	0 01:06	3.30	1.50	1.00
C6	CONDUIT	2.095	0 01:06	3.29	1.01	1.00
C9	CONDUIT	2.948	0 01:51	2.06	1.30	1.00
W1	CONDUIT	0.795	0 01:11	1.21	0.70	0.85
W9	CONDUIT	1.125	0 01:21	0.71	0.28	0.58
OL1	ORIFICE	0.023	0 02:10			1.00
OL2	ORIFICE	0.020	0 01:54			1.00
OR1	ORIFICE	0.050	0 02:12			1.00
OR2	ORIFICE	0.204	0 01:28			1.00
OR3	ORIFICE	0.140	0 01:22			1.00
C15	WEIR	0.294	0 01:13			0.42
C7	WEIR	0.439	0 01:12			0.30
W10	WEIR	0.000	0 00:00			0.00
W11	WEIR	2.925	0 01:10			0.76
W12	WEIR	0.000	0 00:00			0.00
W13	WEIR	0.759	0 01:09			0.64
W14	WEIR	0.015	0 02:10			0.05
W15	WEIR	0.097	0 01:38			0.16
W16	WEIR	0.112	0 01:38			0.11
W17	WEIR	0.000	0 00:00			0.00
W18	WEIR	0.001	0 01:48			0.01
W2	WEIR	1.980	0 01:31			0.77
W3	WEIR	0.271	0 01:21			0.26
W4	WEIR	1.237	0 01:28			0.17
W5	WEIR	1.377	0 01:24			0.70
W6	WEIR	0.000	0 00:00			0.00
W7	WEIR	0.239	0 01:22			0.42
W8	WEIR	1.049	0 01:28			0.50
C13	DUMMY	0.433	0 01:02			
C8	DUMMY	0.298	0 01:02			
Ex.SWMOutlet	DUMMY	1.005	0 02:11			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
		Fraction of Time in Flow Class								
C1	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
C10	1.00	0.00	0.00	0.00	0.31	0.00	0.00	0.69	0.00	0.00
C11	1.00	0.00	0.00	0.00	0.25	0.00	0.00	0.75	0.00	0.00
C12	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.00	0.00
C14	1.00	0.00	0.00	0.00	0.12	0.00	0.00	0.88	0.00	0.00
C16	1.00	0.00	0.00	0.00	0.31	0.00	0.00	0.69	0.20	0.00
C17	1.00	0.00	0.00	0.00	0.56	0.00	0.00	0.44	0.00	0.00
C18	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C19	1.00	0.00	0.00	0.00	0.87	0.09	0.00	0.04	0.84	0.00
C2	1.00	0.00	0.00	0.00	0.31	0.00	0.00	0.69	0.27	0.00
C20	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.00	0.00
C21	1.00	0.00	0.00	0.00	0.51	0.06	0.00	0.44	0.52	0.00
C22	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
C23	1.00	0.00	0.25	0.00	0.75	0.00	0.00	0.00	0.64	0.00
C24	1.00	0.98	0.01	0.00	0.01	0.00	0.00	0.00	0.99	0.00
C3	1.00	0.00	0.00	0.00	0.07	0.18	0.00	0.74	0.12	0.00
C4	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
C5	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
C6	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.96	0.00
C9	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.96	0.00	0.00
W1	1.00	0.99	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
W9	1.00	0.97	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.00

****
Conduit Surcharge Summary
****

Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C1	0.85	0.86	0.88	0.80	0.78
C10	1.20	1.22	1.20	1.59	1.19
C11	1.19	1.20	1.20	1.33	1.18
C12	1.19	1.21	1.19	1.37	1.18

