

MMM GROUP

Prepared for: City of Revelstoke

STORMWATER MANAGEMENT PLAN

FINAL STUDY REPORT

Project Ref. 38-15518

October 2016

WSP | MMM GROUP

ACKNOWLEDGEMENTS

The City of Revelstoke would like to acknowledge the support of Columbia Basin Trust.

EXECUTIVE SUMMARY

A Stormwater Management (SWM) Plan has been completed for the City of Revelstoke, which includes; characterization of the study area, the assessment and analysis of existing stormwater management and drainage conditions, and consideration of the effects of climate change on the performance of the existing system. A prioritized capital upgrade plan has been developed based on the findings of the analysis, including cost estimates for the recommended infrastructure upgrade projects, as well as operations and maintenance activities, monitoring, and survey works associated with City storm drainage infrastructure – and the recommended projects have been consolidated into a proposed 10-year implementation schedule.

The existing City storm drainage bylaw has been reviewed and a draft updated bylaw provided (based on the Columbia Basin Trust model bylaw document) consistent with the findings of the study, and discussions with City staff. Recommendations have also been made on a condition assessment program that the City may wish to implement. Finally, options available to the City related to securing reliable sources of funding for an ongoing SWM improvement program have been discussed.

This report represents the final study document, incorporating comments received from the City on previous drafts of the report issued throughout the study process. An overview of the study and the final draft of recommendations were presented for public feedback at the Revelstoke Community Centre on the evening of October 6th, 2016, but no specific comments were received.

Respectfully submitted,

WSP | MMM

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STANDARD LIMITATIONS

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This Standard Limitations statement is considered part of this report.

1.0 INTRODUCTION

WSP | MMM has been retained by the City of Revelstoke to complete a Stormwater Management Plan (SWMP) assignment in accordance with the City's Request for Proposal process (ref. RFP ENG2015-01). WSP | MMM responded to the City RFP in July, 2015 – and were engaged to commence work on the assignment in September, 2015.

The City of Revelstoke is located on the banks of the Columbia River, in the Columbia-Shuswap Regional District in the Province of British Columbia. The population is approximately 7,000 and the City limits cover an area of around 4,700 hectares. Key road and rail routes (the Trans-Canada Highway and the Canadian Pacific Railway) pass through the city, and the Mount Revelstoke National Park is located to the north.

The need for the SWMP study has been prompted in part by climate projections for the Columbia Basin – which indicate the likelihood of warmer, wetter winters and more frequent intense rainfall events – as well as the recognition that the City last completed a Master Drainage Plan in 1973, and that this should be updated in line with current best practices and stormwater management approaches. In particular the City wishes to better understand how stormwater is currently managed and conveyed by existing drainage infrastructure within their jurisdiction, and to identify areas requiring infrastructure upgrades or improvements to minimize flood risk. Full details of the study objectives and scope of the assignment are provided in the following section.

This report is a result of a comprehensive undertaking that has included field work, desktop assessment, and modelling analyses in accordance with the terms of the RFP. It provides a summary of the work completed through to August 2016, and represents the final study document. City comments received on previous drafts of the report issued throughout the study process have been incorporated, and an overview of the study and the final draft of recommendations were presented for public feedback at the Revelstoke Community Centre on the evening of October 6th, 2016.

2.0 SCOPE OF STUDY

2.1 Project Objectives

The following text is reproduced from Schedule A of the RFP and sets out the City expectations for the study regarding project objectives and success criteria.

The City's stormwater systems should, using best management practices, meet the objectives of flood protection recognizing projected climate change impacts, aquatic habitat and water quality protection, conserve human and financial resources and integrate solutions with future development.

Goals, Policies and recommended actions related to Stormwater management in the City's Official Community Plan (OCP), the Integrated Community Sustainability Plan (ICSP) and the City of Revelstoke Climate Adaptation Scanning and Planning Workshop, CBT Communities Adapting to Climate Change Initiative (CACCI), January 3rd, 2012 are listed below:

OCP GOALS

- Environmentally sensitive storm water management and flood control measures replicate and complement natural hydrological systems and functions
- Reduced storm water discharges to water courses and City owned lands
- Protect the water quality and quantity from local water sources, watercourses and ground water flows.

OCP POLICIES

- Develop and implement a Comprehensive Storm Water Management Plan to:
- Minimize impervious surfaces where possible;
- Identify areas to capture, hold and slowly release storm water runoff so runoff is not released directly into the storm sewer system; and
- Promote alternative storm water management practices in new developments where possible.
- Require storm water management plans for all new development and redevelopment proposals and include measures that capture, retain and, when appropriate promote infiltration of storm water runoff on-site during major storm events. Encourage rain water and snow run-of retention by property owners so that it is used for irrigation and outdoor washing.
- Utilize green infrastructure to provide a natural filtration system, decreasing pollutant discharge and decreasing long term maintenance cost of the storm water system

ICSP – RESILIENT INFRASTRUCTURE – WATER SERVICES

- 4.2.1 Develop and implement an integrated storm water management plan and/or drainage bylaw

CLIMATE ADAPTATION SCANNING AND PLANNING WORKSHOP, CBT COMMUNITIES ADAPTING TO CLIMATE CHANGE INITIATIVE, JANUARY 3RD, 2012

- The report indicated there is a need to assess current and planned infrastructure for stormwater management and make a plan for routine maintenance and capital upgrades that takes climate change impacts into account.

2.2 Scope

The following scope items are included in Schedule A of the RFP document.

1. Develop a master drainage study for the City utilizing GIS data of existing assets and a digital elevation model which consolidates existing studies and considers projected climate change impacts.
2. Identify areas where drainage improvements are required and recommend methodologies consistent with the goals and policies listed above.
3. Review existing stormwater infrastructure and identify areas of high priority for asset management and capital project purposes. Example criteria include:
    a. Mitigating risk of flooding
    b. Conduit or open channel capacity constraints
    c. Known conduit condition issues or age.
    d. Filling in missing links in the network.
4. Based on current land use, identify areas of higher point and non-point contamination and recommend methodology, using best management practices, to improve storm water and stream quality.
5. Develop a storm water drainage bylaw, which recognizes water as a resource and is consistent with OCP polices above.
6. Review the existing Subdivision Servicing Bylaw and make recommendations for drainage design criteria for subdivision servicing, which is consistent with the OCP polices and regulation and factors climate change.
7. Consideration of a stormwater utility with example rate options to address long-term sustainability of stormwater assets.
8. Stormwater infrastructure condition assessment ratings and performance inspections for culverts, pipes, catchbasins, manholes, ditches and swales.
9. Public consultation on proposed priorities, and recommendations through the project.
10. Presentation to committees and council through the project.

3.0 STUDY PROCESS

The study process follows the logical framework of the British Columbia Integrated Stormwater Management Planning (ISMP) document, specifically the ISMP Building Blocks (as shown in Figure 3.1). This process indicates the starting point emerging from understanding the expectations of the community, in addition to legislative initiatives (e.g. Revelstoke OCP and ICSP documents). Following that is how to integrate the objectives and scope, including the scale of the study into the analysis of the stormwater system, including stormwater quantity and quality and relevant hydrologic and hydraulic processes. Finally, the output will incorporate a Stormwater Management Plan tailored to the objectives, problems and opportunities within the study area.

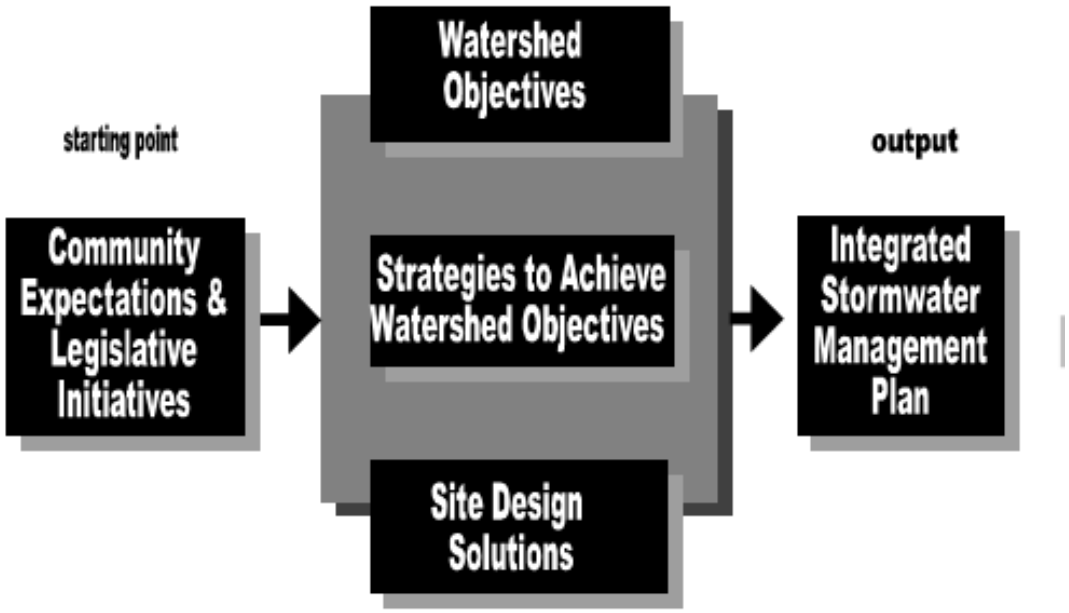


Figure 3.1 ISMP Building Blocks (Source: Stormwater Planning: A Guidebook for BC – Part C – Moving from Planning to Action, Figure 9-2)

3.1 Problem Statement

As part of the impact of urban development, pervious land surfaces are converted to impervious surfaces. Runoff from impervious surfaces, including buildings, roadways, parking surfaces etc. reduce the volume of precipitation lost to the natural hydrologic pathways such as infiltration and evapotranspiration.

As a result, the following environmental impacts are generally observed:

- Runoff volumes and peak flows are increased following precipitation events;
- Hydrologic response times to precipitation events are reduced;

- Base flow conditions are impaired, and groundwater recharge is reduced; and
- The fluvial geomorphic processes of erosion and deposition are altered. Watersheds with significant development are more prone to both erosion and flooding which can lead to degraded riparian habitat and infrastructure damage.

The following figure illustrates representative changes in the proportion of precipitation entering different flow pathways, when land use changes from native vegetation to an urban landscape. In general, for a given storm event, the total volume of stormwater runoff reaching a stream increases 3 to 5 fold compared to rural or forested watersheds, accompanied with an increase in magnitude and duration of peak runoff and a significant decrease (greater than 50%) in infiltration.

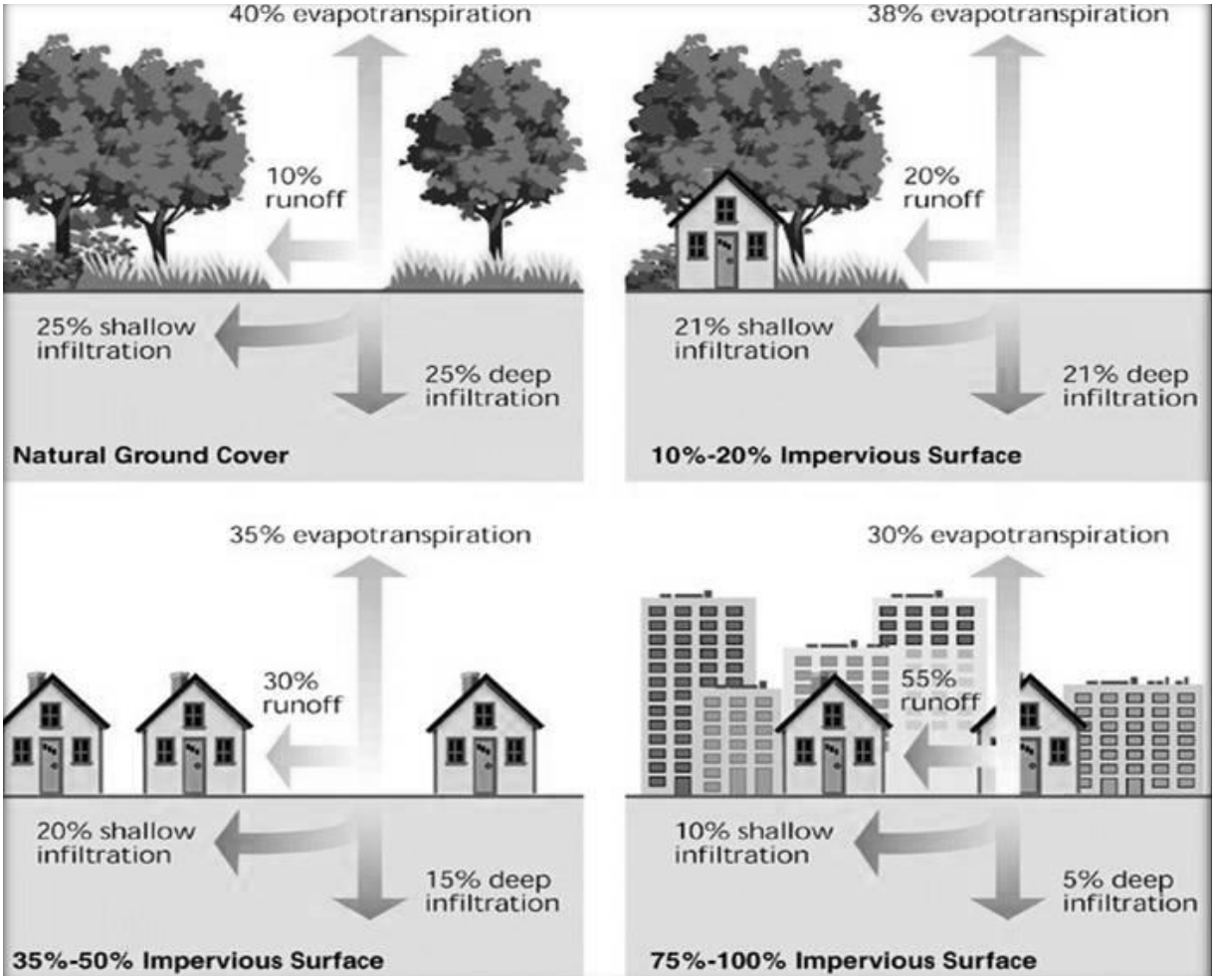


Figure 3.2 – Impact of Urban Development on Water Balance (source: Stream Corridor Restoration Principles, Process and Practices – FIFWG, 1998)

Implications of these impacts include the following areas of concern:

- Water Balance - The increase in impervious surfaces within the new development areas will result in the reduction in infiltration and evapotranspiration due to the reduction in permeable surfaces and natural soil and vegetation cover. Reduction in baseflow contribution to watercourses is also anticipated with specific concern in headwater and first order reaches;
- Water Quality – impacts are anticipated as a result of increasing imperviousness, and changing landuse types. Among expected changes are:
  - Changes in pollutant loadings: including phosphorus loadings, and Total Suspended Sediment loading, and
  - Changes in thermal regime in receiving watercourses, consequently affecting cool water fish species;
- Water Quantity – impacts associated with increased volumes and flow rates of stormwater discharge, including:
  - Flooding – larger runoff volumes and increased peak flows are anticipated as pervious land surfaces are converted to impervious surfaces.
  - Erosion – without mitigation, the fluvial geomorphic processes of erosion and deposition will be altered and increased rates of erosion can be anticipated.

In Revelstoke, specific concerns relate to the condition and conveyance capacity of existing storm drainage infrastructure – particularly where this infrastructure is relied upon to drain natural streams and watercourses (originating in external upstream catchments) through the developed urban areas within the City. Future increases in rainfall intensity and frequency of storm events as a result of climate change will add further stress to the existing storm drainage system.

3.2 Opportunities

Based on background review and discussions with City staff and relevant stakeholders, it is understood that the expectations of the community and legislative initiatives include the following:

1. Improving the conveyance of the storm sewer system within the City, including areas with critical importance to flood management such as Pearson St and Wynn St.
2. Characterizing water quality within the study area, primarily non-point source pollution (e.g. Total Suspended Solids)
3. Developing a Stormwater Management Plan that addresses stormwater quantity (and quality) issues
4. Reviewing policy framework and developing a revised stormwater bylaw
5. Providing an implementation schedule for the SWM Plan

3.3 Policy and Guideline Framework

The following documents provide direction on policy and guidelines related to drainage and stormwater management in the study area.

- City of Revelstoke Official Community Plan (Bylaw No. 1950)
- City of Revelstoke Design Standards – Subdivision, Development and Servicing Bylaw No.1846 (Drainage Standards detailed in Schedule 4, Part 3)
- Stormwater Planning, A Guidebook for British Columbia (BC Ministry of Water, Land and Air Protection, 2002)
- Climate Extremes in the Canadian Columbia Basin: A Preliminary Assessment (Pacific Climate Impacts Consortium, PCIC, 2013)
- Climate Extremes in the Canadian Columbia Basin: Summary Document (Pacific Climate Impacts Consortium, PCIC, 2013)
- City of Revelstoke Storm Drainage Report (Strong Lamb and Nelson Ltd., 1973)

4.0 EXISTING CONDITIONS

4.1 Characterization of Study Area

This chapter focuses on the characterization of the City of Revelstoke study area. The context for the characterization is discussed in terms of the location of the study area within watersheds and key environmental features. Key environmental functions and processes are discussed. Subsequently, a characterization of the existing stormwater drainage infrastructure system, with analysis of performance and functionality of the system in terms of drainage area and design basis, is provided.

4.1.1 Topography and Landuse

The topography of the study area is characterized by relatively flat table lands immediately adjacent to the Columbia River, with steeply sloping forested areas rising above that. The majority of the urban development is within the table lands.

The density of development is highest in the downtown area and typically reduces with distance from the core, as landuse shifts from commercial/business purposes to residential, and other lower imperviousness uses. **Drawing 1** presents the current landuse designations for the City.

4.1.2 Watershed Context

The Columbia River runs through the City of Revelstoke in a southerly direction. It is approximately 250 m wide at the location of the bridge crossings in the north-west part of the City, widening to more than 500 m at the meander further to the south. The Illecillewaet River flows in a westerly direction to a confluence point with the Columbia River south of the downtown Revelstoke area.

The Revelstoke Dam – owned and operated as a hydroelectric generation facility by BC Hydro – is located on the Columbia River around 5 km upstream of Revelstoke.

All areas within the City limits ultimately drain to the Columbia River, either via the Illecillewaet or directly into the Columbia itself. Over time the natural drainage paths formed by creeks and watercourses running down from the hillside areas and through the table lands have been disrupted by urban development. In a number of locations these natural streams have been placed underground and continue to flow as part of the storm drainage infrastructure system. In particular this arrangement has been identified in the pipe systems along Pearson Street, Wynn Street, and Campbell Avenue.

It is noted that several areas of the Town are currently protected from high river water levels by manmade dyke systems, with flood pump controls to discharge water into the river during high water periods. These features are in place on the west bank of the Columbia River to protect the Big Eddy neighbourhood, and

on the north bank of the Illecillewaet to protect the low lying development areas in the Southside area. It is understood that the system of dykes and pumps are owned and operated by BC Hydro.

Drawing 2 illustrates the Surface Water Features within the City, and **Drawing 3** shows the Floodplain and Environmental Features.

It can be seen, through reference to the above noted drawings, that although most of the developed areas within Revelstoke are situated close to large natural watercourses, the vast majority of land is located outside of flood plain areas. This can be attributed to the fact that the downtown core and surrounding neighbourhoods have been constructed on table land that is elevated above normal river levels, providing natural protection from riverine flooding. The two exceptions to this are the Big Eddy and Southside areas which, as previously mentioned, are protected from high water levels by dykes and flood pumps.

4.1.3 Existing Storm Drainage Infrastructure

As noted in the RFP document the City currently provides an underground storm drainage system in the more developed parts of the City, including Farewell, Downtown, Southside, and some parts of Columbia Park. Open drainage ditches are generally used in areas of Arrow Heights and the Big Eddy.

Drawing 4 presents an overview of the existing storm sewer drainage system, with pipes colour-coded according to diameter, and with drainage catchments indicated for each outfall location.

WSP | MMM were provided with GIS records of the storm existing storm network, along with other supporting GIS map-based data – including a digital elevation model (DEM), current landuse designations, catchment areas, environmental features, and more – to support the analyses required for the study. The use of this information, and the data gap analysis process required to resolve some issues identified in records of the current drainage system, is discussed in detail in the following section.

The following tables provide a summary of the quantities of drainage infrastructure elements, based on review of GIS data provided. It is understood that updates to the City GIS database are ongoing – the quantities below are based on GIS files provided in June 2016.

Table 4.1 Existing Storm Drainage Infrastructure

ELEMENT (GIS Asset Type)	COUNT
Drainage POINT Features:	
Manholes	386 no.
Catchbasins	1,060 no.
Outfalls	61 no.
Drainage LINE Features:	
Culvert	2,968 m
Ditch	45,400 m
Dry Drain	75 m
Lateral	10,082 m
Main	36,088 m

Table 4.2 Existing Storm Drainage Infrastructure – Drainage Mains by Diameter

DIAMETER RANGE (mm)		COUNT
Minimum	Maximum	
-	300	21,825 m
350	450	7,517 m
500	600	3,704 m
675	900	1,705 m
1050	1200	1,247 m
Unknown Diameters		90 m
TOTAL		**36,088 m**

4.2 Hydrologic and Hydraulic Analysis

4.2.1 Modelling Approach

In order to develop a detailed understanding of the performance of the existing Revelstoke storm drainage system a hydrologic and hydraulic (H&H) model was developed using EPA-SWMM software (version 5.1). This software was selected as it is an industry standard and is well suited to the planning-level type of analysis required for this study. Other proprietary software options were considered – some of which rely on the freely available EPA-SWMM engine to complete the underlying calculations (e.g. PCSWMM) – however, the user interface improvements and graphical presentation improvements offered by the proprietary software options were outweighed by the fact that by selecting EPA-SWMM for the analysis digital modelling files could be provided to the City at the conclusion of the study, which Revelstoke can then develop further in the future without needing to invest in costly user licenses (which can run to several thousand dollars per year for single users). This is considered to be of significant value, as a properly maintained H&H model can be a valuable management tool for infrastructure decision making.

For a planning level study such as this it is considered appropriate for the analysis to focus on the trunk elements of the drainage network, which are typically defined as parts of the system with a pipe diameter of 450 mm or greater. Based on these criteria, and on a review of the general characteristics of the catchment areas associated with each outfall location, the trunk sections of the network were identified as follows (refer to **Drawing 4** for illustration of catchment locations):

- Catchment DRCA3: Drainage channels and pipework in the vicinity of Farrell Road, Track Street, and Long Avenue which drain Brewery Creek across the CPR corridor and Victoria Street, to the large diameter sewers below Pearson Street that drain through the downtown core to the outfall into the Columbia River.
- Catchment DRCA4: Drainage channels and pipework around Track Street which drains runoff from the undeveloped upstream forested areas across the CPR corridor and Victoria Street, to the large diameter sewers below Wynn Street that drain through the downtown core (and via easements across private lands) to the outfall into the Columbia River.
- Catchment DRCA5: Drainage channels and pipework in the vicinity of Mulock Street/MacKenzie Avenue and Track Street which drain Tapping Creek across the CPR corridor and Victoria Street, to the large diameter sewers below Campbell Avenue that drain through the downtown core to the outfall into the Columbia River.
- Catchment DRCA7: Small catchment area draining through pipework along Orton Street and 9 Street, which then crosses Centennial Park to an outfall point into the Columbia River.
- Catchment DRCA13: Pipework along Pearkes Drive, Laforme Boulevard, and Burke Drive conveying runoff to the Columbia River outfall point at the southern end of Burke Drive.
- Catchment DRCA23: Pipework along Oscar Street conveying runoff to the Illecillewaet River outfall point at the south-east end of Oscar Street, adjacent to the intersection with Simpson Street.

- Catchment DRCA25: Pipework along 8 Street and Edward Street that drains in a south/south-west direction to the drainage channels behind the Illecillewaet River dyke system.
- Catchment DRCA32: Pipes, culverts and channels within the Big Eddy neighbourhood, that drain in a westerly direction to the drainage channels behind the Columbia River dyke system on the west side of Revelstoke.
- Catchment DRCA38: The system of pipes and channels that convey a stream from the National Park area in a south-westerly direction along a section of the Trans-Canada Highway, across the Victoria Street intersection, to an outfall point into the Columbia River adjacent to the bridge crossing. Also includes some pipework entering the same system from Victoria Street to the east.

Appendix A contains a tabulated summary of the key features of each catchment and sub-catchment.

The geometric elements of these sections of the drainage system (including pipe diameters, channel dimensions, invert elevations etc.) were defined in the modelling software based on review of City GIS data (as described previously), and through resolving data gaps that were encountered.

The data gap analysis was completed in conjunction with the model build process. As sections of the system were defined in the software it became apparent where data was incomplete, appeared to be inaccurate, or required further information to supplement what was initially provided. These queries were communicated to Revelstoke City staff via a series of annotated plans, mark ups, and emails through the latter part of 2015. The City were able to provide historic as-built drawing information (where available) to close a number of the data gaps, and also completed some site investigation works to answer further queries. The assistance offered by City staff, particularly Derek Low, is acknowledged and appreciated.

Although the data gap analysis was able to resolve many of the unknowns identified following review of original GIS data, it was also necessary to make assumptions in some areas where unknowns remained. For example, in the absence of manhole invert elevations in isolated areas it was assumed that pipes were set at a constant gradient between known upstream and downstream points. These types of assumptions are considered appropriate for a planning-level study such as this, and are common when analyzing older drainage systems that do not have comprehensive record information available for the entire network. Copies of example calculations completed and assumptions made to resolve some of the data gaps encountered can be provided on request.

4.2.2 Minor System Catchment Analysis

Included in the GIS data provided by the City were catchment areas associated with the storm drainage network (minor system) for each outfall location. These covered the entire City limits, and were referenced in the GIS data as drca1 through to drca44. These catchments were reviewed alongside the digital elevation model (DEM) data, and storm drainage infrastructure layout, to verify their accuracy. They were found to be appropriate for use in the minor system modelling analysis.

In the catchment areas containing trunk drainage elements that were selected for modelling it was necessary to further sub-divide the original catchment areas, to allow the hydraulic model to be loaded correctly by assigning portions of the catchment that would contribute to runoff at each node (manhole/junction). This sub-catchment breakdown process was completed through reference to the DEM, and general inspection of street layout/aerial photography. The sub-catchments were named Sxx-A, Sxx-B, Sxx-C etc. – where "xx" refers to the original "drca" catchment reference within which they were located.

In addition, it was evident that a number of the trunk drainage systems conveyed runoff from external areas (generally from the National Park area to the north) through the City to the river outfalls. It was therefore necessary to quantify runoff from these external catchments as well. Delineation of these catchments was achieved through inspection of DEM data, supplemented by freely available GIS contour information from Natural Resources Canada for catchment areas which appeared to continue beyond the extent of the City DEM provided. These catchments were named Sxx-Z1, Sxx-Z2 etc. – where "xx" refers to the original "drca" catchment reference through which the external area drains.

Minor system sub-catchment delineation is illustrated in **Drawing 6**, and a schematic of the trunk system modelled (and contributing catchment areas is provided in Figure 4.1.

Catchment parameters necessary for modelling were defined based on best practice industry approaches, and engineering judgement/experience. These included:

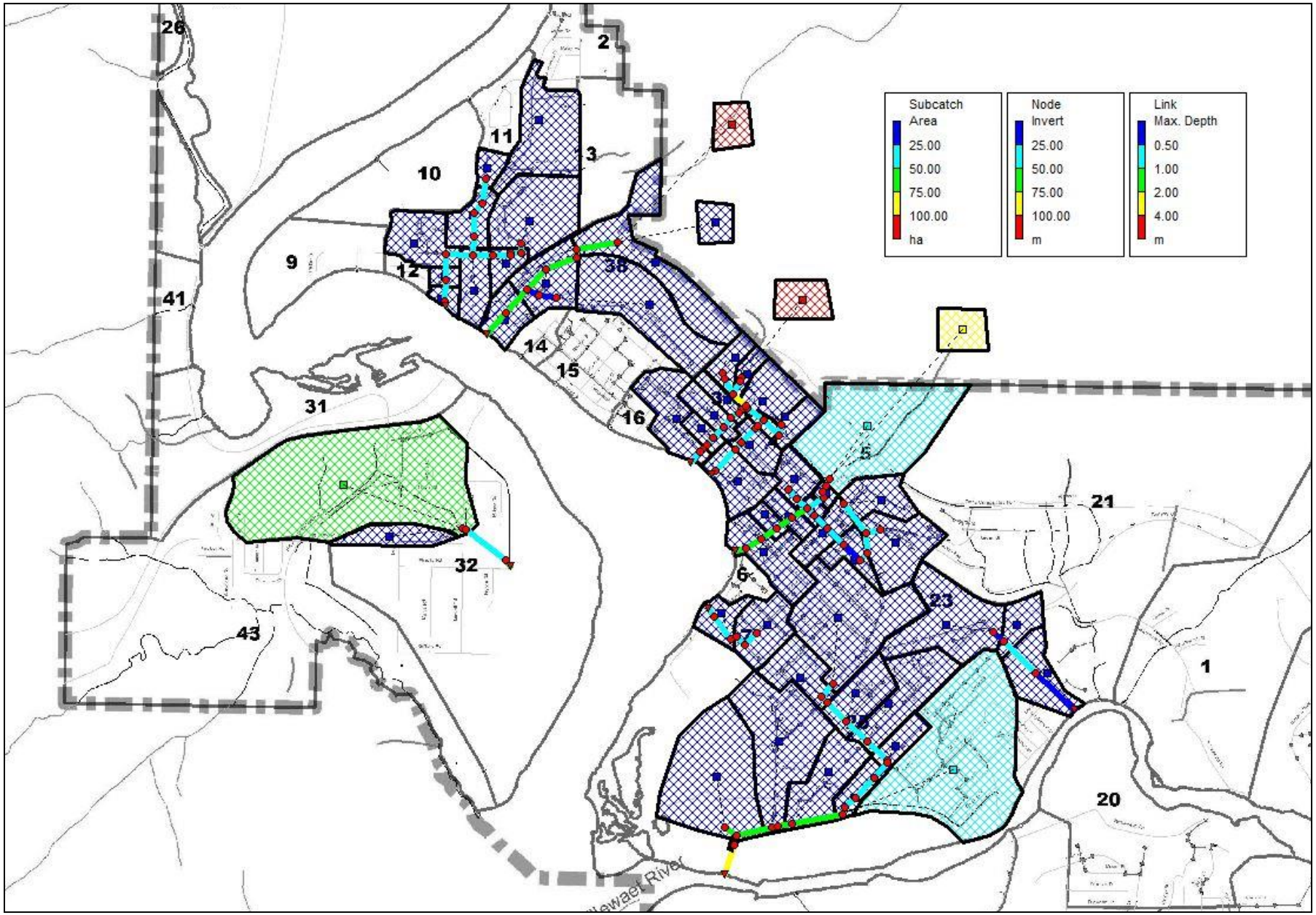
- Percentage Imperviousness – determined through GIS analysis of landuse types within the sub-catchment boundary, and area weighting based on typical imperviousness values for each landuse type. Note the percentage imperviousness values used for analysis were determined with reference to the recommended runoff coefficient (RC) values provided in the City of Revelstoke Design Standards, but recognizing that percentage imperviousness is a different parameter to RC and that engineering judgement is necessary to determine an appropriate value for modelling.
- Slope – determined through GIS analysis of DEM data to determine average slope within the sub-catchment, supplemented by manual measurements and checks as necessary.
- Infiltration – based on background information regarding surficial geology, it was assumed that the study area is primarily dominated by sand, loamy sand, and sandy loams. The Horton infiltration equation has the following properties for these soils:
    - Initial infiltration capacity = 127 mm/hr
    - Final infiltration capacity = 9.5 mm/hr
    - Decay coefficient = 4 hr-1

Table 4.3 presents key geometric parameters and imperviousness values for the sub-catchments analyzed as part of the hydrologic/hydraulic model.

Table 4.3 Summary of Sub-Catchment Modelling Parameters

Subcatchment ID		Area	Width	% Imperv.	% Slope	Outlet
drca13	S13-A	14.43	1550	70	2.5	STMH286
	S13-B	14.18	1060	70	1.9	STMH188
	S13-C	5.03	705	66	1.1	STMH165
	S13-D	2.85	632	77	3.2	STMH161
	S13-E	5.22	727	68	2.1	STMH54
	S13-F	7.67	569	50	0.5	STMH178
	S13-G	1.35	351	48	2	STMH177
	S13-H	1.52	473	57	3.1	STMH398
	S13-I	2.12	370	60	1.0	J1
drca23	S23-A	15.82	1095	69	1.6	STMH116
	S23-B	3.94	770	63	2.6	DRCB64
	S23-C	7.93	966	45	2.1	DRCB40
drca25	S25-A	22.61	902	61	1.3	STMH37
	S25-B	6.7	737	55	1.7	STMH225
	S25-C	7.26	921	52	1	STMH202
	S25-D	10.7	1063	55	1.2	STMH38
	S25-E	10.16	1039	49	1.7	J74
	S25-F	41.71	2239	44	0.8	J73
	S25-G	3.3	633	49	1.9	STMH205
	S25-H	3.45	674	41	1.2	STMH244
	S25-I	20.24	1568	67	2.1	J75
	S25-J	24.53	1501	72	1.3	J84
drca38	S38-A	16.25	1798	79	4.1	J83
	S38-B	18.36	1574	76	5.9	J22
	S38-C	8.37	802	79	4.5	STMH78
	S38-D	4.72	558	73	1.5	STMH79
	S38-Z1	3.97	7483	50	0.5	J83
	S38-Z2	87.7	1114	50	0.5	J83
drca3	S3-A	8.53	955	63	2.9	STMH12
	S3-B	1.98	392	62	1.5	STMH7
	S3-C	3.55	735	61	1.3	STMH6
	S3-D	2.11	617	80	2.1	STMH138
	S3-E	5.92	588	76	17.2	STMH246-DIV
	S3-F	1.92	586	58	13.7	J33
	S3-G	3.26	655	60	13	J87
	S3-Z1	242.7	243	50	0.5	J33
drca4	S4-A	3.83	547	77	19.1	J34
	S4-B	4.08	379	80	1.5	J37
	S4-C	6.76	577	73	3.3	STMH93
drca5	S5-A	8.95	974	64	2.6	STMH133
	S5-B	1.74	288	80	0.9	STMH135
	S5-C	2.5	464	80	0.6	STMH131
	S5-D	1.28	206	80	1.2	STMH196
	S5-E	4.01	610	79	2.3	STMH4
	S5-F	1.02	184	80	6	STMH15
	S5-G	4.1	727	77	0.3	STMH2
	S5-H	3.71	473	73	0.4	STMH147
	S5-I	10.27	885	71	6.2	STMH212
	S5-J	5.91	831	60	9.1	J56
	S5-K	28.67	1446	54	11.9	J46
	S5-Z1	87.7	4909	50	0.5	J46
drca7	S7-A	7.47	684	56	0.9	STMH23
	S7-B	3.9	411	22	7.3	STMH297
drca32	S32-B	5.37	400	50	0.5	DRCB258
	S32-A	54.37	400	50	0.5	DRCB258

Figure 4.1 EPA-SWMM Modelling Schematic



4.2.3 Major System Catchment Analysis

In addition to minor system catchment delineation (used for modelling purposes), the overland flow patterns within the City have also been studied – primarily through use of GIS-based 3D terrain and surface analysis tools to map anticipated flow paths through the City neighbourhoods – in order to develop a series of major system catchment areas, and identify areas within the City that are potentially at risk of surface ponding during major storm events.

The results of this exercise are illustrated on **Drawing 7**. The major system catchments are shown in red, and areas where analysis has identified low points in the topography – i.e. where surface water could potentially pond during large storm events – are shown in blue (with the potential ponding depth represented by increasingly dark shading, as per the legend).

Please refer to latter sections of this report for information on how this information was used in conjunction with minor system hydraulic modelling results to better understand the level of flood risk in different areas of the City.

4.2.4 Hydrology and Climate Change

4.2.4.1 IDF Climate Change Analysis

The City of Revelstoke currently provides rainfall data for storm sewer design purposes in the form of Intensity-Duration-Frequency (IDF) curves for return periods of 2, 5, 10, 25, 50, and 100 years, on City Standard Drawing COR-S21 (provided in Appendix B for reference). The curves allow designers to estimate the total rainfall depth associated with storm events of varying durations and return periods (frequency of occurrence), and therefore establish average intensity values to develop peak flow rates for use in sewer sizing calculations.

The rainfall depth and intensity values obtained from current Revelstoke IDF curves were reviewed alongside depth and intensity values determined based on historic Environment Canada data, and for two future climate change-impacted scenarios. The tool used for this historic/future IDF assessment is the online “Computerized Tool for the Development of Intensity-Duration-Frequency Curves under Climate Change” made available by Western University, Canada (http://www.idf-cc-uwo.ca/).

This service allows users to carry out statistical analysis on historical rainfall data, as well as generate possible future changes based on a methodology that uses a combination of global climate modeling outputs and locally observed weather data. The tool relies on version 2.30 of Environment Canada IDF dataset (December 2014) available at: http://climate.weather.gc.ca/prods_servs/engineering_e.html

For the purposes of this study the analysis was completed using historical data from the Environment Canada station at Revelstoke Airport Road (ID: 1176751). This data set is understood to contain rainfall records from 1970 to 1994.

The tool generates future results for three Representative Concentration Pathways (RCPs) – low (2.6), medium (4.5), and high (8.5) – which are based on different future greenhouse gas concentration scenarios developed by the Intergovernmental Panel on Climate Change (IPCC) in 2013. It is understood that current global emissions are tracking most closely aligned with the worst case scenario (RCP 8.5), and therefore the projected future IDF values discussed in this report are based on that scenario alone. Results for all scenarios are provided in **Appendix B** for reference.

Two timescales were selected for the future climate change analysis. The first was for the period for 2016 to 2036, as a medium term (20-year) planning horizon. The second was for the subsequent 30-year period, from 2037 to 2066, as a longer term infrastructure assessment horizon.

The following table presents a summary of the IDF results and comparisons. Comprehensive results for all scenarios, storm durations, and return periods are provided in the appendix, however for clarity of presentation the results quoted here focus on three storm durations (10 minute, 1 hour, and 24 hours) and on two key return periods (5 year, typically used for design of minor drainage systems; and 100 year, typically used for major system conveyance assessments). The table shows the total rainfall depth for each return period and storm duration combination, and the percentage change that equates to in comparison to the current city standard.

Table 4.4 IDF Analysis – Comparison of Total Rainfall Depths

SCENARIO	5-year Rainfall Depths (mm)						100-year Rainfall Depths (mm)					
	10 min.		1 hour		24 hours		10 min.		1 hour		24 hours	
Current City Std.	6.00	-	11.90	-	38.40	-	10.00	-	19.00	-	60.00	-
Historic Data	6.05	0.8%	12.87	8.2%	38.57	0.4%	9.73	-2.7%	23.49	23.6%	59.34	-1.1%
2016 - 2036	6.94	15.7%	15.24	28.1%	43.10	12.2%	11.30	13.0%	27.53	44.9%	67.58	12.6%
2037 - 2066	7.33	22.2%	16.55	39.1%	45.77	19.2%	12.00	20.0%	30.06	58.2%	72.19	20.3%

Figure 4.2 IDF Curve Comparison (5-Year Return Period)

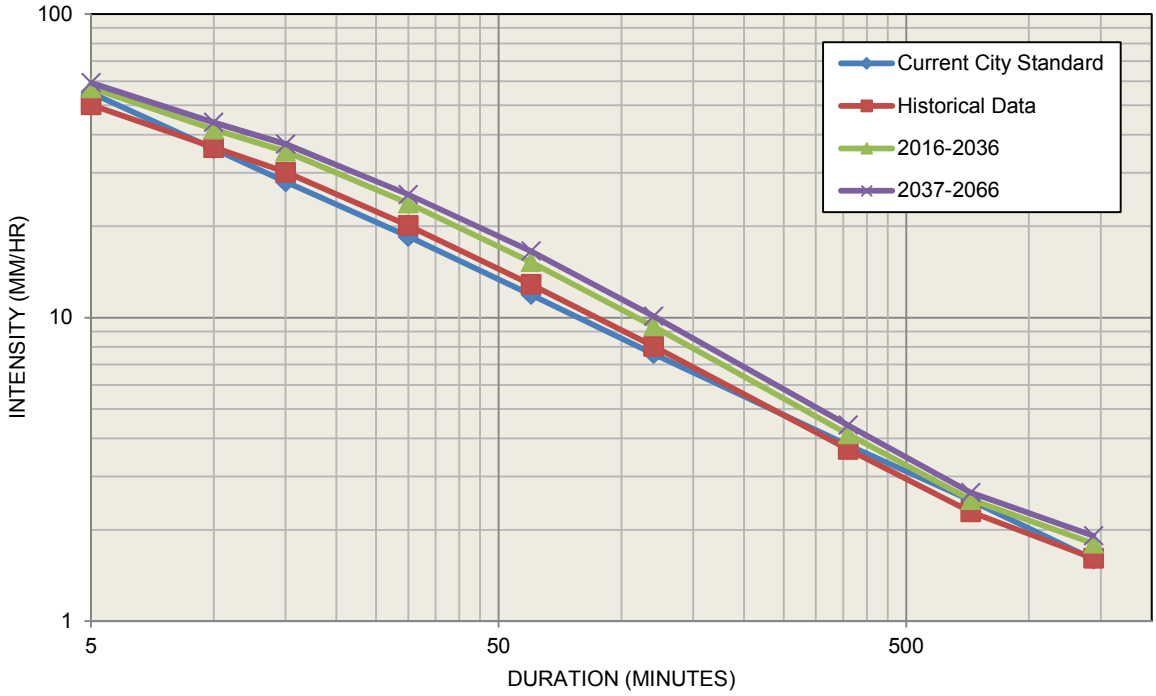
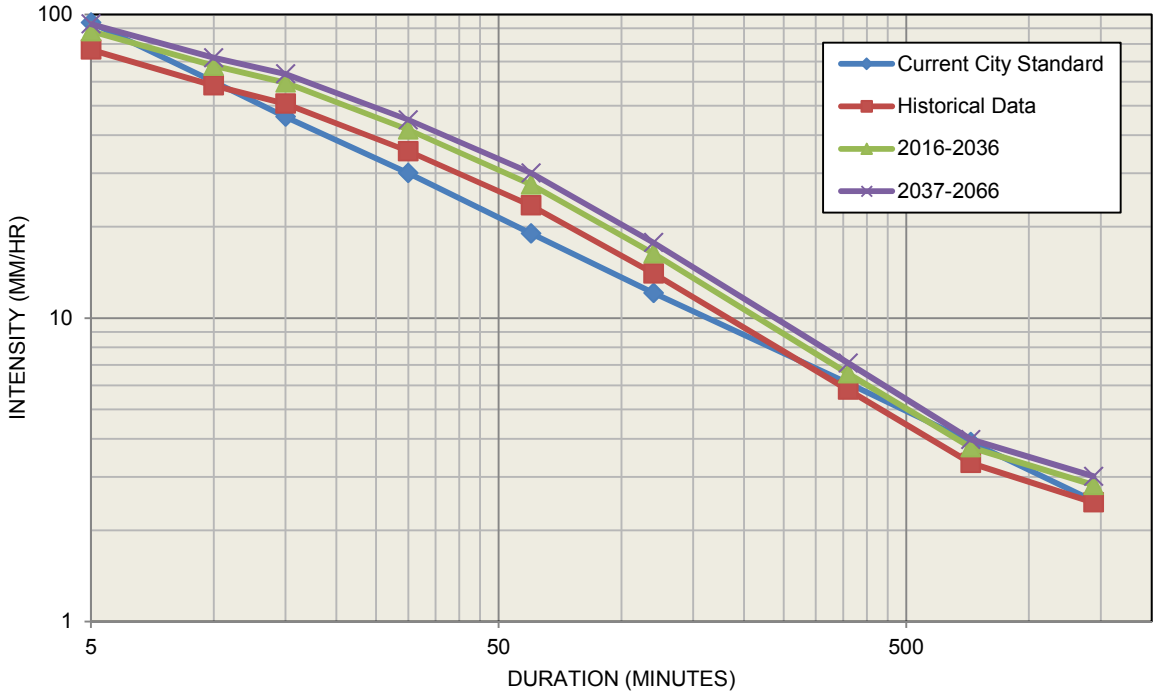


Figure 4.3 IDF Curve Comparison (100-Year Return Period)



The tabulated results of the IDF comparison show relatively good agreement between the current city standard values and the analysis of historic Environment Canada data, with the exception of the 1 hour storm duration. The reason for this discrepancy is not clear. The general agreement though implies that the current City standards are determined appropriately, but as would be expected they do not currently fully account for the anticipated impacts of climate change.