C14	1.42	1.55	1.42	2.14	1.42
C16	1.14	1.22	1.17	0.01	0.77
C17	1.29	1.46	1.29	2.00	1.29
C18	0.01	1.36	0.01	2.66	0.01
C19	1.12	1.12	2.04	0.01	0.01
C2	1.17	1.17	1.21	0.01	0.01
C20	1.02	1.04	1.09	0.95	0.91
C21	0.93	0.93	1.03	0.01	0.01
C22	0.92	0.92	0.92	0.82	0.79
C23	1.26	1.27	1.33	0.01	0.55
C3	1.20	1.20	1.39	0.01	0.01
C4	0.82	0.92	0.82	1.40	0.82
C5	0.88	0.88	0.89	0.85	0.83
C6	0.90	0.90	0.96	0.01	0.02
C9	1.40	1.40	1.40	1.37	1.37

Analysis begun on: Tue Jun 16 15:51:16 2020
Analysis ended on: Tue Jun 16 15:51:27 2020
Total elapsed time: 00:00:11

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.013)
--------------------------------------------------------------

*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 04/01/2005 00:00:00
Ending Date .............. 04/04/2005 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 1
Head Tolerance ........... 0.001500 m


**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......        10.209       114.013
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         2.724        30.425
Surface Runoff ...........         7.362        82.223
Final Storage ............         0.125         1.396
Continuity Error (%) .....        -0.029


**************************        Volume         Volume
Flow Routing Continuity        hectare-m       10^6 ltr
**************************     ---------      ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         7.363        73.626
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         6.767        67.674
Flooding Loss ............         0.001         0.006
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.601         6.013
Initial Stored Volume ....         0.007         0.070
Final Stored Volume ......         0.002         0.016
Continuity Error (%) .....        -0.017


***************************
Time-Step Critical Elements
***************************
Link C23 (3.59%)


********************************
Highest Flow Instability Indexes
********************************
Link Ex.SWMOutlet (1)
Link W13 (1)
Link W4 (1)
Link C23 (1)


*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     0.99 sec
Maximum Time Step           :     1.00 sec
Percent in Steady State     :    -0.00
Average Iterations per Step :     2.02
Percent Not Converging      :     0.08