The 2016-2036 climate change scenario indicates an average increase of total rainfall depth of 18.7% for the varying storm durations for the 5-year return period, and 23.5% for the 100-year return period. Equivalent values for the 2037-2066 scenario are 26.8% and 32.8%, respectively. It is noted though that the 1 hour storm duration appears to increase by a far larger proportion than the 10 minute and 24 hour duration design storms. The IDF curve plots reinforce this finding. They indicate that the variation in rainfall intensities (between the existing City standard and future climate change scenarios) is greatest for storm durations in the range of 30 minutes to 2 hours, with the maximum difference occurring at 1 hour storm duration. Either side of this duration range, at both the short durations and longer durations, the differences are lower.

4.2.4.2 Storm Distributions

For modelling purposes it is necessary to transform the total rainfall depths obtained from IDF analysis into a storm distribution which describes the variation of rainfall intensity over time. Various storm distributions are available to practitioners – the most widely used include; the Atmospheric Environment Service (AES, now known as the Meteorological Service of Canada) distributions, the US Soil Conservation Service (SCS) distributions, and the Chicago Design Storm. No specific storm distribution is specified in the current City of Revelstoke Drainage Design Standards (Subdivision, Development and Servicing Bylaw No.1846 – Schedule 4, Part 3), therefore judgment needs to be applied to select a rainfall distribution that is most representative of rainfall patterns in the study area.

For the City of Revelstoke the AES Type 2 storm distribution (BC Interior region), as defined in Table 9.3 and Figure 9.3 of the *Hydrology of Floods in Canada: A Guide to Planning and Design* (National Research Council Canada, 1989), was selected for use in the modelling analysis (reproduced below as Figure 4.4). The AES distribution was selected given its widespread use in BC, and the fact that it offers modifications to the distribution to suit different regional rainfall patterns (in this case BC Interior). This decision is supported by the *Master Municipal Constriction Documents Design Guidelines* (MMCD, 2014), which recommends use of AES rainfall distributions for cases where the local authority has no specific guidelines.

A 1-hour storm duration has been selected as suitable for assessment of urban flooding and storm conveyance issues in Revelstoke. Drainage systems that include storage facilities, or other flow detention features, would typically require analysis of longer duration events in order to ensure critical conditions are being assessed. However, the existing Revelstoke infrastructure does not include any SWM ponds or other storage features that would necessitate consideration of longer duration storms.

Table 9.3 AES type 2 one-hour storm distributions

Region	*Percentage of total storm rainfall in interval specified interval (5 minutes)*											
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*
Atlantic Canada	1	4	10	17	27	14	11	7	5	2	1	1
Northern Quebec	1	6	15	32	15	11	8	5	3	2	1	1
Southwest Quebec	1	4	9	18	29	14	10	7	4	2	1	1
Northern Ontario	1	3	8	16	31	15	11	7	4	2	1	1
Southern Ontario	1	3	8	15	28	15	12	8	5	3	1	1
Prairies	1	7	17	31	13	11	8	5	3	2	1	1
BC Interior	4	17	32	14	10	8	6	4	2	1	1	1
BC Coast	1	3	6	10	15	21	16	12	8	5	2	1

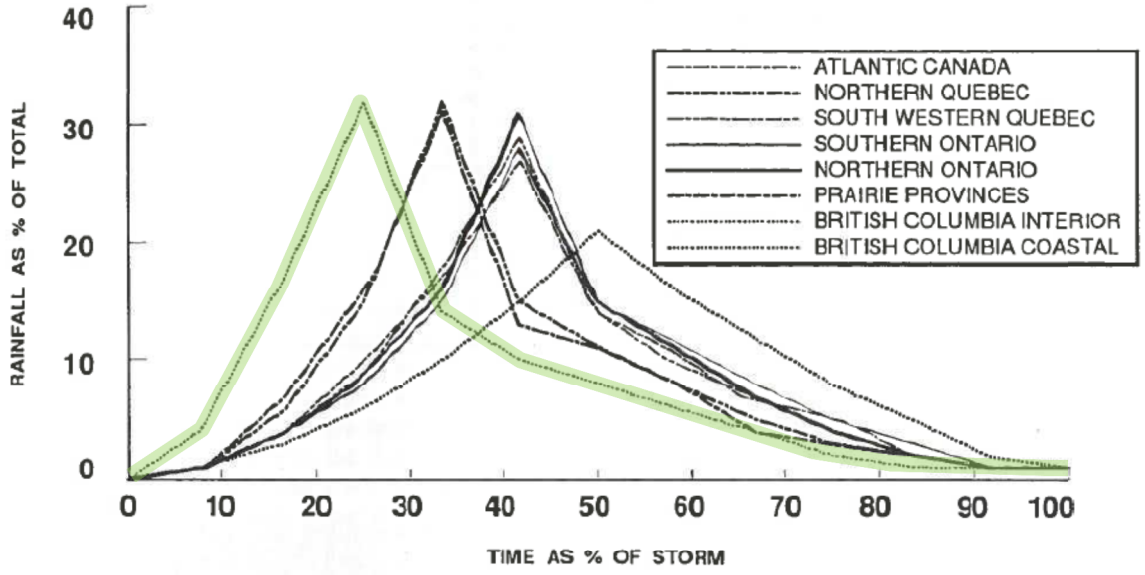


Figure 9.3 AES type 2 one-hour storm distributions (after Hogg 1982)

Figure 4.4 Definition of AES Type 2 One-Hour Storm Distribution (source: Hydrology of Floods in Canada: A Guide to Planning and Design, National Research Council Canada, 1989)

4.2.5 Model Results

As noted previously, an event-based hydrologic/hydraulic model using the 5-year and the 100-year storm events was developed to assess three (3) different scenarios:

- Scenario 1: Existing Conditions (based on use of the City's current IDF curve)
- Scenario 2: 2016-2036 Climate Change Scenario
- Scenario 3: 2037-2066 Climate Change Scenario

For each scenario, the results were summarized to represent the following key hydrologic and hydraulic functions within the existing drainage system:

1. Subcatchment Hydrology Analysis:
    a. Water Balance: primarily constituting infiltration and surface runoff volumes (in mm)
    b. Peak Surface Runoff in Litres per second (LPS); and
    c. Runoff coefficient: based on the surface runoff generated for each subcatchment.
2. Node Flooding Analysis (i.e. locations where modelled HGL exceeds rim elevation of MH node):
    a. Maximum Flow Rate (LPS); and
    b. Flood Volume (Litres)

These results are presented in the following Tables 4.5 to 4.16. For each of the climate change scenarios columns are included which show the percentage increase for each value from the "baseline" existing conditions results (Scenario 1).

In addition to the subcatchment hydrology and node flooding results, the modelled hydraulic grade line (HGL) results were also reviewed carefully to develop an understanding of how the trunk drainage systems were performing hydraulically, so that suitable remedial measures could be identified to help alleviate surcharge/flooding areas. These HGL results are discussed further (and illustrated in figures) in Section 5, which covers the development of conceptual sewer upgrades as part of a capital upgrade plan.

Drawings 8A/8B through to 13A/13B illustrate the EPA-SWMM results for each scenario and each return period analyzed (5-year and 100-year). Modelling node symbols are colour coded to represent the flooding volume results at each node – split into the following five (5) categories:

- No flooding
- 0 to 0.1 x 10^6 Litres
- 0.1 – 0.5 x 10^6 Litres
- 0.5 – 1.0 x 10^6 Litres
- > 1.0 x 10^6 Litres

Inspection of modelling results for existing (baseline) conditions indicates that a total of 38 nodes flood during the 5-year event, and 44 during the 100-year event – and the respective total flood volumes across the modelled parts of the system are 5.17 megalitres (10^6 Litres) and 16.37 megalitres.

As would be expected, the results indicate that subcatchment runoff volumes and flow rates increase during analysis pf future climate change scenarios, and we see associated increases in the occurrences (and volume) of node flooding as more water attempts to enter the system:

- Climate Change Scenario 2016-2036 5-year event:
    - Number of flooded nodes = 39 (increase of 1 from baseline existing conditions)
    - Total flooded volume = 9.90 megalitres (increase of 91% from baseline existing conditions)
- Climate Change Scenario 2016-2036 100-year event:
    - Number of flooded nodes = 60 (increase of 16 from baseline existing conditions)
    - Total flooded volume = 32.98 megalitres (increase of 101% from baseline existing conditions)
- Climate Change Scenario 2037-2066 5-year event:
    - Number of flooded nodes = 41 (increase of 3 from baseline existing conditions)
    - Total flooded volume = 12.08 megalitres (increase of 134% from baseline existing conditions)
- Climate Change Scenario 2037-2066 100-year event:
    - Number of flooded nodes = 59 (increase of 15 from baseline existing conditions)
    - Total flooded volume = 38.27 megalitres (increase of 134% from baseline existing conditions)

Table 4.5 - Subcatchment Hydrology under the 5-Year Storm Event - Existing Conditions

SUB-CATCHMENT	5-YR STORM DEPTH [MM]		INFILTRATION [MM]		RUNOFF [mm]		RUNOFF VOLUME [10^6 ltr]		PEAK RUNOFF [LPS]		RUNOFF COEFF.	
	RESULT	INCREASE	RESULT	INCREASE	RESULT	INCREASE	RESULT	INCREASE	RESULT	INCREASE	RESULT	INCREASE
S13-A	11.9	-	3.6	-	7.5	-	1.1	-	1101.8	-	0.63	-
S13-B	11.9	-	3.6	-	7.5	-	1.1	-	919.8	-	0.63	-
S13-C	11.9	-	4.1	-	7.1	-	0.4	-	354.0	-	0.60	-
S13-D	11.9	-	2.7	-	8.3	-	0.2	-	269.8	-	0.70	-
S13-E	11.9	-	3.8	-	7.3	-	0.4	-	405.1	-	0.61	-
S13-F	11.9	-	6.0	-	5.3	-	0.4	-	304.7	-	0.45	-
S13-G	11.9	-	6.2	-	5.2	-	0.1	-	81.4	-	0.44	-
S13-H	11.9	-	5.1	-	6.2	-	0.1	-	109.5	-	0.52	-
S13-I	11.9	-	0.9	-	9.0	-	0.2	-	152.0	-	0.75	-
S23-A	11.9	-	3.7	-	7.4	-	1.2	-	949.6	-	0.62	-
S23-B	11.9	-	4.4	-	6.8	-	0.3	-	304.4	-	0.57	-
S23-C	11.9	-	6.6	-	4.9	-	0.4	-	426.3	-	0.41	-
S25-A	11.9	-	4.6	-	6.4	-	1.5	-	906.7	-	0.54	-
S25-B	11.9	-	5.4	-	5.9	-	0.4	-	409.0	-	0.50	-
S25-C	11.9	-	5.7	-	5.6	-	0.4	-	412.4	-	0.47	-
S25-D	11.9	-	5.4	-	5.9	-	0.6	-	606.1	-	0.50	-
S25-E	11.9	-	6.1	-	5.3	-	0.5	-	558.0	-	0.44	-
S25-F	11.9	-	6.7	-	4.7	-	2.0	-	1487.0	-	0.39	-
S25-G	11.9	-	6.1	-	5.3	-	0.2	-	199.5	-	0.44	-
S25-H	11.9	-	7.0	-	4.4	-	0.2	-	174.1	-	0.37	-
S25-I	11.9	-	3.9	-	7.2	-	1.5	-	1320.4	-	0.60	-
S25-J	11.9	-	3.3	-	7.6	-	1.9	-	1346.7	-	0.64	-
S32-A	11.9	-	6.0	-	4.6	-	2.5	-	662.1	-	0.39	-
S32-B	11.9	-	6.0	-	5.3	-	0.3	-	213.8	-	0.45	-
S38-A	11.9	-	2.5	-	8.5	-	1.4	-	1451.7	-	0.71	-
S38-B	11.9	-	2.9	-	8.2	-	1.5	-	1566.3	-	0.69	-
S38-C	11.9	-	2.5	-	8.5	-	0.7	-	731.7	-	0.71	-
S38-D	11.9	-	3.2	-	7.8	-	0.4	-	355.1	-	0.66	-
S38-Z1	11.9	-	10.7	-	1.1	-	1.5	-	1732.2	-	0.10	-
S38-Z2	11.9	-	10.7	-	1.2	-	0.1	-	72.4	-	0.10	-
S3-A	11.9	-	4.4	-	6.8	-	0.6	-	615.7	-	0.57	-
S3-B	11.9	-	4.5	-	6.7	-	0.1	-	146.6	-	0.56	-
S3-C	11.9	-	4.6	-	6.6	-	0.2	-	258.2	-	0.55	-
S3-D	11.9	-	2.4	-	8.6	-	0.2	-	208.0	-	0.73	-
S3-E	11.9	-	2.9	-	8.2	-	0.5	-	555.4	-	0.69	-
S3-F	11.9	-	5.0	-	6.4	-	0.1	-	141.4	-	0.54	-
S3-G	11.9	-	4.8	-	6.6	-	0.2	-	247.9	-	0.55	-
S3-Z1	11.9	-	10.7	-	1.1	-	2.7	-	3065.0	-	0.09	-
S4-A	11.9	-	2.7	-	8.4	-	0.3	-	371.2	-	0.70	-
S4-B	11.9	-	2.4	-	8.6	-	0.4	-	298.2	-	0.72	-
S4-C	11.9	-	3.2	-	7.8	-	0.5	-	519.2	-	0.66	-
S5-A	11.9	-	4.3	-	6.9	-	0.6	-	643.1	-	0.58	-
S5-B	11.9	-	2.4	-	8.6	-	0.2	-	143.0	-	0.72	-
S5-C	11.9	-	2.4	-	8.6	-	0.2	-	199.6	-	0.72	-
S5-D	11.9	-	2.4	-	8.6	-	0.1	-	108.9	-	0.72	-
S5-E	11.9	-	2.5	-	8.5	-	0.3	-	360.4	-	0.71	-
S5-F	11.9	-	2.4	-	8.6	-	0.1	-	100.9	-	0.73	-
S5-G	11.9	-	2.7	-	8.2	-	0.3	-	273.9	-	0.69	-
S5-H	11.9	-	3.2	-	7.8	-	0.3	-	220.8	-	0.65	-
S5-I	11.9	-	3.5	-	7.6	-	0.8	-	835.2	-	0.64	-
S5-J	11.9	-	4.8	-	6.5	-	0.4	-	444.3	-	0.55	-
S5-K	11.9	-	5.5	-	5.8	-	1.7	-	1794.4	-	0.49	-
S5-Z1	11.9	-	10.7	-	1.1	-	1.0	-	1113.7	-	0.10	-
S7-A	11.9	-	5.2	-	6.0	-	0.5	-	395.7	-	0.50	-
S7-B	11.9	-	9.3	-	2.4	-	0.1	-	108.8	-	0.20	-

Table 4.6 - Flooding Nodes under the 5-Year Storm Event – Existing Conditions

SUB-CATCHMENT	NODE REF.	MAXIMUM FLOW RATE [LPS]	FLOOD VOLUME [10^6 LTR]	
			RESULT	TOTAL
S3	J87	-	0.000	0.995
	J88	-	0.000	
	J33	-	0.000	
	J86	399	0.026	
	J85	-	0.000	
	STMH246-DIV	-	0.000	
	STMH139	881	0.177	
	STMH138	1,215	0.545	
	STMH183	401	0.236	
	STMH6	130	0.011	
	STMH7	-	0.000	
	STMH187	-	0.000	
	STMH185	-	0.000	
	STMH12	-	0.000	
	DROF3	-	0.000	
S4	J89	-	0.000	0.000
	J90	-	0.000	
	J91	-	0.000	
	J34	-	0.000	
	J38	-	0.000	
	STMH17	-	0.000	
	J37	-	0.000	
	STMH254	-	0.000	
	STMH93	-	0.000	
	DROF4	-	0.000	
S5	J46	390	0.028	1.001
	J79	-	0.000	
	STMH15	1,262	0.442	
	STMH137	-	0.000	
	STMH4	-	0.000	
	STMH216	-	0.000	
	J56	293	0.002	
	STMH212	985	0.480	
	STMH253	460	0.003	
	STMH194	183	0.046	
	STMH147	-	0.000	
	STMH28	-	0.000	
	STMH2	-	0.000	
	STMH197	-	0.000	
	STMH196	-	0.000	
	STMH131	-	0.000	
	STMH135	-	0.000	
	STMH133	-	0.000	
	STMH190	-	0.000	
	DROF5	-	0.000	
S7	STMH23	-	0.000	0.000
	STMH22	-	0.000	
	STMH26	-	0.000	
	STMH297	-	0.000	
	STMH298	-	0.000	
	DROF7	-	0.000	
S13	J1	436	0.029	0.333
	STMH286	304	0.010	
	STMH56	572	0.162	
	STMH165	341	0.001	
	STMH188	259	0.002	
	STMH64	-	0.000	
	STMH63	-	0.000	
	STMH62	298	0.040	
	STMH161	406	0.086	
	STMH54	238	0.000	
	STMH178	383	0.001	
	STMH177	425	0.002	
	STMH398	-	0.000	
	DROF13	-	0.000	
S23	STMH116	79	0.004	1.062
	DRCB64	56	0.000	
	DRCB40	1,329	1.058	
	DROF23	-	0.000	
S25	STMH37	73	0.007	1.115
	STMH225	204	0.001	
	STMH226	481	0.160	
	STMH202	462	0.054	
	STMH38	549	0.232	
	STMH205	297	0.001	
	STMH204	221	0.001	
	STMH109	597	0.658	
	STMH244	211	0.001	
	STMH362	196	0.000	
	J73	-	0.000	
	J74	-	0.000	
	J78	-	0.000	
	J75	-	0.000	
	J84	-	0.000	
	J76	-	0.000	
	J77	-	0.000	
	DROF25	-	0.000	
S32	DRCB258	-	0.000	0.000
	DRCB260	-	0.000	
	J94	-	0.000	
	DRFI2017	-	0.000	
S38	J83	-	0.000	0.666
	STMH77	-	0.000	
	STMH74	-	0.000	
	STMH78	-	0.000	
	J22	1,340	0.604	
	STMH235	408	0.054	
	STMH83	625	0.003	
	STMH79	837	0.005	
	DROF38	-	0.000	
			5.172	

Table 4.7 - Subcatchment Hydrology under the 100-Year Storm Event - Existing Conditions

SUB-CATCHMENT	100-YR STORM DEPTH [MM]		INFILTRATION [MM]		RUNOFF [mm]		RUNOFF VOLUME [10^6 ltr]		PEAK RUNOFF [LPS]		RUNOFF COEFF.	
	RESULT	INCREASE	RESULT	INCREASE	RESULT	INCREASE	RESULT	INCREASE	RESULT	INCREASE	RESULT	INCREASE
S13-A	19.0	-	5.7	-	12.7	-	1.8	-	1927.1	-	0.67	-
S13-B	19.0	-	5.7	-	12.6	-	1.8	-	1726.3	-	0.66	-
S13-C	19.0	-	6.5	-	12.0	-	0.6	-	626.0	-	0.63	-
S13-D	19.0	-	4.4	-	14.1	-	0.4	-	440.8	-	0.74	-
S13-E	19.0	-	6.1	-	12.4	-	0.6	-	692.0	-	0.65	-
S13-F	19.0	-	9.5	-	9.0	-	0.7	-	602.4	-	0.47	-
S13-G	19.0	-	9.9	-	8.8	-	0.1	-	131.0	-	0.46	-
S13-H	19.0	-	8.2	-	10.5	-	0.2	-	175.4	-	0.55	-
S13-I	19.0	-	0.9	-	16.3	-	0.3	-	286.3	-	0.86	-
S23-A	19.0	-	5.9	-	12.4	-	2.0	-	1823.3	-	0.65	-
S23-B	19.0	-	7.0	-	11.5	-	0.5	-	498.1	-	0.61	-
S23-C	19.0	-	10.5	-	8.2	-	0.7	-	709.3	-	0.43	-
S25-A	19.0	-	7.4	-	10.9	-	2.5	-	1885.3	-	0.57	-
S25-B	19.0	-	8.6	-	10.0	-	0.7	-	709.1	-	0.53	-
S25-C	19.0	-	9.1	-	9.4	-	0.7	-	720.7	-	0.50	-
S25-D	19.0	-	8.6	-	9.9	-	1.1	-	1089.2	-	0.52	-
S25-E	19.0	-	9.7	-	8.9	-	0.9	-	962.4	-	0.47	-
S25-F	19.0	-	10.6	-	7.9	-	3.3	-	2922.1	-	0.42	-
S25-G	19.0	-	9.7	-	9.0	-	0.3	-	325.2	-	0.47	-
S25-H	19.0	-	11.2	-	7.5	-	0.3	-	284.2	-	0.40	-
S25-I	19.0	-	6.3	-	12.1	-	2.5	-	2430.6	-	0.64	-
S25-J	19.0	-	5.3	-	12.9	-	3.2	-	2694.6	-	0.68	-
S32-A	19.0	-	9.5	-	8.1	-	4.4	-	1333.3	-	0.43	-
S32-B	19.0	-	9.5	-	9.0	-	0.5	-	422.3	-	0.47	-
S38-A	19.0	-	4.0	-	14.3	-	2.3	-	2492.2	-	0.76	-
S38-B	19.0	-	4.6	-	13.8	-	2.5	-	2699.5	-	0.73	-
S38-C	19.0	-	4.0	-	14.3	-	1.2	-	1270.5	-	0.75	-
S38-D	19.0	-	5.1	-	13.2	-	0.6	-	638.0	-	0.70	-
S38-Z1	19.0	-	17.1	-	1.9	-	2.5	-	2764.4	-	0.10	-
S38-Z2	19.0	-	17.1	-	1.9	-	0.1	-	115.5	-	0.10	-
S3-A	19.0	-	7.0	-	11.5	-	1.0	-	1049.5	-	0.60	-
S3-B	19.0	-	7.2	-	11.3	-	0.2	-	244.0	-	0.60	-
S3-C	19.0	-	7.4	-	11.1	-	0.4	-	430.1	-	0.59	-
S3-D	19.0	-	3.8	-	14.6	-	0.3	-	339.3	-	0.77	-
S3-E	19.0	-	4.6	-	13.9	-	0.8	-	904.8	-	0.73	-
S3-F	19.0	-	8.0	-	10.7	-	0.2	-	225.7	-	0.56	-
S3-G	19.0	-	7.6	-	11.1	-	0.4	-	396.3	-	0.58	-
S3-Z1	19.0	-	17.1	-	1.9	-	4.5	-	4893.9	-	0.10	-
S4-A	19.0	-	4.4	-	14.2	-	0.5	-	596.5	-	0.75	-
S4-B	19.0	-	3.8	-	14.4	-	0.6	-	562.7	-	0.76	-
S4-C	19.0	-	5.1	-	13.2	-	0.9	-	924.0	-	0.70	-
S5-A	19.0	-	6.8	-	11.6	-	1.0	-	1108.2	-	0.61	-
S5-B	19.0	-	3.8	-	14.5	-	0.3	-	257.3	-	0.76	-
S5-C	19.0	-	3.8	-	14.5	-	0.4	-	363.7	-	0.76	-
S5-D	19.0	-	3.8	-	14.5	-	0.2	-	192.8	-	0.76	-
S5-E	19.0	-	4.0	-	14.4	-	0.6	-	616.7	-	0.76	-
S5-F	19.0	-	3.8	-	14.7	-	0.2	-	164.2	-	0.77	-
S5-G	19.0	-	4.4	-	13.8	-	0.6	-	526.4	-	0.73	-
S5-H	19.0	-	5.1	-	13.1	-	0.5	-	433.0	-	0.69	-
S5-I	19.0	-	5.5	-	12.9	-	1.3	-	1423.9	-	0.68	-
S5-J	19.0	-	7.6	-	11.0	-	0.7	-	716.4	-	0.58	-
S5-K	19.0	-	8.7	-	9.8	-	2.8	-	3039.0	-	0.52	-
S5-Z1	19.0	-	17.1	-	1.9	-	1.6	-	1777.4	-	0.10	-
S7-A	19.0	-	8.4	-	10.1	-	0.8	-	736.9	-	0.53	-
S7-B	19.0	-	14.8	-	4.1	-	0.2	-	173.8	-	0.21	-

Table 4.8 - Flooding Nodes under the 100-Year Storm Event – Existing Conditions

SUB-CATCHMENT	NODE REF.	MAXIMUM FLOW RATE [LPS]	FLOOD VOLUME [10^6 LTR]	
			RESULT	TOTAL
S3	J87	-	0.000	3.055
	J88	-	0.000	
	J33	539	0.034	
	J86	1761	0.571	
	J85	-	0.000	
	STMH246-DIV	-	0.000	
	STMH139	1447	0.628	
	STMH138	1346	1.197	
	STMH183	401	0.480	
	STMH6	525	0.144	
	STMH7	440	0.001	
	STMH187	-	0.000	
	STMH185	-	0.000	
	STMH12	-	0.000	
	DROF3	-	0.000	
S4	J89	-	0.000	0.000
	J90	-	0.000	
	J91	-	0.000	
	J34	-	0.000	
	J38	-	0.000	
	STMH17	-	0.000	
	J37	-	0.000	
	STMH254	-	0.000	
	STMH93	-	0.000	
	DROF4	-	0.000	
S5	J46	2294	0.600	3.014
	J79	-	0.000	
	STMH15	1350	1.033	
	STMH137	-	0.000	
	STMH4	-	0.000	
	STMH216	-	0.000	
	J56	278	0.002	
	STMH212	1754	1.160	
	STMH253	429	0.003	
	STMH194	441	0.216	
	STMH147	104	0.000	
	STMH28	-	0.000	
	STMH2	-	0.000	
	STMH197	-	0.000	
	STMH196	-	0.000	
	STMH131	-	0.000	
	STMH135	-	0.000	
	STMH133	-	0.000	
	STMH190	-	0.000	
	DROF5	-	0.000	
S7	STMH23	-	0.000	0.000
	STMH22	-	0.000	
	STMH26	-	0.000	
	STMH297	-	0.000	
	STMH298	105	0.000	
	DROF7	-	0.000	
S13	J1	482	0.076	1.683
	STMH286	1050	0.296	
	STMH56	847	0.550	
	STMH165	291	0.020	
	STMH188	719	0.177	
	STMH64	213	0.001	
	STMH63	-	0.000	
	STMH62	337	0.210	
	STMH161	750	0.351	
	STMH54	-	0.000	
	STMH178	316	0.001	
	STMH177	298	0.001	
	STMH398	-	0.000	
	DROF13	-	0.000	
S23	STMH116	1070	0.340	2.220
	DRCB64	126	0.000	
	DRCB40	1726	1.880	
	DROF23	-	0.000	
S25	STMH37	1182	0.520	2.939
	STMH225	120	0.000	
	STMH226	810	0.486	
	STMH202	529	0.229	
	STMH38	1043	0.663	
	STMH205	257	0.015	
	STMH204	198	0.007	
	STMH109	660	1.018	
	STMH244	260	0.001	
	STMH362	243	0.000	
	J73	-	0.000	
	J74	-	0.000	
	J78	-	0.000	
	J75	-	0.000	
	J84	-	0.000	
	J76	-	0.000	
	J77	-	0.000	
	DROF25	-	0.000	
S32	DRCB258	-	0.000	1.120
	DRCB260	715	1.120	
	J94	-	0.000	
	DRFI2017	-	0.000	
S38	J83	-	0.000	2.339
	STMH77	-	0.000	
	STMH74	-	0.000	
	STMH78	437	0.002	
	J22	2476	1.549	
	STMH235	596	0.292	
	STMH83	2038	0.401	
	STMH79	776	0.095	
	DROF38	-	0.000	
			16.370	

Table 4.9 - Subcatchment Hydrology under the 5-Year Storm Event – Climate Change 2016-2036

SUB-CATCHMENT	5-YR STORM DEPTH [MM]		INFILTRATION [MM]		RUNOFF [mm]		RUNOFF VOLUME [10^6 ltr]		PEAK RUNOFF [LPS]		RUNOFF COEFF.	
	RESULT	INCREASE	RESULT	INCREASE	RESULT	INCREASE	RESULT	INCREASE	RESULT	INCREASE	RESULT	INCREASE
S13-A	15.2	27.8%	4.6	28.0%	9.9	32.2%	1.4	31.2%	1498.0	36.0%	0.65	3.3%
S13-B	15.2	27.8%	4.6	28.0%	9.9	32.1%	1.4	32.1%	1302.9	41.7%	0.65	3.3%
S13-C	15.2	27.8%	5.2	27.7%	9.4	32.0%	0.5	30.6%	484.5	36.9%	0.62	3.4%
S13-D	15.2	27.8%	3.5	27.7%	11.1	33.0%	0.3	29.2%	351.3	30.2%	0.73	4.0%
S13-E	15.2	27.8%	4.9	27.8%	9.7	32.2%	0.5	34.2%	542.9	34.0%	0.64	3.6%
S13-F	15.2	27.8%	7.6	27.7%	7.0	32.0%	0.5	31.7%	444.2	45.8%	0.46	3.4%
S13-G	15.2	27.8%	7.9	27.8%	6.9	33.5%	0.1	28.6%	104.9	28.9%	0.46	4.3%
S13-H	15.2	27.8%	6.5	27.7%	8.3	33.5%	0.1	44.4%	140.7	28.5%	0.54	4.4%
S13-I	15.2	27.8%	0.9	0.0%	12.4	38.2%	0.3	36.8%	214.3	41.0%	0.81	8.1%
S23-A	15.2	27.8%	4.7	27.9%	9.7	32.1%	1.5	32.8%	1362.4	43.5%	0.64	3.2%
S23-B	15.2	27.8%	5.6	27.7%	9.0	32.8%	0.4	33.3%	396.9	30.4%	0.59	3.9%
S23-C	15.2	27.8%	8.4	27.8%	6.4	32.6%	0.5	34.2%	561.9	31.8%	0.42	3.7%
S25-A	15.2	27.8%	5.9	28.0%	8.5	32.1%	1.9	31.5%	1358.0	49.8%	0.56	3.3%
S25-B	15.2	27.8%	6.9	27.8%	7.8	32.3%	0.5	30.0%	553.2	35.2%	0.51	3.4%
S25-C	15.2	27.8%	7.3	27.8%	7.4	32.0%	0.5	31.7%	560.4	35.9%	0.49	3.4%
S25-D	15.2	27.8%	6.9	27.8%	7.8	32.0%	0.8	31.7%	837.4	38.2%	0.51	3.4%
S25-E	15.2	27.8%	7.8	27.8%	7.0	32.3%	0.7	31.5%	752.2	34.8%	0.46	3.4%
S25-F	15.2	27.8%	8.5	27.7%	6.2	32.1%	2.6	32.3%	2160.8	45.3%	0.41	3.3%
S25-G	15.2	27.8%	7.8	27.8%	7.0	32.9%	0.2	35.3%	259.4	30.0%	0.46	4.1%
S25-H	15.2	27.8%	9.0	27.7%	5.9	32.7%	0.2	33.3%	226.6	30.2%	0.39	4.0%
S25-I	15.2	27.8%	5.0	27.7%	9.5	32.1%	1.9	32.4%	1849.9	40.1%	0.62	3.3%
S25-J	15.2	27.8%	4.3	27.9%	10.1	32.1%	2.5	32.6%	1976.2	46.7%	0.66	3.3%
S32-A	15.2	27.8%	7.6	27.7%	6.3	34.9%	3.4	34.9%	968.0	46.2%	0.41	5.7%
S32-B	15.2	27.8%	7.6	27.7%	7.0	32.0%	0.4	31.0%	311.5	45.7%	0.46	3.4%
S38-A	15.2	27.8%	3.2	28.0%	11.2	32.2%	1.8	32.6%	1951.4	34.4%	0.74	3.4%
S38-B	15.2	27.8%	3.7	27.6%	10.8	32.2%	2.0	32.0%	2110.5	34.7%	0.71	3.5%
S38-C	15.2	27.8%	3.2	28.0%	11.2	32.3%	0.9	32.4%	990.4	35.4%	0.74	3.5%
S38-D	15.2	27.8%	4.1	27.6%	10.3	32.1%	0.5	32.4%	490.5	38.1%	0.68	3.2%
S38-Z1	15.2	27.8%	13.7	27.8%	1.5	31.0%	2.0	30.5%	2218.7	28.1%	0.10	2.1%
S38-Z2	15.2	27.8%	13.7	27.8%	1.5	28.7%	0.1	14.3%	92.6	27.9%	0.10	1.0%
S3-A	15.2	27.8%	5.6	27.7%	9.0	32.3%	0.8	32.8%	824.0	33.8%	0.59	3.5%
S3-B	15.2	27.8%	5.8	27.6%	8.9	32.6%	0.2	38.5%	193.2	31.8%	0.58	3.7%
S3-C	15.2	27.8%	5.9	28.0%	8.7	32.6%	0.3	34.8%	340.6	31.9%	0.57	3.6%
S3-D	15.2	27.8%	3.0	27.7%	11.5	32.9%	0.2	33.3%	270.6	30.1%	0.75	4.0%
S3-E	15.2	27.8%	3.7	27.6%	10.9	32.9%	0.7	32.7%	721.9	30.0%	0.72	4.1%
S3-F	15.2	27.8%	6.4	27.8%	8.5	32.5%	0.2	33.3%	181.1	28.1%	0.56	3.5%
S3-G	15.2	27.8%	6.1	27.9%	8.8	33.2%	0.3	38.1%	317.9	28.3%	0.58	4.4%
S3-Z1	15.2	27.8%	13.7	27.8%	1.5	33.6%	3.5	33.1%	3927.5	28.1%	0.10	3.2%
S4-A	15.2	27.8%	3.5	27.7%	11.1	33.3%	0.4	34.4%	477.9	28.7%	0.73	4.3%
S4-B	15.2	27.8%	3.0	27.7%	11.3	31.9%	0.5	31.4%	423.7	42.1%	0.74	3.2%
S4-C	15.2	27.8%	4.1	27.6%	10.4	32.0%	0.7	32.1%	713.2	37.4%	0.68	3.3%
S5-A	15.2	27.8%	5.5	27.7%	9.1	32.3%	0.8	30.6%	866.5	34.7%	0.60	3.5%
S5-B	15.2	27.8%	3.0	27.7%	11.3	32.1%	0.2	33.3%	197.7	38.3%	0.74	3.2%
S5-C	15.2	27.8%	3.0	27.7%	11.3	32.1%	0.3	33.3%	278.0	39.3%	0.74	3.3%
S5-D	15.2	27.8%	3.0	27.7%	11.4	32.1%	0.2	36.4%	149.1	37.0%	0.75	3.3%
S5-E	15.2	27.8%	3.2	28.0%	11.2	32.2%	0.5	32.4%	483.5	34.2%	0.74	3.5%
S5-F	15.2	27.8%	3.0	27.7%	11.5	33.0%	0.1	33.3%	131.0	29.9%	0.76	4.0%
S5-G	15.2	27.8%	3.5	27.7%	10.8	32.0%	0.4	29.4%	393.2	43.5%	0.71	3.2%
S5-H	15.2	27.8%	4.1	27.6%	10.3	32.0%	0.4	31.0%	320.5	45.2%	0.67	3.4%
S5-I	15.2	27.8%	4.4	27.8%	10.1	32.3%	1.0	33.3%	1117.8	33.8%	0.66	3.4%
S5-J	15.2	27.8%	6.1	27.9%	8.7	33.2%	0.5	34.2%	573.3	29.1%	0.57	4.2%
S5-K	15.2	27.8%	7.0	27.7%	7.7	32.4%	2.2	32.3%	2391.8	33.3%	0.51	3.5%
S5-Z1	15.2	27.8%	13.7	27.8%	1.5	31.0%	1.3	31.3%	1426.6	28.1%	0.10	2.1%
S7-A	15.2	27.8%	6.7	27.9%	7.9	32.1%	0.6	31.1%	558.1	41.0%	0.52	3.4%
S7-B	15.2	27.8%	11.9	27.8%	3.2	33.2%	0.1	44.4%	139.5	28.2%	0.21	3.9%

Table 4.10 - Flooding Nodes under the 5-Year Storm Event – Climate Change 2016-2036

SUB-CATCHMENT	NODE REF.	MAXIMUM FLOW RATE [LPS]	FLOOD VOLUME [10^6 LTR]		
			RESULT	TOTAL	INCREASE
S3	J87	-	0.000	1.909	92%
	J88	-	0.000		
	J33	-	0.000		
	J86	1,295	0.232		
	J85	-	0.000		
	STMH246-DIV	-	0.000		
	STMH139	1,109	0.403		
	STMH138	1,278	0.855		
	STMH183	401	0.358		
	STMH6	304	0.061		
	STMH7	-	0.000		
	STMH187	-	0.000		
	STMH185	-	0.000		
	STMH12	-	0.000		
	DROF3	-	0.000		
S4	J89	-	0.000	0.000	0%
	J90	-	0.000		
	J91	-	0.000		
	J34	-	0.000		
	J38	-	0.000		
	STMH17	-	0.000		
	J37	-	0.000		
	STMH254	-	0.000		
	STMH93	-	0.000		
	DROF4	-	0.000		
S5	J46	1,298	0.236	1.878	88%
	J79	-	0.000		
	STMH15	1,301	0.724		
	STMH137	-	0.000		
	STMH4	-	0.000		
	STMH216	-	0.000		
	J56	281	0.002		
	STMH212	1,359	0.798		
	STMH253	329	0.002		
	STMH194	276	0.116		
	STMH147	68	0.000		
	STMH28	-	0.000		
	STMH2	-	0.000		
	STMH197	-	0.000		
	STMH196	-	0.000		
	STMH131	-	0.000		
	STMH135	-	0.000		
	STMH133	-	0.000		
	STMH190	-	0.000		
	DROF5	-	0.000		
S7	STMH23	-	0.000	0.000	0%
	STMH22	-	0.000		
	STMH26	-	0.000		
	STMH297	-	0.000		
	STMH298	-	0.000		
	DROF7	-	0.000		
S13	J1	509	0.049	0.888	167%
	STMH286	564	0.116		
	STMH56	761	0.339		
	STMH165	336	0.001		
	STMH188	311	0.044		
	STMH64	-	0.000		
	STMH63	-	0.000		
	STMH62	318	0.134		
	STMH161	564	0.202		
	STMH54	217	0.000		
	STMH178	397	0.001		
	STMH177	451	0.002		
	STMH398	-	0.000		
	DROF13	-	0.000		
S23	STMH116	559	0.122	1.598	50%
	DRCB64	111	0.000		
	DRCB40	1,529	1.476		
	DROF23	-	0.000		
S25	STMH37	581	0.189	1.937	74%
	STMH225	-	0.000		
	STMH226	749	0.331		
	STMH202	561	0.129		
	STMH38	792	0.433		
	STMH205	318	0.002		
	STMH204	171	0.003		
	STMH109	630	0.849		
	STMH244	179	0.001		
	STMH362	129	0.000		
	J73	-	0.000		
	J74	-	0.000		
	J78	-	0.000		
	J75	-	0.000		
	J84	-	0.000		
	J76	-	0.000		
	J77	-	0.000		
	DROF25	-	0.000		
S32	DRCB258	-	0.000	0.366	0%
	DRCB260	291	0.366		
	J94	-	0.000		
	DRFI2017	-	0.000		
S38	J83	-	0.000	1.324	99%
	STMH77	-	0.000		
	STMH74	-	0.000		
	STMH78	-	0.000		
	J22	1,888	1.027		
	STMH235	596	0.191		
	STMH83	841	0.076		
	STMH79	747	0.030		
	DROF38	-	0.000		
			9.900		

Table 4.11 - Subcatchment Hydrology under the 100-Year Storm Event – Climate Change 2016-2036