***************************
Subcatchment Runoff Summary
***************************

-----------------------------------------------------------------------------------------------------------------
                          Total      Total      Total      Total     Imperv      Perv     Total      Total      Peak  Runoff
                         Precip      Runon       Evap      Infil     Runoff    Runoff    Runoff     Runoff     Runoff   Coeff
Subcatchment                 mm         mm         mm         mm         mm        mm        mm   10^6 ltr       CMS
-----------------------------------------------------------------------------------------------------------------
A10                        114.01       0.00       0.00      16.57      96.05     11.62     96.05       1.29      0.62   0.842
A20                        114.01       0.00       0.00      23.24      89.40     16.22     89.40       1.43      0.65   0.784
A30                        114.01       0.00       0.00      29.83      61.95     82.88     82.88       0.72      0.37   0.727
A40                        114.01       0.00       0.00      29.83      61.95     82.88     82.88       0.86      0.44   0.727
```



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A50                        114.01       0.00       0.00      27.18      66.46     85.53     85.53       0.75      0.39   0.750
A60                        114.01       0.00       0.00      30.19      61.91     51.50     82.46       2.97      0.90   0.723
A70                        114.01       0.00       0.00      30.04      61.92     82.63     82.63       1.63      0.58   0.725
A80                        114.01       0.00       0.00      66.49       0.00     46.26     46.26       0.98      0.22   0.406
A90.1                      114.01       0.00       0.00      23.28      73.18     52.78     89.37       0.51      0.23   0.784
A90.2                      114.01       0.00       0.00      33.25      56.30     51.28     79.43       0.25      0.10   0.697
B10                        114.01       0.00       0.00      29.83      61.95     82.88     82.88       0.52      0.27   0.727
B20                        114.01       0.00       0.00      29.83      61.95     82.88     82.88       0.51      0.26   0.727
B30                        114.01       0.00       0.00      29.83      61.95     82.88     82.88       0.87      0.45   0.727
B40                        114.01       0.00       0.00      33.59      56.28     50.93     79.07       3.34      0.93   0.694
EXT10                      114.01       0.00       0.00      30.38      61.90     51.31     82.26      16.47      4.23   0.722
EXT20                      114.01       0.00       0.00      30.42      61.90     51.26     82.21      21.21      5.26   0.721
EXT30                      114.01       0.00       0.00      20.03      79.19     19.43     92.60       3.00      1.34   0.812
EXT40                      114.01       0.00       0.00      14.25      88.20     13.94     98.37       1.27      0.63   0.863
EXT50                      114.01       0.00       0.00      29.80      61.96     82.93     82.93       0.60      0.32   0.727
EXT60                      114.01       0.00       0.00      33.25      56.31     79.44     79.44       0.39      0.16   0.697
EXT70                      114.01       0.00       0.00      29.78      61.96     82.95     82.95       0.74      0.40   0.728
EXT80                      114.01       0.00       0.00      30.77      81.87     19.97     81.87      13.31      5.21   0.718


******************
Node Depth Summary
******************

-----------------------------------------------------------------------------------------------------------
                                  Average  Maximum  Maximum  Time of Max    Reported
                                    Depth    Depth      HGL   Occurrence   Max Depth
Node                 Type          Meters   Meters   Meters  days hr:min      Meters
-----------------------------------------------------------------------------------------------------------
J1                   JUNCTION       0.14     2.98   256.04    0  09:21        2.98
J10                  JUNCTION       0.15     2.97   255.67    0  09:22        2.97
J11                  JUNCTION       0.15     3.89   256.37    0  09:06        2.88
J12                  JUNCTION       0.23     3.82   255.00    0  09:05        3.21
J13                  JUNCTION       0.12     3.65   256.90    0  09:10        3.65
J14                  JUNCTION       0.12     3.06   256.06    0  09:25        3.00
J15                  JUNCTION       0.00     0.25   254.25    0  09:24        0.25
J16                  JUNCTION       0.21     2.96   254.00    0  09:05        2.44
J17                  JUNCTION       0.22     3.08   253.98    0  09:05        1.89
J18                  JUNCTION       0.12     4.03   257.28    0  09:22        4.03
J19                  JUNCTION       0.00     0.05   256.55    0  09:25        0.05
J2                   JUNCTION       0.09     3.53   258.35    0  09:12        3.53
J20                  JUNCTION       0.10     3.91   256.51    0  09:05        2.61
J21                  JUNCTION       0.08     2.93   256.39    0  09:25        2.88
J22                  JUNCTION       0.09     2.99   256.62    0  09:25        2.94
J23                  JUNCTION       0.09     4.08   257.73    0  09:10        4.08
J3                   JUNCTION       0.12     3.93   256.21    0  09:06        2.77
J4                   JUNCTION       0.10     4.85   260.31    0  09:11        4.85
J5                   JUNCTION       0.08     3.12   257.43    0  09:25        3.11
J6                   JUNCTION       0.17     4.72   257.73    0  09:10        4.72
J7                   JUNCTION       0.21     3.24   257.21    0  09:25        3.23
J8                   JUNCTION       0.16     4.71   256.39    0  09:05        3.06
J9                   JUNCTION       0.17     3.62   256.43    0  09:06        3.07
DorchesterCreek      OUTFALL        0.00     0.00   253.90    0  00:00        0.00
Ex.Ditch             OUTFALL        0.00     0.00   255.30    0  00:00        0.00
Ex.Major             OUTFALL        0.00     0.00   255.50    0  00:00        0.00
Ex.Sewer             OUTFALL        0.13     1.17   252.05    0  09:20        1.17
Comm.Storage         STORAGE        0.35     3.44   258.05    0  09:36        3.44
Ex.Storage           STORAGE        0.19     2.80   257.62    0  09:18        2.80
Ex.SWMF              STORAGE        0.12     1.40   256.30    0  09:26        1.40
MedDensStorage       STORAGE        0.34     2.58   257.19    0  09:25        2.57
ROW1                 STORAGE        0.03     1.22   256.82    0  09:25        1.22
ROW2                 STORAGE        0.01     0.68   257.28    0  09:20        0.68
RY-1                 STORAGE        0.03     0.31   257.31    0  09:47        0.31
RY-2                 STORAGE        0.03     0.32   257.32    0  09:36        0.32
RY-3                 STORAGE        0.03     0.29     0.29    0  09:51        0.29
RY-4                 STORAGE        0.03     0.28   258.16    0  09:51        0.28
RY-5                 STORAGE        0.04     0.40   256.40    0  09:18        0.40
RY-6                 STORAGE        0.04     0.48   257.59    0  09:19        0.48
RY-7                 STORAGE        0.07     0.45   257.45    0  10:21        0.45


******************
Node Inflow Summary
******************

-----------------------------------------------------------------------------------------------------------
                                  Maximum  Maximum                    Lateral     Total     Flow
                                  Lateral    Total  Time of Max      Inflow    Inflow  Balance
                                   Inflow   Inflow   Occurrence      Volume    Volume    Error
Node                 Type             CMS      CMS  days hr:min   10^6 ltr   10^6 ltr  Percent
-----------------------------------------------------------------------------------------------------------
J1                   JUNCTION       0.000    2.251    0  09:21          0      29.6   -0.043
J10                  JUNCTION       0.000    2.966    0  09:23          0      36.6   -0.000
J11                  JUNCTION       0.000    2.966    0  09:23          0      36.6    0.053
J12                  JUNCTION       0.000    4.990    0  09:20          0      54.7    0.013
J13                  JUNCTION       5.260    5.260    0  09:10       21.2      21.2    0.101
J14                  JUNCTION       0.000    2.188    0  09:05          0      17.9   -0.004
J15                  JUNCTION       0.000    2.217    0  09:24          0      2.71    0.000
J16                  JUNCTION       0.000    4.990    0  09:20          0      54.7    0.008
J17                  JUNCTION       0.000    4.990    0  09:20          0      54.7   -0.012
J18                  JUNCTION       0.898    2.451    0  09:18       2.97      5.65   -0.197
J19                  JUNCTION       0.000    0.187    0  09:25          0      0.32    0.020
J2                   JUNCTION       0.000    2.634    0  09:05          0      15.9   -0.014
J20                  JUNCTION       0.105    2.266    0  09:05      0.254      18.1   -0.038
J21                  JUNCTION       0.000    2.171    0  09:05          0      15.5   -0.040
J22                  JUNCTION       0.000    2.177    0  09:04          0      15.5    0.047
J23                  JUNCTION       0.230    0.230    0  09:10      0.509     0.513   -3.027
J3                   JUNCTION       0.000    2.966    0  09:24          0      36.5   -0.006
J4                   JUNCTION       4.228    4.228    0  09:10       16.5      16.5    0.123
J5                   JUNCTION       0.000    2.102    0  09:05          0        15   -0.035
J6                   JUNCTION       1.245    1.245    0  09:10       3.93      3.93    0.001
J7                   JUNCTION       0.000    2.096    0  09:05          0        15   -0.473
J8                   JUNCTION       0.000    2.966    0  09:23          0      36.5   -0.021
J9                   JUNCTION       0.000    2.434    0  09:17          0      32.5   -0.005
```