SUB-CATCHMENT	5-YR STORM DEPTH [MM]		INFILTRATION [MM]		RUNOFF [mm]		RUNOFF VOLUME [10^6 ltr]		PEAK RUNOFF [LPS]		RUNOFF COEFF.	
	RESULT	INCREASE	RESULT	INCREASE	RESULT	INCREASE	RESULT	INCREASE	RESULT	INCREASE	RESULT	INCREASE
S13-A	27.5	44.9%	8.3	44.9%	18.8	48.1%	2.7	48.1%	2877.4	49.3%	0.68	2.2%
S13-B	27.5	44.9%	8.3	44.9%	18.7	48.5%	2.7	48.6%	2671.7	54.8%	0.68	2.4%
S13-C	27.5	44.9%	9.4	44.9%	17.7	48.3%	0.9	48.3%	939.4	50.1%	0.64	2.2%
S13-D	27.5	44.9%	6.3	44.9%	20.7	47.1%	0.6	47.5%	642.1	45.7%	0.75	1.5%
S13-E	27.5	44.9%	8.8	44.9%	18.3	48.0%	1.0	48.4%	1023.2	47.9%	0.66	2.2%
S13-F	27.5	44.9%	13.8	44.8%	13.3	48.8%	1.0	47.8%	962.6	59.8%	0.48	2.5%
S13-G	27.5	44.9%	14.3	44.9%	12.9	46.4%	0.2	41.7%	190.1	45.1%	0.47	1.1%
S13-H	27.5	44.9%	11.8	44.9%	15.3	45.9%	0.2	43.8%	254.4	45.0%	0.56	0.5%
S13-I	27.5	44.9%	0.9	0.0%	24.9	53.4%	0.5	55.9%	456.9	59.6%	0.91	5.8%
S23-A	27.5	44.9%	8.5	44.8%	18.4	48.6%	2.9	49.0%	2860.0	56.9%	0.67	2.6%
S23-B	27.5	44.9%	10.2	45.0%	17.0	47.2%	0.7	48.9%	726.0	45.7%	0.62	1.7%
S23-C	27.5	44.9%	15.1	44.9%	12.1	47.7%	1.0	47.7%	1038.9	46.5%	0.44	1.9%
S25-A	27.5	44.9%	10.7	44.9%	16.2	48.9%	3.7	48.8%	3122.5	65.6%	0.59	2.8%
S25-B	27.5	44.9%	12.4	44.9%	14.8	48.1%	1.0	47.8%	1054.8	48.7%	0.54	2.3%
S25-C	27.5	44.9%	13.2	44.8%	14.0	48.3%	1.0	48.5%	1075.8	49.3%	0.51	2.2%
S25-D	27.5	44.9%	12.4	44.9%	14.8	48.4%	1.6	49.1%	1647.0	51.2%	0.54	2.5%
S25-E	27.5	44.9%	14.0	44.9%	13.2	48.1%	1.3	48.9%	1428.6	48.4%	0.48	2.1%
S25-F	27.5	44.9%	15.4	44.9%	11.7	48.8%	4.9	48.9%	4651.4	59.2%	0.43	2.7%
S25-G	27.5	44.9%	14.0	44.9%	13.2	47.0%	0.4	46.7%	473.4	45.6%	0.48	1.5%
S25-H	27.5	44.9%	16.2	44.9%	11.0	47.2%	0.4	46.2%	413.9	45.6%	0.40	1.5%
S25-I	27.5	44.9%	9.1	44.8%	18.0	48.5%	3.6	48.2%	3721.1	53.1%	0.65	2.5%
S25-J	27.5	44.9%	7.7	44.9%	19.2	48.8%	4.7	48.7%	4341.6	61.1%	0.70	2.8%
S32-A	27.5	44.9%	13.8	44.9%	12.4	52.3%	6.7	52.3%	2271.4	70.4%	0.45	5.1%
S32-B	27.5	44.9%	13.8	44.9%	13.3	48.8%	0.7	50.0%	674.7	59.7%	0.48	2.5%
S38-A	27.5	44.9%	5.8	44.9%	21.2	48.0%	3.5	48.1%	3692.3	48.2%	0.77	2.1%
S38-B	27.5	44.9%	6.6	45.0%	20.4	48.1%	3.8	48.2%	4005.8	48.4%	0.74	2.2%
S38-C	27.5	44.9%	5.8	44.9%	21.2	48.1%	1.8	48.3%	1891.1	48.8%	0.77	2.3%
S38-D	27.5	44.9%	7.4	44.8%	19.6	48.3%	0.9	48.4%	964.6	51.2%	0.71	2.3%
S38-Z1	27.5	44.9%	24.8	44.9%	2.7	44.9%	3.7	44.8%	4005.5	44.9%	0.10	0.0%
S38-Z2	27.5	44.9%	24.8	44.9%	2.7	44.3%	0.2	36.4%	167.4	44.9%	0.10	0.0%
S3-A	27.5	44.9%	10.2	45.0%	16.9	47.9%	1.4	46.9%	1550.5	47.7%	0.62	2.0%
S3-B	27.5	44.9%	10.5	44.9%	16.7	47.6%	0.3	50.0%	357.4	46.5%	0.61	1.8%
S3-C	27.5	44.9%	10.7	44.9%	16.4	47.6%	0.6	48.7%	630.2	46.5%	0.60	1.9%
S3-D	27.5	44.9%	5.5	45.0%	21.5	47.1%	0.5	45.2%	494.0	45.6%	0.78	1.4%
S3-E	27.5	44.9%	6.6	45.0%	20.5	47.1%	1.2	47.6%	1317.1	45.6%	0.74	1.5%
S3-F	27.5	44.9%	11.6	44.9%	15.5	45.0%	0.3	42.9%	327.0	44.9%	0.57	0.2%
S3-G	27.5	44.9%	11.0	44.9%	16.1	45.5%	0.5	47.2%	574.4	44.9%	0.59	0.3%
S3-Z1	27.5	44.9%	24.8	44.9%	2.7	44.9%	6.5	45.3%	7091.8	44.9%	0.10	0.0%
S4-A	27.5	44.9%	6.3	44.9%	20.7	46.3%	0.8	46.3%	865.5	45.1%	0.75	0.9%
S4-B	27.5	44.9%	5.5	45.0%	21.4	48.6%	0.9	47.5%	873.5	55.2%	0.78	2.5%
S4-C	27.5	44.9%	7.4	44.8%	19.6	48.3%	1.3	48.3%	1390.7	50.5%	0.71	2.4%
S5-A	27.5	44.9%	9.9	44.9%	17.2	48.0%	1.5	48.1%	1644.4	48.4%	0.63	2.3%
S5-B	27.5	44.9%	5.5	45.0%	21.5	48.3%	0.4	48.0%	389.3	51.3%	0.78	2.4%
S5-C	27.5	44.9%	5.5	45.0%	21.4	48.4%	0.5	50.0%	553.7	52.3%	0.78	2.5%
S5-D	27.5	44.9%	5.5	45.0%	21.5	48.3%	0.3	42.1%	289.5	50.2%	0.78	2.4%
S5-E	27.5	44.9%	5.8	44.9%	21.2	48.0%	0.9	46.6%	912.5	48.0%	0.77	2.1%
S5-F	27.5	44.9%	5.5	45.0%	21.5	47.0%	0.2	46.7%	238.9	45.5%	0.78	1.4%
S5-G	27.5	44.9%	6.3	44.9%	20.6	48.6%	0.8	47.4%	826.2	56.9%	0.75	2.6%
S5-H	27.5	44.9%	7.4	44.8%	19.5	48.6%	0.7	46.9%	688.4	59.0%	0.71	2.6%
S5-I	27.5	44.9%	8.0	44.8%	19.1	48.0%	2.0	47.4%	2103.8	47.8%	0.69	2.1%
S5-J	27.5	44.9%	11.0	44.9%	16.1	46.5%	1.0	46.2%	1040.1	45.2%	0.59	1.0%
S5-K	27.5	44.9%	12.7	44.9%	14.5	47.9%	4.2	47.5%	4479.0	47.4%	0.53	2.1%
S5-Z1	27.5	44.9%	24.8	44.9%	2.7	44.9%	2.4	45.1%	2575.1	44.9%	0.10	0.0%
S7-A	27.5	44.9%	12.1	44.9%	15.0	48.6%	1.1	49.3%	1135.3	54.1%	0.54	2.4%
S7-B	27.5	44.9%	21.5	44.9%	5.9	45.6%	0.2	43.8%	252.0	44.9%	0.22	0.5%

Table 4.12 - Flooding Nodes under the 100-Year Storm Event – Climate Change 2016-2036

SUB-CATCHMENT	NODE REF.	MAXIMUM FLOW RATE [LPS]	FLOOD VOLUME [10^6 LTR]		
			RESULT	TOTAL	INCREASE
S3	J87	-	0.000	5.854	92%
	J88	-	0.000		
	J33	2,837	0.641		
	J86	1,761	1.052		
	J85	-	0.000		
	STMH246-DIV	-	0.000		
	STMH139	1,923	1.233		
	STMH138	1,501	1.851		
	STMH183	410	0.657		
	STMH6	1,050	0.416		
	STMH7	541	0.002		
	STMH187	-	0.000		
	STMH185	179	0.001		
	STMH12	503	0.001		
	DROF3	-	0.000		
S4	J89	-	0.000	0.007	0%
	J90	-	0.000		
	J91	-	0.000		
	J34	-	0.000		
	J38	-	0.000		
	STMH17	218	0.007		
	J37	28	0.000		
	STMH254	-	0.000		
	STMH93	-	0.000		
	DROF4	-	0.000		
S5	J46	4,530	1.714	5.931	97%
	J79	-	0.000		
	STMH15	1,763	1.743		
	STMH137	-	0.000		
	STMH4	49	0.002		
	STMH216	20	0.000		
	J56	311	0.051		
	STMH212	2,453	1.939		
	STMH253	407	0.002		
	STMH194	799	0.474		
	STMH147	161	0.000		
	STMH28	67	0.000		
	STMH2	352	0.005		
	STMH197	281	0.001		
	STMH196	131	0.000		
	STMH131	-	0.000		
	STMH135	-	0.000		
	STMH133	-	0.000		
	STMH190	-	0.000		
	DROF5	-	0.000		
S7	STMH23	268	0.036	0.036	0%
	STMH22	-	0.000		
	STMH26	-	0.000		
	STMH297	1	0.000		
	STMH298	112	0.000		
	DROF7	-	0.000		
S13	J1	514	0.190	3.866	130%
	STMH286	2,011	0.833		
	STMH56	862	0.946		
	STMH165	714	0.181		
	STMH188	1,663	0.632		
	STMH64	-	0.000		
	STMH63	444	0.000		
	STMH62	316	0.353		
	STMH161	1,158	0.726		
	STMH54	442	0.001		
	STMH178	509	0.001		
	STMH177	748	0.003		
	STMH398	-	0.000		
	DROF13	-	0.000		
S23	STMH116	2,169	0.994	3.633	64%
	DRCB64	121	0.010		
	DRCB40	2,111	2.629		
	DROF23	-	0.000		
S25	STMH37	2,517	1.474	5.299	80%
	STMH225	164	0.015		
	STMH226	667	0.762		
	STMH202	884	0.499		
	STMH38	1,600	1.197		
	STMH205	418	0.071		
	STMH204	72	0.012		
	STMH109	693	1.258		
	STMH244	448	0.010		
	STMH362	329	0.001		
	J73	-	0.000		
	J74	-	0.000		
	J78	-	0.000		
	J75	-	0.000		
	J84	-	0.000		
	J76	-	0.000		
	J77	-	0.000		
	DROF25	-	0.000		
S32	DRCB258	174	0.000	3.183	184%
	DRCB260	1,792	3.183		
	J94	-	0.000		
	DRFI2017	-	0.000		
S38	J83	1,715	0.224	5.166	121%
	STMH77	-	0.000		
	STMH74	-	0.000		
	STMH78	1,440	0.351		
	J22	3,780	2.757		
	STMH235	596	0.504		
	STMH83	2,102	1.058		
	STMH79	1,035	0.272		
	DROF38	-	0.000		
			32.975		

Table 4.13 - Subcatchment Hydrology under the 5-Year Storm Event – Climate Change 2037-2066

SUB-CATCHMENT	5-YR STORM DEPTH [MM]		INFILTRATION [MM]		RUNOFF [mm]		RUNOFF VOLUME [10^6 ltr]		PEAK RUNOFF [LPS]		RUNOFF COEFF.	
	RESULT	INCREASE	RESULT	INCREASE	RESULT	INCREASE	RESULT	INCREASE	RESULT	INCREASE	RESULT	INCREASE
S13-A	16.6	39.0%	5.0	39.2%	10.9	45.1%	1.6	45.0%	1649.2	49.7%	0.66	4.3%
S13-B	16.6	39.0%	5.0	39.2%	10.9	45.1%	1.5	45.3%	1451.3	57.8%	0.66	4.3%
S13-C	16.6	39.0%	5.6	39.0%	10.3	45.0%	0.5	44.4%	534.4	50.9%	0.62	4.4%
S13-D	16.6	39.0%	3.8	39.1%	12.1	46.0%	0.4	45.8%	382.8	41.9%	0.73	5.0%
S13-E	16.6	39.0%	5.3	39.1%	10.6	45.2%	0.6	44.7%	595.5	47.0%	0.64	4.6%
S13-F	16.6	39.0%	8.3	38.9%	7.7	44.9%	0.6	43.9%	499.2	63.8%	0.47	4.3%
S13-G	16.6	39.0%	8.6	39.1%	7.6	46.5%	0.1	42.9%	114.1	40.1%	0.46	5.3%
S13-H	16.6	39.0%	7.1	39.1%	9.1	46.5%	0.1	55.6%	152.8	39.6%	0.55	5.2%
S13-I	16.6	39.0%	0.9	0.0%	13.8	53.6%	0.3	52.6%	239.1	57.4%	0.83	10.4%
S23-A	16.6	39.0%	5.1	39.0%	10.7	45.0%	1.7	45.7%	1523.3	60.4%	0.64	4.2%
S23-B	16.6	39.0%	6.1	39.0%	9.9	45.9%	0.4	44.4%	432.5	42.1%	0.60	4.9%
S23-C	16.6	39.0%	9.1	39.1%	7.1	45.6%	0.6	47.4%	613.8	44.0%	0.43	4.7%
S25-A	16.6	39.0%	6.5	39.2%	9.4	45.2%	2.1	44.5%	1539.6	69.8%	0.56	4.3%
S25-B	16.6	39.0%	7.5	39.0%	8.6	45.2%	0.6	45.0%	608.1	48.7%	0.52	4.2%
S25-C	16.6	39.0%	8.0	39.0%	8.1	45.1%	0.6	43.9%	616.9	49.6%	0.49	4.5%
S25-D	16.6	39.0%	7.5	39.0%	8.6	44.9%	0.9	46.0%	926.0	52.8%	0.52	4.4%
S25-E	16.6	39.0%	8.5	39.2%	7.7	45.2%	0.8	44.4%	826.3	48.1%	0.46	4.3%
S25-F	16.6	39.0%	9.3	39.0%	6.8	45.1%	2.8	45.1%	2425.7	63.1%	0.41	4.3%
S25-G	16.6	39.0%	8.5	39.2%	7.7	46.1%	0.3	47.1%	282.5	41.6%	0.47	5.2%
S25-H	16.6	39.0%	9.8	39.0%	6.5	45.8%	0.2	46.7%	246.8	41.8%	0.39	4.8%
S25-I	16.6	39.0%	5.5	38.9%	10.4	45.0%	2.1	44.8%	2053.8	55.5%	0.63	4.3%
S25-J	16.6	39.0%	4.6	39.3%	11.1	45.0%	2.7	45.5%	2225.4	65.2%	0.67	4.2%
S32-A	16.6	39.0%	8.3	38.9%	6.9	49.1%	3.8	49.2%	1094.0	65.2%	0.42	7.5%
S32-B	16.6	39.0%	8.3	38.9%	7.7	44.9%	0.4	41.4%	350.1	63.8%	0.47	4.3%
S38-A	16.6	39.0%	3.5	39.2%	12.3	45.2%	2.0	45.7%	2142.0	47.6%	0.75	4.3%
S38-B	16.6	39.0%	4.0	38.8%	11.9	45.1%	2.2	45.3%	2318.1	48.0%	0.72	4.5%
S38-C	16.6	39.0%	3.5	39.2%	12.3	45.2%	1.0	45.1%	1089.1	48.9%	0.74	4.3%
S38-D	16.6	39.0%	4.5	38.8%	11.4	45.0%	0.5	45.9%	542.4	52.7%	0.69	4.3%
S38-Z1	16.6	39.0%	14.9	39.0%	1.6	42.5%	2.2	42.2%	2409.7	39.1%	0.10	2.1%
S38-Z2	16.6	39.0%	14.9	39.0%	1.6	40.0%	0.1	28.6%	100.6	39.0%	0.10	1.0%
S3-A	16.6	39.0%	6.1	39.0%	9.9	45.3%	0.8	44.8%	903.5	46.7%	0.60	4.6%
S3-B	16.6	39.0%	6.3	38.9%	9.7	45.7%	0.2	46.2%	211.1	44.0%	0.59	4.6%
S3-C	16.6	39.0%	6.5	39.2%	9.6	45.7%	0.3	47.8%	372.1	44.1%	0.58	4.7%
S3-D	16.6	39.0%	3.3	39.1%	12.6	45.9%	0.3	50.0%	294.7	41.7%	0.76	5.1%
S3-E	16.6	39.0%	4.0	38.8%	12.0	46.0%	0.7	44.9%	786.1	41.6%	0.72	5.1%
S3-F	16.6	39.0%	7.0	39.2%	9.3	44.7%	0.2	50.0%	196.7	39.1%	0.56	4.1%
S3-G	16.6	39.0%	6.6	39.1%	9.6	46.0%	0.3	47.6%	345.4	39.3%	0.58	5.1%
S3-Z1	16.6	39.0%	14.9	39.0%	1.6	45.5%	3.9	45.5%	4265.8	39.2%	0.10	4.3%
S4-A	16.6	39.0%	3.8	39.1%	12.2	46.3%	0.5	46.9%	519.5	39.9%	0.74	5.1%
S4-B	16.6	39.0%	3.3	39.1%	12.4	44.9%	0.5	45.7%	472.4	58.4%	0.75	4.2%
S4-C	16.6	39.0%	4.5	38.8%	11.4	44.9%	0.8	45.3%	787.4	51.7%	0.69	4.3%
S5-A	16.6	39.0%	6.0	38.9%	10.0	45.2%	0.9	43.5%	951.7	48.0%	0.60	4.5%
S5-B	16.6	39.0%	3.3	39.1%	12.4	45.0%	0.2	46.7%	218.7	52.9%	0.75	4.2%
S5-C	16.6	39.0%	3.3	39.1%	12.4	45.0%	0.3	47.6%	308.1	54.4%	0.75	4.2%
S5-D	16.6	39.0%	3.3	39.1%	12.5	45.1%	0.2	45.5%	164.5	51.1%	0.75	4.3%
S5-E	16.6	39.0%	3.5	39.2%	12.4	45.3%	0.5	47.1%	530.4	47.2%	0.75	4.5%
S5-F	16.6	39.0%	3.3	39.1%	12.6	46.1%	0.1	44.4%	142.7	41.4%	0.76	5.0%
S5-G	16.6	39.0%	3.8	39.1%	11.9	44.9%	0.5	44.1%	439.7	60.5%	0.72	4.2%
S5-H	16.6	39.0%	4.5	38.8%	11.3	44.9%	0.4	44.8%	359.6	62.9%	0.68	4.3%
S5-I	16.6	39.0%	4.8	39.1%	11.1	45.3%	1.1	46.2%	1225.7	46.8%	0.67	4.4%
S5-J	16.6	39.0%	6.6	39.1%	9.5	46.3%	0.6	47.4%	623.5	40.3%	0.57	5.1%
S5-K	16.6	39.0%	7.6	39.1%	8.5	45.4%	2.4	44.9%	2619.8	46.0%	0.51	4.5%
S5-Z1	16.6	39.0%	14.9	39.0%	1.6	42.5%	1.4	42.4%	1549.3	39.1%	0.10	2.1%
S7-A	16.6	39.0%	7.3	39.1%	8.7	44.9%	0.7	44.4%	620.8	56.9%	0.52	4.2%
S7-B	16.6	39.0%	12.9	39.1%	3.5	46.1%	0.1	55.6%	151.5	39.3%	0.21	4.9%

Table 4.14 - Flooding Nodes under the 5-Year Storm Event – Climate Change 2037-2066

SUB-CATCHMENT	NODE REF.	MAXIMUM FLOW RATE [LPS]	FLOOD VOLUME [10^6 LTR]		
			RESULT	TOTAL	INCREASE
S3	J87	-	0.000	2.303	131%
	J88	-	0.000		
	J33	-	0.000		
	J86	1,650	0.350		
	J85	-	0.000		
	STMH246-DIV	-	0.000		
	STMH139	1,196	0.484		
	STMH138	1,302	0.977		
	STMH183	401	0.405		
	STMH6	381	0.087		
	STMH7	-	0.000		
	STMH187	-	0.000		
	STMH185	-	0.000		
	STMH12	-	0.000		
	DROF3	-	0.000		
S4	J89	-	0.000	0.000	0%
	J90	-	0.000		
	J91	-	0.000		
	J34	-	0.000		
	J38	-	0.000		
	STMH17	-	0.000		
	J37	-	0.000		
	STMH254	-	0.000		
	STMH93	-	0.000		
	DROF4	-	0.000		
S5	J46	1,652	0.352	2.261	126%
	J79	-	0.000		
	STMH15	1,318	0.831		
	STMH137	-	0.000		
	STMH4	-	0.000		
	STMH216	-	0.000		
	J56	276	0.002		
	STMH212	1,501	0.925		
	STMH253	319	0.002		
	STMH194	333	0.149		
	STMH147	83	0.000		
	STMH28	-	0.000		
	STMH2	-	0.000		
	STMH197	-	0.000		
	STMH196	-	0.000		
	STMH131	-	0.000		
	STMH135	-	0.000		
	STMH133	-	0.000		
	STMH190	-	0.000		
	DROF5	-	0.000		
S7	STMH23	-	0.000	0.000	0%
	STMH22	-	0.000		
	STMH26	-	0.000		
	STMH297	-	0.000		
	STMH298	86	0.000		
	DROF7	-	0.000		
S13	J1	504	0.057	1.149	245%
	STMH286	745	0.173		
	STMH56	812	0.415		
	STMH165	342	0.003		
	STMH188	446	0.084		
	STMH64	-	0.000		
	STMH63	-	0.000		
	STMH62	327	0.163		
	STMH161	628	0.252		
	STMH54	228	0.000		
	STMH178	382	0.001		
	STMH177	410	0.001		
	STMH398	-	0.000		
	DROF13	-	0.000		
S23	STMH116	738	0.190	1.815	71%
	DRCB64	114	0.000		
	DRCB40	1,599	1.625		
	DROF23	-	0.000		
S25	STMH37	789	0.294	2.282	105%
	STMH225	-	0.000		
	STMH226	784	0.388		
	STMH202	526	0.163		
	STMH38	881	0.513		
	STMH205	241	0.005		
	STMH204	192	0.005		
	STMH109	641	0.913		
	STMH244	207	0.001		
	STMH362	169	0.000		
	J73	-	0.000		
	J74	-	0.000		
	J78	-	0.000		
	J75	-	0.000		
	J84	-	0.000		
	J76	-	0.000		
	J77	-	0.000		
	DROF25	-	0.000		
S32	DRCB258	-	0.000	0.613	0%
	DRCB260	438	0.613		
	J94	-	0.000		
	DRFI2017	-	0.000		
S38	J83	-	0.000	1.655	148%
	STMH77	-	0.000		
	STMH74	-	0.000		
	STMH78	203	0.000		
	J22	2,097	1.207		
	STMH235	596	0.231		
	STMH83	1,102	0.167		
	STMH79	618	0.050		
	DROF38	-	0.000		
			12.078		

Table 4.15 - Subcatchment Hydrology under the 100-Year Storm Event – Climate Change 2037-2066

SUB-CATCHMENT	5-YR STORM DEPTH [MM]		INFILTRATION [MM]		RUNOFF [mm]		RUNOFF VOLUME [10^6 ltr]		PEAK RUNOFF [LPS]		RUNOFF COEFF.	
	RESULT	INCREASE	RESULT	INCREASE	RESULT	INCREASE	RESULT	INCREASE	RESULT	INCREASE	RESULT	INCREASE
S13-A	30.1	58.2%	9.0	58.1%	20.6	62.3%	3.0	62.3%	3156.1	63.8%	0.69	2.5%
S13-B	30.1	58.2%	9.0	58.2%	20.5	62.8%	2.9	62.6%	2949.2	70.8%	0.68	2.9%
S13-C	30.1	58.2%	10.2	58.2%	19.4	62.3%	1.0	63.3%	1031.3	64.7%	0.65	2.7%
S13-D	30.1	58.2%	6.9	58.1%	22.7	60.8%	0.7	62.5%	701.6	59.2%	0.75	1.6%
S13-E	30.1	58.2%	9.6	58.2%	20.0	62.0%	1.0	62.5%	1120.6	61.9%	0.67	2.5%
S13-F	30.1	58.2%	15.0	58.1%	14.6	63.2%	1.1	62.3%	1069.4	77.5%	0.49	3.0%
S13-G	30.1	58.2%	15.6	58.2%	14.1	59.9%	0.2	58.3%	207.7	58.5%	0.47	1.1%
S13-H	30.1	58.2%	12.9	58.1%	16.7	59.3%	0.3	56.3%	277.8	58.3%	0.56	0.7%
S13-I	30.1	58.2%	0.9	0.0%	27.5	69.1%	0.6	70.6%	508.8	77.7%	0.91	6.9%
S23-A	30.1	58.2%	9.3	58.2%	20.2	63.0%	3.2	63.3%	3165.3	73.6%	0.67	2.9%
S23-B	30.1	58.2%	11.1	58.2%	18.5	60.9%	0.7	62.2%	793.3	59.3%	0.62	1.8%
S23-C	30.1	58.2%	16.5	58.2%	13.2	61.5%	1.1	61.5%	1136.1	60.2%	0.44	2.1%
S25-A	30.1	58.2%	11.7	58.2%	17.8	63.4%	4.0	63.4%	3495.1	85.4%	0.59	3.3%
S25-B	30.1	58.2%	13.5	58.1%	16.2	62.1%	1.1	61.2%	1156.2	63.1%	0.54	2.5%
S25-C	30.1	58.2%	14.4	58.1%	15.3	62.3%	1.1	63.2%	1180.0	63.7%	0.51	2.6%
S25-D	30.1	58.2%	13.5	58.1%	16.2	63.2%	1.7	64.2%	1830.7	68.1%	0.54	3.3%
S25-E	30.1	58.2%	15.3	58.2%	14.4	62.2%	1.5	62.2%	1565.5	62.7%	0.48	2.6%
S25-F	30.1	58.2%	16.8	58.2%	12.9	63.1%	5.4	63.2%	5163.1	76.7%	0.43	3.1%
S25-G	30.1	58.2%	15.3	58.2%	14.4	60.6%	0.5	60.0%	517.2	59.1%	0.48	1.7%
S25-H	30.1	58.2%	17.7	58.2%	12.1	60.8%	0.4	61.5%	452.3	59.1%	0.40	1.5%
S25-I	30.1	58.2%	9.9	58.2%	19.7	62.6%	4.0	62.4%	4099.4	68.7%	0.65	2.8%
S25-J	30.1	58.2%	8.4	58.1%	21.0	63.1%	5.2	63.3%	4831.1	79.3%	0.70	3.2%
S32-A	30.1	58.2%	15.0	58.1%	13.6	67.8%	7.4	67.9%	2570.2	92.8%	0.45	6.1%
S32-B	30.1	58.2%	15.0	58.1%	14.6	63.2%	0.8	62.5%	749.4	77.4%	0.49	3.0%
S38-A	30.1	58.2%	6.3	58.1%	23.2	62.1%	3.8	62.2%	4044.8	62.3%	0.77	2.4%
S38-B	30.1	58.2%	7.2	58.1%	22.4	62.1%	4.1	62.5%	4389.3	62.6%	0.74	2.5%
S38-C	30.1	58.2%	6.3	58.1%	23.2	62.2%	1.9	61.7%	2073.2	63.2%	0.77	2.5%
S38-D	30.1	58.2%	8.1	58.1%	21.5	62.5%	1.0	62.9%	1060.2	66.2%	0.71	2.7%
S38-Z1	30.1	58.2%	27.1	58.2%	2.9	57.8%	4.0	57.9%	4373.7	58.2%	0.10	0.0%
S38-Z2	30.1	58.2%	27.1	58.2%	2.9	57.8%	0.2	54.5%	182.7	58.2%	0.10	0.0%
S3-A	30.1	58.2%	11.1	58.2%	18.5	61.9%	1.6	61.2%	1697.8	61.8%	0.62	2.3%
S3-B	30.1	58.2%	11.4	58.2%	18.3	61.5%	0.4	63.6%	390.8	60.2%	0.61	2.0%
S3-C	30.1	58.2%	11.7	58.2%	18.0	61.4%	0.6	64.1%	689.2	60.2%	0.60	2.1%
S3-D	30.1	58.2%	6.0	58.2%	23.5	60.8%	0.5	61.3%	539.8	59.1%	0.78	1.6%
S3-E	30.1	58.2%	7.2	58.1%	22.4	60.7%	1.3	61.0%	1439.1	59.0%	0.74	1.6%
S3-F	30.1	58.2%	12.6	58.1%	17.0	58.2%	0.3	57.1%	357.1	58.2%	0.56	0.0%
S3-G	30.1	58.2%	12.0	58.2%	17.6	58.9%	0.6	58.3%	627.2	58.3%	0.59	0.3%
S3-Z1	30.1	58.2%	27.1	58.2%	2.9	58.4%	7.1	58.5%	7743.9	58.2%	0.10	0.0%
S4-A	30.1	58.2%	6.9	58.1%	22.6	59.7%	0.9	61.1%	945.2	58.4%	0.75	1.1%
S4-B	30.1	58.2%	6.0	58.2%	23.5	62.8%	1.0	62.7%	964.8	71.5%	0.78	2.9%
S4-C	30.1	58.2%	8.1	58.1%	21.5	62.4%	1.5	62.9%	1527.4	65.3%	0.71	2.7%
S5-A	30.1	58.2%	10.8	58.2%	18.8	62.0%	1.7	62.5%	1801.9	62.6%	0.63	2.6%
S5-B	30.1	58.2%	6.0	58.2%	23.5	62.5%	0.4	64.0%	427.9	66.3%	0.78	2.8%
S5-C	30.1	58.2%	6.0	58.2%	23.5	62.6%	0.6	63.9%	609.4	67.6%	0.78	2.9%
S5-D	30.1	58.2%	6.0	58.2%	23.5	62.4%	0.3	57.9%	317.9	64.9%	0.78	2.8%
S5-E	30.1	58.2%	6.3	58.1%	23.3	62.0%	0.9	60.3%	999.4	62.1%	0.77	2.5%
S5-F	30.1	58.2%	6.0	58.2%	23.5	60.6%	0.2	60.0%	261.0	59.0%	0.78	1.6%
S5-G	30.1	58.2%	6.9	58.1%	22.6	62.9%	0.9	61.4%	914.5	73.7%	0.75	3.0%
S5-H	30.1	58.2%	8.1	58.1%	21.4	63.0%	0.8	61.2%	764.0	76.4%	0.71	3.2%
S5-I	30.1	58.2%	8.7	58.1%	20.9	61.9%	2.2	61.7%	2303.6	61.8%	0.70	2.4%
S5-J	30.1	58.2%	12.0	58.2%	17.6	60.0%	1.0	60.0%	1136.0	58.6%	0.59	1.2%
S5-K	30.1	58.2%	13.8	58.1%	15.9	61.8%	4.6	61.7%	4902.6	61.3%	0.53	2.3%
S5-Z1	30.1	58.2%	27.1	58.2%	2.9	57.8%	2.6	58.0%	2811.9	58.2%	0.10	0.0%
S7-A	30.1	58.2%	13.2	58.1%	16.4	62.8%	1.2	64.0%	1252.2	69.9%	0.55	3.0%
S7-B	30.1	58.2%	23.4	58.2%	6.5	58.9%	0.3	56.3%	275.1	58.3%	0.21	0.0%

Table 4.16 - Flooding Nodes under the 100-Year Storm Event – Climate Change 2037-2066

SUB-CATCHMENT	NODE REF.	MAXIMUM FLOW RATE [LPS]	FLOOD VOLUME [10^6 LTR]		
			RESULT	TOTAL	INCREASE
S3	J87	-	0.000	6.719	120%
	J88	-	0.000		
	J33	3,518	0.903		
	J86	1,760	1.163		
	J85	-	0.000		
	STMH246-DIV	-	0.000		
	STMH139	2,064	1.441		
	STMH138	1,547	2.003		
	STMH183	474	0.693		
	STMH6	1,213	0.513		
	STMH7	578	0.002		
	STMH187	-	0.000		
	STMH185	152	0.000		
	STMH12	511	0.001		
	DROF3	-	0.000		
S4	J89	-	0.000	0.039	0%
	J90	-	0.000		
	J91	-	0.000		
	J34	-	0.000		
	J38	-	0.000		
	STMH17	289	0.039		
	J37	31	0.000		
	STMH254	-	0.000		
	STMH93	-	0.000		
	DROF4	-	0.000		
S5	J46	5,189	2.109	6.858	128%
	J79	-	0.000		
	STMH15	1,810	1.930		
	STMH137	-	0.000		
	STMH4	156	0.011		
	STMH216	24	0.000		
	J56	388	0.081		
	STMH212	2,652	2.158		
	STMH253	432	0.003		
	STMH194	867	0.554		
	STMH147	168	0.000		
	STMH28	94	0.000		
	STMH2	375	0.010		
	STMH197	310	0.001		
	STMH196	215	0.001		
	STMH131	-	0.000		
	STMH135	-	0.000		
	STMH133	-	0.000		
	STMH190	-	0.000		
	DROF5	-	0.000		
S7	STMH23	384	0.066	0.066	0%
	STMH22	-	0.000		
	STMH26	-	0.000		
	STMH297	4	0.000		
	STMH298	91	0.000		
	DROF7	-	0.000		
S13	J1	525	0.232	4.574	172%
	STMH286	2,289	1.019		
	STMH56	863	1.040		
	STMH165	827	0.245		
	STMH188	1,939	0.794		
	STMH64	-	0.000		
	STMH63	-	0.000		
	STMH62	322	0.392		
	STMH161	1,246	0.841		
	STMH54	481	0.005		
	STMH178	626	0.002		
	STMH177	908	0.004		
	STMH398	-	0.000		
	DROF13	-	0.000		
S23	STMH116	2,473	1.218	4.054	83%
	DRCB64	174	0.023		
	DRCB40	2,209	2.813		
	DROF23	-	0.000		
S25	STMH37	2,887	1.783	6.021	105%
	STMH225	265	0.034		
	STMH226	755	0.828		
	STMH202	988	0.584		
	STMH38	1,783	1.361		
	STMH205	284	0.090		
	STMH204	274	0.014		
	STMH109	693	1.307		
	STMH244	459	0.019		
	STMH362	272	0.001		
	J73	-	0.000		
	J74	-	0.000		
	J78	-	0.000		
	J75	-	0.000		
	J84	-	0.000		
	J76	-	0.000		
	J77	-	0.000		
	DROF25	-	0.000		
S32	DRCB258	182	0.000	3.843	243%
	DRCB260	2,145	3.843		
	J94	-	0.000		
	DRFI2017	-	0.000		
S38	J83	2,449	0.412	6.096	161%
	STMH77	-	0.000		
	STMH74	-	0.000		
	STMH78	1,631	0.473		
	J22	4,163	3.114		
	STMH235	596	0.563		
	STMH83	2,102	1.189		
	STMH79	1,264	0.345		
	DROF38	-	0.000		
			38.270		

4.3 Water Quality Analysis

4.3.1 TSS Loading

An assessment of water quality has been completed based on current landuse designations within each sub-catchment area identified.

In accordance with standard industry practice, Total Suspended Solids (TSS) has been selected as the primary parameter for analysis of water quality. Although there are other undesirable contaminants and pollutants typically contained in stormwater runoff – such as nutrients and heavy metals – that are often considered for study, it is common to use TSS as a surrogate parameter to understand these issues at a planning level, as this parameter can be considered representative of overall runoff quality.

A literature review was completed to identify suitable average TSS loadings (in mg/l) for each landuse type within Revelstoke. The TSS values selected for the analysis are shown in the following table (based on previous experience and engineering judgment). These loadings were then applied to the landuse types in each sub-catchment, and weighted based on area coverage to arrive at a composite average TSS loading associated with each catchment area. The composite TSS loadings were then combined with the actual drainage area, and an average annual precipitation depth for Revelstoke of 630 mm (Source: Environment Canada Climate Normals dataset for the Glacier NP Rogers Pass station, ID 1173191), in order to determine the total average annual sediment load associated with each drainage outfall.

The composite TSS loadings for each sub-catchment are illustrated on **Drawing 5A**. Full calculation details are provided in **Appendix D**, and the results are summarized in the following tables.

It is understood that Revelstoke does not currently have any water quality treatment facilities located within the City, therefore no treatment reductions were applied to the sediment loads calculated.

The results of the calculations are consistent with expectations based on the development patterns in the City. Average TSS loadings increase in catchment areas containing more urban development and areas with a higher density of commercial and industrial land uses. This can be seen in Drawing 5A, as the orange/red colors are clustered in the more populated areas of the City, indicating that urban development generally has a detrimental impact on quality of stormwater runoff – unless mitigating treatment facilities are integrated into the drainage systems. The absence of any dedicated SWM quality treatment facilities within the City is understandable given the nature of existing drainage systems, and how the urban area has developed historically, however it is something that could be addressed should the regulatory requirements of the receiving watercourse (Columbia River) mandate it. Refer to Section 5.5 for further discussion on potential approaches to storm water quality treatment in the City.

Table 4.17 Average TSS Loadings by Landuse (for Water Quality Analysis)

REVELSTOKE LANDUSE TYPE	AVERAGE TSS LOADING (mg/l/ha)
HEAVY INDUSTRIAL	87
LIGHT INDUSTRIAL	87
PARKS AND TRAILS	63
PUBLIC AND INSTITUTIONAL	79
RESIDENTIAL	131
TOURIST COMMERCIAL	77
URBAN RESERVE	55
RIGHT OF WAY	85
MIXED USE COMMERCIAL	77
MIXED USE SERVICE	85
CENTRAL BUSINESS DISTRICT COMMERCIAL	85
FUTURE GROWTH	85
RESERVOIR DRAWDOWN	81
RESORT LANDS	55
RURAL RESIDENTIAL	71
NEIGHBOURHOOD COMMERCIAL	77
SAND AND GRAVEL	98
RESORT CORES	77
AGRICULTURAL	100
NEIGHBOURHOODS	71

Table 4.18 Water Quality (TSS) Analysis Summary (1)

CATCHMENT REFERENCE	SUB-CATCHMENT REFERENCE	TOTAL AREA (HECTARES)	COMPOSITE % IMPERVIOUSNESS	COMPOSITE TSS LOADING (mg/l/ha)	TSS LOADING (tonnes/year)	TSS LOADING (tonnes/year)
drca1	-	127.61	37.6	68.0	20.58	-
drca2	-	15.09	62.7	102.1	6.08	-
drca6	-	3.84	56.6	96.1	1.32	-
drca8	-	31.64	46.6	89.1	8.28	-
drca9	-	21.21	20.7	72.4	2.01	-
drca10	-	27.24	12.5	64.7	1.38	-
drca11	-	8.08	50.6	108.9	2.80	-
drca12	-	2.49	52.0	112.3	0.92	-
drca14	-	4.84	64.1	99.5	1.94	-
drca15	-	20.17	57.8	103.5	7.60	-
drca16	-	4.17	48.7	113.7	1.46	-
drca17	-	7.92	74.4	82.1	3.05	-
drca18	-	138.33	36.5	76.3	24.27	-
drca19	-	82.87	10.1	55.0	2.89	-
drca20	-	61.08	50.4	102.2	19.81	-
drca21	-	192.50	31.8	74.5	28.68	-
drca22	-	59.06	56.1	109.2	22.78	-
drca24	-	124.27	42.1	97.2	32.02	-
drca26	-	329.23	41.1	71.0	60.52	-
drca27	-	57.17	31.3	61.8	6.97	-
drca28	-	129.11	31.2	61.7	15.65	-
drca29	-	115.60	43.8	65.6	20.92	-
drca30	-	2.29	73.3	82.1	0.87	-
drca31	-	51.52	32.6	64.6	6.84	-
drca33	-	364.45	74.0	83.2	141.32	-
drca34	-	13.07	44.5	69.8	2.56	-
drca35	-	64.69	20.3	59.4	4.91	-
drca36	-	240.27	36.4	69.2	38.13	-
drca37	-	19.48	37.8	67.2	3.12	-
drca39	-	354.34	50.9	72.4	82.29	-
drca40	-	107.86	53.6	77.8	28.32	-
drca41	-	10.95	20.3	59.4	0.83	-
drca42	-	87.30	52.6	68.4	19.79	-
drca43	-	129.29	50.8	80.2	33.18	-
drca44	-	91.77	79.4	77.1	35.38	-

Table 4.19 Water Quality (TSS) Analysis Summary (2)

CATCHMENT REFERENCE	SUB-CATCHMENT REFERENCE	TOTAL AREA (HECTARES)	COMPOSITE % IMPERVIOUSNESS	COMPOSITE TSS LOADING (mg/l/ha)	TSS LOADING (tonnes/year)	TSS LOADING (tonnes/year)
drca3	S3-A	8.55	63.0	100.6	3.42	11.16
	S3-B	1.98	61.7	104.5	0.81	
	S3-C	3.57	60.7	106.1	1.45	
	S3-D	2.14	80.0	81.9	0.88	
	S3-E	5.94	75.6	86.0	2.44	
	S3-F	1.96	57.6	110.8	0.79	
	S3-G	3.37	60.3	107.9	1.38	
drca4	S4-A	3.79	76.9	83.6	1.54	5.90
	S4-B	4.10	79.7	84.8	1.74	
	S4-C	6.79	73.4	83.5	2.62	
drca5	S5-A	9.07	64.0	101.2	3.70	22.73
	S5-B	1.72	80.0	85.0	0.73	
	S5-C	2.50	80.0	85.0	1.07	
	S5-D	1.21	80.0	85.0	0.52	
	S5-E	4.16	79.5	85.9	1.79	
	S5-F	0.98	80.0	85.7	0.42	
	S5-G	4.06	77.1	89.3	1.76	
	S5-H	3.73	72.8	93.2	1.60	
	S5-I	10.21	70.8	96.8	4.41	
	S5-J	5.89	59.5	108.4	2.39	
	S5-K	28.62	31.3	76.7	4.32	
drca7	S7-A	7.44	55.8	105.3	2.76	3.17
	S7-B	3.84	21.8	78.7	0.41	
drca13	S13-A	34.22	63.1	98.3	13.37	29.41
	S13-B	19.24	62.7	90.4	6.87	
	S13-C	5.10	66.5	99.5	2.13	
	S13-D	2.86	76.8	80.8	1.12	
	S13-E	5.09	67.5	93.3	2.02	
	S13-F	7.50	50.1	119.4	2.83	
	S13-G	1.54	47.9	121.9	0.57	
	S13-H	1.41	56.6	102.3	0.51	
drca23	S23-A	15.91	69.5	96.3	6.71	13.08
	S23-B	3.96	63.0	104.0	1.64	
	S23-C	7.88	45.2	123.7	2.78	
	S23-D	6.05	46.1	111.4	1.96	
drca25	S25-A	22.59	60.6	106.2	9.16	69.20
	S25-B	6.80	54.9	108.9	2.56	
	S25-C	7.32	52.2	117.2	2.82	
	S25-D	10.65	54.6	114.2	4.19	
	S25-E	10.10	48.8	109.2	3.39	
	S25-F	41.61	44.2	113.7	13.16	
	S25-G	3.44	49.3	120.3	1.28	
	S25-H	3.43	40.6	106.4	0.93	
	S25-I	19.93	67.3	89.3	7.55	
	S25-J	24.23	71.6	83.1	9.08	
	S25-K	64.60	47.3	78.3	15.07	
drca32	S32-A	54.37	67.1	97.2	22.33	64.30
	S32-B	5.37	76.1	85.3	2.20	
	S32-C	121.15	56.3	92.5	39.78	
drca38	S38-A	16.49	78.9	83.1	6.82	19.52
	S38-B	18.35	76.2	86.1	7.58	
	S38-C	8.40	79.1	82.1	3.44	
	S38-D	4.53	73.0	80.6	1.68	

4.3.2 Point Source Contamination

Potential point source contamination locations have been identified in the buildings layer of the GIS data set (with the assistance of City of Revelstoke staff). This identification process was based on building use classification in conjunction with local knowledge, with the intention of identifying any sites where there was potential for fuel storage (or other activities) that could present an increased risk of point source contamination to the surface drainage system. The results of this mapping exercise are presented in **Drawing 5B**, with each point colour-coded based on site use classification (as per the legend). The reference numbers adjacent to each point are detailed in Table 4.20.