DorchesterCreek	OUTFALL	0.222	2.422	0	09:24	0.981	3.7	0.000
Ex.Ditch	OUTFALL	1.506	1.506	0	09:10	3.39	3.71	0.000
Ex.Major	OUTFALL	0.000	2.904	0	09:26	0	5.59	0.000
Ex.Sewer	OUTFALL	0.000	4.990	0	09:20	0	54.7	0.000
Comm.Storage	STORAGE	0.624	0.635	0	09:10	1.29	1.3	-0.002
Ex.Storage	STORAGE	0.628	0.699	0	09:09	1.27	1.38	-0.001
Ex.SWMF	STORAGE	5.207	8.711	0	09:10	13.3	17.5	0.005
MedDensStorage	STORAGE	0.651	0.661	0	09:10	1.43	1.44	0.001
ROW1	STORAGE	0.000	2.088	0	09:22	0	3.45	0.006
ROW2	STORAGE	0.000	0.922	0	09:10	0	1.08	0.006
RY-1	STORAGE	0.442	0.442	0	09:10	0.862	0.862	0.011
RY-2	STORAGE	0.392	0.392	0	09:10	0.753	0.753	0.011
RY-3	STORAGE	0.268	0.268	0	09:10	0.522	0.522	0.011
RY-4	STORAGE	0.264	0.264	0	09:10	0.514	0.514	0.011
RY-5	STORAGE	0.846	0.846	0	09:10	1.61	1.61	0.009
RY-6	STORAGE	0.370	2.380	0	09:11	0.721	3.07	-0.407
RY-7	STORAGE	0.577	0.577	0	09:11	1.63	1.63	0.009

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
J10	JUNCTION	1.26	1.603	0.597
J11	JUNCTION	1.26	2.515	0.000
J12	JUNCTION	1.46	2.177	0.000
J14	JUNCTION	1.09	2.055	0.743
J16	JUNCTION	1.48	1.556	0.000
J17	JUNCTION	1.35	1.682	0.020
J20	JUNCTION	1.15	2.882	0.000
J21	JUNCTION	0.99	1.910	1.140
J22	JUNCTION	0.88	1.671	1.083
J3	JUNCTION	1.26	2.560	0.000
J4	JUNCTION	0.08	0.078	0.292
J5	JUNCTION	0.95	2.194	0.369
J7	JUNCTION	0.98	2.170	0.565
J8	JUNCTION	1.45	3.335	0.000
J9	JUNCTION	1.28	2.245	0.000

****
Node Flooding Summary
****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate CMS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
J11	0.01	0.559	0 09:06	0.001	0.000
J12	0.01	0.572	0 09:05	0.001	0.000
J16	0.01	0.371	0 09:05	0.001	0.000
J20	0.01	0.322	0 09:05	0.000	0.000
J3	0.01	0.545	0 09:06	0.001	0.000
J8	0.01	1.248	0 09:05	0.003	0.000
J9	0.01	0.431	0 09:06	0.000	0.000

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Storage Volume Summary
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Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Comm.Storage	0.242	28	0	0	0.851	100	0 09:36	0.099
Ex.Storage	0.029	6	0	31	0.425	88	0 09:18	0.461
Ex.SWMF	0.562	8	0	0	7.470	100	0 09:26	3.063
MedDensStorage	0.228	29	0	0	0.801	100	0 09:25	0.201
ROW1	0.018	2	0	0	0.839	91	0 09:25	2.023
ROW2	0.007	1	0	0	0.388	81	0 09:20	0.541
RY-1	0.029	2	0	98	0.450	36	0 09:47	0.050
RY-2	0.024	3	0	91	0.375	39	0 09:36	0.064
RY-3	0.017	6	0	100	0.271	90	0 09:51	0.027
RY-4	0.016	1	0	100	0.267	22	0 09:51	0.027
RY-5	0.034	3	0	54	0.521	43	0 09:18	0.400
RY-6	0.021	2	0	18	0.573	64	0 09:19	1.756
RY-7	0.100	6	0	99	0.930	57	0 10:21	0.055

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
DorchesterCreek	25.58	0.056	2.422	3.695
Ex.Ditch	41.73	0.036	1.506	3.710
Ex.Major	1.60	1.337	2.904	5.594
Ex.Sewer	99.95	0.229	4.990	54.675
System	42.22	1.659	4.990	67.674