As shown in the drawing, the potential point source locations are clustered in areas with a higher density of industrial/manufacturing/auto repair facilities, such as the Big Eddy neighbourhood and along the primary transportation corridors (including Victoria Road and Highway 23).

It should be noted that none of the locations indicated have been verified as presenting an increased risk of water quality contamination, and there is no implication intended that any of the properties identified are deficient in terms of on-site contamination protection measures (the assessment of these issues is considered beyond the scope of this exercise). The mapping is just intended to present a broad overview of areas which have the potential for point source contamination to help inform risk management decisions.

Table 4.20 Summary of Potential Point Source Contamination Locations

Ref.	Category	Address*
0	CONSTRUCTION	961 Sandstone Rd
1	CONSTRUCTION	813 Sandstone Rd
2	CONSTRUCTION	1835 Boruch Rd
3	FUEL	142 Hwy 23 North
4	AUTOS	2376 Boulder Rd
5	TRANSPORTATION	122 Hwy 23 North
6	AUTOS	722 Hwy 23 South
7	AUTOS	722 Begbie Rd
8	AUTOS	1960 Big Eddy Rd
9	TRANSPORTATION	1801 Boruch Rd
10	MACHINE	1608 Illinisky Rd
11	AUTOD	1321 Victoria Rd West
12	CONSTRUCTION	1011 Sandstone Rd
13	AUTOS	709 Victoria Rd West
14	AUTOS	727 Haines Rd
15	WOOD MILL	1792 Camozzi Rd
16	RETAIL	210 Hwy 23 North
17	FUEL	1875 Fraser Dr
18	AUTOT	2100 Big Eddy Rd
19	PUBLICWORKS	
20	CONSTRUCTION	735 Begbie Rd
21	RETAIL	96 Cartier St
22	WOOD MILL	1351 Vernon Ave
23	MECHANICAL	107 Track St East
24	CONSTRUCTION	703 Hwy 23 South
25	LANDSCAPING	1795 Nichol Rd
26	AUTOS	770 Lundell Rd
27	OTHER	723 Hwy 23 South
28	AUTOT	96 MacPherson St
29	FUELB	733 Hwy 23 South
30	AUTOS	294 Hwy 23 North
31	OTHER	6000 Westside Rd
32	CONSTRUCTION	2500 Westside Rd
33	FUELB	1250 Westside Rd
34	AUTOS	1500 Powerhouse Rd
35	AUTOS	1240 Powerhouse Rd
36	FUEL	1840 Trans Canada Hwy No 1 West
37	MACHINE	721 Begbie Rd
38	OTHER	
39	AUTOS	744 Hwy 23 South
40	TRANSPORTATION	530 Westside Rd
41	MACHINE	64 Westside Rd
42	MACHINE	64 Westside Rd
43	FIRE HALL	227 Fourth St West
44	AUTOS	401 First St West
45	FUEL	1888 Big Eddy Rd
46	OTHER	481 Westside Rd
47	MACHINE	1735 Celgar Rd
48	AIRPORT	2931 Airport Way
49	FUEL	1011 Victoria Rd West
50	FUEL	401 Victoria Rd West

* As noted above there is no implication intended here that any of the properties listed are currently allowing contaminated storm runoff to leave their sites. The addresses have been identified as part of a screening level exercise based on land uses (or business activities) that could present increased risk if not managed appropriately.

5.0 STORMWATER MANAGEMENT PLAN

In line with the findings of Chapter 4 and based on issues observed as part of the overall analysis of stormwater management and drainage within the City, a Stormwater Management Plan is proposed.

The SWM Plan includes specific recommendations under the following four key areas (which are discussed in detail in the subsequent sections of the report):

- Capital Works – Prioritized Infrastructure Upgrades
- Capital Works – Survey and Investigative Works
- Operations and Maintenance Activities
- Monitoring Activities

The plan also includes more general recommendations related to improvements to water quality of stormwater runoff, and a condition assessment methodology the City may want to put in place to help with asset management practices (as part of the O&M procedures).

The SWM Plan recommendations have been consolidated into a proposed 10-year implementation schedule, along with cost estimates for each element, to help the City determine the required funding necessary to deliver the recommendations.

Finally, a revised draft servicing bylaw is provided to address shortfalls identified in the current bylaw document, and to bring it in line with current best practice.

5.1 Capital Works – Prioritized Infrastructure Upgrades

A capital works program of prioritized infrastructure upgrades has been developed based on results of the hydrologic and hydraulic modelling analyses completed.

The process followed for developing the recommendations was as follows:

- Inspection of modelling results (as illustrated in Drawings 8A/8B through to 13A/13B) – specifically the node flooding results – in order to identify clusters of nodes/manholes that appeared to be susceptible to surcharge/flooding (i.e. HGL rising above rim elevations of manholes).
- Denoting these clusters of nodes as “storm sewer surcharge areas” (or “flood damage centers”) – as illustrated on **Drawings 14A/14B/14C** – and determining total flooding volume within each cluster in order to rank the issues in terms of severity. (Note that these drawings also provide additional information to supplement the modelling results shown, including primary overland flow directions and potential low point ponding areas (shown in varying shades of blue), as developed as part of the major system catchment analysis.)

- Undertaking revisions to the hydraulic model to determine the necessary storm infrastructure modifications/upgrades necessary in each of the flood damage centers in order to minimize the level of flood risk, and increase the level of service (LOS) in each area to an acceptable level.

The target LOS for each flood damage center was to achieve free flow conditions (i.e. pipes not surcharged) in the sections of the trunk system under consideration for the minor rainfall event (5-year return period). Where this did not prove feasible the minimum acceptable LOS was considered to be no node flooding during the minor rainfall event (i.e. HGL stays below rim elevations).

The following Table 5.1 summarizes the results of this work – including the cumulative flood volumes for each flood damage center, associated priority ranking, and describes the proposed works necessary to achieve the targeted LOS improvements. Subsequent sections of the report provide illustrations of HGL modelling results in the affected parts of the system before and after each of the recommended upgrades.

Drawings 15A/15B/15C are based on Drawings 14A/14B/14C but with additional annotation provided to highlight the prioritized infrastructure upgrades recommended in each location.

Note that unless stated otherwise all HGL model screenshots represent 5-year return period results (based on current City IDF coefficients), and are shown for the 20 minute time step, which, based on the 1-hour AES storm simulated, typically represents the peak HGL elevations in the system.

Full EPA-SWMM Model output for the “Proposed Conditions” (i.e. including all recommended upgrades) is provided in **Appendix E**, and cost estimate breakdowns for each of the infrastructure upgrade projects is provided in **Appendix F**.

Table 5.1 Summary of Prioritized Infrastructure Upgrades

STORM SEWER SURCHARGE AREA REF. ("Flood Damage Centre")	NODE REF.	FLOOD VOLUME (10^6 LTR)				PRIORITY RANKING	COMMENTS ON RESULTS	PROPOSED REMEDIAL UPGRADES
		5-YEAR (MINOR) EXISTING CONDITIONS		100-YEAR (MAJOR) EXISTING CONDITIONS				
1	J1	0.029	0.291	0.076	1.295	**7**	Inspection of HGL in downstream portion of the system (Burke Drive) indicates sufficient minor system conveyance capacity. However results indicate a general lack of conveyance capacity in storm sewer system (flooding in both minor and major events) upstream of Burke/Laforme (Colbeck Rd - Pearkes Dr - Laforme Blvd. Detailed design study should confirm results of planning-level modelling. Length of storm sewer system affected approximately 750 m.	To achieve acceptable minor system performance (no flooding) the following pipe size upgrades are recommended along Pearkes Drive and Laforme Blvd: STMP435 900mm (ex. 675mm), STMP14 900mm (ex.675mm), STMP428 750mm (ex. 675mm), STMP427 750mm (ex. 675mm), STMP9 750mm (ex. 675mm).
	STMH286	0.010		0.296				
	STMH56	0.162		0.550				
	STMH165	0.001		0.020				
	STMH161	0.086		0.351				
	STMH54	0.000		0.000				
	STMH178	0.001		0.001				
	STMH177	0.002		0.001				
2	J22	0.604	0.666	1.549	2.339	**3**	Modelling results for trunk system along Trans Canada Highway north of bridge crossing in vicinity of Victoria St intersection indicate some flooding in minor event (primarily on Victoria Rd). This is consistent with understanding that sewer system on TCH was re-built in early 2000s). Flooding volumes in major system event indicate the focus for remedial measures should be on ensuring safe overland flow path(s) exist in the area.	In minor system design event flood volume is almost entirely at node J22 (upstream end of STMP964, at Victoria Rd entrance to commercial plaza area). Existing pipe size from this point to connection to 1200mm dia. sewers in TCH bridge approach is 450mm. Increasing 450mm piepwork to improve conveyance capacity shows reduction in flood volume, but does not prevent flooding completely (due to downstream constraints of TCH system). Focus in this area should be on major system improvements.
	STMH78	0.000		0.002				
	STMH83	0.003		0.401				
	STMH235	0.054		0.292				
	STMH79	0.005		0.095				
3	J46	0.028	0.470	0.600	1.633	**5**	Results indicate lack of capacity within network of culverts/channels at upstream end of Campbell Avenue storm sewer system as runoff is conveyed across Mulock St, Track St, the rail corridor and Victoria St. Modelling currently indicates good performance of Campbell St system from Victoria St to outfall - it is noted that improving conveyance capacity at upstream end may impact this. I.e. less water will be lost to flooding at upstream nodes therefore more kept in the system through Campbell St, which may lead to increased HGL. Detailed design to account for this condition.	To achieve acceptable minor system performance (no flooding) the following pipe size upgrades are recommended at the upstream end of the Campbell Ave system: STMP99 900mm (ex. 600mm), STMP98 900mm (ex. 600mm), STMP850 900mm (ex. 600mm), and the existing culvert crossing of the rail corridor/Track St/Mulock St (ex. 600 mm).
	J79	0.000		0.000				
	STMH15	0.442		1.033				
	STMH137	0.000		0.000				
4	J56	0.002	0.531	0.002	1.381	**6**	Modelling results for drainage system in the vicinity of Victoria Rd and Track St east of Mackenzie Ave, either side of the rail corridor and proceeding south to McArthur Ave, indicate a general lack of conveyance capacity in storm sewer system (flooding in both minor and major events). Detailed design study should confirm results of planning-level modelling and be cogniscent of potential low point ponding area immediately downstream near Mackenzie/First intersection. Length of storm sewer system affected approximately 375 m.	To achieve acceptable minor system performance (no flooding) it is recommended that pipe STMP120 is upsized to 600mm diameter (ex. 400mm diameter). This pipe currently acts as a pinch point in the system (upstream pipes are larger, at 500mm diameter), so by removing that constriction the resulting HGL stays below ground and flooding is avoided for the 5-year event.
	STMH253	0.003		0.003				
	STMH212	0.480		1.160				
	STMH194	0.046		0.216				
	STMH147	0.000		0.000				
5	DRCB40	1.058	1.058	1.880	1.880	**4**	Oscar St between intersections with Humbert St and Leach St - flooding caused by reduction in pipe size at downstream end of system. 600 mm diameter pipe reduces to 350 mm prior to outfall which is causing HGL to surcharge above ground level in both minor and major events. Length of storm sewer system affected approximately 205 m.	To achieve acceptable minor system performance (no flooding) it is recommended that pipe STMP1086 is upsized to 900mm diameter (ex. 350mm diameter) from DRCB40 to outlet DROF23. This pipe currently acts as a pinch point in the system (upstream pipe is larger, at 600mm diameter), so by removing that constriction flooding is avoided for the 5-year event.
6	STMH37	0.007	1.115	0.520	2.939	**1**	Modelling results indicate general lack of conveyance capacity in system from Victoria St, along Eighth St and Edward St Length of storm sewer system affected approximately 770 m. It is noted that this section of the storm system discharges into the channel behind the Illicilliwaet River dyke system, with outflow to the river ultimately controlled by a pump station. Inspection of HGL profiles indicate however that tailwater conditions in the ditch/channel are not influencing node flooding in the upstream sections of the system - the issues are indicative of a lack of conveyannce capacity.	To achieve acceptable minor system performance (no flooding) the following pipe size upgrades are recommended: STMP1516 900mm (ex. 600mm), STMP249 900mm (ex. 600mm), STMP248 900mm (ex.600mm), STMP184 900mm (ex. 600mm), STMP749 750mm (ex. 600mm), STMP183 750mm (ex. 600mm), STMP182 750mm (ex. 600mm). Also recommended grade of pipe is flattened from node J46 (outlet to ditch) to STMH 204 to approx 0.5% in order to achieve minimum cover requirements, and satisfy no flooding target for minor system.
	STMH225	0.001		0.000				
	STMH226	0.160		0.486				
	STMH202	0.054		0.229				
	STMH38	0.232		0.663				
	STMH205	0.001		0.015				
	STMH204	0.001		0.007				
	STMH109	0.658		1.018				
	STMH244	0.001		0.001				
	STMH362	0.000		0.000				
7	STMH183	0.236	0.969	0.480	2.450	**2**	Flooding volumes relatively high, plus it is noted that this storm sewer surcharge location (Pearson/First intersection) coincides with an area identified as a low point within the overland flow system which would be susceptible to ponding during major system events. Consideration should be given as part of detailed design exercise to increasing capacity of downstream system to convey major system flows (rather than just minor system) to alleviate ponding risks. Length of storm sewer system affected approximately 280 m.	Increase diameter of all pipework within Pearson Street from Victoria Rd (STMH139) to outfall (DROF3) from 750mm to 1200mm (pipe refs. STMP90, STMP595, STMP594, STMP591, STMP554, STMP556, STMP555, and STMP521). Also add highcapacity CB inlets (assume 4no.) at low points in vicinity of Pearson/First intersection, and flatten grade of pipe from STMH184 to STMH 139 to approx 0.5% in order to achieve minimum cover requirements higher in the system, and keep HGL below ground level for all events up to 100-year storm (due to ponding concerns at First/Pearson).
	STMH6	0.011		0.144				
	STMH7	0.000		0.001				
	STMH138	0.545		1.197				
	STMH139	0.177		0.628				

5.1.1 Flood Damage Centre #1

Figure 5.1 Existing 5-year HGL Plot (Pearkes Dr. - Laforme Blvd. – Burke Dr.)

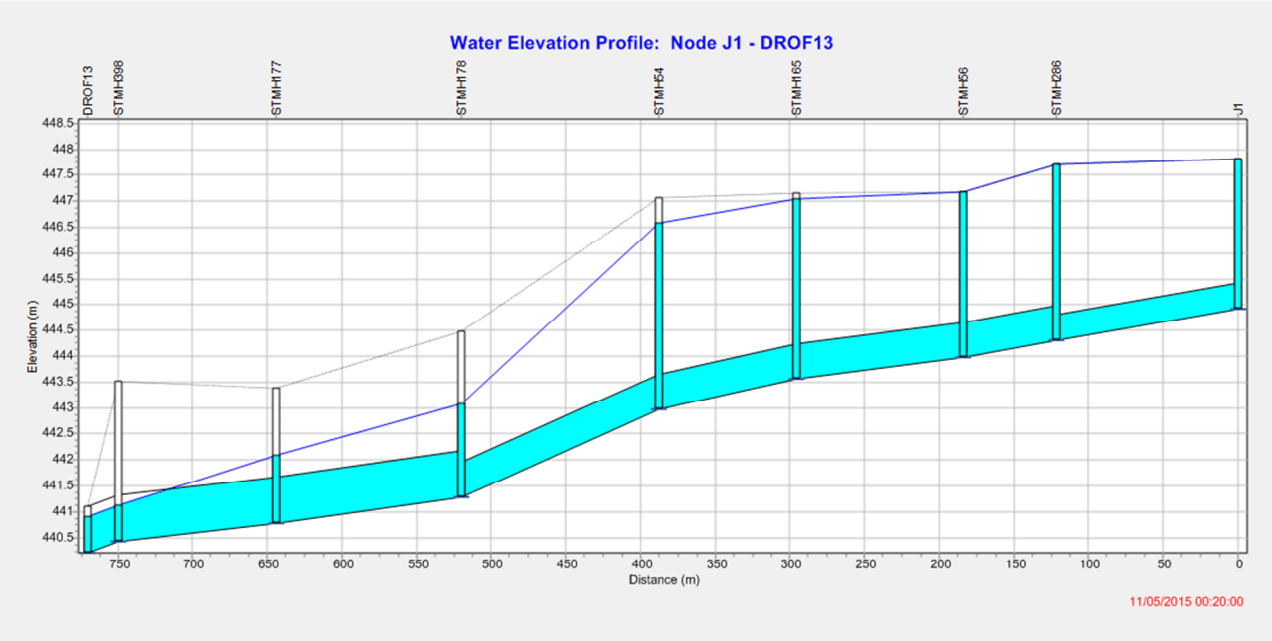


Figure 5.2 Proposed 5-year HGL Plot (Pearkes Dr. - Laforme Blvd. – Burke Dr.)

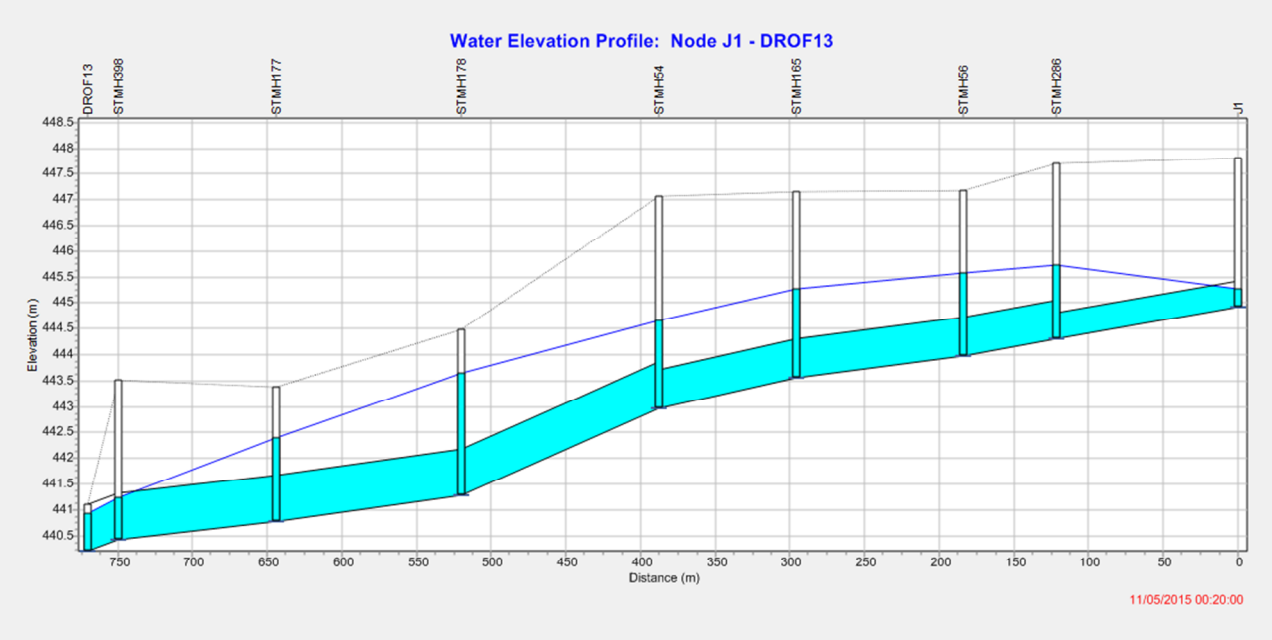


Figure 5.3 Existing 5-year HGL Plot (Laforme Blvd. – Burke Dr.)

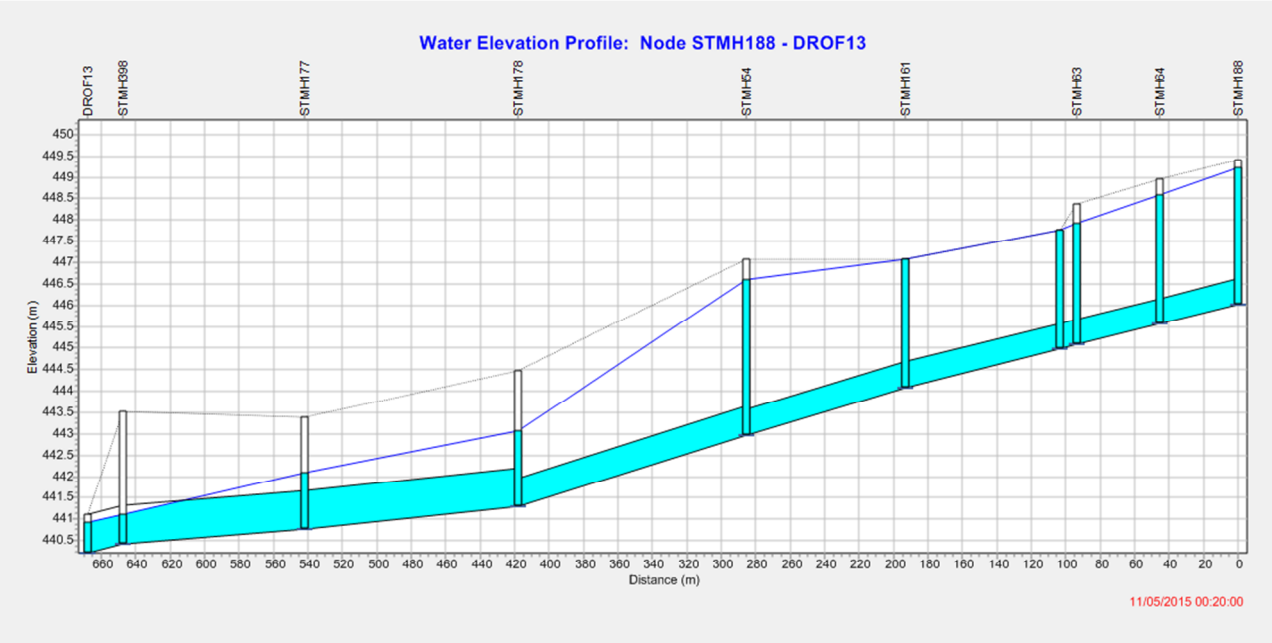
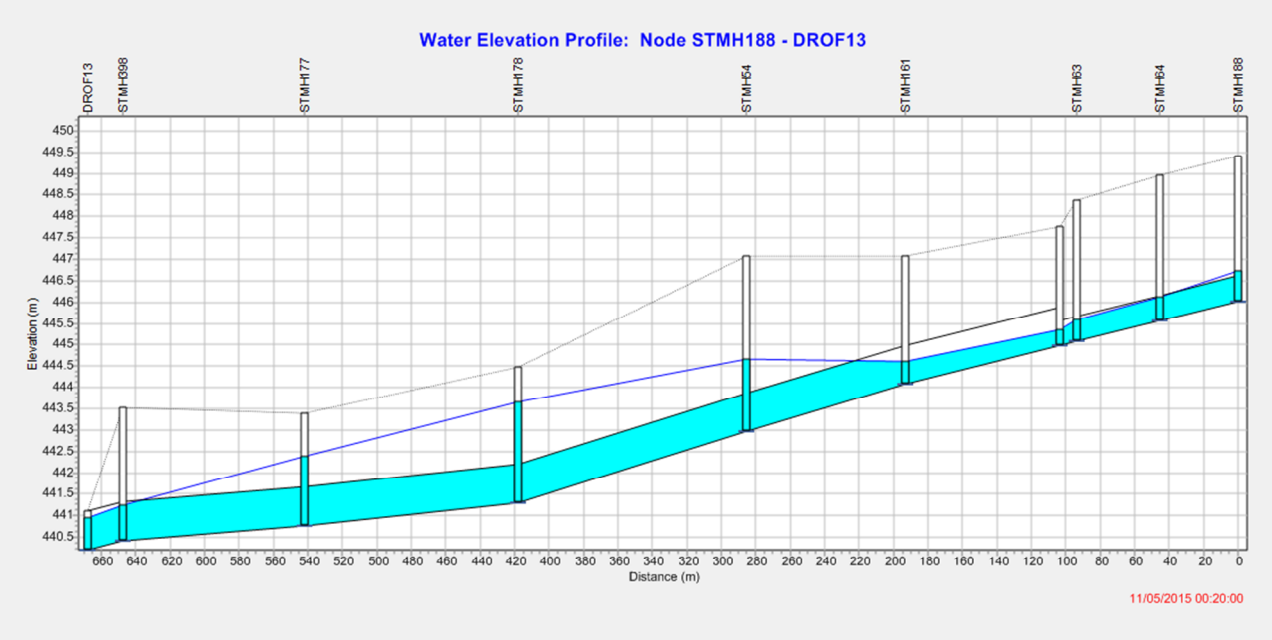


Figure 5.4 Proposed 5-year HGL Plot (Laforme Blvd. – Burke Dr.)



5.1.2 Flood Damage Centre #2

As noted in the summary table of prioritized infrastructure upgrades the modelling results for storm sewer system in the vicinity of the Trans-Canada Highway and Victoria St intersection indicate node flooding on Victoria Road adjacent to the entrance to the commercial plaza area (Petro Canada, McDonalds, A&W properties).

Various iterations of pipe upgrades were tested and modelled in this area in an attempt to relieve flooding, however it was concluded that improvements to below ground conveyance capacity were not sufficient to address the surface flooding issues identified, and that instead the focus for remedial measures should be on ensuring safe overland flow path(s) exist in the area.

Inspection of existing topography data indicates that runoff in this area would likely drain down from Victoria Road to the south-west end of the commercial plaza area. Overland flow paths from that point onwards (through the park area to the river) are not clear. It is recommended that these issues be studied in more detail following the SWM Plan in order to address the major system issues (possible in conjunction with any development opportunities that arise in the area).

Model results indicate that the estimated overland flow rates that would need to be safely conveyed in this area are 1.4 m^3/sec (5-year) and 2.5 m^3/sec (100-year) based on the current City IDF values, but increase up to 1.9 m^3/sec (5-year) and 3.8 m^3/sec (100-year) for the first climate change scenario tested (2016-2036), and 2.1 m^3/sec (5-year) and 4.2 m^3/sec (100-year) for the second scenario (2037-2066).

5.1.3 Flood Damage Centre #3

Figure 5.5 Existing 5-year HGL Plot (Campbell Ave.)

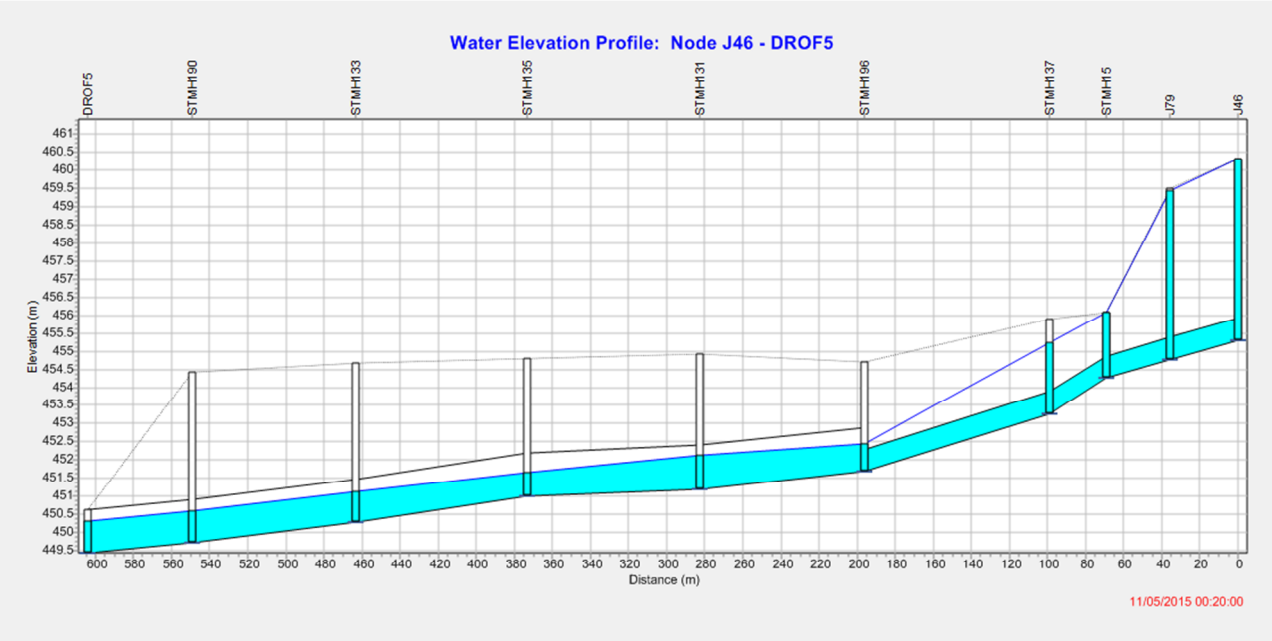
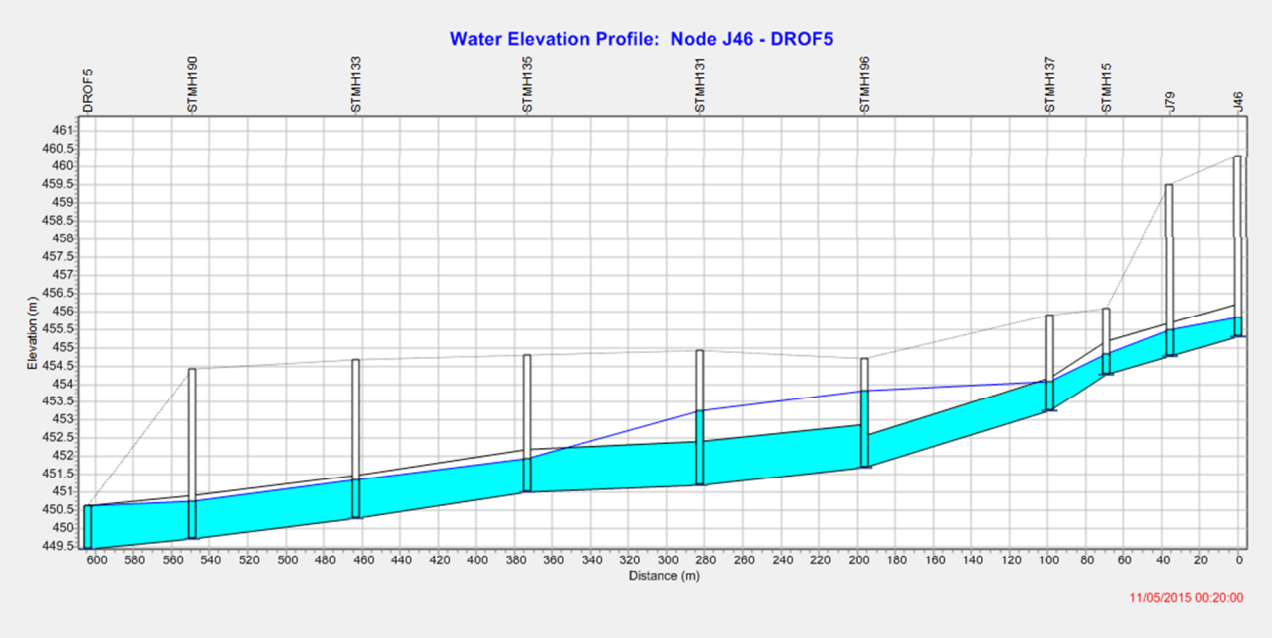


Figure 5.6 Proposed 5-year HGL Plot (Campbell Ave.)



5.1.4 Flood Damage Centre #4

Figure 5.7 Existing 5-year HGL Plot (First St. – Campbell Ave.)

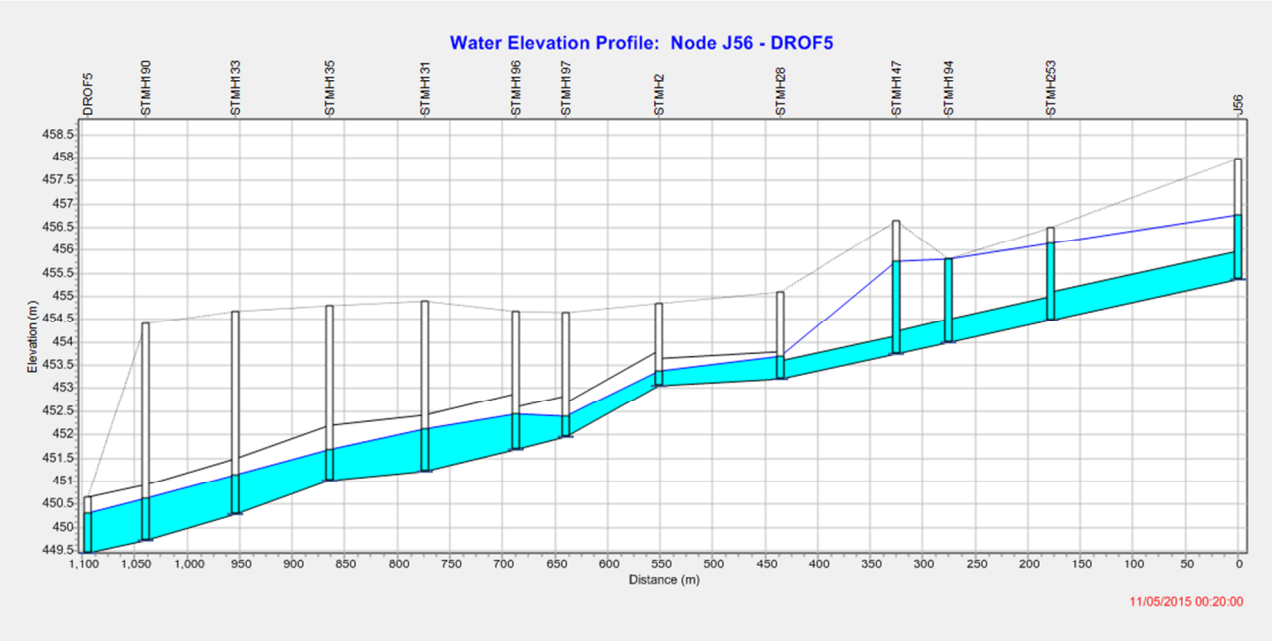
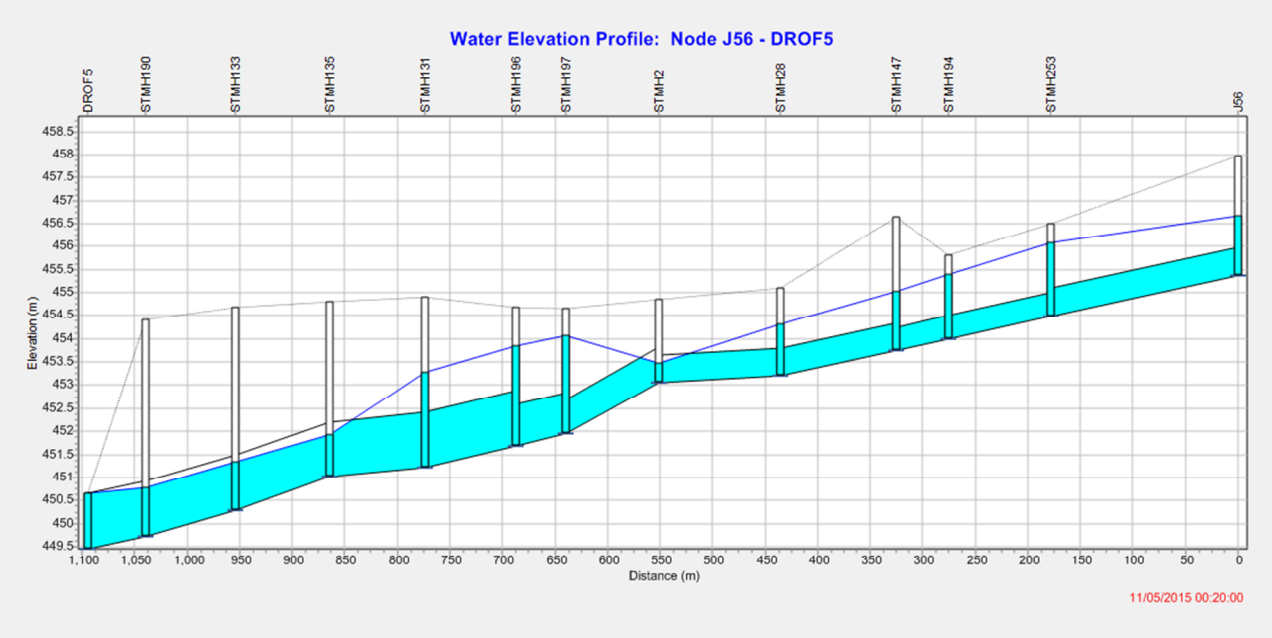


Figure 5.8 Proposed 5-year HGL Plot (First St. – Campbell Ave.)



5.1.5 Flood Damage Centre #5

Figure 5.9 Existing 5-year HGL Plot (Oscar St.)

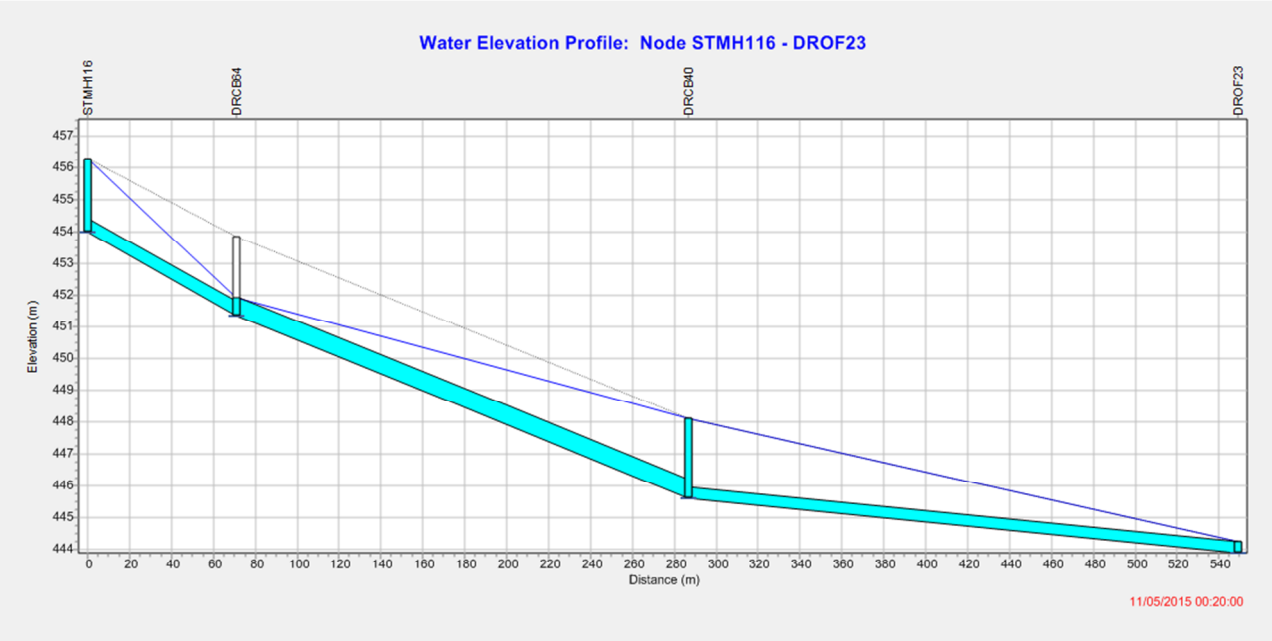
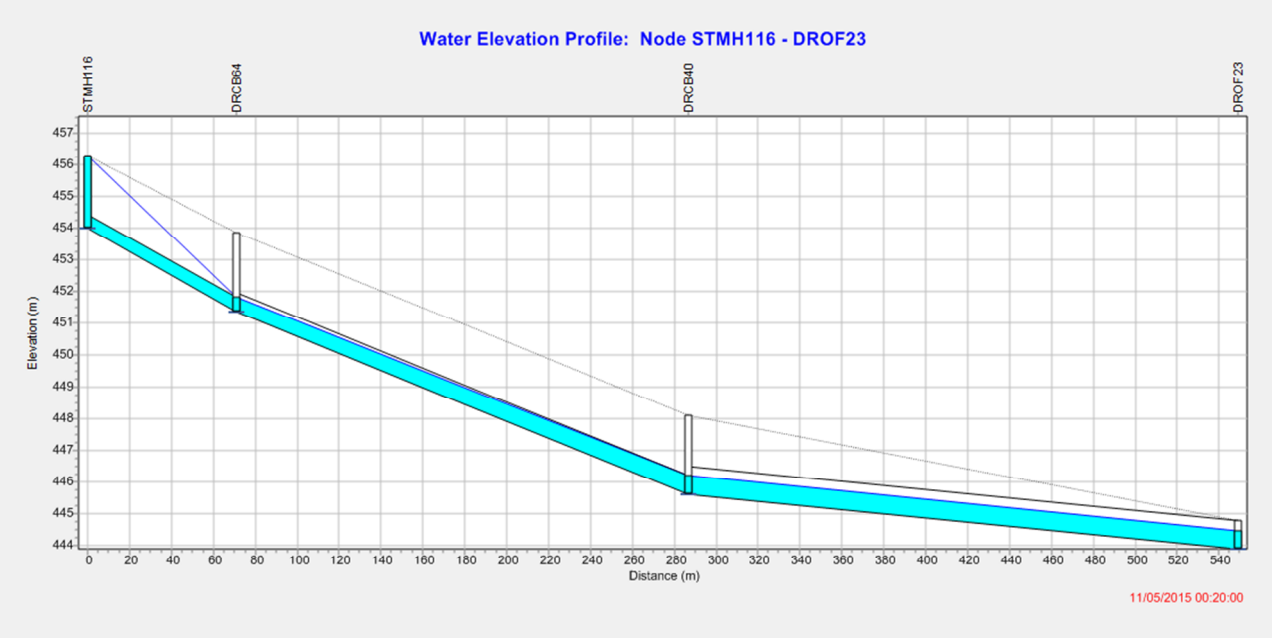


Figure 5.10 Proposed 5-year HGL Plot (Oscar St.)



5.1.6 Flood Damage Centre #6

Figure 5.11 Existing 5-year HGL Plot (Victoria Rd. – Eight St. – Edward St.)

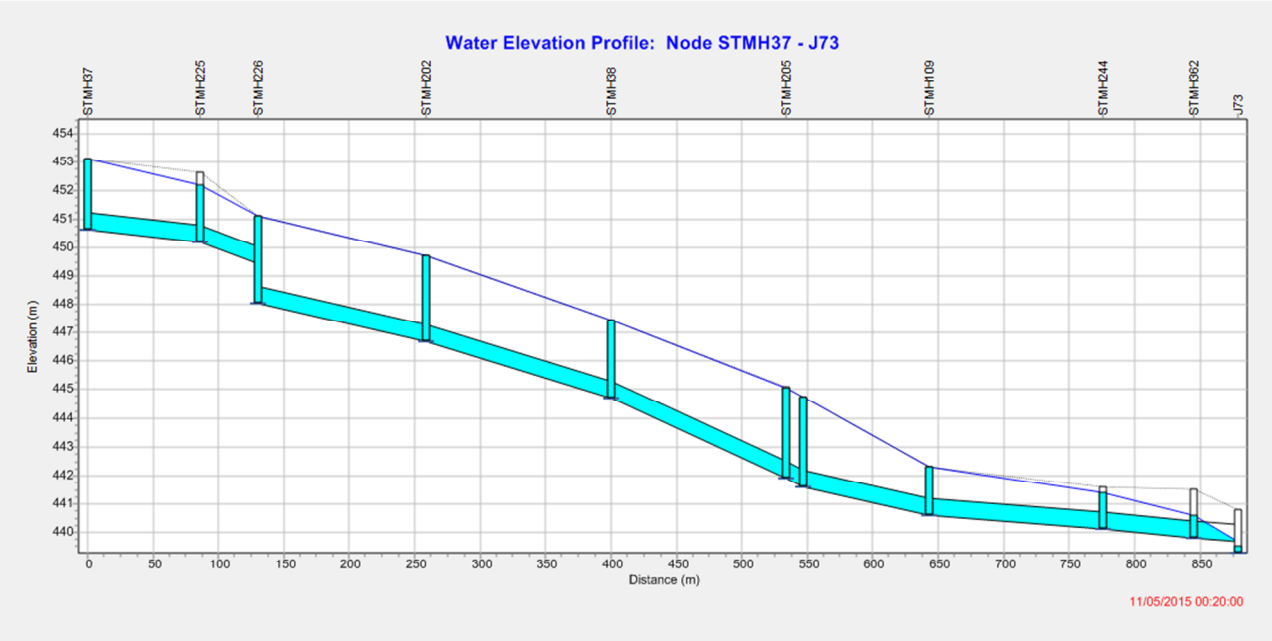
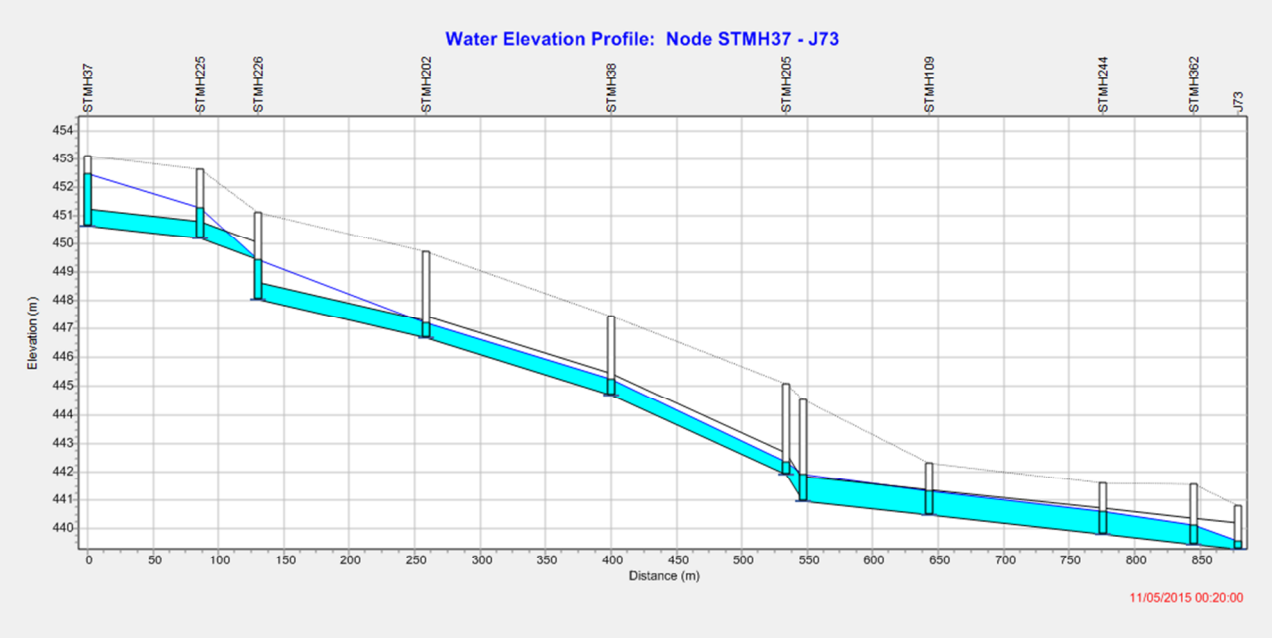


Figure 5.12 Proposed 5-year HGL Plot (Victoria Rd. – Eight St. – Edward St.)



5.1.7 Flood Damage Centre #7

Figure 5.13 Existing 5-year HGL Plot (Pearson St.)

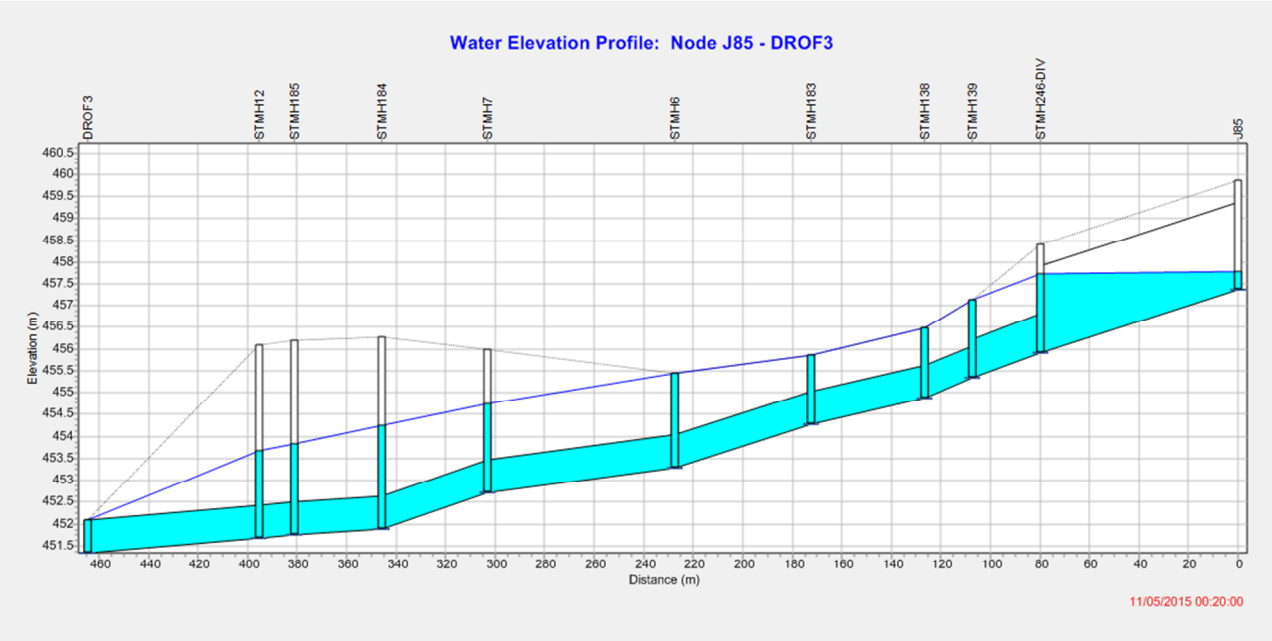


Figure 5.14 Proposed 5-year HGL Plot (Pearson St.)

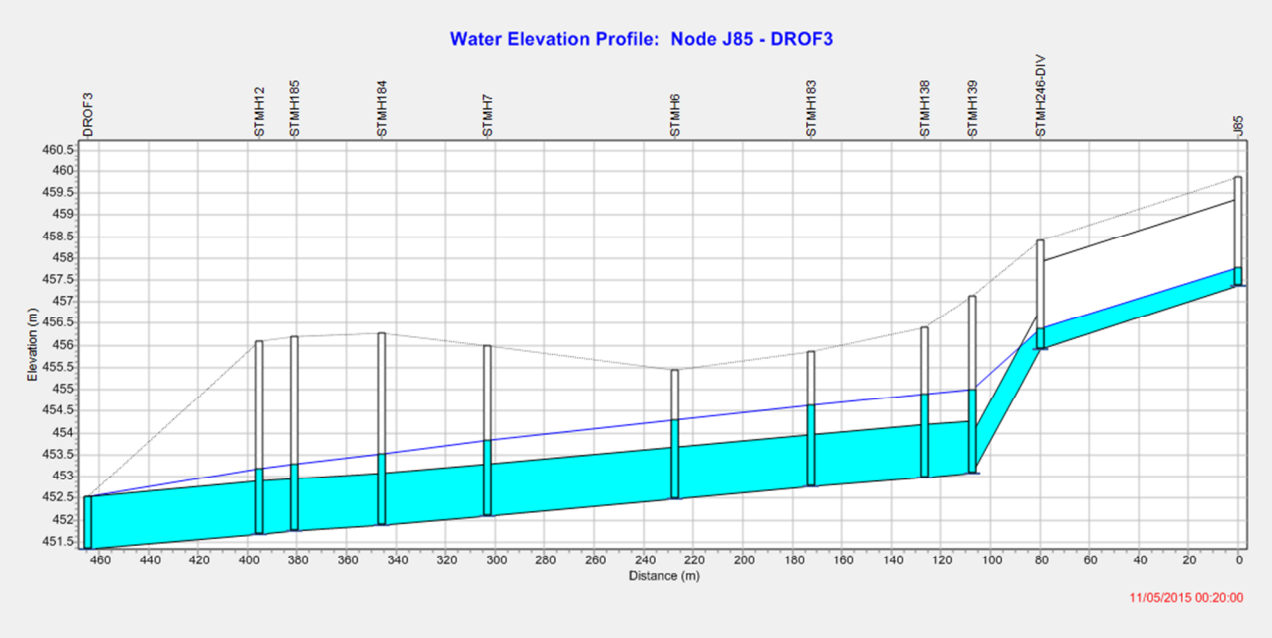


Figure 5.15 Existing 100-year HGL Plot (Pearson St.)

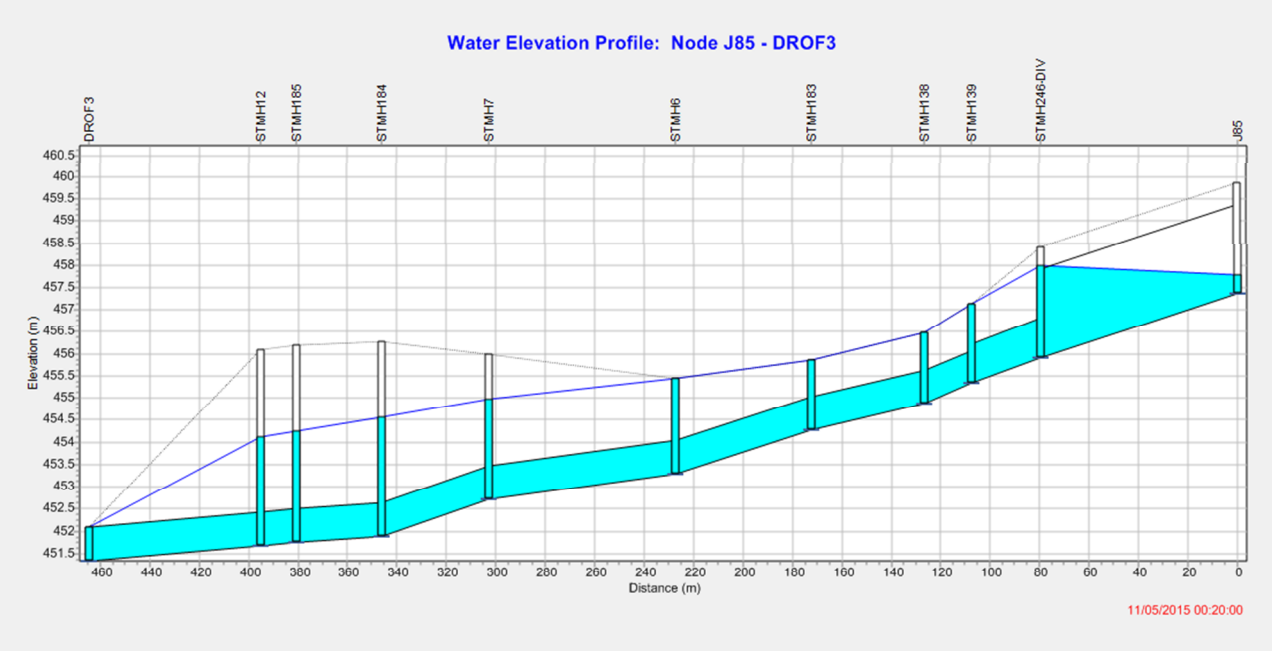
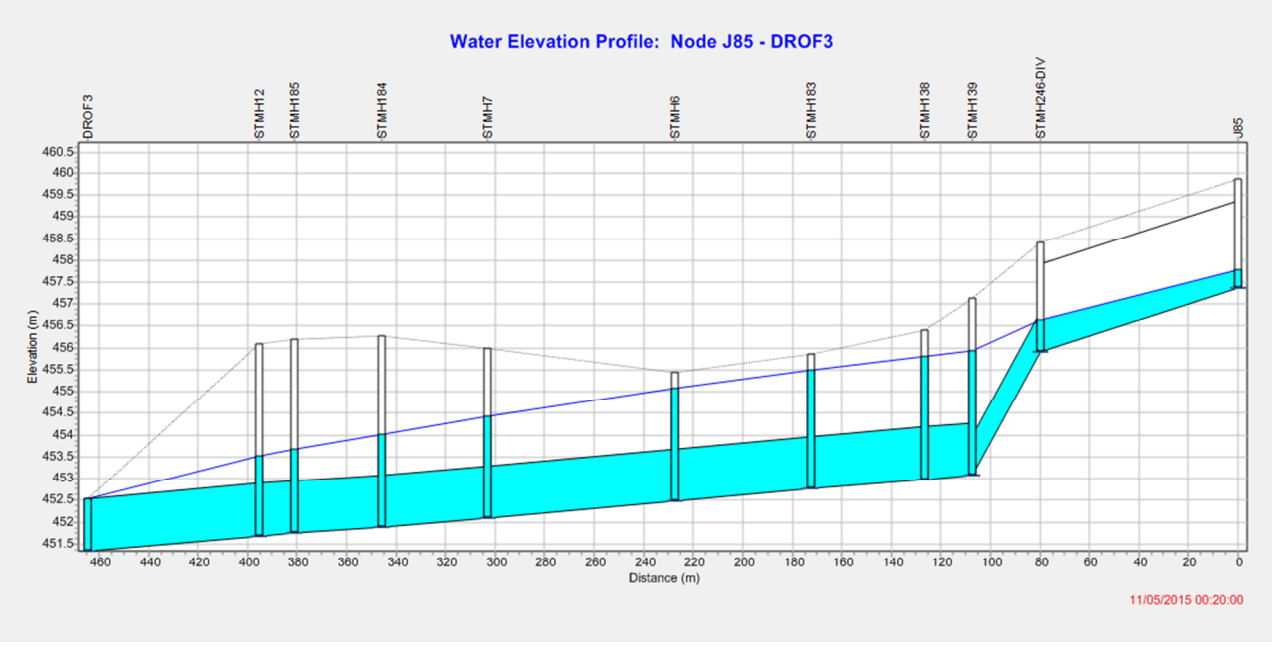


Figure 5.16 Proposed 100-year HGL Plot (Pearson St.)



5.1.8 Additional Observations

5.1.8.1 Connaught Avenue

It was noted by City staff that during a recent rainfall event (July 30, 2016) a manhole grate inlet in the vicinity of Connaught Avenue and Fifth Street (thought to be STMH228) was observed to be "bubbling". This condition is indicative of a storm drainage system that has insufficient capacity to convey inflows that are trying to pass through the system, which results in the HGL rising above the rim elevations of manholes and water escaping the pipe system via surface openings.

Although this part of the system is not part of the trunk network modelled as part of the study, storm sewer data has been inspected in order to determine whether any recommendations could be provided in order to improve level of service in this area.

Environment Canada daily data reports have been checked for nearby stations on July 30 – specifically the closest one at Revelstoke Airport – in an attempt to determine the magnitude of the rainfall event that caused the surface flooding situation. The hourly observations indicate that there were several periods of rainfall that day; including one identified as "thunderstorms/rain" from 2pm to 3pm, and a further period identified as "rain" from 6pm to 8pm. Unfortunately though no precipitation depths are available for that day, the dataset notes that they are "missing". Therefore the preliminary calculations detailed below have been completed in order to assess the situation.

The manhole in question receives inflow from two upstream pipes; STMP134 from the east (250 mm dia.) and STMP 697 from the north (200 mm dia.). In a downstream direction the system continues through the Community Centre parking area via a series of 250 mm diameter pipes (STMP704, STMP703, STMP132) before joining the large diameter Campbell Avenue system which outfalls into the river.

The free-flow capacity of the 250 mm pipe immediately downstream of STMH228 (where the issues were observed) is in the range of 60 to 100 l/sec, depending on pipe slope (limited GIS data available) – say 80 l/sec for preliminary calculation purposes.

The upstream drainage area contributing to flow at this point is estimated to be 4.25 hectares – consisting of land east to a point just past Orton Avenue, and from the midpoint between 3rd/4th Streets to a point just south of 5th Street. A runoff coefficient of 0.50 (single lot residential) is estimated for the area. Using the rational method formula (Q=CiA), and converting as required to correct units, it can be determined that the pipe would begin to surcharge at a rainfall intensity of around 13.5 mm/hour.

The design rainfall intensity based on current City of Revelstoke bylaw requirements (free flow conditions for 5-year return period) is in the range of 25 to 35 mm/hour (depending on time of concentration). On this basis the pipes appear to be undersized. The majority of pipework in the area is 250 mm diameter but preliminary calculations indicate a more suitable size at the downstream end of the system would be 450 mm diameter.

In conclusion, the magnitude of the July 30, 2016 rainfall event that caused surcharge at Connaught/Fifth cannot be accurately quantified due to absence of accurate rainfall depth/duration measurements – however it can be noted that it was a relatively significant event. Preliminary analysis of the storm sewer system in this area has indicated that the pipes generally appear to be undersized, and it is recommended that a detailed design exercise be completed in order to confirm infrastructure upgrades necessary to achieve the target level of service. It is also noted that the current pipe layout in the Community Centre parking lot appears to pass below the northernmost corner of the new swimming pool building, and therefore any upgrades would likely need to identify a new route through the parking lot in order to connect to the Campbell Avenue system.

5.1.8.2 Humbert Street – Moss Street

It was noted that the storm sewer system draining sub-catchment S25-F in the vicinity of Humbert Street and Moss Street (which outfalls into the ditch behind the Illecillewaet dyke) reduces in diameter in a downstream direction. Within Humbert Street existing pipes are 600 mm diameter (including STMP199, STMP297, STMP298), but at STMH110 it reduces to 450 mm (STMP299, STMP293). At STMH40 in Moss Street it then reduces further to 250 mm diameter, and continues at this size to the ditch outfall location.

Reduction in capacity in a downstream direction is obviously not a preferred design approach and could result in additional surcharge/flood risk at the constriction points (especially within Moss Street). Given the lack of a clearly defined overland flow path within Moss Street (road generally at similar elevation to adjacent buildings, and no curb/gutter system to contain major system flows), and noting that the storm sewer system passes through what appears to be private land (from Fourth Street to Moss Street), it is recommended that pipework upgrades be considered to maintain the 600 mm storm sewer diameter from Humbert Street through to the ditch outfall location. This would reduce the current significant “pinch point” in the system and reduce flood risk for nearby residential properties.

5.1.8.3 Arrow Heights

Inspection of GIS storm infrastructure data records within the Arrow Heights neighbourhood indicates that there is relatively little infrastructure at present. There are some existing catchbasin and pipe conveyance systems in localized areas, but coverage is not extensive – and there is nothing present that would be classified as a “trunk” system. The neighbourhood appears to predominantly rely on natural surface drainage and infiltration to manage rainfall events, aided by constructed dry drains (infiltration rock pits) in certain locations. This arrangement is indicative of an area with very well drained soils that doesn’t necessarily need formalized storm drainage systems to safely manage regular rainfall events. Local knowledge (and the limited soil data available) supports the idea that the neighbourhood sits within an area of sandy soils that have very good natural drainage properties.

It is noted though that the Arrow Heights area is relatively flat topographically, and lacks clearly defined overland (major system) flow paths to natural receiving systems (Illecillewaet or Columbia Rivers). Although the informal drainage systems have evidently developed over time to manage regular rainfall

events without the need for overland flow paths, there remains a residual risk that during extreme storm events rainfall intensities may exceed the infiltration capacity of the native soils and result in excess surface water flow. In this case buildings may be at risk of flooding.

To mitigate these risks it is recommended that proponents of any new developments study the potential for overland flows in the vicinity of their sites, and set building threshold elevations safely above maximum possible water depths on the adjacent streets or properties. This approach should be standard good practice for any new development site, but is particularly important in Arrow Heights due to the low density of existing storm drainage infrastructure and reliance on natural systems for conveyance/infiltration of rainfall runoff.

5.2 Survey and Investigative Works

It is recognised that the large diameter sections of the City's storm sewer network running along Pearson Street, Wynn Street, and Campbell Avenue are particularly critical elements of the City's storm drainage system, as they convey natural streams originating in the Mount Revelstoke national park areas through the downtown core to the outfall points into the Columbia River. It is also noted that relatively little is known about the condition of these parts of the system, in terms of both structural integrity and sediment buildup (which could affect conveyance capacity). Therefore camera survey works are recommended for these three sections of the system.

5.2.1 Costing of Camera Survey Works

The table below summarizes the costs associated with the recommended camera survey works.

Note that the costing is based on an estimated total survey length of 1,100 m, and it has been assumed that the work would be completed during a low flow period of the year where the water would be pumped between manholes in order to isolate sections of pipe for survey (and that no creek diversions or major work done by large equipment would be required).

Table 5.2 Survey Works Costing Summary

Element of Work	Assumptions	$
Video Inspection	$150/hr * 8 hours / 300m /hr = $4.00 /m	$5 /m
Pumping	2 – 4 inch trash pumps @ $260 / week plus fuel	$2 /m
Manpower	2 men @ $65 / hr * 5 days * 8 hrs / day = $5200 / 1100m	$5 /m
Additional equipment	Service truck, isolation balls and small tools	$2 /m
Disbursements	$200 /day * 3 people * 5 days = $ 3,000	$3 /m
Total survey cost (on a linear meter basis)		**$20 /m**
Total survey cost (assumed survey length 1,100 m)		**$22,000**

5.3 Operations and Maintenance Activities

It is recommended that allowances be made within the SWM Plan for annual operations and maintenance (O&M) activities deemed necessary to prolong the asset life of existing storm drainage infrastructure.

For the City of Revelstoke the following typical O&M tasks are considered appropriate:

- Clean out of catchbasins (CBs) – to remove any accumulated sediment within the sump, and ensure grate inlet is not blocked at the surface.

- Drainage ditch maintenance – removal of debris, ensuring pipe/culvert inlets and outlets are free draining, control of overgrown vegetation etc.
- Inspection of manhole (MH) locations – lifting lid, ensuring inlets/outlets are not blocked.
- Inspection of dry drain (infiltration) locations – general inspection to ensure lifting lid, ensuring inlets/outlets are not blocked.
- Flushing of storm sewers – to clear any blockages identified, and ensure system remains free draining.

5.3.1 Costing of Operations and Maintenance Activities

In order to estimate costs for the various O&M activities City maintenance staff were consulted to understand typical methods and approximate rates applicable. These discussions occurred in August 2016, and are detailed below.

5.3.1.1 Catchbasin Clean Out

It is understood that catchbasin clean out would typically by undertaken by Vacuum Truck (Vactor, or other) by two operators. Cost to the City for this service is $210 per hour, and it was noted that approximately 5 locations could be cleaned out per hour, which results in a CB clean out unit rate of $42.

Inspection of GIS infrastructure data indicates that the City currently has 997 catchbasin assets (refer to earlier Table 4.1 for breakdown of existing infrastructure assets). A figure of 1,000 has been used for estimating costs, which results in a total clean out cost of $42,000.

It is recommended that the SWM Plan cost schedule incorporates a full CB clean out programme in the first year of implementation, but that this could potentially be scaled back in subsequent years (on the basis though that all CBs are still inspected visually every year to ensure continued good drainage performance). The subsequent O&M costing summary therefore includes this full sum for the first year, and reduces it by 50% for subsequent years.

5.3.1.2 Drainage Ditch Maintenance

It was noted by the City that ditch maintenance activities would typically be completed by a rubber tire backhoe vehicle, along with tandem dump truck and operator crew – at a cost of approximately $146 per hour. And it was estimated that for full ditch clean out activities around 300 m of ditching could be completed in a work day (assume 7.5 hour day). This equates to a rate of $3.65 per linear meter of ditch.

GIS data indicates that there is around 45,000 m (45 km) of ditching within the City (reference Table 4.1 for details), which results in a total clean out cost of $164,250. It is not considered necessary to undertake full ditch clean out activities on an annual basis however – instead it is recommended that this programme be implemented on a 3-year cycle, at an estimated annual cost of $54,750. Maintenance priorities should be decided based on condition assessment (refer to following section 5.3.2 for details).

5.3.1.3 Additional Operations and Maintenance Cost Assumptions

Estimated costs for the following additional O&M works are based on use of a service truck and labourer, at a cost to the City of $52 per hour.

- Annual inspection of manhole locations – assumed three locations can be completed per hour, resulting in a unit cost of $17. Approximately 400 manholes within City, which gives an annual cost of $6,800.
- Annual inspection of dry drain (infiltration) locations – assumed one location can be completed per hour, resulting in a unit cost of $52. Approximately 60 of these assets within the City, which gives an annual cost of $3,120.

The following lump sum budgetary allowances are also recommended for O&M works that are difficult to quantify in advance of future condition assessment work:

- Flushing of storm sewers (not including investigation and survey works associated with large diameter pipework in Pearson, Wynn, and Campbell – as detailed in Section 5.2) – annual lump sum $15,000.
- Undertaking additional condition assessment inspections (as detailed in Section 5.3) – assumed to primarily cover labour costs as required for City staff working on the assignment – annual lump sum $10,000.

5.3.1.4 Summary of Operations and Maintenance Costing

The following table presents a summary of the cost schedule for Operations and Maintenance activities, as described above.

Table 5.3 Operations and Maintenance Costing Summary

Year	OPERATION & MAINTENANCE		
	Details	$	$/year
Year 1 (2017)	Catchbasin Clean Out (100%)	42,000	131,670
	Drainage Ditch Maintenance	54,750	
	Manhole Inspections	6,800	
	Dry Drain Inspections	3,120	
	Flushing of storm sewers	15,000	
	Condition assessment inspections	10,000	
Years 2 to 10 (2018 to 2026)	Catchbasin Clean Out (50%)	21,000	110,670
	Drainage Ditch Maintenance	54,750	
	Manhole Inspections	6,800	
	Dry Drain Inspections	3,120	
	Flushing of storm sewers	15,000	
	Condition assessment inspections	10,000	

5.3.2 Condition Assessment Methodology

As part of the Operations and Maintenance activities associated with the SWM Plan it is recommended that the City undertake a coordinated program of storm drainage infrastructure condition assessments to catalogue the current state of the City's infrastructure assets, and to help identify priorities for maintenance (and/or future investment to replace deficient infrastructure). Sample assessment criteria and methodology are provided below for different elements of the drainage system.

5.3.2.1 Storm Sewers

Condition assessment of storm sewers is difficult without specialist equipment, as the infrastructure is buried and generally inaccessible for simple visual inspection. As indicated in Section 5.2.1 it is recommended that the Town consider retaining the services of a camera survey firm to assist with the full condition assessment of storm sewers.

One approach that WSP | MMM has seen used successfully in other jurisdictions in order to complete this type of exercise in a cost-effective manner is to undertake a zoom camera survey in advance of the full CCTV survey contract. The zoom camera assessment utilizes video camera equipment that is lowered into manhole structures and from that point is able to look (via zoom lenses) into all incoming and outgoing pipework for a distance of between 25 and 100 m. This investigation is often undertaken as a screening exercise in order to identify areas of the network that do require full CCTV survey. Typically, only 20-30% of the system may require full cleaning, or remedial measures, so funds available for survey should be focused on the areas that are most in need of inspection. Rather than undertake full CCTV survey on all 35km+ of storm sewer mains in the City it may be possible to reduce the survey extent to the 5-10 km of the network that actually warrants the survey investment.

The results of the zoom camera screening exercise should then inform the extent of the CCTV survey inspection contract. Priority for this CCTV inspection should be given to the trunk drainage network, and in particular any parts of the system that conveys external upstream drainage areas through the downtown areas of the City.

Note that this general condition assessment of the overall storm sewer system is recommended in addition to the specific survey recommendations for large diameter pipework on Pearson Street, Wynn Street, and Campbell Avenue, as detailed in Section 5.2.

5.3.2.2 Drainage Channels

Condition assessment of drainage ditches, channels and natural streams/watercourses within the City limits should be completed based on visual inspection. Attention should be paid to locations where the open channels connect to below ground storm drainage infrastructure, as these points can be particularly susceptible to debris accumulation and blockage.

The visual inspection should identify any issues that could result in a reduction of flow conveyance capacity – for example, natural (or man-made) debris that could block flow, evidence of excessive sediment build-up at the base of the channel or on banks at changes in direction. It should also look for any evidence of erosion within the open channels that could signify a change in flow regime, or a particularly severe storm event. This would typically be represented by erosion of vegetation on the banks.

The inspections should also attempt to identify any locations where vegetation management O&M activities need to be amended, or undertaken more frequently. For example, some ditches may have a tendency to become overgrown quicker than others depending on the nature of vegetation present, and therefore may need more frequent maintenance to ensure continued flow conveyance capacity.

As noted above, at pipe/headwall locations where the open conveyance system enters the pipe network the visual inspection should look for excessive sediment build-up (which can occur due to deposition when flow velocity drops immediately upstream of the pipe entry point during large flow events), as well as accumulation of debris on grates or within the pipe cross section which could reduce flow conveyance capacity.

Given the ease of access to digital photography nowadays, it is recommended that a photographic summary of conditions be completed as part of all visual inspection surveys. This will allow the City to build-up a library of knowledge on the performance of the system, help establish baseline conditions for future comparison, and help identify any recurring issues that should be addressed with more than regular maintenance operations. For example, if there are areas of the system that appear to be particularly prone to debris blockage the underlying causes for this issue can be investigated to reduce the need to regularly clean out the location.

Upon completion of the visual investigation the issues encountered should be ranked based on potential severity. Priority should be given to issues that could result in reduced flow capacity in the system, and maintenance resources assigned accordingly in order to reduce flood risk for any future storm events. Any longer term issues identified – such as those related to erosion of channels – should be studied on a case by case basis, and an appropriate course of action selected based on the potential increase to flood risk.

5.3.2.3 Outfalls

Regular visual inspection of storm sewer outfalls is recommended to ensure that no blockages are present that would prevent runoff being discharged into the receiving watercourse. Checks should also be completed to confirm stability of outfall structures and any associated riprap protection, particularly following large storm events.

It is important to note that safe working practices be established for City staff to complete these inspections as locations of outfalls will typically be on steep slopes, and/or on the banks of watercourses, and therefore individuals may have to access dangerous areas in order to complete the inspections. The

proposed work plan for accessing these areas should be reviewed and agreed in advance, and signed off by appropriate management staff.

5.3.2.4 Stormwater Management Facilities

There are currently no stormwater management detention facilities (e.g. dry or wet ponds) in Revelstoke. If/when facilities are constructed in the future the City should insist that the developer/designer provide an operations and maintenance manual specific to the SWM facility prior to acceptance (if the facility/pond is to be assumed by the City). This document should set out the recommended inspection frequency for different components of the facility (incoming/outgoing pipework, control structures etc.), and the condition assessment methodology to be followed. It should also determine the typical clean-out frequency for accumulated sediment, and safe working methods that should be followed for this process.

Other SWM facilities under the jurisdiction of the City – such as the dry drains (rock pits and dedicated rainwater collection/infiltration tanks) clustered in subcatchment 15 (Wright Street to Wales Street), as well as throughout the Arrow Heights neighbourhood – also require annual inspection and maintenance to ensure continued function. At a minimum this should consist of visual inspection of any visible parts of the system and remedial works to clear any blockages or other issues identified.

5.4 Monitoring Activities

As part of the SWM Plan implementation process a 3-year flow monitoring program is recommended in order to collect data at several key locations within the City's storm drainage system – specifically the parts of the network that drain large parts of the national park area from the north-east through the Revelstoke downtown core. This information would allow for verification (and refinement as required) of the modelled flow rates entering the City system from the external catchment areas. The current modelling exercise has made best estimates for runoff parameters based on information available, however these are large ungauged catchments and collection of monitored flow data would allow for a proper verification and calibration exercise to be completed, which would provide significant benefit to the accuracy of the simulations.

The process would involve installation of data logging equipment in three separate locations (one for each of the Pearson Street, Wynn Street, and Campbell Avenue systems) to continuously record depth and velocity of flow at that point. The data collected would then show how the flow regime at each location is affected by rainfall events, and the data recorded would be converted into flow rates (m^3/sec) for comparison to simulated results and to enable further model calibration as required.

5.4.1 Costing of Monitoring Activities

The table below summarizes the costs associated with the recommended flow monitoring activities over the 3-year period.

Note that the costing includes an allowance for an initial site visit (by WSP, or other competent professional) to install the flow monitoring devices and to instruct City staff on monthly maintenance/data collection requirements, with the assumption that the City would then take responsibility for these monthly visits over the remainder of the monitoring program. It is also noted that this program covers collection of data only – costs associated for any additional consultant assignments to analyze the data and verify/calibrate the current modelling is not included.

Table 5.4 Monitoring Activities Costing Summary

Year	MONITORING ACTIVITIES		
	Details	**$**	**$**
Year 1 (2017)	Purchase of depth/velocity flow meters (3 no.)	12,000	17,600
	Initial site visit for flow meter installation (and City staff training)	2,000	
	Monthly site visits by City staff to check continued function of equipment and collect/download data	3,600	
Year 2 (2018)	Monthly site visits by City staff to check continued function of equipment and collect/download data	3,600	3,600
Year 3 (2019)	Monthly site visits by City staff to check continued function of equipment and collect/download data	3,600	3,600

5.5 Water Quality Treatment

As detailed in Section 4.3 an analysis of runoff quality has been completed based on current land uses within the City. The results of this analysis are illustrated on Drawings 5A and 5B. As would be expected, the results show that the water quality indicator studied (estimated TSS loading contained in stormwater runoff) is higher in areas of more intense development – i.e. within the downtown core and in other sub-catchments with high imperviousness development.

Typical retrofit approaches to improving quality of runoff would involve construction of end-of-pipe facilities (SWM ponds/wetlands, or individual OGS treatment devices) at the downstream end of the drainage systems, prior to the outfall into receiving watercourses. This approach is often complicated though by the fact that suitable plots of land are rarely available at the required locations (close to outfalls) for construction of pond facilities. OGS devices require significantly less land-take, but their effectiveness is limited to far smaller catchment areas.

In Revelstoke it is recognized that in addition to stormwater runoff generated from developed areas within the City, the majority of the trunk drainage systems convey flow from natural streams and watercourses originating beyond the City limits. This is a function of the way the City has developed historically due to its geographic location; situated on table land at the base of steep mountainside areas and adjacent to the Columbia River. It is a relatively unusual situation though in the context of stormwater management and therefore typical approaches are not necessarily applicable here. It is evident that runoff from undeveloped upstream areas is from natural catchments and therefore does not require any form of water quality treatment. However, the nature of the existing conveyance systems means that this “clean” runoff is mixed with runoff from the developed areas (which would benefit from quality treatment) as it passes through the

City. As a result, typical approaches relying on end-of-pipe treatment facilities are not considered suitable as they would need to be designed to cope with large flow rates – a significant proportion of which consists of runoff that does not require treatment.

Separating the systems to permit treatment of runoff from just the developed areas within the City is considered excessive and unnecessary, however options should be investigated that would encourage treatment of runoff on a site by site basis. As a minimum, bylaw requirements requiring quality treatment for new developments should be enforced strictly, and methods to incentivize existing land owners to retrofit their private drainage systems with quality treatment features should be considered. One way of doing this would be to implement the incentives as part of the introduction of a stormwater management rate (as discussed further in Section 5.10). As part of this system rebates (or reductions in payments due) could be offered to land owners if they take proactive actions on their own property to minimize the impacts of stormwater runoff. This approach can be scaled to different types of development as well. For example, at an individual residential lot level, the property owner could be given benefit for discharging roof leaders to a rain barrel (for collection and re-use) or landscaped area designed to accept infiltration, or through the installation of permeable surfaces on driveways that would accept infiltration, rather than generate runoff to municipal roadways. At a larger industrial/commercial scale interventions may need to be of a more structural nature – for example, installation of suitable sized OGS devices prior to connection into the municipal storm sewer system, or retrofitting private collection systems to discharge runoff to infiltration facilities rather than directly offsite.

It should be noted that targets for quality of stormwater runoff are often informed by criteria related to the receiving watercourse – in this case the Columbia and Illecillewaet rivers – and that these requirements would usually be defined at a level beyond that of the local municipality. Further work is necessary to determine whether these systems have criteria associated with them that Revelstoke should be targeting, or whether the contributing area under consideration is at a scale (relative to the overall river catchment) that would mean discharge criteria are not mandated. Regardless though, the measures outlined above related to implementation of water quality treatment on a site by site basis are considered best practice approaches that are consistent with the goals and policies of the City's OCP document, and which should be implemented as part of bylaw enforcement processes.

5.6 Costing and Implementation Schedule

The following Table 5.5 provides a summary of the implementation schedule for the proposed SWM Plan. All recommended works identified as part of the study assignment have been costed and a schedule (based on prioritization of the recommended upgrades) has been set out for implementation over the next 10 years.

Note that all costing is based on 2016 estimates and no allowance has been made for inflation increases over the course of the 10-year implementation.

Table 5.5 SWM Plan Implementation Costing Schedule

Year	DESIGN STUDIES[1]		CAPITAL WORKS				OPERATION & MAINTENANCE[5]		MONITORING ACTIVITIES[6]		TOTAL EXPENDITURE (2016 Costs)
	Details	$	Infrastructure Upgrades[2,3]	$	Survey & Investigative Works[4]	$	Details	$	Details	$	$
Year 1 (2017)	-		-		CCTV camera condition surveys of sewers in Pearson St, Wynn St, and Campbell Ave.	22,000	Implement annual O&M programme.	131,670	Implement monitoring programme (Year 1 of 3)	17,600	**171,270**
Year 2 (2018)	Flood Damage Centre #6 (Priority Rank 1): Detailed storm system modelling to confirm suitability of sewer upgrade proposals (Eighth St & Edward St)	30,000	-		-		Implement annual O&M programme.	110,670	Implement monitoring programme (Year 2 of 3)	3,600	**144,270**
Year 3 (2019)	Flood Damage Centre #7 (Priority Rank 2): Detailed storm system modelling to confirm suitability of sewer upgrade proposals (Pearson St & First St)	20,000	Flood Damage Centre #6 (Priority Rank 1): Sewer Upgrades (Eighth St & Edward St)	1,373,750	-		Implement annual O&M programme.	110,670	Implement monitoring programme (Year 3 of 3)	3,600	**1,508,020**
Year 4 (2020)	Flood Damage Centre #2 (Priority Rank 3): Investigate major system flow paths in vicinity of TCH/Victoria St/Woodenhead Loop	20,000	Flood Damage Centre #7 (Priority Rank 2): Sewer Upgrades (Pearson St & First St)	695,660	-		Implement annual O&M programme.	110,670	-		**826,330**
Year 5 (2021)	Flood Damage Centre #5 (Priority Rank 4): Detailed storm system modelling to confirm suitability of sewer upgrade proposals (Oscar St)	15,000	Flood Damage Centre #2 (Priority Rank 3): Implement findings of Year 3 design study (assumed lump sum cost item)	150,000	-		Implement annual O&M programme.	110,670	-		**275,670**
Year 6 (2022)	Flood Damage Centre #3 (Priority Rank 5): Detailed storm system modelling to confirm suitability of sewer upgrade proposals (Mulock St & Track St)	15,000	Flood Damage Centre #5 (Priority Rank 4): Sewer Upgrades (Oscar St)	379,015	-		Implement annual O&M programme.	110,670	-		**504,685**
Year 7 (2023)	Flood Damage Centre #4 (Priority Rank 6): Detailed storm system modelling to confirm suitability of sewer upgrade proposals (First St, east of Orton Ave)	10,000	Flood Damage Centre #3 (Priority Rank 5): Sewer/Culvert Upgrades (Mulock St & Track St)	285,600	-		Implement annual O&M programme.	110,670	-		**406,270**
Year 8 (2024)	Flood Damage Centre #1 (Priority Rank 7): Detailed storm system modelling to confirm suitability of sewer upgrade proposals (Pearkes Dr & Laforme Blvd)	20,000	Flood Damage Centre #4 (Priority Rank 6): Sewer Upgrades (First St, east of Orton Ave)	110,800	-		Implement annual O&M programme.	110,670	-		**241,470**
Year 9 (2025)	-		Flood Damage Centre #1 (Priority Rank 7): Sewer Upgrades (Pearkes Dr & Laforme Blvd)	630,070	-		Implement annual O&M programme.	110,670	-		**740,740**
Year 10 (2026)	-		-		-		Implement annual O&M programme.	110,670	-		**110,670**
TOTAL	**-**	**130,000**	**-**	**3,624,895**	**-**	**22,000**	**-**	**1,127,700**	**-**	**24,800**	**4,929,395**

Notes:

1. Detailed dual drainage studies are recommended to confirm the master plan level findings for each flood damage centre location. Study costs are estimated based on the scale of the preliminary works proposed.
2. Infrastructure upgrade costs are based on cost estimates for preliminary proposals - refer to appendix for cost breakdowns for each flood damage centre.
3. Costs for addressing major flow issues in vicinity of Flood Damage Centre #2 location are based on lump sum estimate for budgeting purposes - detailed design study required to confirm suitable approach.
4. Survey works cost based on details/assumptions provided in Section 5.2 of the report.
5. Operations and maintenance costs based on details/assumptions provided in Section 5.3 of the report.
6. Monitoring activities costs based on details/assumptions provided in Section 5.4 of the report.

5.7 Financing

Securing a reliable source of funding for investment in stormwater management infrastructure at a municipal level (both for capital expenditure projects, and ongoing operations and maintenance) is an issue that many municipalities across Canada are currently tackling. Traditionally, SWM investments would be funded by revenue raised from the standard property tax base (and/or development charges paid by proponents of development schemes), and the portion of that revenue made available for infrastructure investment via council budget would then need to be distributed across all municipal investment projects.

The result of this traditional arrangement is a situation where SWM investment projects often need to compete with other infrastructure investment projects for funding each year – and given the longer-term nature of typical SWM projects (e.g. providing improvements to quality of stormwater runoff to help restore natural environmental features, or reduction of flood risk during extreme rainfall events) – the short-term benefits of these schemes are not always immediately apparent to the general public (and the non-technical decision makers). The end result is that SWM investment projects often struggle to secure regular, reliable funding.

This traditional financing arrangement is also set against a regulatory framework which is pushing for increasing investment in stormwater management, as the long-term benefits of providing protection to natural environmental features are better understood, and the importance of protecting urban development from increased flood risks associated with climate change becomes more widely accepted, and necessary.