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	2.634	0 09:05	4.14	1.90	1.00
C10	CONDUIT	2.434	0 09:17	1.83	1.52	1.00
C11	CONDUIT	2.966	0 09:23	2.24	1.26	1.00
C12	CONDUIT	2.966	0 09:24	2.41	1.31	1.00
C14	CONDUIT	4.990	0 09:20	3.49	3.21	1.00
C16	CONDUIT	1.750	0 09:01	1.83	0.70	1.00
C17	CONDUIT	4.990	0 09:20	3.49	2.67	1.00
C18	CONDUIT	4.990	0 09:20	3.59	5.23	0.93
C19	CONDUIT	2.206	0 09:06	2.95	0.83	1.00
C2	CONDUIT	2.221	0 10:15	1.65	0.88	1.00
C20	CONDUIT	2.190	0 09:05	2.97	1.67	1.00
C21	CONDUIT	2.174	0 09:05	3.88	0.97	1.00
C22	CONDUIT	2.171	0 09:05	2.94	1.48	1.00
C23	CONDUIT	0.080	0 00:00	0.71	0.19	1.00
C24	CONDUIT	0.125	0 09:10	0.29	0.02	0.49
C3	CONDUIT	2.966	0 09:23	2.39	0.73	1.00
C4	CONDUIT	2.097	0 09:04	2.82	2.77	1.00
C5	CONDUIT	2.102	0 09:05	3.30	1.50	1.00
C6	CONDUIT	2.096	0 09:05	3.29	1.01	1.00
C9	CONDUIT	2.966	0 09:23	2.07	1.30	1.00
W1	CONDUIT	1.109	0 09:12	1.33	0.98	0.96
W9	CONDUIT	1.728	0 09:19	0.84	0.43	0.76
OL1	ORIFICE	0.023	0 09:58			1.00
OL2	ORIFICE	0.020	0 09:58			1.00
OR1	ORIFICE	0.050	0 10:14			1.00
OR2	ORIFICE	0.210	0 09:25			1.00
OR3	ORIFICE	0.148	0 09:20			1.00
C15	WEIR	0.448	0 09:11			0.49
C7	WEIR	0.488	0 09:12			0.32
W10	WEIR	0.011	0 10:21			0.02
W11	WEIR	3.507	0 09:10			0.86
W12	WEIR	0.000	0 00:00			0.00
W13	WEIR	0.922	0 09:10			0.73
W14	WEIR	0.081	0 09:36			0.14
W15	WEIR	0.187	0 09:25			0.26
W16	WEIR	0.195	0 09:36			0.16
W17	WEIR	0.010	0 09:47			0.04
W18	WEIR	0.032	0 09:36			0.08
W2	WEIR	2.904	0 09:26			1.00
W3	WEIR	0.366	0 09:18			0.32
W4	WEIR	2.221	0 09:24			0.25
W5	WEIR	2.088	0 09:22			0.93
W6	WEIR	0.091	0 09:21			0.16
W7	WEIR	0.394	0 09:20			0.59
W8	WEIR	1.813	0 09:25			0.73
C13	DUMMY	0.433	0 09:01			
C8	DUMMY	0.298	0 09:01			
Ex.SWMOutlet	DUMMY	1.017	0 10:14			

****
Flow Classification Summary
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Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
C1	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.98	0.00	0.00
C10	1.00	0.00	0.00	0.00	0.53	0.00	0.00	0.47	0.00	0.00
C11	1.00	0.00	0.00	0.00	0.49	0.00	0.00	0.51	0.00	0.00
C12	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.00	0.00
C14	1.00	0.00	0.00	0.00	0.27	0.00	0.00	0.73	0.00	0.00
C16	1.00	0.00	0.00	0.00	0.53	0.00	0.00	0.47	0.37	0.00
C17	1.00	0.00	0.00	0.00	0.74	0.00	0.00	0.26	0.00	0.00
C18	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
C19	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.98	0.00
C2	1.00	0.00	0.00	0.00	0.53	0.00	0.00	0.47	0.47	0.00
C20	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.00	0.00
C21	1.00	0.00	0.00	0.00	0.42	0.25	0.00	0.33	0.62	0.00
C22	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
C23	1.00	0.00	0.24	0.00	0.76	0.00	0.00	0.00	0.58	0.00
C24	1.00	0.98	0.01	0.00	0.01	0.00	0.00	0.00	0.87	0.00
C3	1.00	0.00	0.00	0.00	0.07	0.42	0.00	0.50	0.32	0.00
C4	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
C5	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
C6	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.95	0.00
C9	1.00	0.00	0.00	0.00	0.05	0.00	0.00	0.95	0.00	0.00
W1	1.00	0.99	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
W9	1.00	0.97	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.00