For these reasons many municipalities across Canada are considering implementing (or already have implemented) changes to their revenue collection systems in order to provide a secure source of financing specifically “ring-fenced” for investment in stormwater management programs. Access to a reliable source of funding for SWM projects allows Engineering/Development departments within municipal organizations to properly fund long-term, coordinated programs of SWM improvements – rather than having to rely on uncertain funding on an annual basis. This helps avoid a piecemeal approach to implementation of SWM improvements that can be detrimental to the long-term objectives.

Changes to revenue collection practices can be controversial, as residents are often understandably sensitive to any perceived increases in taxation (regardless of whether the SWM funding program is actually implemented as part of standard tax system). Therefore a consultation process (with an education/outreach element) would typically be recommended in advance to ensure residents understand why the changes are being considered and how the SWM investments would specifically benefit them and their community.

The following section provides an overview of some of the mechanisms other municipalities have considered when faced with the same challenges, which the City of Revelstoke may want to consider if a reliable source of ongoing funding would benefit the implementation of the SWM improvement program.

- Tax Levy Fund – tax based funds are reallocated from the general fund. A dedicated tax levy can be administered specifically to raise revenue for stormwater services, such that a fixed property tax rate is

applied and itemized on the property owner's annual tax bill. A by-law would likely be required to dedicate these funds specifically to the stormwater management program;

- Stormwater Management Rate – shift from funding stormwater using a tax based systems to a rate based system. A number of municipalities in Ontario have implemented a stormwater user fee that charges a flat rate to residential properties, and an area-based charge to commercial/industrial properties. This includes:
  - Tiered Flat Rate: based on property's zoning/land use classification;
  - User Rate: measured by the amount of impervious area contained on each property;
- Development Charges – a portion of charges paid by developers (generally used to pay the cost of new capital projects required as a result of growth) is allocated for SWM retrofits, sediment removal and LID implementation;
- Combination Fee Structure – blended revenue from tax and stormwater rate;

For the implementation of any of these funding alternatives, or any combination thereof, a phasing strategy (over 3 to 5 years) is important to ease the transition from the current revenue collection system.

As per the proposed schedule set out in the preceding section, an estimated total of $4.93 million is required over 10 years to implement the SWM Plan recommendations. This equates to an average annual expenditure of $493,000.

Based on publically available 2011 census information it is understood that the City of Revelstoke has around 3,100 private residential dwellings. If the financial burden were to be placed purely on residents the average annual cost per household would therefore be approximately $160. It would be reasonable though to assume that businesses would also contribute a significant proportion of the revenue for SWM Plan implementation. The exact proportion would depend on how the revenue collection system is developed and what metrics are used to determine rates, however for budgeting purposes a business contribution proportion of 25% is considered appropriate. On this basis an average total sum of $123,250 would need to be raised from businesses in the City per year, and the remaining $369,750 from residents (at an estimated average annual cost per household of $120). As noted previously, these costs are based on 2016 rates and no allowance for inflation has been made in the budget estimates.

5.8 Bylaw Provisions

5.8.1 Existing Subdivision Servicing Bylaw

The RFP notes that the consultant should review the existing Subdivision Servicing Bylaw and make recommendations for drainage design criteria for subdivision servicing, which is consistent with the OCP polices and regulation and factors climate change. The document in question is the City of Revelstoke Subdivision, Servicing and Development Bylaw No. 1846. The section covering storm drainage is contained in Schedule 4 (Design Standards), Part 3 (Drainage) – this section of the bylaw is reproduced in **Appendix G** for reference.

5.8.1.1 Review of Current Bylaw

The current drainage design standards are split into the following (five) sections in the bylaw:

- 3.1 – Runoff Analysis
- 3.2 – Minor System Design
- 3.3 – Major System Design
- 3.4 – Stormwater Storage
- 3.5 – Erosion and Sedimentation Control

In general the existing drainage design standards represent a good basis for ensuring that development within the City's jurisdiction is undertaken in a responsible manner. There are several areas though that have been identified which could benefit from revision, or further clarification. In particular, the assumptions related to use of IDF curves for determining peak flows for storm sewer sizing, and secondly, additional direction on when the City require SWM facilities to be provided by developers.

As outlined in Section 4.2.3, climate change science is predicting higher rainfall intensity events in the future, and the design standards should reflect this in the requirements for storm sewer sizing. This could be achieved in either of the following ways; the City's standard IDF curve could be revised, or a requirement could be introduced for use of a "climate change allowance" on top of calculated peak rainfall intensities. The latter approach is recommended in this instance, primarily due to the general uncertainties surrounding climate change-related rainfall predictions, and also due to the relative simplicity of implementation. At this point a figure of 20% is recommended for the climate change allowance. This factor should be applied to rainfall depths/intensities determined through reference to the City's current IDF curve for all return period events, to ensure storm sewer infrastructure and any SWM facilities are sized appropriately.

A more complex approach could link the required percentage increase to the design life of the infrastructure under consideration – i.e. a lower allowance for an asset with a design life of 20 years, compared to an asset that is being designed to last 50 years. This approach is not warranted in many

cases though, and is not recommended for Revelstoke. The majority of infrastructure being designed using these design standards should have similar expectations for design life, and therefore this method would complicate matters unnecessarily. Instead, it is recommended that the climate change allowance figure be reviewed on a 5-yearly basis to ensure it remains aligned with current best estimates on future rainfall patterns. If (or when) climate science reaches a point at which future increases in rainfall intensity can be predicted with a higher level of certainty, consideration should be given to revising the City's base IDF curve. In the interim though, addition of an appropriate allowance on top of calculated peak rainfall intensities is considered an adequate response.

The second area for improvement identified in the design standards is related to the requirement for SWM control facilities for new development. Section 3.4 of the standards currently provides clear direction to designers regarding the City's requirements for detailed design of SWM pond facilities. However, the instruction on when these types of facilities are required not conveyed as clearly. The document does state, in Section 3.4-(b)-(i)-(b), that 100-year storage is required based on a 5-year pre-development release rate (which is considered an appropriate design standard) – however this requirement could be given more prominence in the way the document is presented to more clearly demonstrate the necessity of SWM controls for all developments. Given the cost of providing SWM control facilities (primarily due to land-take) developers may look to avoid constructing these facilities where possible. Therefore the City should strengthen the bylaw requirements in this area to allow less scope for avoidance.

The current Revelstoke design requirements for flow control (100-year controlled down to pre-development 5-year rate, with an emphasis placed on matching pre-development hydrograph) are considered appropriate. This approach ensures that the performance of existing municipal storm sewer systems is not worsened by new development (which would typically increase imperviousness of catchment areas). This is considered particularly important with reference to the modelling results presented earlier in the report. It is evident that historic sections of the trunk drainage network do not currently achieve the target level of service expected by the City for new development, so it is imperative that flow control requirements are enforced for all new development to ensure that the situation is not worsened.

Requirements for quality control of runoff from new sub-division development is set out in 3.2 (i) of the current standard, with reference to the City's Sewer Regulations Bylaw No. 1683 for allowable discharge criteria. Consideration could be given to simplifying the criteria for water quality control and basing it on a target percentage reduction in TSS loading, rather than requirements for contaminant concentrations in runoff. This approach is common in other jurisdictions and could help make the design, review, and approval process more straightforward for all parties (the City, the developer, and their designer), resulting in increased levels of compliance.

5.8.2 Proposed Subdivision Servicing Bylaw

The RFP document requests that a draft stormwater drainage bylaw be developed, which recognizes water as a resource and is consistent with the City's Official Community Plan policies.

During discussions with City staff a preference was expressed to use the model Subdivision and Development Servicing (SDS) Bylaw document produced by the Columbia Basin Trust (CBT) as the basis for the revised City of Revelstoke bylaw document. A draft of the proposed bylaw document is provided in **Appendix H**.

This draft document incorporates the recommendations above and the general findings from the study, as well as comments received from City staff related to applicability of particular sections/clauses within the CBT model bylaw for the City of Revelstoke. The document in the appendix also includes annotations intended to provide commentary on the rationale for the revisions made to the model CBT bylaw.

5.8.2.1 Low Impact Development Techniques

As per current best practice thinking the draft bylaw includes a section on SWM Facilities which sets out a low impact development (LID) methodology focusing on "lot-level" source control techniques (over end-of pipe approaches), in order to achieve a better approximation of natural watershed hydrologic conditions following development.

Source control measures are small-scale stormwater management measure located at the beginning of a drainage system where stormwater is captured and treated on-site or close to where the rainfall lands. In Canada, the implementation of source control measures has become more common in the last decade. Integrating these measures as part of a treatment train approach helps mimic natural features and hydrologic processes and protect water resources at many scales.

- Disconnection of Roof Leader: A stormwater management control measure where roof leaders (or eaves troughs) drain to a lawn area or rain barrel. Naturalized gardens and bio-retention techniques can be utilized in conjunction with disconnected roof leaders.
- Bio-retention Areas: A stormwater management control measure that uses engineered sand filter. Bio-retention areas are relatively inexpensive to build, easy to maintain, and can add aesthetic value to a site, without consuming large amounts of valuable land area.
- Permeable Driveways: A stormwater management control measure that designs driveways using permeable pavements to allow rain water to drain through the pavement and into the ground.
- Green Rooftop Technology: Units constructed on top of buildings to reduce runoff volume (via increased evapotranspiration) and improve water quality.

As an alternative to source control methods, conveyance control approaches can be utilized to treat stormwater quantity and quality as it travels overland or through pipes. These measures include traditional

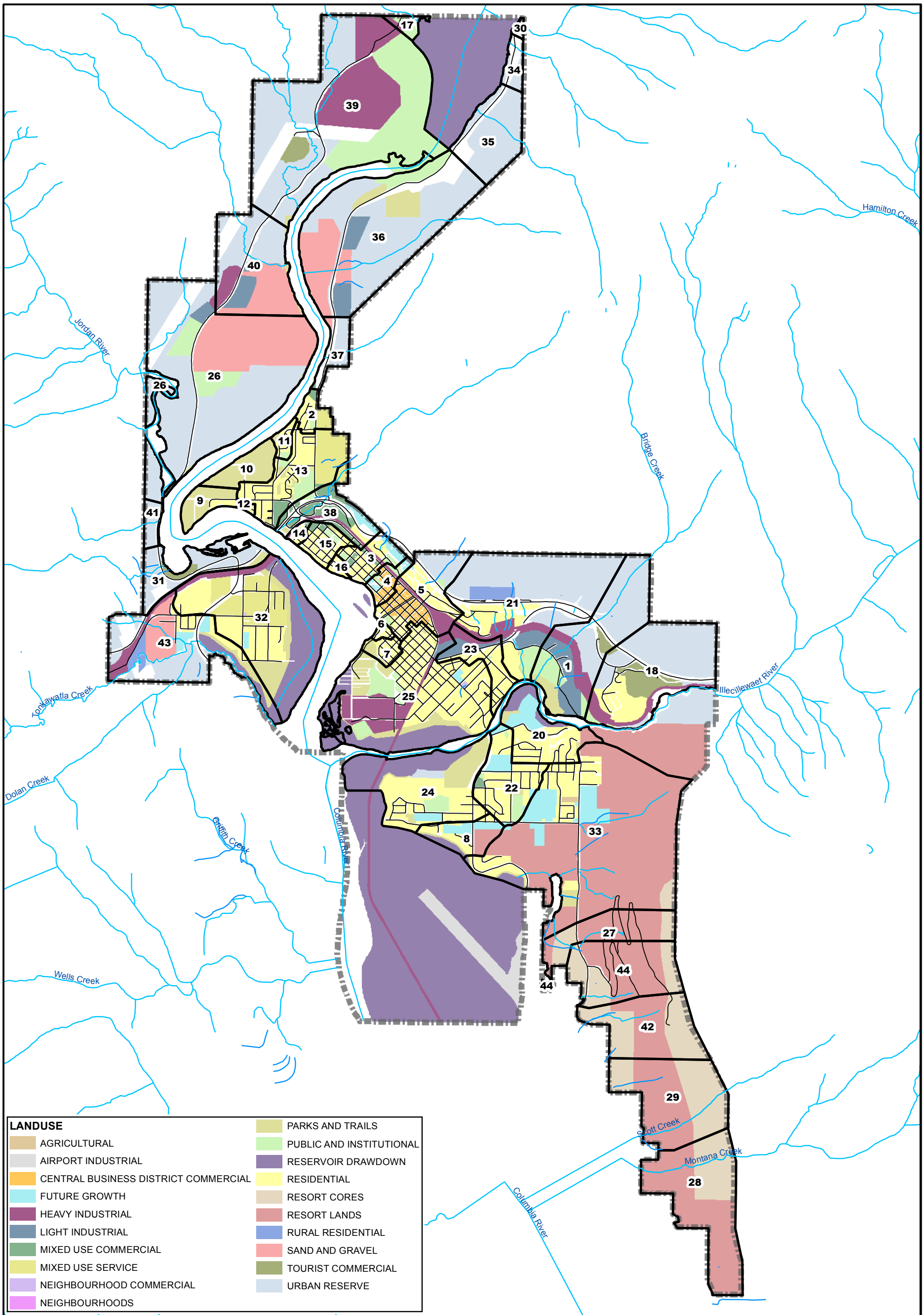
systems such as curbs, gutters and pipes that carry stormwater away from an urban area to a receiving water body, and innovative LID systems that include bioswales and perforated pipes.

Environmental benefits of LID conveyance control measures include decreasing stormwater volume and flow rate prior to entering the storm sewer network. In addition, these measures help slow the erosive velocity of stormwater filter out pollutants before entering watercourses downstream.

- Bioswales: These are bio-retention areas that are placed within the Right of Way for stormwater quantity and quality treatment. These measures use plants and soil to trap and treat contaminants such as heavy metals, nutrients, sediments and other pollutants that typically accumulate on asphalt surfaces.
- Perforated Pipe System: These systems promote infiltration of road drainage as it is conveyed along road right-of-ways.
- Vegetated Filter Strip: Densely vegetated strip of land engineered and constructed to improve water quality by permitting sediment deposition during shallow flow conditions.

It is noted that there may be some initial resistance to these requirements from the development community, however during the review/approval process for new developments it is recommended that the City should request clear demonstration of reasons why LID approaches cannot be deployed – for example, inadequate soil conditions – before accepting alternative approaches.

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Legend

- Roads
- Streams
- DRCA (Ref.)
- Boundary Line

N W E S

0 0.5 1 2 Kilometers

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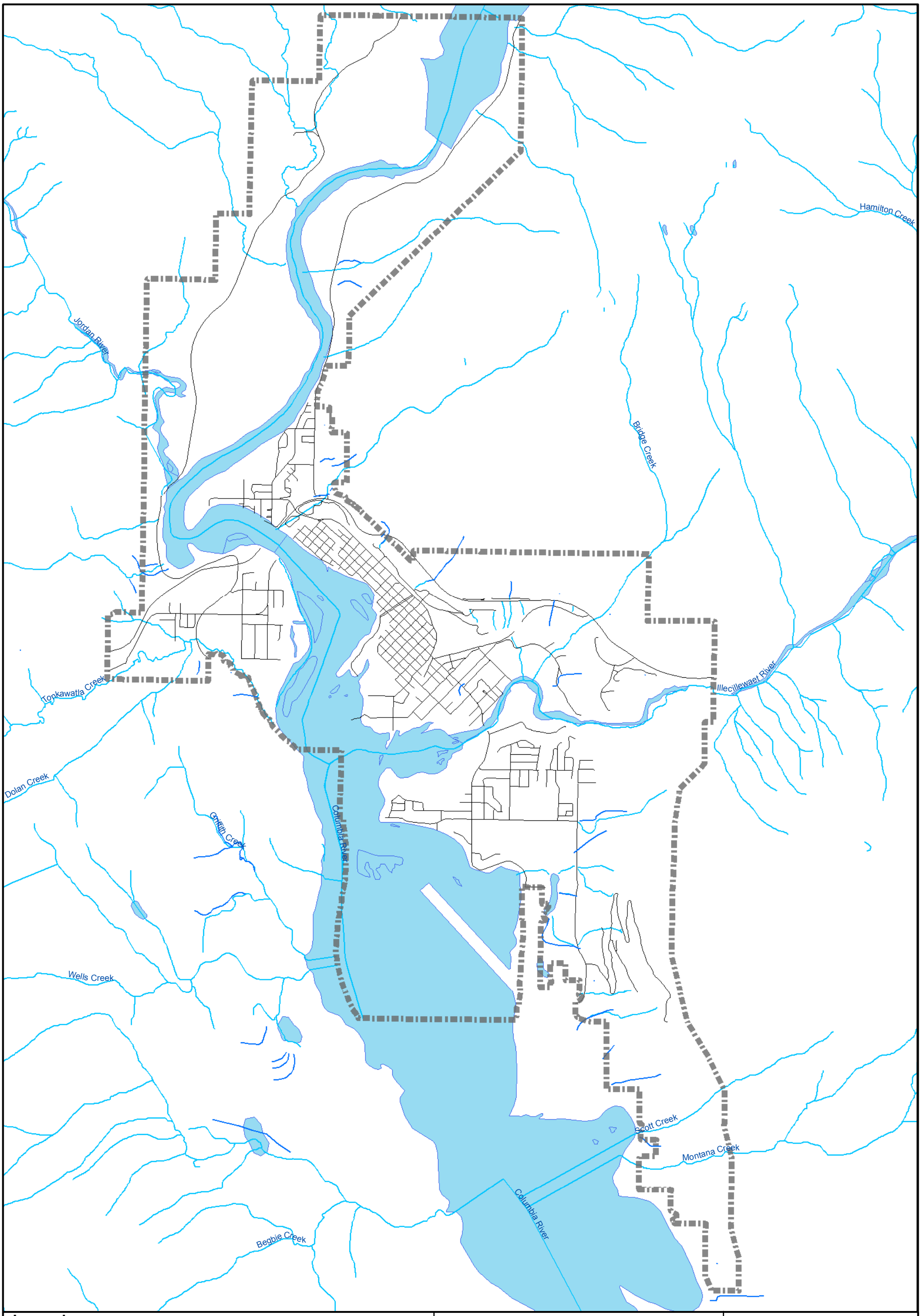
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LANDUSE AND CATCHMENTS OVERVIEW

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Legend

- Boundary Line
- Roads
- Streams
- Creeks
- WaterBody

N W E S

0 0.5 1 2 Kilometers

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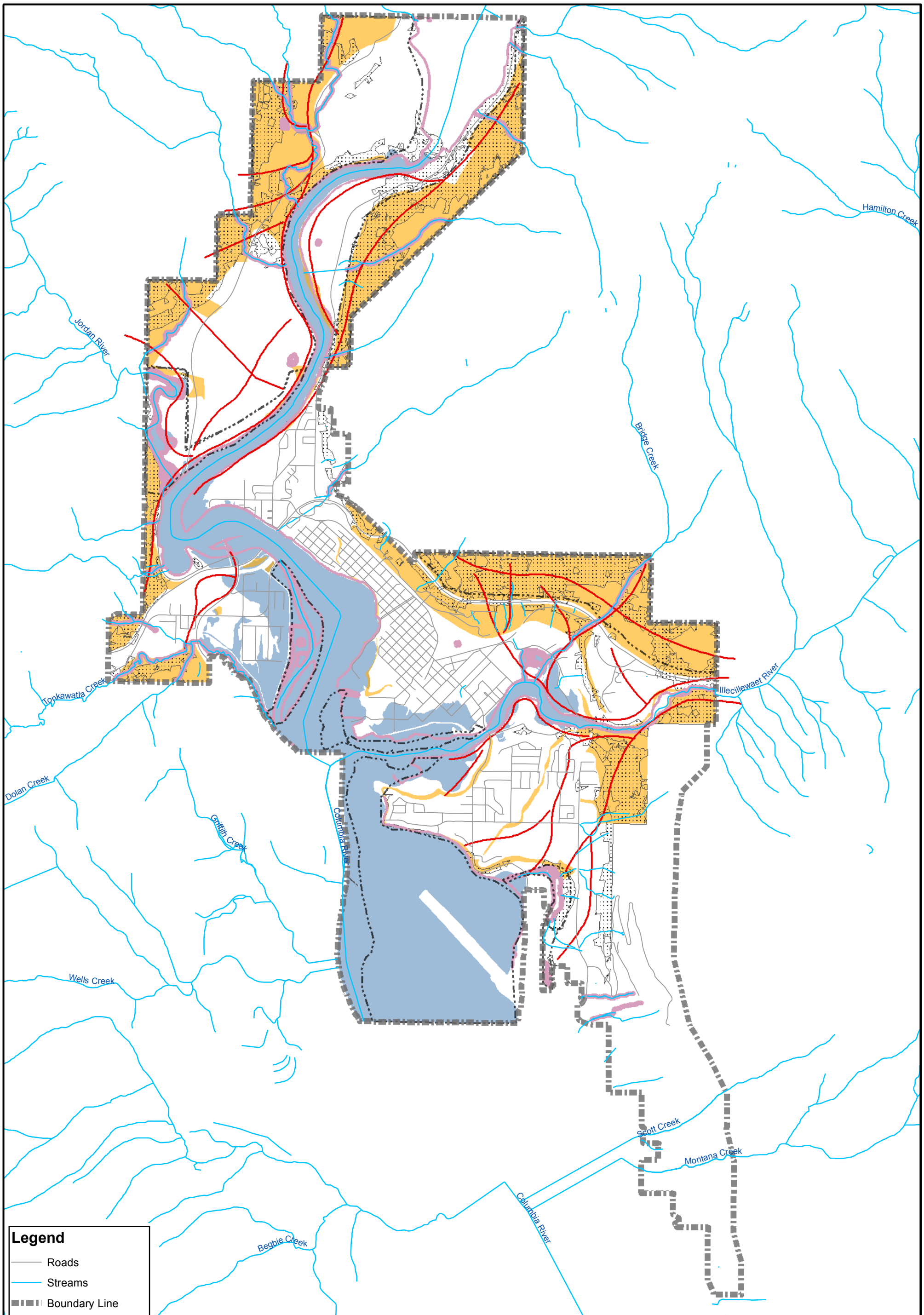
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REVELSTOKE STORMWATER MANAGEMENT PLAN

SURFACE WATER FEATURE OVERVIEW

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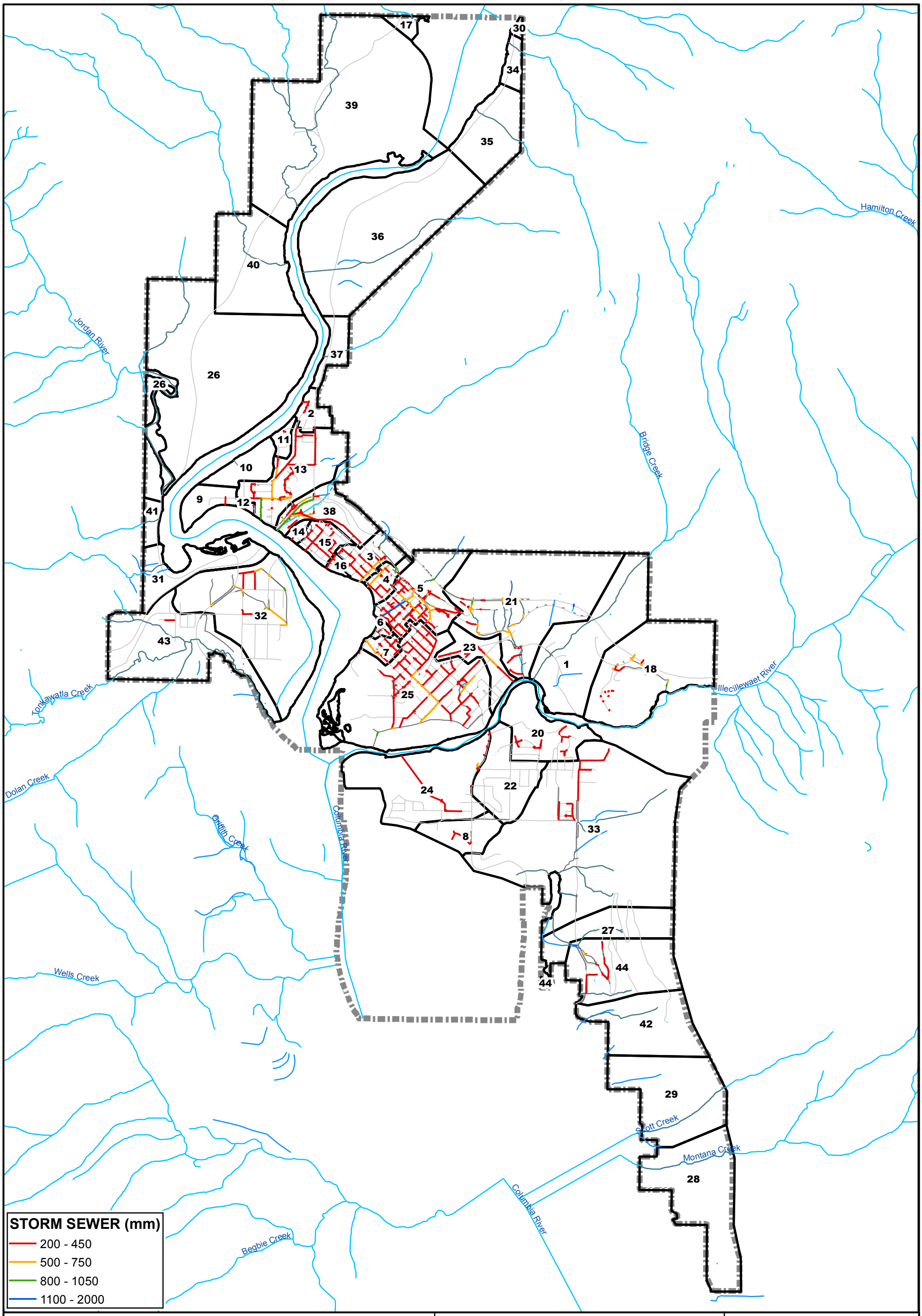
REVELSTOKE STORMWATER MANAGEMENT PLAN

FLOODPLAIN AND ENVIRONMENTAL FEATURES OVERVIEW

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Legend

- Roads
- Streams
- DRCA (Ref.)
- Boundary Line

N W E S

0 0.5 1 2 Kilometers

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REVELSTOKE STORMWATER MANAGEMENT PLAN

STORM SEWER SYSTEM OVERVIEW

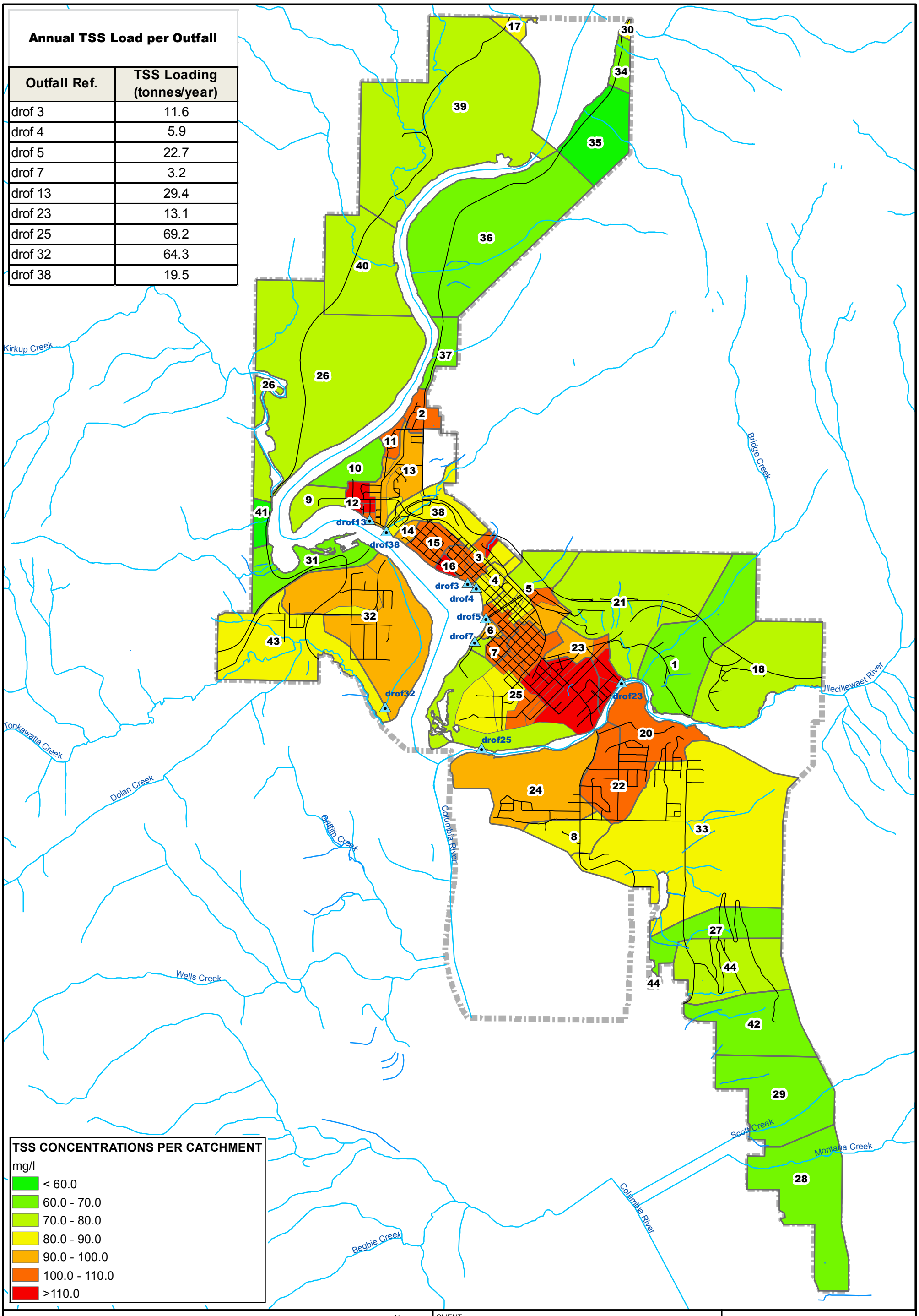
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Annual TSS Load per Outfall

Outfall Ref.	TSS Loading (tonnes/year)
drof 3	11.6
drof 4	5.9
drof 5	22.7
drof 7	3.2
drof 13	29.4
drof 23	13.1
drof 25	69.2
drof 32	64.3
drof 38	19.5



TSS CONCENTRATIONS PER CATCHMENT
mg/l
- < 60.0
- 60.0 - 70.0
- 70.0 - 80.0
- 80.0 - 90.0
- 90.0 - 100.0
- 100.0 - 110.0
- >110.0

Legend
- *Outfalls*
- Roads
- Streams
- DRCA (Ref.)
- Boundary Line

N W E S

0 0.5 1 2 Kilometers

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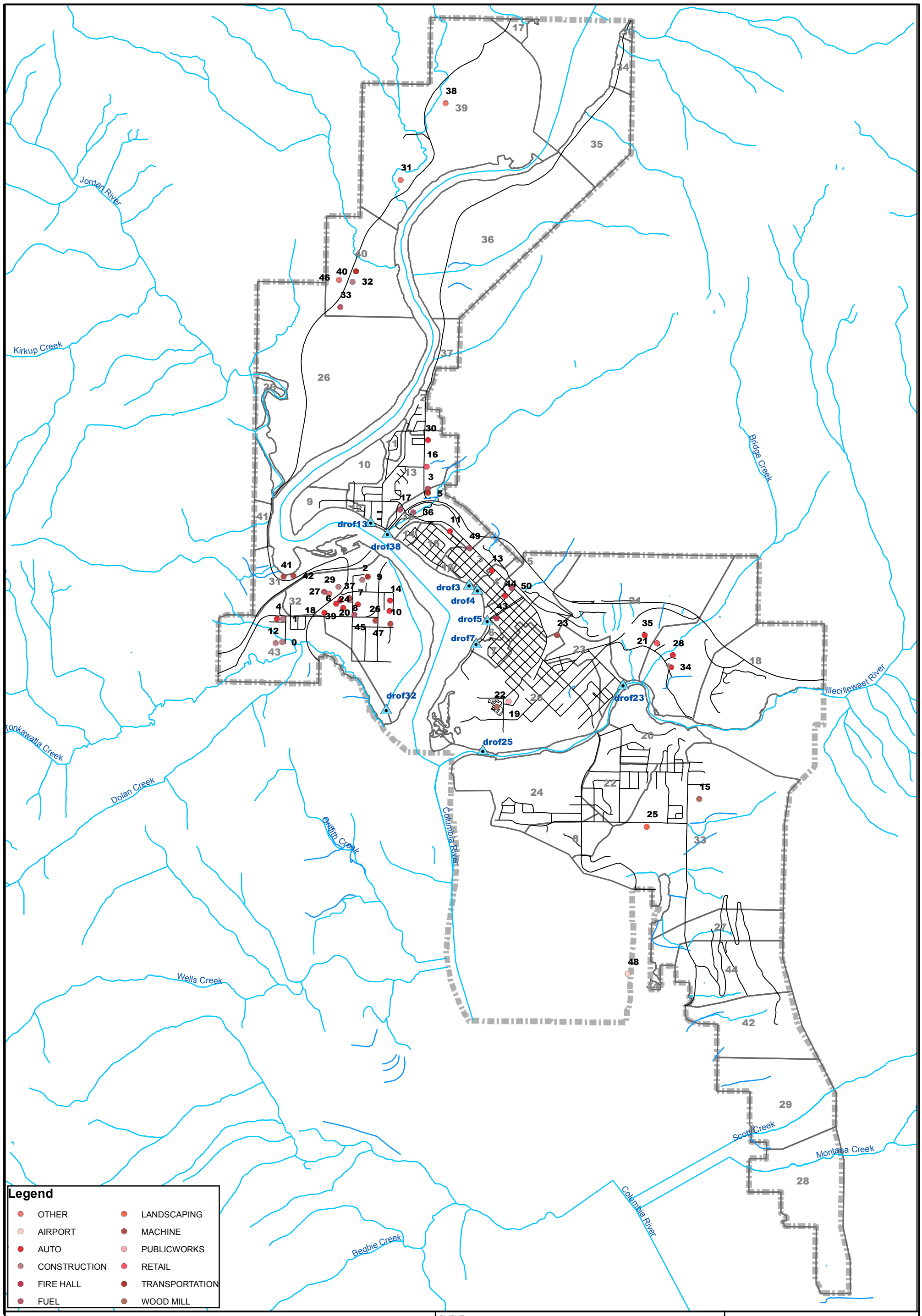
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WATER QUALITY - TSS CONCENTRATIONS PER CATCHMENT (EXISTING CONDITIONS)

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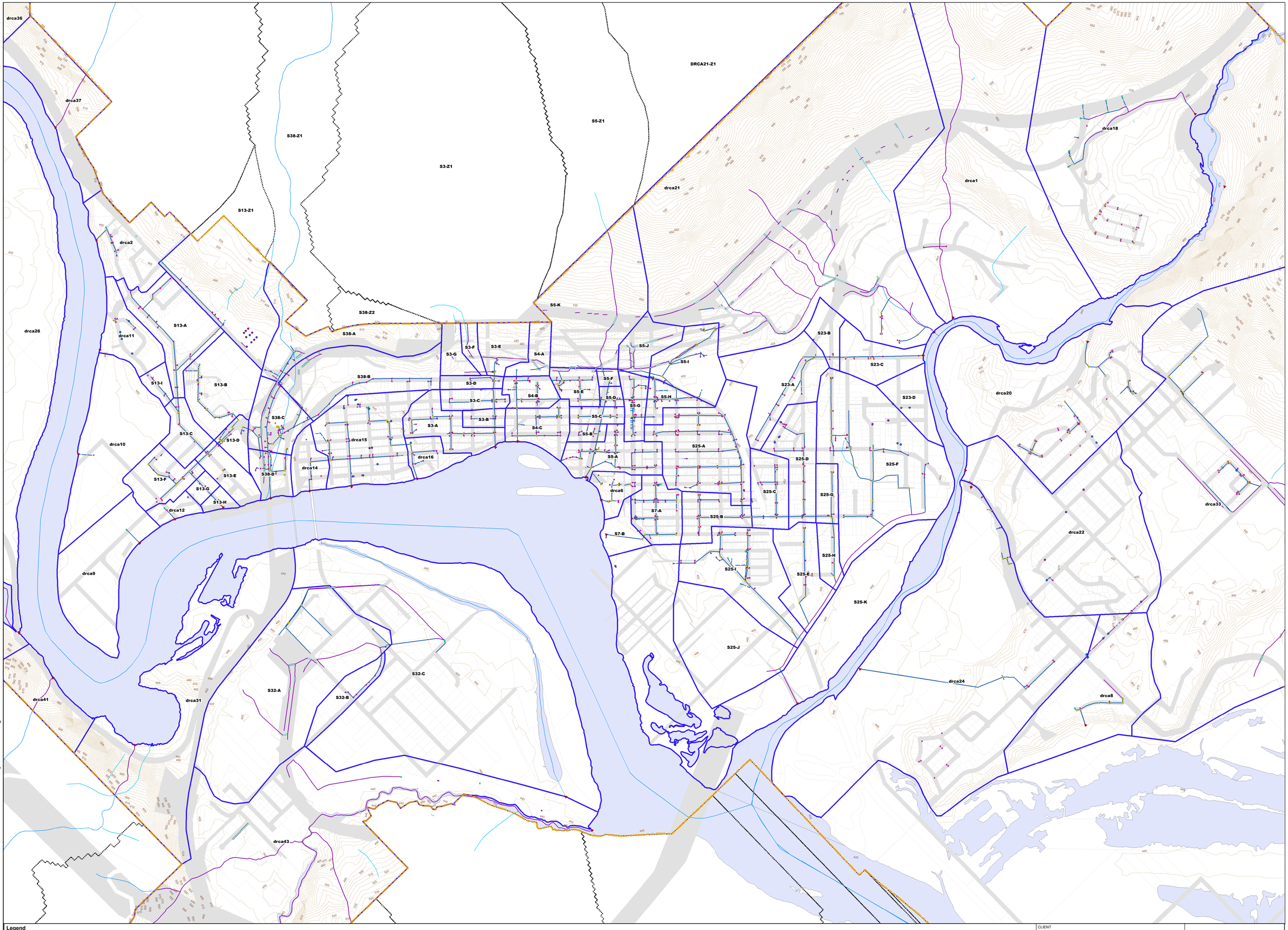
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TITLE
REVELSTOKE STORMWATER MANAGEMENT PLAN

WATER QUALITY - POTENTIAL POINT SOURCE CONTAMINATION LOCATIONS

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Legend

Drainage Point	Drainage Line	
DRCB	Culvert	Boundary
Dry Drain	Ditch	Streams
Fitting	Dry Drain	Minor System Catchments
Manhole	Lateral	External Catchments
Outfall	Main	5m Contour

0 75 150 300 450 600 Meters

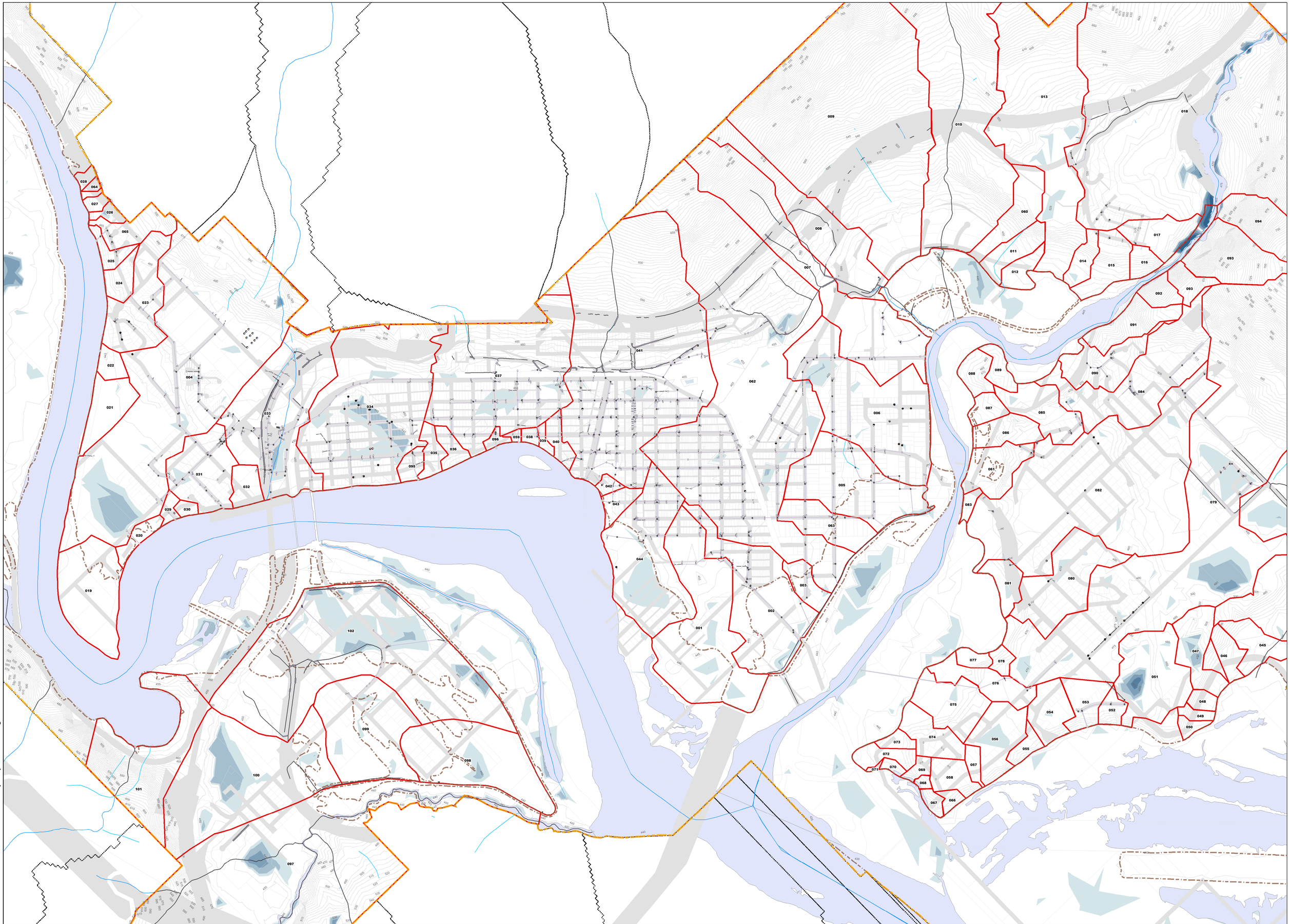
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MINOR SYSTEM DRAINAGE CATCHMENT DELINEATION

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Legend

Drainage Point	Drainage Line		lowpts10cm_PtCld
DRCB	Culvert	Boundary	0.10000104 - 0.929260852
Dry Drain	Ditch	Streams	0.929260852 - 2.7536213
Fitting	Dry Drain	Flood Plain (OCP)	2.753621301 - 6.402342194
Manhole	Lateral	Major System Subcatchments	6.402342195 - 11.62664711
Outfall	Main	External Catchments	11.62664712 - 21.2460022
		5m Contour	

0 75 150 300 450 600 Meters

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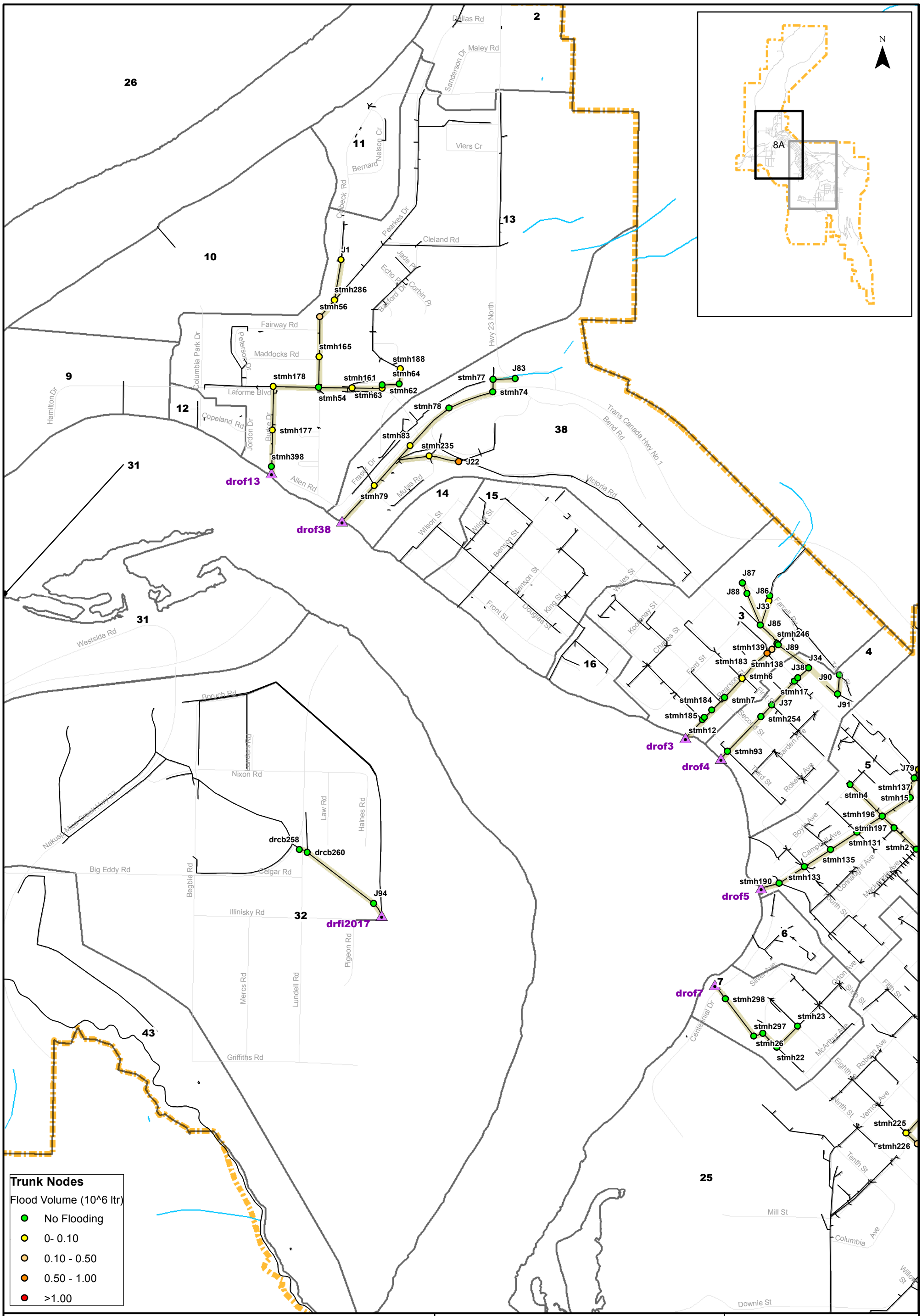
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MAJOR SYSTEM DRAINAGE CATCHMENT DELINEATION

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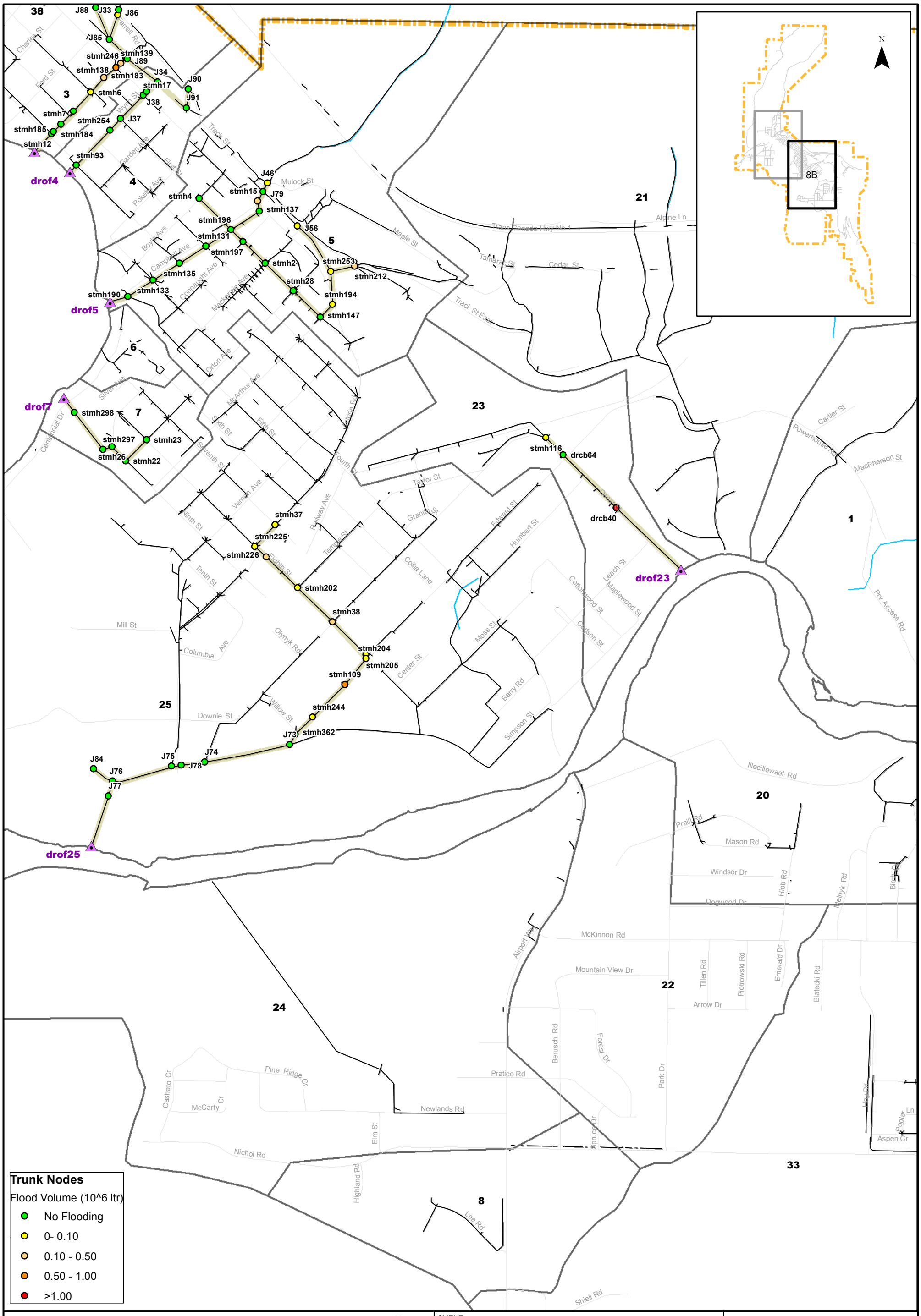
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REVELSTOKE STORMWATER MANAGEMENT PLAN

MODELLING RESULTS - 5 YEAR EXISTING CONDITIONS

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Trunk Nodes
Flood Volume (10^6 ltr)
- No Flooding
- 0- 0.10
- 0.10 - 0.50
- 0.50 - 1.00
- >1.00

Legend
- Outfalls
- Storm Sewer
- Trunk_Network
- Roads
- Streams
- DRCA (Ref.)
- Boundary Line

0 0.125 0.25 0.5 Kilometers

CLIENT
CITY OF REVELSTOKE

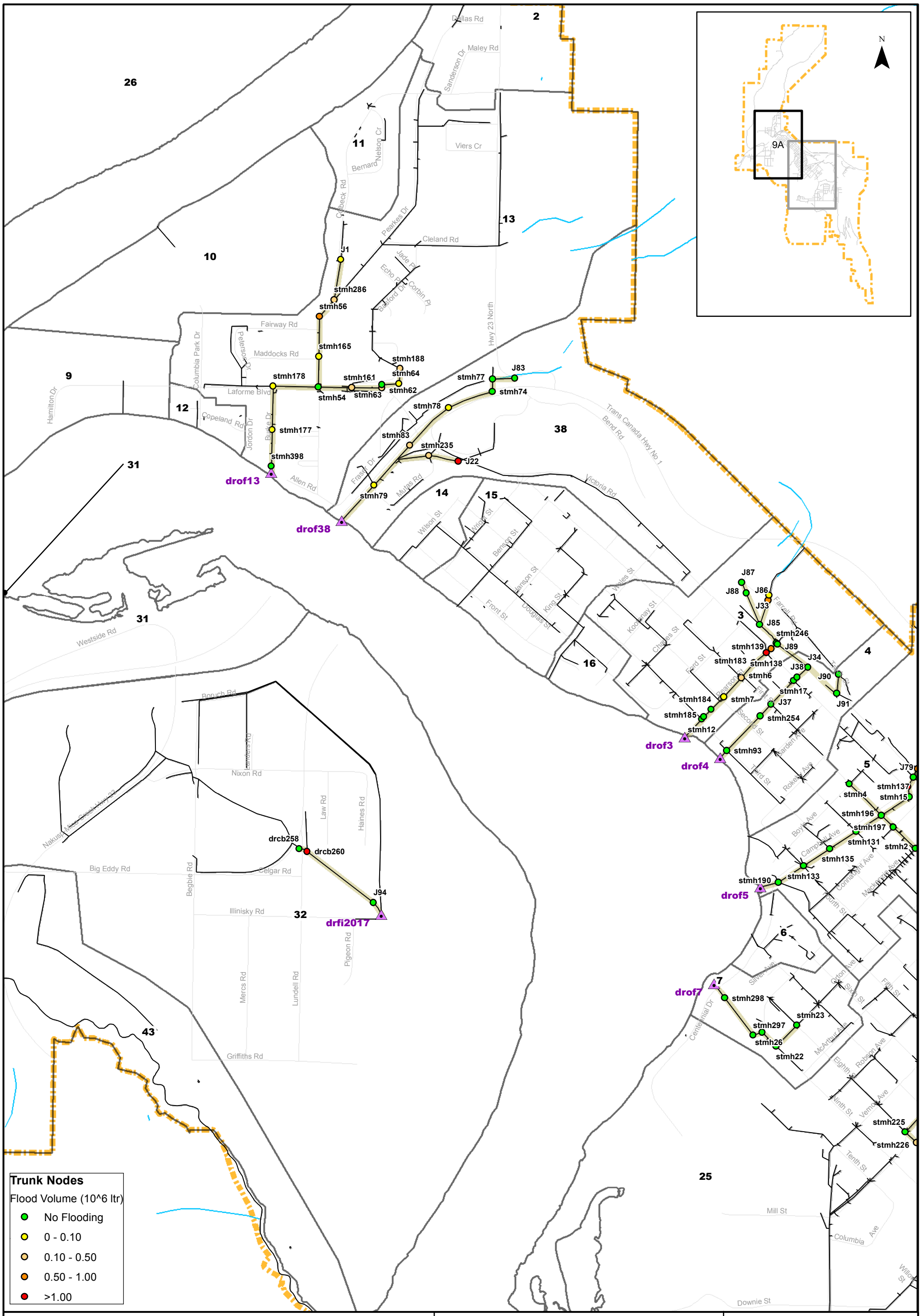
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REVELSTOKE STORMWATER MANAGEMENT PLAN

MODELLING RESULTS - 5 YEAR EXISTING CONDITIONS

WSP | MMM GROUP

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Trunk Nodes
Flood Volume (10^6 ltr)
- No Flooding
- 0 - 0.10
- 0.10 - 0.50
- 0.50 - 1.00
- >1.00

Legend
- Outfalls
- Storm Sewer
- Trunk_Network
- Roads
- Streams
- DRCA (Ref.)
- Boundary Line

0 0.125 0.25 0.5 Kilometers

CLIENT: CITY OF REVELSTOKE

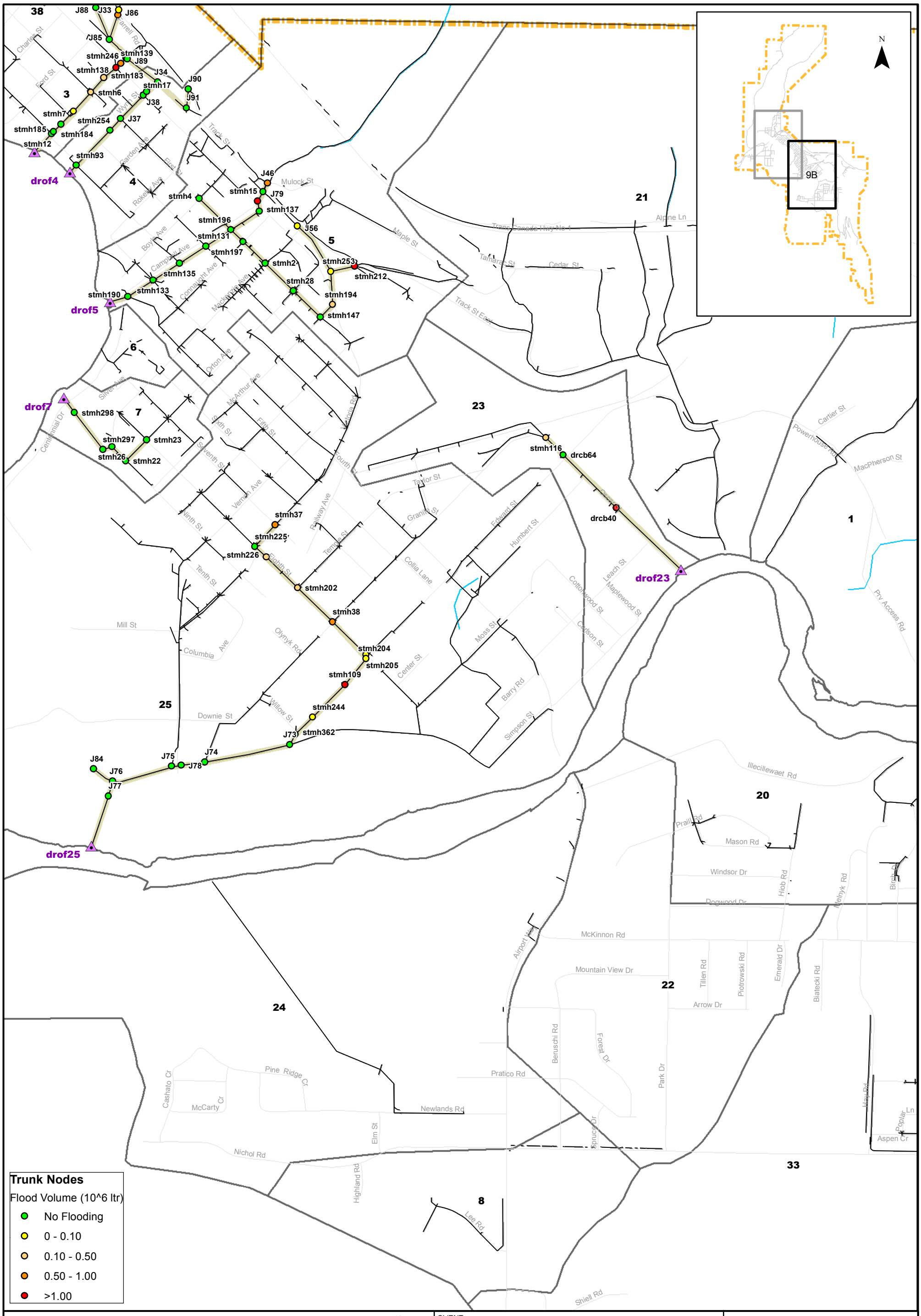
TITLE: REVELSTOKE STORMWATER MANAGEMENT PLAN

MODELLING RESULTS - 100 YEAR EXISTING CONDITIONS

WSP | MMM GROUP

Checked: B.W	Drawn: S.Y
Date: October 2016	Proj. No.: 38-15518
Scale: 1:10,000	Drawing No.: 9A

Document Path: R:\38-15518-Revelstoke\FIG\DWG 9- 100Year Existing-Flood Vol.mxd



Trunk Nodes

Flood Volume (10^6 ltr)

- No Flooding
- 0 - 0.10
- 0.10 - 0.50
- 0.50 - 1.00
- >1.00

Legend

- Outfalls
- Storm Sewer
- Trunk_Network
- Roads
- Streams
- DRCA (Ref.)
- Boundary Line

0 0.125 0.25 0.5 Kilometers

CLIENT: CITY OF REVELSTOKE

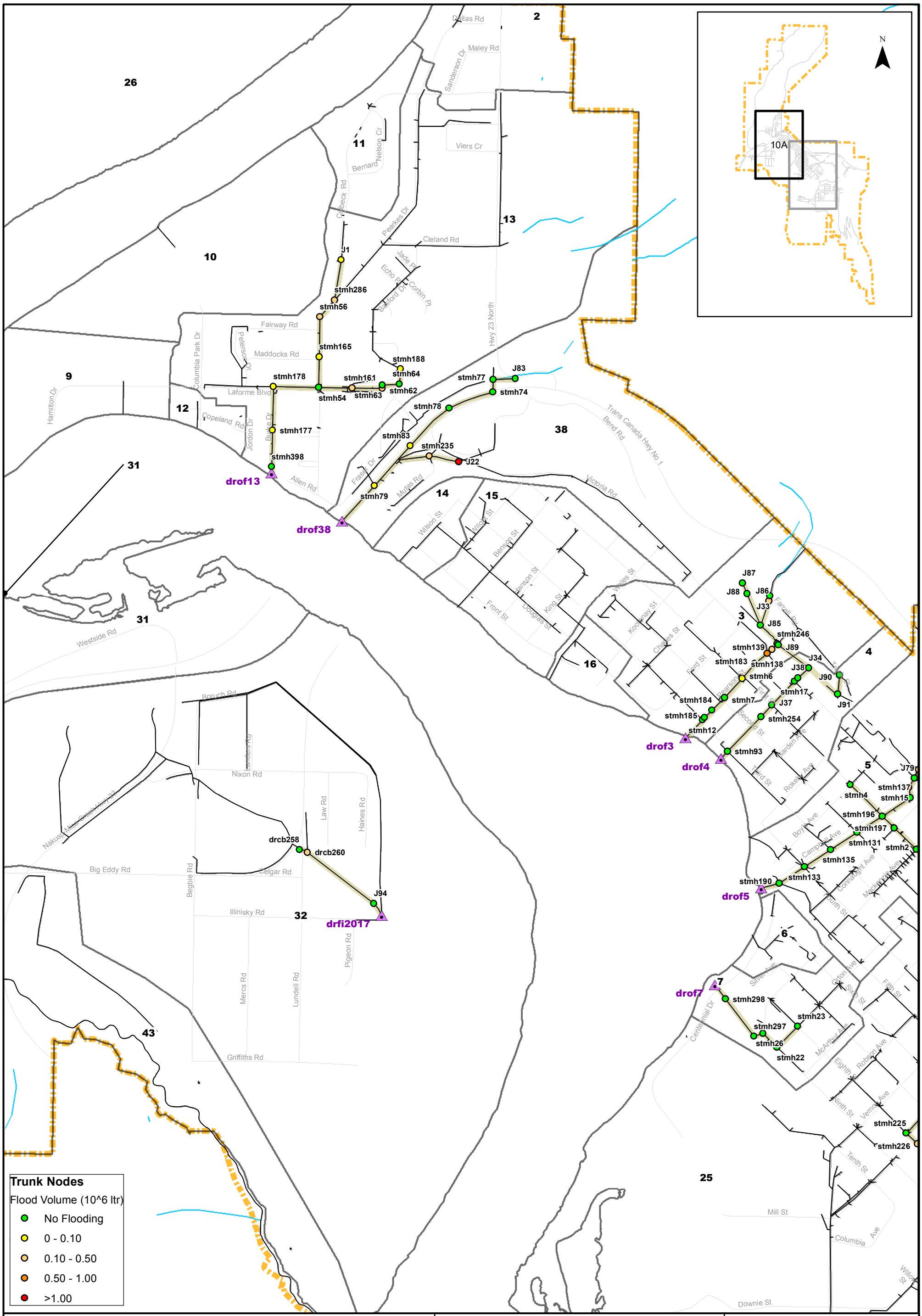
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MODELLING RESULTS - 100 YEAR EXISTING CONDITIONS

WSP | MMM GROUP

Checked: B.W	Drawn: S.Y
Date: October 2016	Proj. No.: 38-15518
Scale: 1:10,000	Drawing No.: **9B**

Document Path: R:\38-15518-Revelstoke\FIG\DWG 10- 5Year Senario1-Flood Vol.mxd



Legend

- Outfalls
- Storm Sewer
- Trunk_Network
- Roads
- Streams
- DRCA (Ref.)
- Boundary Line

N W E S

0 0.125 0.25 0.5 Kilometers

CLIENT: CITY OF REVELSTOKE

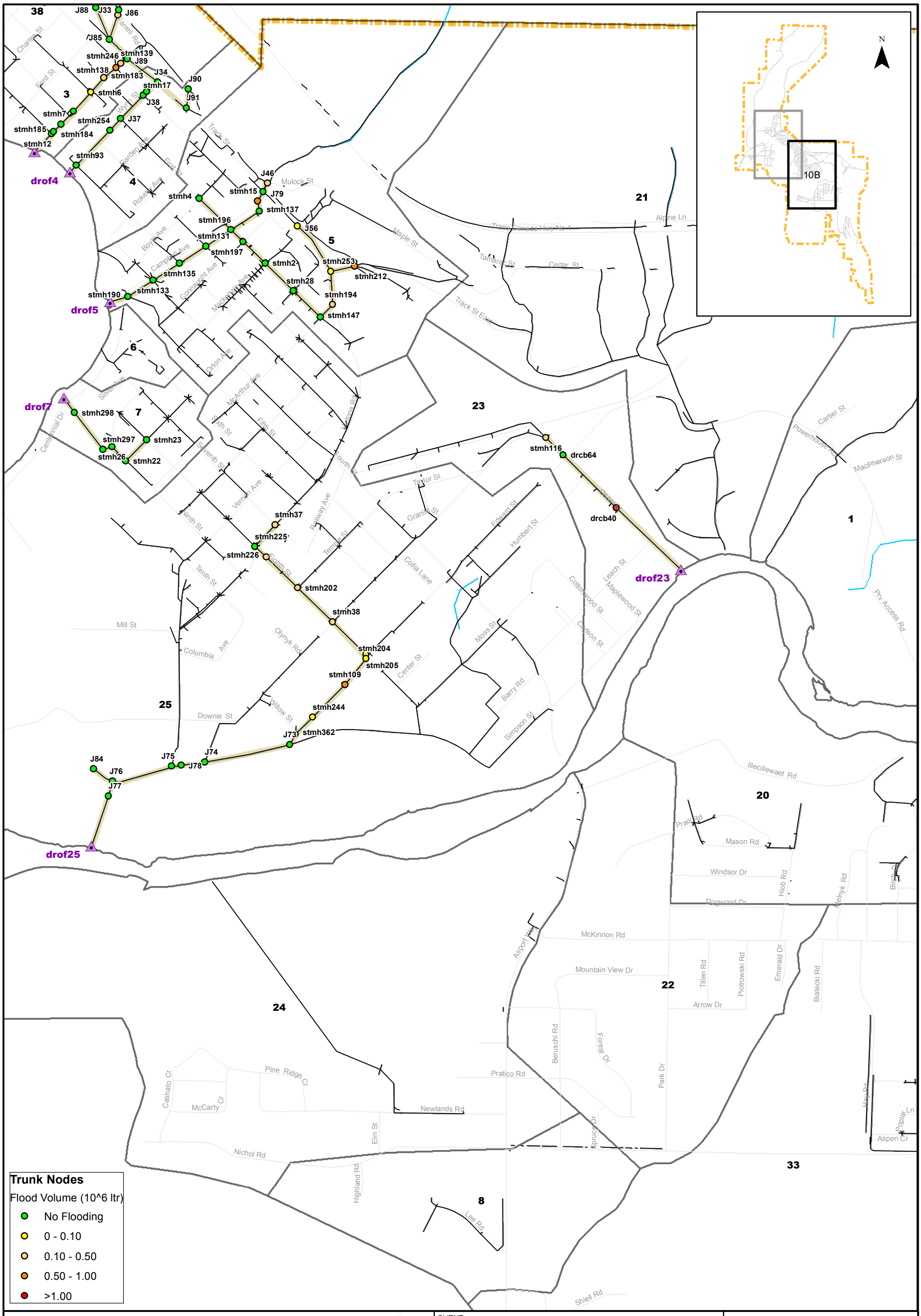
TITLE: REVELSTOKE STORMWATER MANAGEMENT PLAN

MODELLING RESULTS - 5 YEAR CCS1 (2016-2036)

WSP | MMM GROUP

Checked: B.W	Drawn: S.Y
Date: October 2016	Proj. No.: 38-15518
Scale: 1:10,000	Drawing No.: **10A**

Document Path: R:\38-15518-Revelstoke\FIG\DWG 10- 5Year Senario1-Flood Vol.mxd



Trunk Nodes

Flood Volume (10^6 ltr)

- No Flooding
- 0 - 0.10
- 0.10 - 0.50
- 0.50 - 1.00
- >1.00

Legend

- Outfalls
- Storm Sewer
- Trunk_Network
- Roads
- Streams
- DRCA (Ref.)
- Boundary Line

0 0.125 0.25 0.5 Kilometers

CLIENT: CITY OF REVELSTOKE

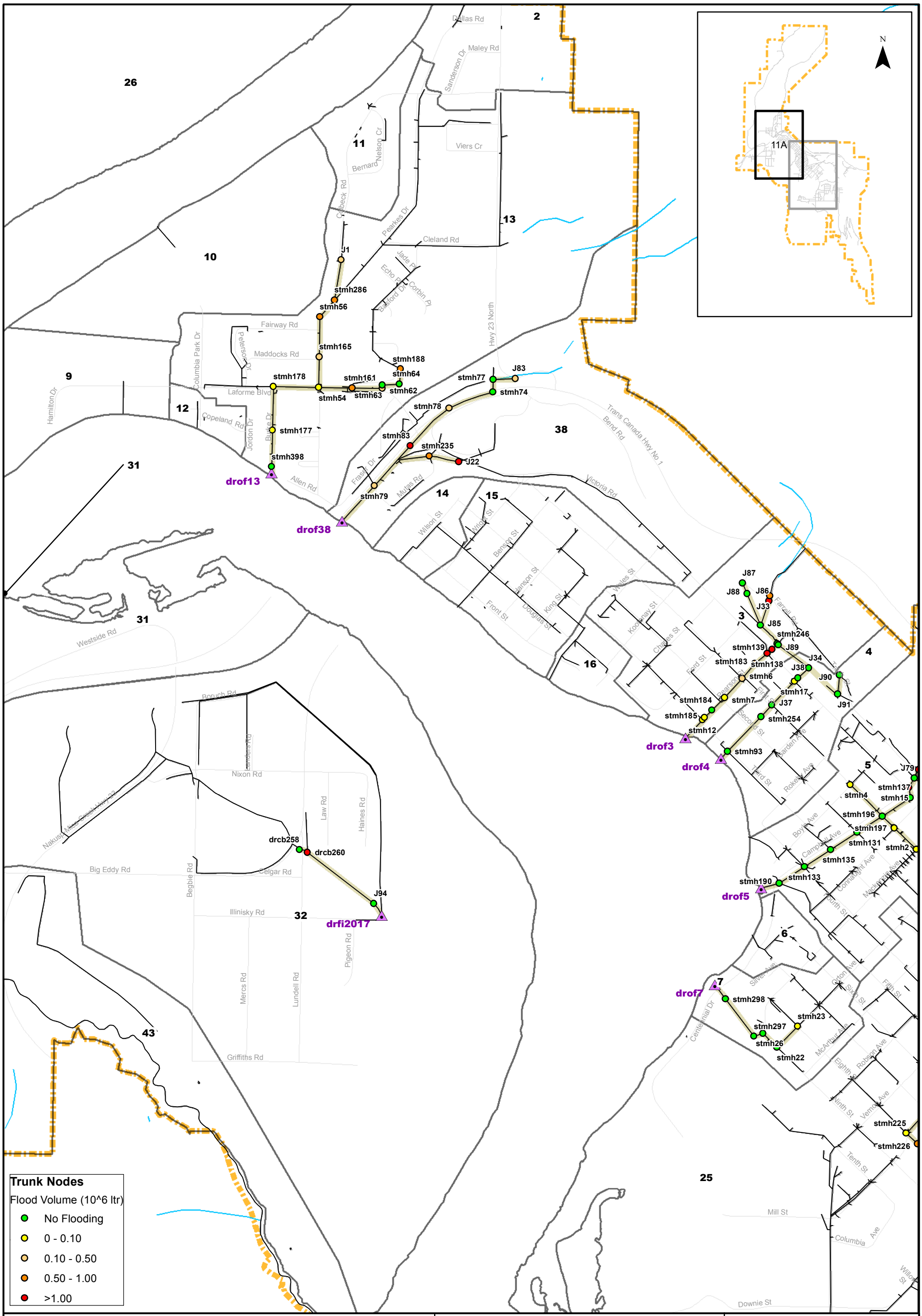
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MODELLING RESULTS - 5 YEAR CCS1 (2016-2036)

WSP | MMM GROUP

Checked: B.W	Drawn: S.Y
Date: October 2016	Proj. No.: 38-15518
Scale: 1:10,000	Drawing No.: **10B**

Document Path: R:\38-15518-Revelstoke\FIG\DWG 11- 100Year Senario1-Flood Vol.mxd



Legend

- Outfalls
- Storm Sewer
- Trunk_Network
- Roads
- Streams
- DRCA (Ref.)
- Boundary Line

0 0.125 0.25 0.5 Kilometers

CLIENT: CITY OF REVELSTOKE

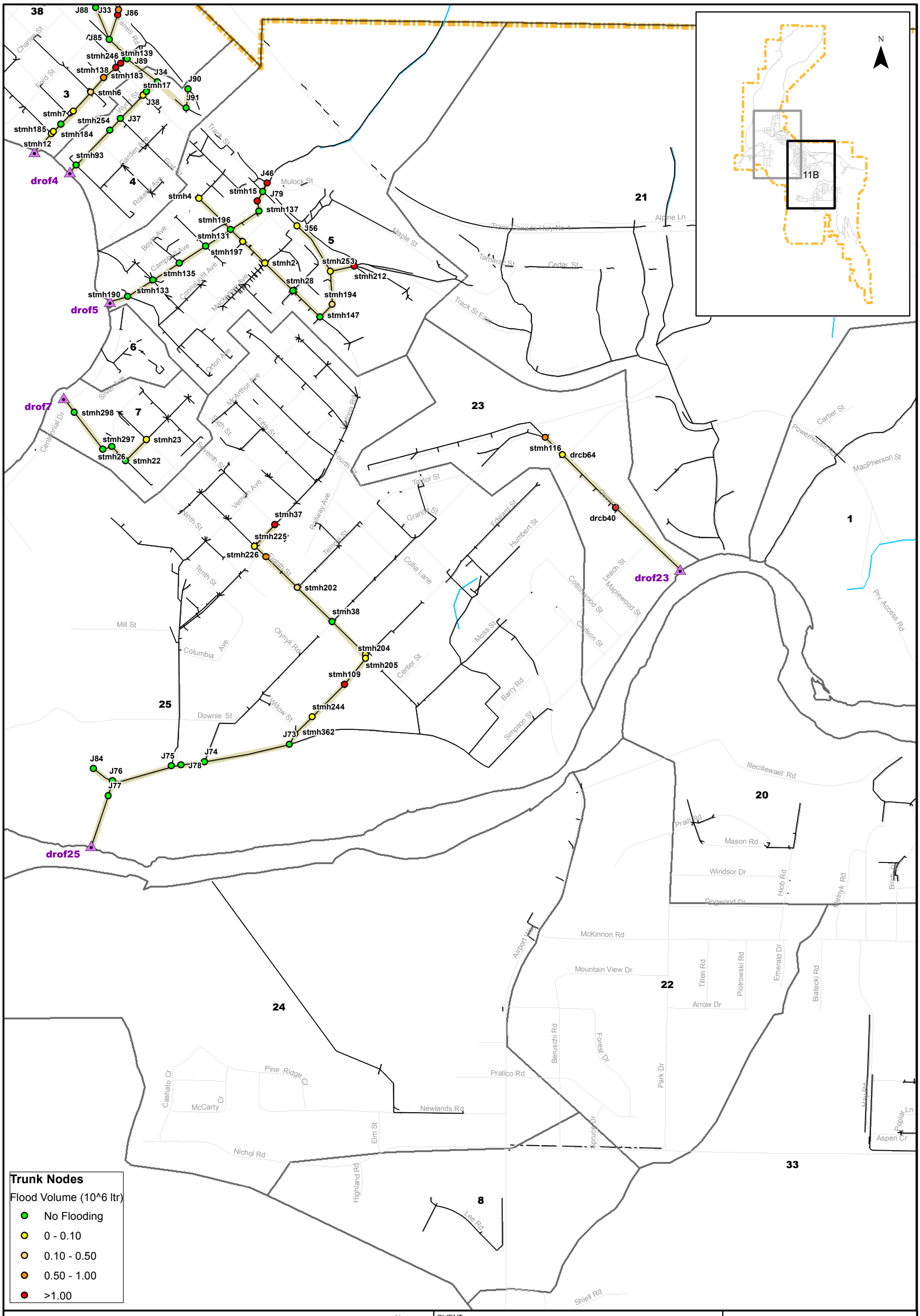
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MODELLING RESULTS - 100 YEAR CCS1 (2016-2036)

WSP | MMM GROUP

Checked: B.W	Drawn: S.Y
Date: October 2016	Proj. No.: 38-15518
Scale: 1:10,000	Drawing No.: **11A**

Document Path: R:\38-15518-Revelstoke\FIG\DWG 11- 100Year Senario1-Flood Vol.mxd



Trunk Nodes
Flood Volume (10^6 ltr)
- No Flooding
- 0 - 0.10
- 0.10 - 0.50
- 0.50 - 1.00
- >1.00

Legend
- Outfalls
- Storm Sewer
- Trunk_Network
- Roads
- Streams
- DRCA (Ref.)
- Boundary Line

0 0.125 0.25 0.5 Kilometers

CLIENT: CITY OF REVELSTOKE

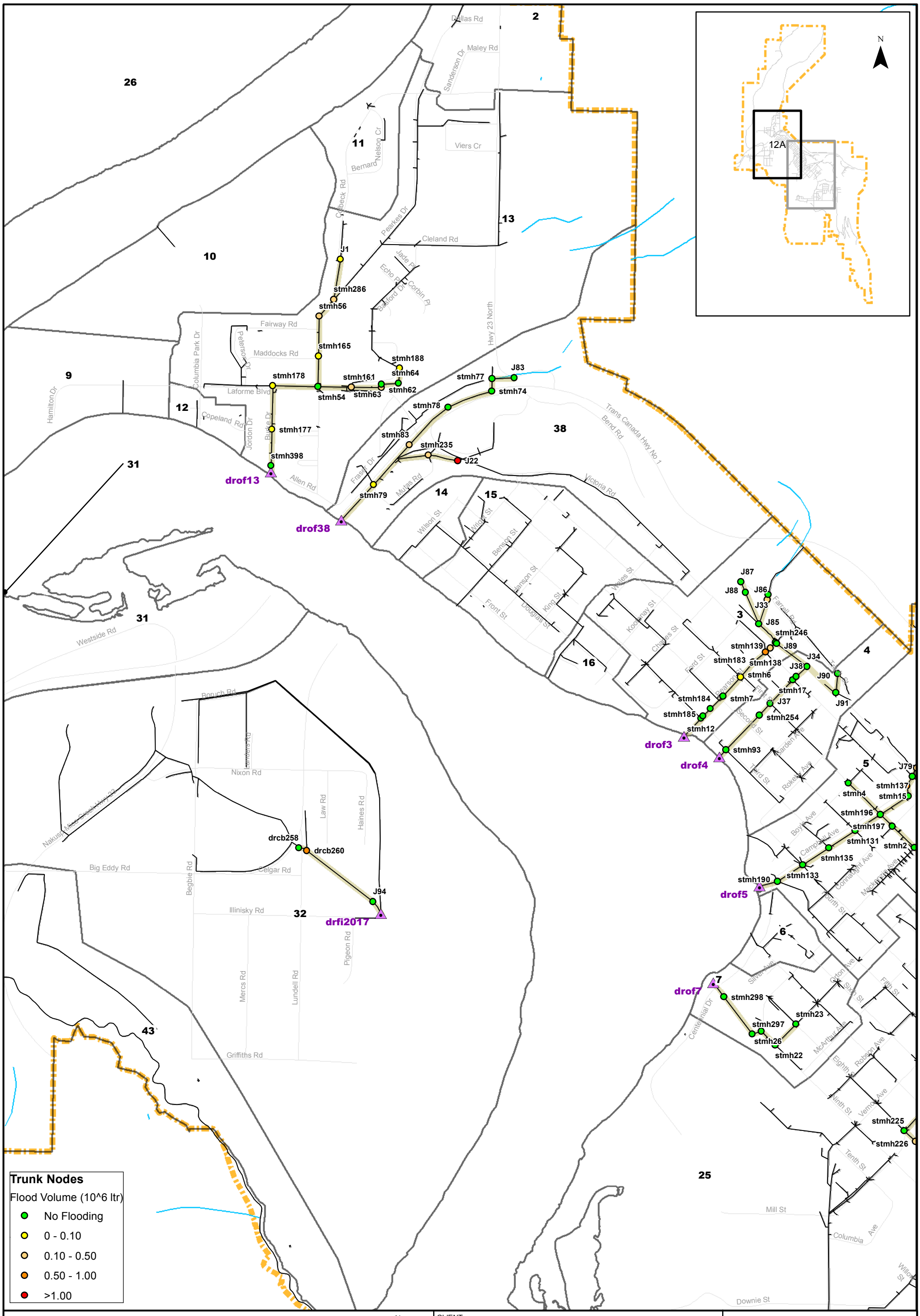
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MODELLING RESULTS - 100 YEAR CCS1 (2016-2036)

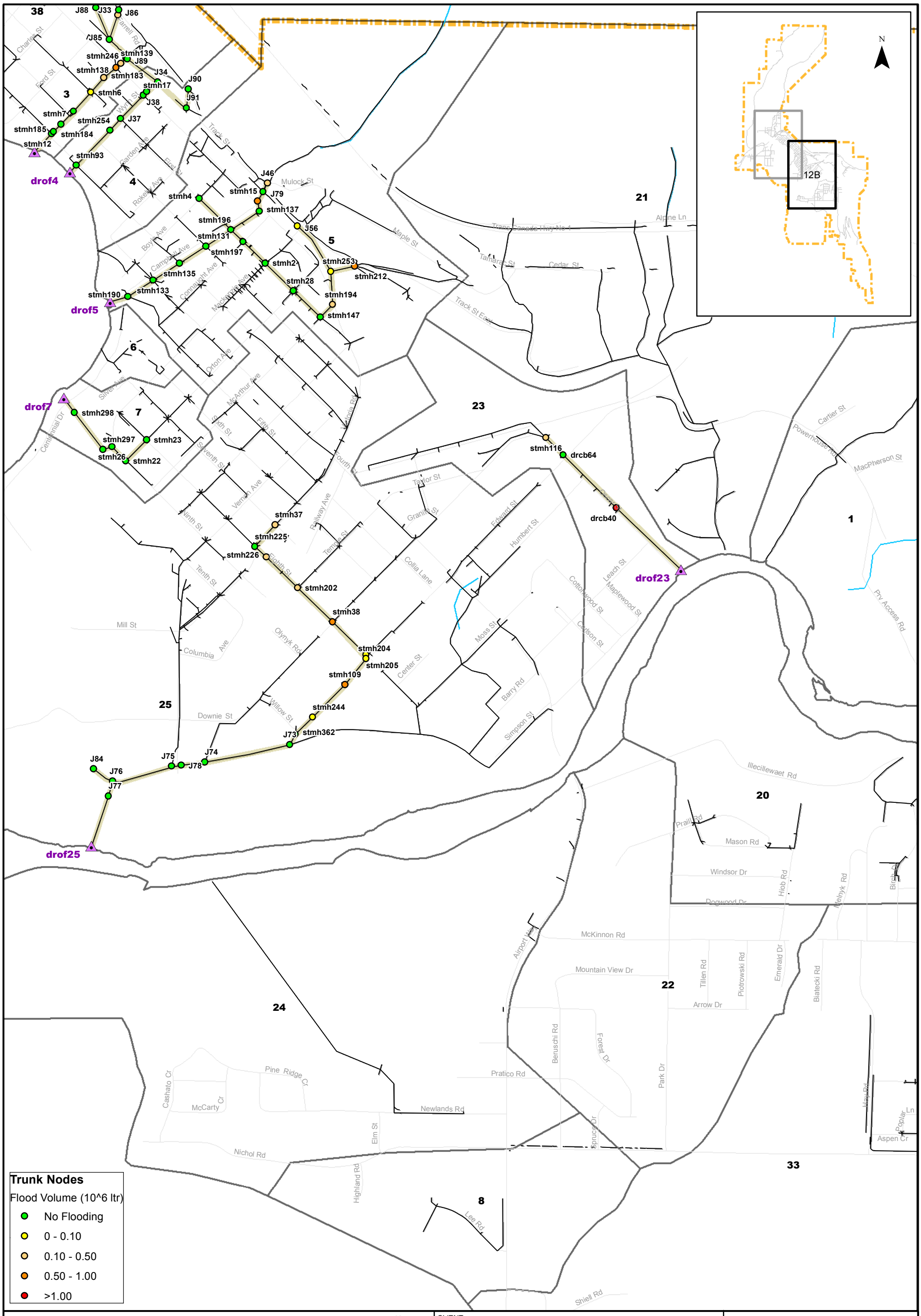
WSP | MMM GROUP

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Date: October 2016	Proj. No.: 38-15518
Scale: 1:10,000	Drawing No.: **11B**