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Conduit Surcharge Summary
****

Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited

C1	0.91	0.92	0.94	0.86	0.84
C10	1.26	1.28	1.26	1.65	1.26
C11	1.26	1.27	1.26	1.39	1.25
C12	1.26	1.27	1.26	1.43	1.24
C14	1.48	1.61	1.48	2.38	1.48
C16	1.21	1.28	1.24	0.01	0.84
C17	1.35	1.52	1.35	2.07	1.35
C18	0.01	1.42	0.01	3.45	0.01
C19	1.18	1.18	2.16	0.01	0.01
C2	1.24	1.24	1.28	0.01	0.01
C20	1.09	1.11	1.15	1.01	0.98
C21	0.99	0.99	1.09	0.01	0.01
C22	0.98	0.98	0.99	0.88	0.85
C23	1.31	1.32	1.38	0.01	0.56
C3	1.27	1.27	1.45	0.01	0.01
C4	0.88	0.98	0.88	1.45	0.88
C5	0.94	0.94	0.95	0.91	0.89
C6	0.96	0.96	1.02	0.01	0.02
C9	1.46	1.46	1.46	1.44	1.43
W1	0.01	0.08	0.01	0.01	0.01

```
Analysis begun on:  Tue Jun 16 15:52:14 2020
Analysis ended on:  Tue Jun 16 15:52:26 2020
Total elapsed time: 00:00:12
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AECOM Imagine it. Delivered.

Appendix F

Water Balance

AECOM

Month (-)	Average Monthy Temp (°C)	Heat Index (-)	Potential ET (mm)	Daylight Correction Value (-)	Adjusted ET (mm)	Total Precipitation (mm)	Surplus (mm)	Deficit (mm)
Jan	-5.6	0	0	0.78	0	74.2	74.2	
Feb	-4.5	0	0	0.88	0	65.5	65.5	
Mar	-0.1	0	0	0.99	0.0	71.5	71.5	
Apr	6.8	1.6	30.2	1.12	33.7	83.4	49.7	
May	13.1	4.3	62.2	1.22	75.9	89.8	13.9	-13.9
Jun	18.3	7.1	89.9	1.28	91.7	91.7	0.0	0.0
Jul	20.8	8.7	103.6	1.25	82.7	82.7	0.0	0.0
Aug	19.7	8.0	97.5	1.16	82.9	82.9	0.0	0.0
Sep	15.5	5.5	74.9	1.05	78.6	103.0	24.4	-24.4
Oct	9.2	2.5	42.1	0.92	38.8	81.3	42.5	-42.5
Nov	3.4	0.6	14.0	0.81	11.4	98.0	86.6	-86.6
Dec	-2.6	0.0	-	0.75	0	87.5	87.5	
Totals		38.3			496	1,012	516	-167
	a	1.10						
					Total Water Surplus	516		

1. Average London, ON monthly temperature and precipitation from Canadian Climate Normals (Government of Canada) from 1981-2010.

2. Daylight correction values from Thornthwaite's Equation for estimating potential evapotranspiration (Hydrology: An Environmental Approach, I. Watson & A.D. Burnett)

$PET\ (m) = 0.63(10T/I)^a$

Where $a = 6.751x10^{-7}(I^3) - 7.71x10^{-5}(I^2) + 1.792x10^{-2}(I) + 0.49239$

And I is the sum of the i values for the year,

Where $i = (T/5)^{1.514}$

Latitude correction for daylight hours

$(24\cos^{-1}(-\tan(LT/180)\tan(0.4093\sin(2\Pi(int(30.4m-15))(365-1.39)))/12\Pi$

Where L is latitude, and m is month number (1 to 12).

Topography	Flat Land, average slope < 0.6 m/km	0.3
	Rolling Land, average slope 2.8 m to 3.8 m/km	0.2
	Hilly Land, average slope 28 m to 47 m/km	0.1
Soils	Tight impervious clay	0.1
	Medium combinations of clay and loam	0.2
	Open Sandy loam	0.4
Cover	Cultivated Land	0.1
	Woodland	0.2

Infiltration Factors	Pervious	Impervious	Outputs		
Topography Infiltration Factor	0.15	0.15	Precipitation Surplus	516	mm/year
Soil Infiltration Factor	0.40	0.40	Net Surplus	516	mm/year
Land Cover Infiltration Factor	0.10	0.10	Evapotranspiration	496	mm/year
MOE Infiltration Factor	0.65	0.00	Infiltration	335	mm/year
Runoff Coefficient	0.35	1.00	Runoff	181	mm/year
Runoff from Impervious Surfaces	0.00	0.80	Total Outputs	1,012	mm/year

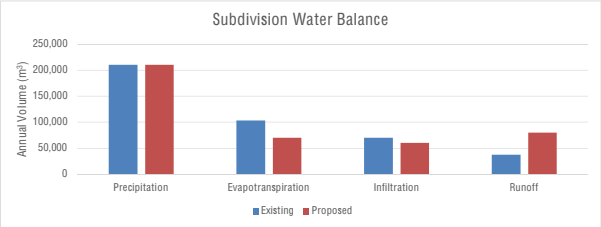
Existing Conditions

	Catchments (ID)	Area (ha)		Land Use	Area (ha)	Annual Water Balance Precipitation (mm)	Evapotranspiration (mm)	Infiltration (mm)	Runoff (mm)
Subject Property	A1	15.55	Impervious	Existing Field	0	1,012	0	0	1,012
			Pervious		15.55	1,012	496	335	181
	A2	5.29	Impervious	Existing Field	0	1,012	0	0	1,012
			Pervious		5.29	1,012	496	335	181
Total Subject Property		20.84			20.84	1,012	496	335	181
Total (m^3)						210,800	103,300	69,900	37,600

Proposed Future Conditions

		Area (ha)			Area (ha)	Annual Water Balance Precipitation (mm)	Evapotranspiration (mm)	Infiltration (mm)	Runoff (mm)
Subject Property	A10	1.34	Impervious	Commercial (75% Imperviousness)	1.01	1,012	0	0	1,012
			Pervious		0.34	1,012	496	335	181
	A20	1.60	Impervious	Medium-Density (65% Imperviousness)	1.04	1,012	0	0	1,012
			Pervious		0.56	1,012	496	335	181
	A60, A90.1, A90.2, B40	8.71	Impervious	Subdivision ROW	4.61	1,012	0	0	1,012
			Pervious		4.10	1,012	496	335	181
	A30, A40, A50, A60, A70, B10, B20, B30	7.07	Impervious	Infiltrated Rear-Yards	3.92	1,012	496	516	0
			Pervious		3.15	1,012	496	480	0
	A80	2.12	Impervious	Buffer Area	0.00	1,012	0	0	1,012
			Pervious		2.12	1,012	496	335	181
Total Subject Property		20.84			20.84	1,012	337	290	385
Total (m^3)						210,800	70,300	60,500	80,100

Parameter	Existing Conditions		Proposed Conditions	
	Sewer/Culvert	Dorchester Creek	Sewer/Culvert	Dorchester Creek
	(m^3)		(m^3)	
Rainfall	157,300	53,500	117,900	92,900
Evapotranspiration (1)	103,300		70,300	
Infiltration (2)	69,900		60,500	
Runoff	28,100	9,600	76,300	3,800
Total Discharge	28,100	79,500	76,300	64,300



Notes:

1. Evapotranspiration assumed to be across the subdivision lands.
2. Golder Associates hydrogeology report indicates groundwater discharges to Dorchester Creek.

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