Document Path: R:\38-15518-Revelstoke\FIG\DWG 12- 5Year Senario2-Flood Vol.mxd



Document Path: R:\38-15518-Revelstoke\FIG\DWG 12- 5Year Senario2-Flood Vol.mxd



CLIENT
CITY OF REVELSTOKE

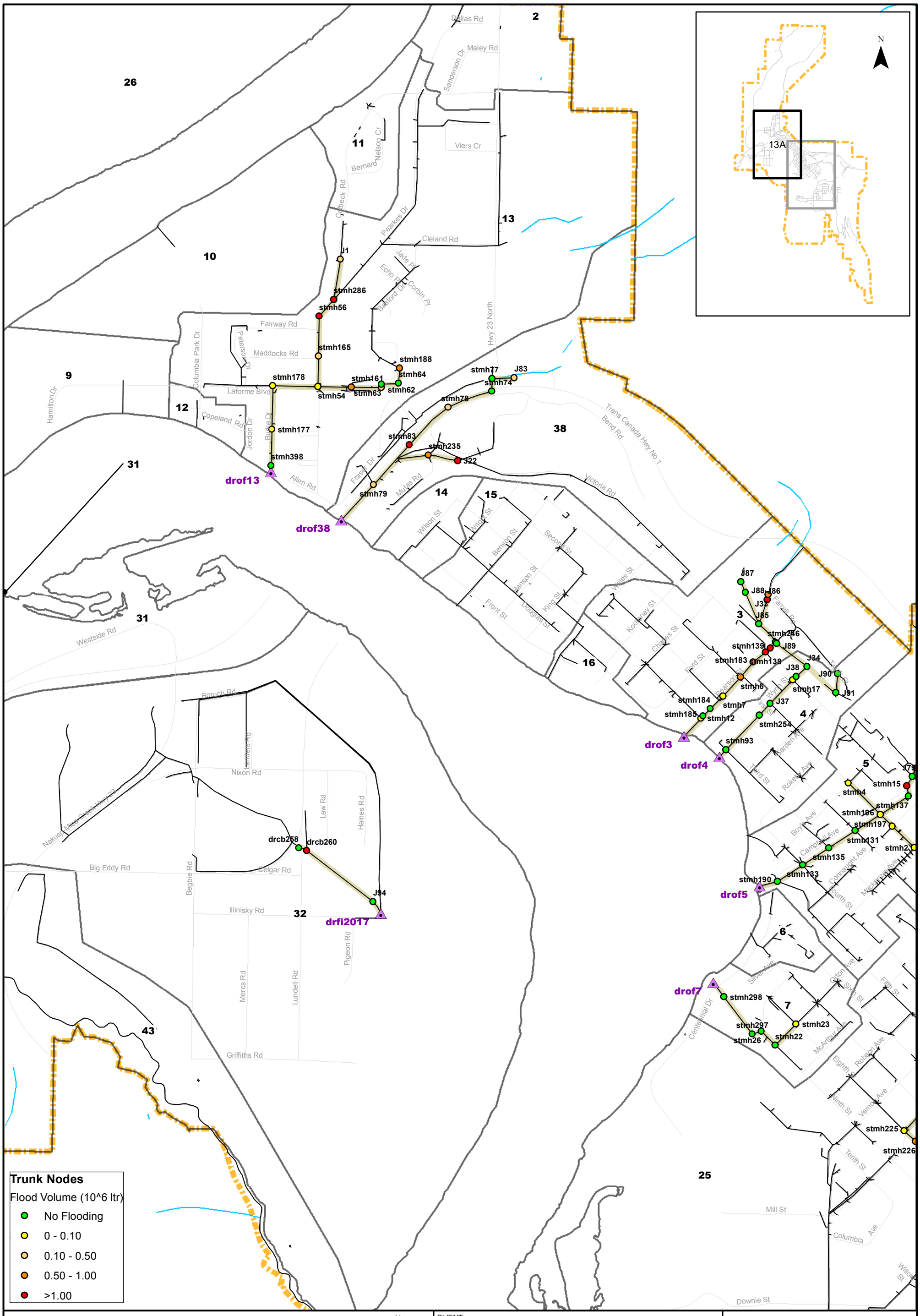
TITLE
REVELSTOKE STORMWATER MANAGEMENT PLAN - MODELLING RESULTS

MODELLING RESULTS - 5 YEAR CCS2 (2037-2066)

WSP | MMM GROUP

Checked: B.W	Drawn: S.Y
Date: October 2016	Proj. No.: 38-15518
Scale: 1:10,000	Drawing No.: **12B**

Document Path: R:\38-15518-Revelstoke\FIG\DWG 13- 100Year Senario2-Flood Vol.mxd



CLIENT
CITY OF REVELSTOKE

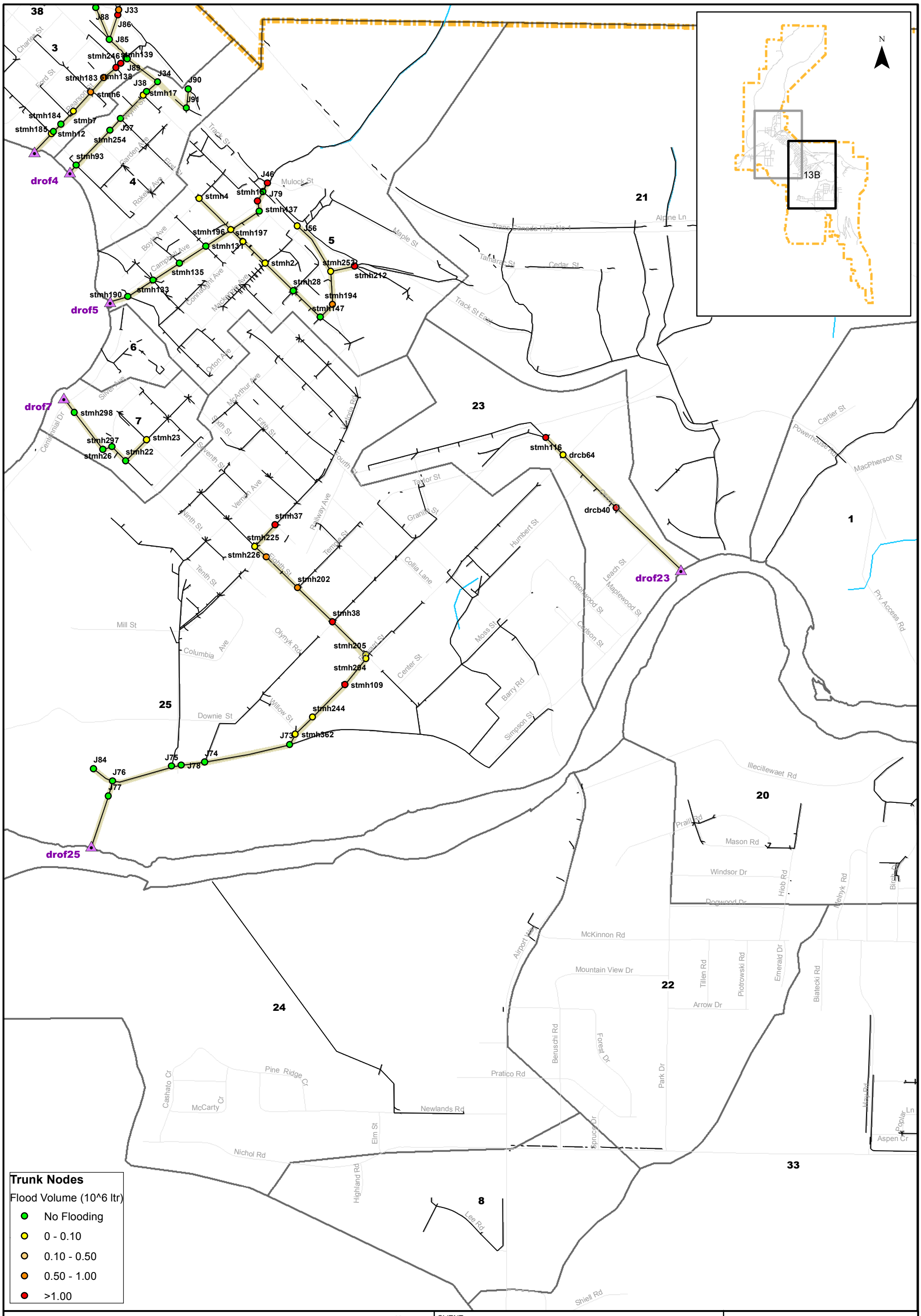
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REVELSTOKE STORMWATER MANAGEMENT PLAN - MODELLING RESULTS

MODELLING RESULTS - 100 YEAR CCS2 (2037-2066)

WSP | MMM GROUP

Checked: B.W	Drawn: S.Y
Date: October 2016	Proj. No.: 38-15518
Scale: 1:10,000	Drawing No.: **13A**

Document Path: R:\38-15518-Revelstoke\FIG\DWG 13- 100Year Senario2-Flood Vol.mxd



Trunk Nodes
Flood Volume (10^6 ltr)
- No Flooding
- 0 - 0.10
- 0.10 - 0.50
- 0.50 - 1.00
- >1.00

Legend
- Outfalls
- Storm Sewer
- Trunk_Network
- Roads
- Streams
- DRCA (Ref.)
- Boundary Line

0 0.125 0.25 0.5 Kilometers

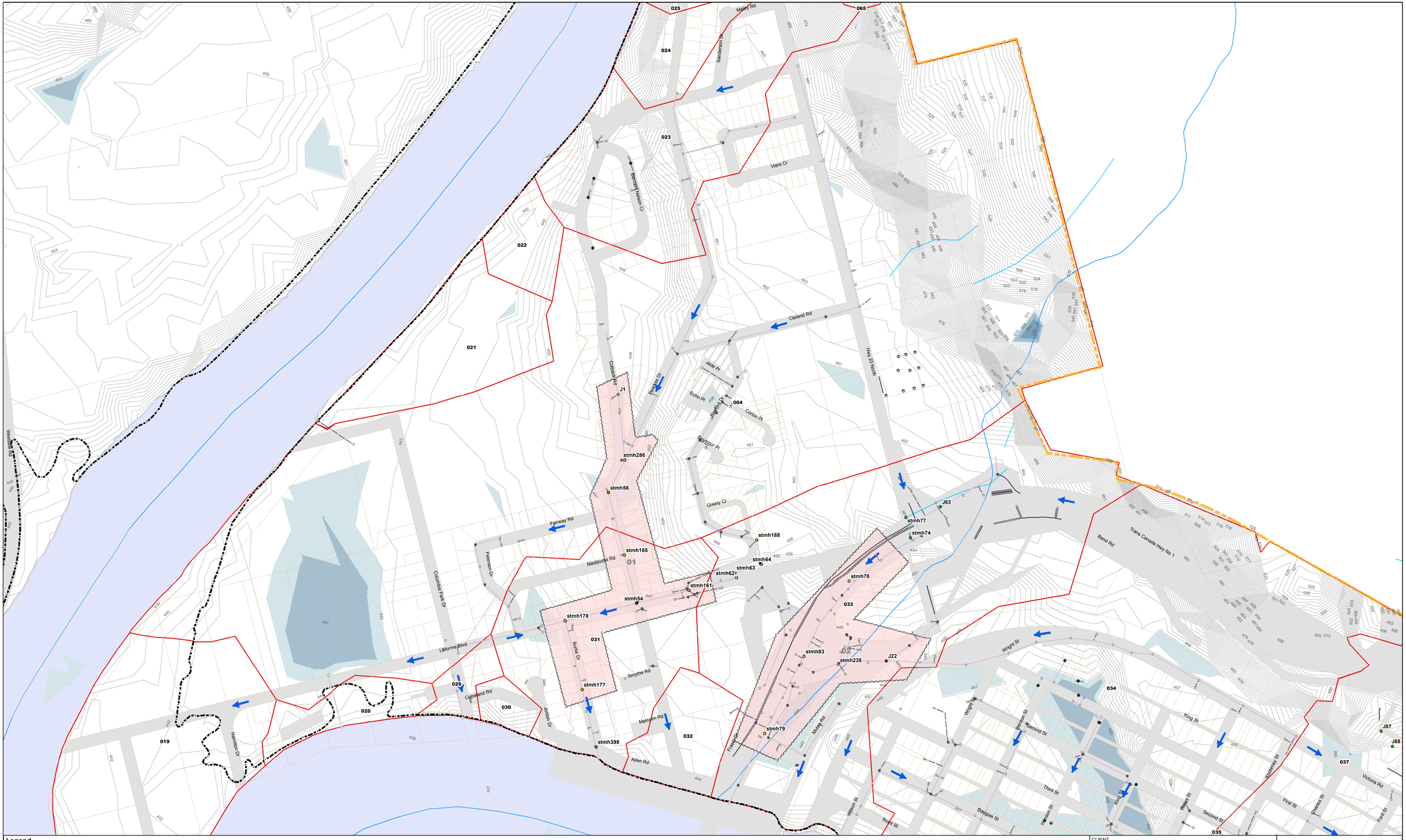
CLIENT
CITY OF REVELSTOKE

TITLE
REVELSTOKE STORMWATER MANAGEMENT PLAN - MODELLING RESULTS

MODELLING RESULTS - 100 YEAR CCS2 (2037-2066)

WSP | MMM GROUP

Checked B.W	Drawn S.Y
Date October 2016	Proj. No. 38-15518
Scale 1:10,000	Drawing No. **13B**



Legend

Existing - 100Year

Flood Volume (10^6 ltr)

- No Flooding
- 0 - 0.10
- 0.10 - 0.50
- 0.50 - 1.00
- >1.00

Drainage Point

- DRCB
- Dry Drain
- Fitting
- Manhole
- Outfall

Drainage Line

- Culvert
- Ditch
- Dry Drain
- Lateral
- Main

- Boundary
- Major System Flow Direction
- Streams
- 1m Contour
- Flood Plain (OCP)
- Major System Subcatchments
- Flood Damage Centres

Low Points (Potential Ponding Areas)

- 0.1 - 0.93
- 0.94 - 2.75
- 2.76 - 6.4
- 6.41 - 11.63
- 11.64 - 21.25

0 25 50 100 150 200 Meters

CLIENT: CITY OF REVELSTOKE

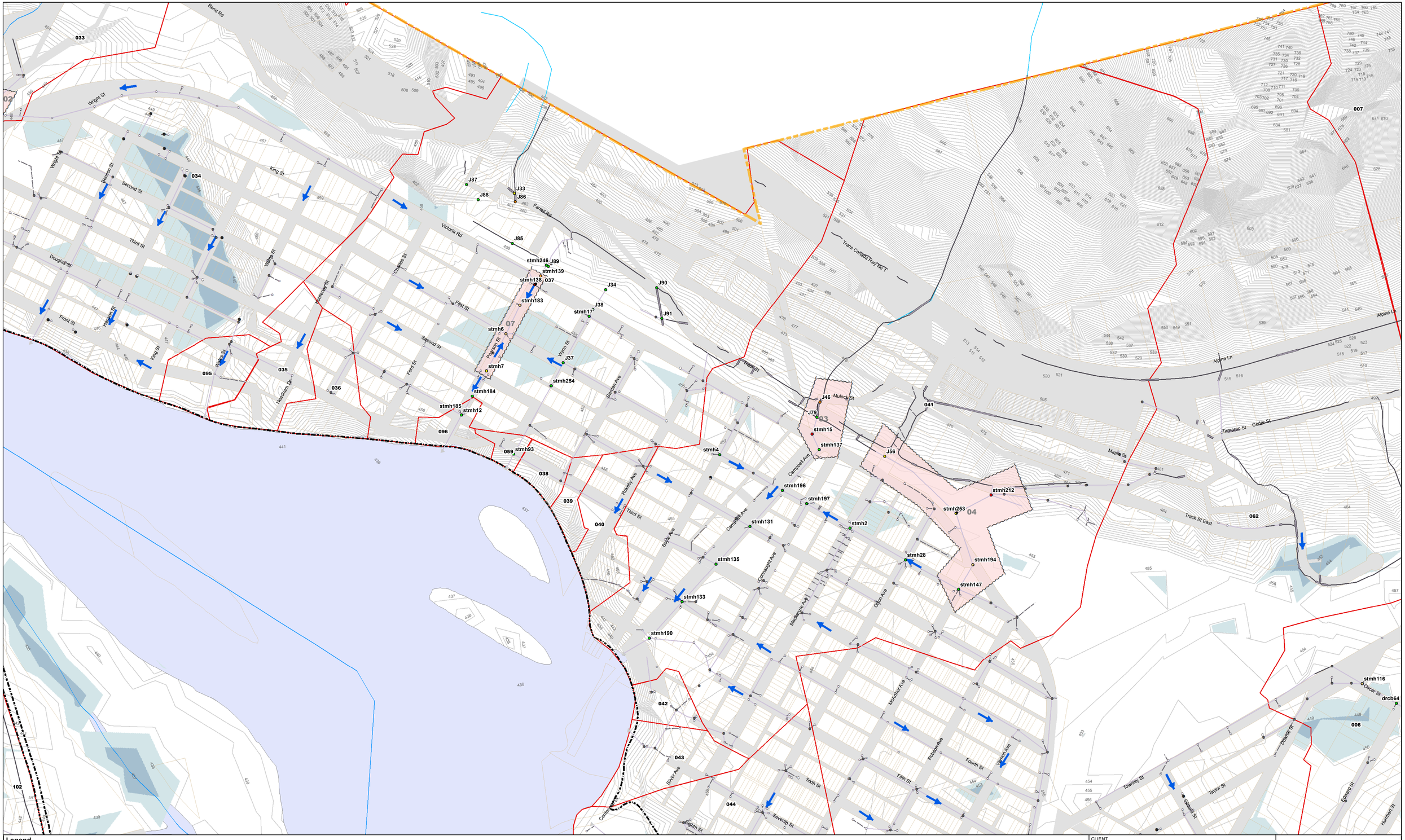
TITLE: REVELSTOKE STORMWATER MANAGEMENT PLAN

MODELLING RESULTS DETAIL SHEETS – FLOOD DAMAGE CENTRES

WSP | MMM GROUP

Checked: B.W.	Drawn: S.Y
Date: October 2016	Proj. No.: 38-15518
Scale: 1:3,000	Figure No.: **14A**

Document Path: R:\38-15518-Revelstoke\FIG\DWG 14 Detail Sheets – Flood Damage Centres.mxd



Legend

Existing - 100Year
Flood Volume (10^6 ltr)
- No Flooding
- 0 - 0.10
- 0.10 - 0.50
- 0.50 - 1.00
- >1.00

Drainage Point
- DRCB
- Dry Drain
- Fitting
- Manhole
- Outfall

Drainage Line
- Culvert
- Ditch
- Dry Drain
- Lateral
- Main

- Boundary
- Major System Flow Direction
- Streams
- 1m Contour
- Flood Plain (OCP)
- Major System Subcatchments
- Flood Damage Centres

Low Points (Potential Ponding Areas)
- 0.1 - 0.93
- 0.94 - 2.75
- 2.76 - 6.4
- 6.41 - 11.63
- 11.64 - 21.25

0 25 50 100 150 200 Meters

Document Path: R:\38-15518-Revelstoke\FIG\DWG 14 Detail Sheets – Flood Damage Centres.mxd

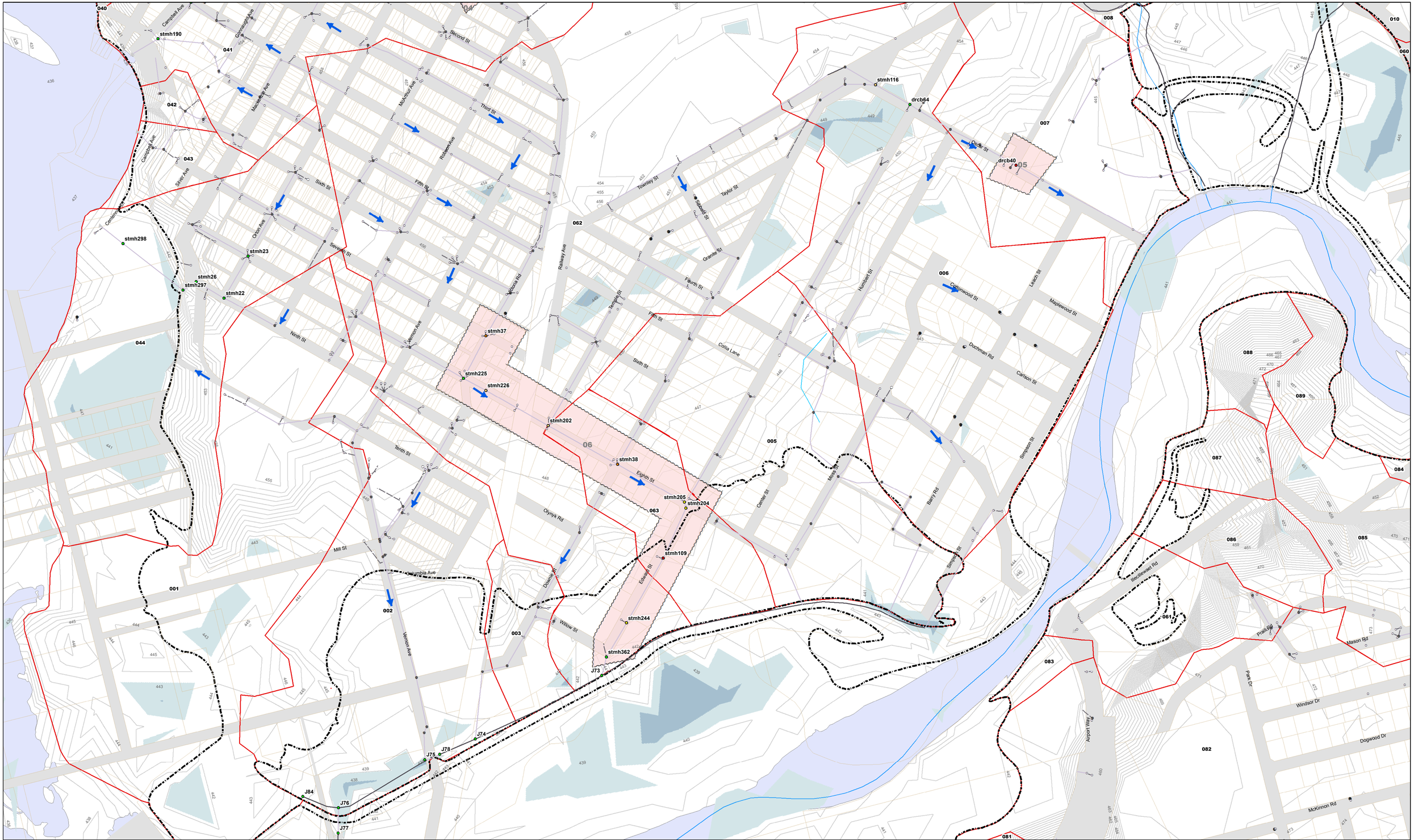
CLIENT: CITY OF REVELSTOKE

TITLE: REVELSTOKE STORMWATER MANAGEMENT PLAN

MODELLING RESULTS DETAIL SHEETS – FLOOD DAMAGE CENTRES

WSP | MMM GROUP

Checked: B.W.	Drawn: S.Y
Date: October 2016	Proj. No.: 38-15518
Scale: 1:3,000	Figure No.: **14B**



Legend

Existing - 100Year
Flood Volume (10^6 ltr)
- No Flooding
- 0 - 0.10
- 0.10 - 0.50
- 0.50 - 1.00
- >1.00

Drainage Point
- DRCB
- Dry Drain
- Fitting
- Manhole
- Outfall

Drainage Line
- Culvert
- Ditch
- Dry Drain
- Lateral
- Main

- Boundary
- Major System Flow Direction
- Streams
- 1m Contour
- Flood Plain (OCP)
- Major System Subcatchments
- Flood Damage Centres

Low Points (Potential Ponding Areas)
- 0.1 - 0.93
- 0.94 - 2.75
- 2.76 - 6.4
- 6.41 - 11.63
- 11.64 - 21.25

0 25 50 100 150 200 Meters

Document Path: R:\38-15518-Revelstoke\FIG\DWG 14 Detail Sheets – Flood Damage Centres.mxd

CLIENT: CITY OF REVELSTOKE

TITLE: REVELSTOKE STORMWATER MANAGEMENT PLAN

MODELLING RESULTS DETAIL SHEETS – FLOOD DAMAGE CENTRES

WSP | MMM GROUP

Checked: B.W.	Drawn: S.Y
Date: October 2016	Proj. No.: 38-15518
Scale: 1:3,000	Figure No.: **14C**

STORM SEWER SURCHARGE AREA 01:
5-YR EX. FLOOD VOL. 0.291*10^6 LTR
100-YR EX. FLOOD VOL. 1.295*10^6 LTR
PRIORITY RANK: 7 (OF 7)

STORM SEWER SURCHARGE AREA 02:
5-YR EX. FLOOD VOL. 0.666*10^6 LTR
100-YR EX. FLOOD VOL. 2.339*10^6 LTR
PRIORITY RANK: 3 (OF 7)

STMP9 750mm
(EX. 675mm)
LENGTH 62m

STMP427 750mm
(EX. 675mm)
LENGTH 112m

STMP428 750mm
(EX. 675mm)
LENGTH 92m

STMP435 900mm
(EX. 675mm)
LENGTH 132m

STMP14 900mm
(EX. 675mm)
LENGTH 93m

CONSIDER MAJOR SYSTEM
OVERLAND FLOW
IMPROVEMENTS WHEN
OPPORTUNITIES ARISE

Maley Rd
Sanderson Dr
Viers Cr
Bernard Nelson Cr
Cleland Rd
Hwy 23 North
Jade Pl
Echo Pl
Peoples Dr
Cobden Rd
Seymour Pl
Corbin Pl
Greely Cr
Fairway Rd
Maddocks Rd
Paterson Dr
Columbia Park Dr
Laforme Blvd
Burke Dr
Smythe Rd
Copeland Rd
Johnson Dr
Malcolm Rd
Allen Rd
Harriman Dr
Westside Rd
Fraser Dr
Mulvey Rd
Wright St
Benson St
Second St
Third St
King St
Douglas St
Wilson St
Richt St
Kootenay St
Victoria Rd
First St
Charles St
Ford St
Bend Rd
Trans Canada Hwy No 1

J1 J83 J22 J87 J88

stmh286 stmh56 stmh165 stmh54 stmh161 stmh178 stmh177 stmh398
stmh188 stmh64 stmh63 stmh62 stmh77 stmh74 stmh78 stmh83 stmh35 stmh79

001 002 004 021 022 023 024 025 065 019 020 029 030 031 032 033 034 035 037

Legend

Existing - 100Year
Flood Volume (10^6 ltr)
- No Flooding
- 0 - 0.10
- 0.10 - 0.50
- 0.50 - 1.00
- >1.00

Drainage Point
- DRCB
- Dry Drain
- Fitting
- Manhole
- Outfall

Drainage Line
- Culvert
- Ditch
- Dry Drain
- Lateral
- Main

- Boundary
- Major System Flow Direction
- Streams
- 1m Contour
- Flood Plain (OCP)
- Major System Subcatchments
- Flood Damage Centres

Low Points (Potential Ponding Areas)
- 0.1 - 0.93
- 0.94 - 2.75
- 2.76 - 6.4
- 6.41 - 11.63
- 11.64 - 21.25

0 25 50 100 150 200 Meters

CLIENT: CITY OF REVELSTOKE

TITLE: REVELSTOKE STORMWATER MANAGEMENT PLAN

PRIORITIZED CAPITAL UPGRADES

WSP | MMM GROUP

Checked: B.W.	Drawn: S.Y
Date: October 2016	Proj. No.: 38-15518
Scale: 1:3,000	Figure No.: **15A**

Document Path: R:\38-15518-Revelstoke\FIG\DWG 15 Prioritized Capital Upgrades.mxd

STORM SEWER SURCHARGE AREA 07:
5-YR EX. FLOOD VOL. 0.969*10^6 LTR
100-YR EX. FLOOD VOL. 2.450*10^6 LTR
PRIORITY RANK: 2 (OF 7)

STORM SEWER SURCHARGE AREA 03:
5-YR EX. FLOOD VOL. 0.470*10^6 LTR
100-YR EX. FLOOD VOL. 1.633*10^6 LTR
PRIORITY RANK: 5 (OF 7)

STORM SEWER SURCHARGE AREA 04:
5-YR EX. FLOOD VOL. 0.531*10^6 LTR
100-YR EX. FLOOD VOL. 1.381*10^6 LTR
PRIORITY RANK: 6 (OF 7)

PROVIDE NEW HIGH CAPACITY CB INLETS (ASSUME 4 NO.) AT LOW POINTS IN VICINITY OF FIRST/PEARSON INTERSECTION

UPSIZE ALL PEARSON ST PIPEWORK TO 1200mm (EX. 750mm) TOTAL LENGTH 360m (PIPE REFS. STMP90, STMP595, STMP594, STMP591, STMP554, STMP556, STMP555, and STMP521)

UPSIZE PIPEWORK TO 900mm (EX. 600mm) TOTAL LENGTH 200m (PIPE REFS. STMP99, STMP98, STMP850, and DRCU63/64)

STMP120 600mm (EX. 400mm) LENGTH 110m

Wright St
Bentley St
Second St
Third St
Douglas St
Front St
Hamilton St
Kong St
Victoria Rd
Farrell Rd
Trans Canada Hwy/NB T
Alpine Ln
Tamarac St
Cedar St
Maple St
Track St East
Mulock St
Campbell Ave
Roxby Ave
Boyle Ave
Connaught Ave
Mackenzie Ave
Oak Drive
McArthur Ave
Robson Ave
Vernon Ave
Fourth St
Fifth St
Sixth St
Seventh St
Silver Ave
Cartier Ave
Townley St
Taylor St
Spokane St
Edward St
Dunn St
Oscar St
Humbert St
Newbigin Dr
Wynn St
Garden Ave
Pearson St
Front St
Wilson St
Boulder St
Charles St
Wilson St
Trans Canada Hwy/NB T

Legend

Existing - 100Year
Flood Volume (10^6 ltr)
- No Flooding
- 0 - 0.10
- 0.10 - 0.50
- 0.50 - 1.00
- >1.00

Drainage Point
- DRCB
- Dry Drain
- Fitting
- Manhole
- Outfall

Drainage Line
- Culvert
- Ditch
- Dry Drain
- Lateral
- Main

- Boundary
- Major System Flow Direction
- Streams
- 1m Contour
- Flood Plain (OCP)
- Major System Subcatchments
- Flood Damage Centres

Low Points (Potential Ponding Areas)
- 0.1 - 0.93
- 0.94 - 2.75
- 2.76 - 6.4
- 6.41 - 11.63
- 11.64 - 21.25

0 25 50 100 150 200 Meters

CLIENT: CITY OF REVELSTOKE

TITLE: REVELSTOKE STORMWATER MANAGEMENT PLAN

PRIORITIZED CAPITAL UPGRADES

WSP | MMM GROUP

Checked	Drawn
B.W.	S.Y
Date: October 2016	Proj. No.: 38-15518
Scale: 1:3,000	Figure No.: **15B**

Document Path: R:\38-15518-RevelstokeFIG\DWG 15 Prioritized Capital Upgrades.mxd

STMP1086 900mm
(EX. 350mm)
LENGTH 265m

STORM SEWER SURCHARGE AREA 05:
5-YR EX. FLOOD VOL. 1.058*10^6 LTR
100-YR EX. FLOOD VOL. 1.880*10^6 LTR
PRIORITY RANK: 4 (OF 7)

UPSIZE EIGHTH ST PIPEWORK
TO 750mm (EX. 600mm)
TOTAL LENGTH 290m
(PIPE REFS. STMP183, STMP749)

UPSIZE EDWARD ST PIPEWORK
TO 900mm (EX. 600mm)
TOTAL LENGTH 335m
(PIPE REFS. STMP184, STMP248, STMP249, STMP1516)

STORM SEWER SURCHARGE AREA 06:
5-YR EX. FLOOD VOL. 1.115*10^6 LTR
100-YR EX. FLOOD VOL. 2.939*10^6 LTR
PRIORITY RANK: 1 (OF 7)

Legend

Existing - 100Year
Flood Volume (10^6 ltr)
- No Flooding
- 0 - 0.10
- 0.10 - 0.50
- 0.50 - 1.00
- >1.00

Drainage Point
- DRCB
- Dry Drain
- Fitting
- Manhole
- Outfall

Drainage Line
- Culvert
- Ditch
- Dry Drain
- Lateral
- Main

- Boundary
- Major System Flow Direction
- Streams
- 1m Contour
- Flood Plain (OCP)
- Major System Subcatchments
- Flood Damage Centres

Low Points (Potential Ponding Areas)
- 0.1 - 0.93
- 0.94 - 2.75
- 2.76 - 6.4
- 6.41 - 11.63
- 11.64 - 21.25

0 25 50 100 150 200 Meters

CLIENT: CITY OF REVELSTOKE

TITLE: REVELSTOKE STORMWATER MANAGEMENT PLAN

PRIORITIZED CAPITAL UPGRADES

WSP | MMM GROUP

Checked	Drawn
B.W.	S.Y
Date	Proj. No.
October 2016	38-15518
Scale	Figure No.
1:3,000	**15C**

Document Path: R:\38-15518-Revelstoke\FIG\DWG 15 Prioritized Capital Upgrades.mxd

APPENDIX A

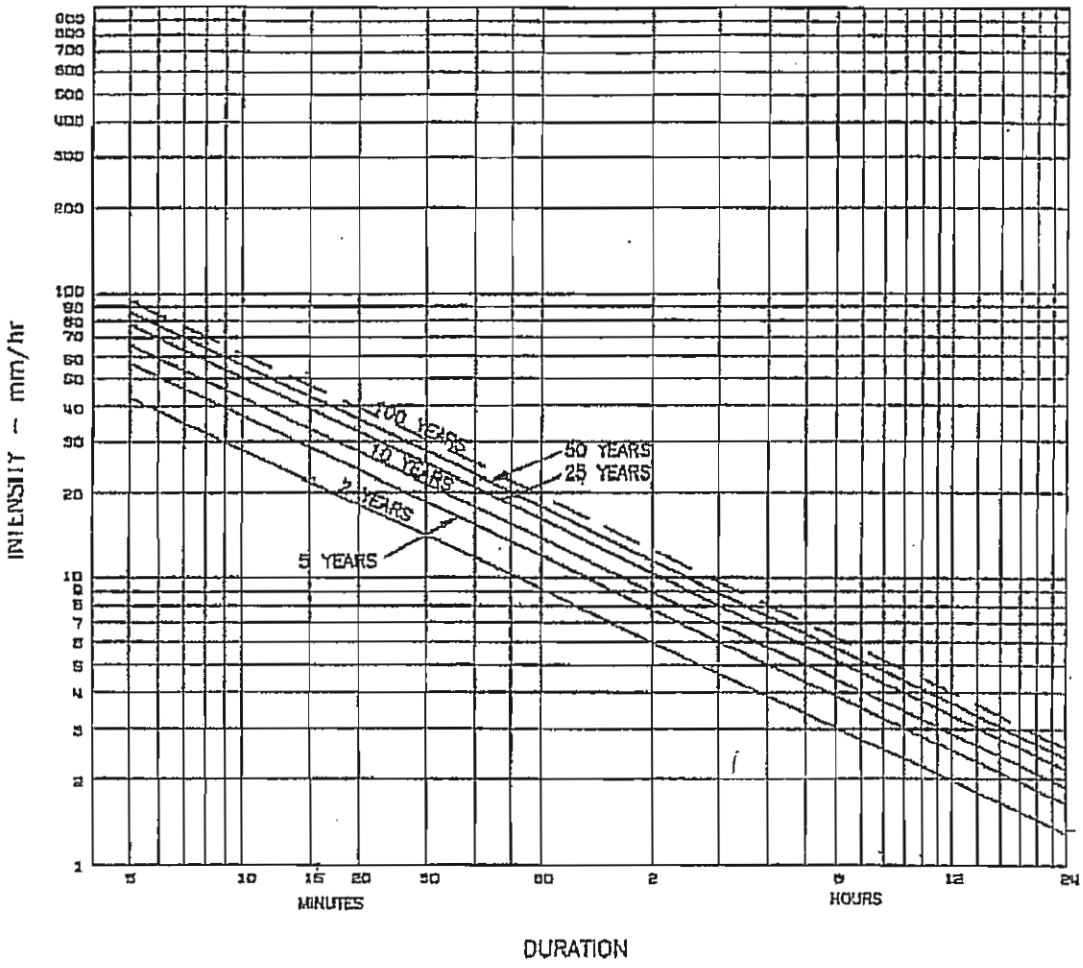
Catchment Summary Table

CATCHMENT REFERENCE	SUB-CATCHMENT REFERENCE	TOTAL AREA (HECTARES)	COMPOSITE % IMPERVIOUSNESS	GIS ASSET GROUP	CATCHMENT AREA DESCRIPTION
SUB-CATCHMENTS RECEIVED FROM CITY (NOT MODIFIED):					
drca1	-	127.61	37.6	Bridge Creek	Largely undeveloped, but with some light industrial and recreational uses. CPR rail corridor and several roads pass through the catchment. External drainage area from mountainside drains through catchment via natural streams/ditches. Likely several culvert crossings but no data available.
drca2	-	15.09	62.7	Columbia 1	Small residential sub-catchment. Some eixtsing drainage infrastructure along Pearkes Drive (generally 300 mm diameter or less), ultimately draining to 450 mm diameter outfall to river. May be draining some external hillside areas from the east, if so would appear to require culvert crossing of highway and nothing indicated. No data available though.
drca6	-	3.84	56.6	Columbia 13	Very small, enclosed sub-catchment within main City area. No external drainage. Some residential and commercial land uses. Existing drainage system pipework all less than 300 mm diameter.
drca8	-	31.64	46.6	Columbia 16	Small catchment area, generally undeveloped but with small area of single lot residential. Existing drainage infrastructure consists of Airport Way roadside ditch system that drains into 250 mm diameter system, which thendischarges into natural wetland area ("reservoir drawdown" landuse) adjacent to river. Final pipe before outlet is 450 mm.
drca9	-	21.21	20.7	Columbia 2	Catchment consists of several residential properties and golf course facility. Only recorded drainage infrastructure within the sub-catchment is a single 450 mm diameter pipe draining golf course land north of Laforme Blvd southwards to the Columbia River.
drca10	-	27.24	12.5	Columbia 3	Catchment consists solely of golf course facility. Only recorded drainage infrastructure within the sub-catchment is a single 150 mm diameter pipe draining golf course parking area northwards to the Columbia River.
drca11	-	8.08	50.6	Columbia 4	Small residential sub-catchment draining northwards to river. No external drainage. Isolated pieces of existing drainage infrastructure, all diameters less than 450 mm.
drca12	-	2.49	52.0	Columbia 5	Small residential sub-catchment draining southwards to river. No external drainage. Some existing drainage infrastructure at south end of Columbia Park Drive, all diameters less than or equal to 300 mm.
drca14	-	4.84	64.1	Columbia 7	Sub-catchment areas within main City core, generally enclosed by Victoria Road, with no external drainage areas. Predominantly residential and some commercial land uses. Existing drainage infrastructure systems appear to be linked between the three sub-catchments identified. All pipe size less than 450 mm diameter.
drca15	-	20.17	57.8	Columbia 8	
drca16	-	4.17	48.7	Columbia 9	
drca17	-	7.92	74.4	Deadman's Creek	Small catchment. Stream passing through (carrying upstream external catchment) - likely a culvert crossing in external area but no data available.
drca18	-	138.33	36.5	Illecillewaet 1	Generally undeveloped, but with some tourist (campground) and residential (semi-permanent homes?). CPR rail corridor and several roads pass through the catchment. External drainage area from mountainside drains through catchment. Existing ditch drainage system includes several culvert structures (up to 600 dia.) crossing highway.
drca19	-	82.87	10.1		
drca20	-	61.08	50.4	Illecillewaet 4	Generally residential landuse. Localised storm sewer infrastructure shown in GIS data servicing some areas - system pipe diameters all <300 mm. Drainage ultimately to the north into Illicillewat River.
drca21	-	192.50	31.8	Illecillewaet 5	Largely undeveloped, but with small area of residential use, and some light industrial. CPR rail corridor and several roads pass through the catchment. Large external drainage area from mountainside drains through catchment via series of natural streams/ditches and isloated pieces of culvert/pipe infrastructure.
drca22	-	59.06	56.1	Illecillewaet 6	Residential landuse predominantly. No drainage infrastructure recorded. Some culvert crossings of Airport Way immediately to west. Some CBs seen in residential areas via Google Streetview inspection - e.g. at Beruschi/Forest intersection. Not clear where these drain to.
drca24	-	124.27	42.1	Illecillewaet 8	Landuses within sub-catchment include residential and institutional (hospital). Limited amount of drainage infrastructure - existing system consists of 200/300 mm diameter pipe system that drains a section Newlands Road, ultimately discharges to Illicillewat. Several culvert crossings of Airport Way at eastern edge of catchment (flow likely from drca22) - diameters vary from 300-600 mm. Also, it is noted that residential development around Cashato Drive, McCarty Crescent shows numerous CBs in GIS data, however no evidence of pipework (CBs could not be seen in Google Streetview).
drca26	-	329.23	41.1	Jordan River	Generally undeveloped, although some quarrying activities and isolated buildings within catchment. No recorded drainage infrastructure. Highway present and natural watercourse (Jordan River, carrying upstream external catchment) - likely a culvert crossing at downstream end but no data available.
drca27	-	57.17	31.3	Locks Creek	Largely undeveloped, some overlap with Mountain Resort development (drca44). Existing streams from mountainside pass through catchment, some culvert crossings of roads but limited data available on pipe diameters etc. Ultimate discharge to Williamson Lake.
drca28	-	129.11	31.2	Montana Creek	Undeveloped hillside area. Existing stream (Montana Creek) shown discharging at base of catchment to Columbia River. Outfall would require culvert crossing of Airport Way (and side road further upstream), however no crossing data is available.
drca29	-	115.60	43.8	Scott Creek	Undeveloped hillside area. Existing stream (Scott Creek) shown discharging at base of catchment to Columbia River. Outfall would require culvert crossing of Airport Way, however no crossing data is available.
drca30	-	2.29	73.3	Stream 1	Generally undeveloped. No recorded drainage infrastructure. Highway present with stream passing through (carrying upstream external catchment) - likely a culvert crossing but no data available.
drca31	-	51.52	32.6	Stream 10	Generally undeveloped, some isloated buildings. No recorded drainage infrastructure. Roads present with streams passing through (carrying upstream external catchment) - likely culvert crossing but no data available.
drca33	-	364.45	74.0	Stream 12	Largely undeveloped, but with some residential and light industrial. Existing drainage system consists of natural streams, ditches, and pipe infrastructure (all diameters less than 450 mm), Catchment discharges to Williamson Lake.
drca34	-	13.07	44.5	Stream 2	Generally undeveloped. No recorded drainage infrastructure. Highway present with stream passing through (carrying upstream external catchment) - likely a culvert crossing but no data available.
drca35	-	64.69	20.3	Stream 3	Generally undeveloped. No recorded drainage infrastructure. Highway present with stream passing through (carrying upstream external catchment) - likely a culvert crossing but no data available.
drca36	-	240.27	36.4	Stream 4	Generally undeveloped, but some quarrying activities (light industrial landuse). No recorded drainage infrastructure. Highway present with stream passing through (carrying upstream external catchment) - likely a culvert crossing but no data available.
drca37	-	19.48	37.8	Stream 5	Generally undeveloped. No recorded drainage infrastructure. Highway present with stream passing through (carrying upstream external catchment) - likely a culvert crossing but no data available.
drca39	-	354.34	50.9	Stream 7	Generally undeveloped, some isloated buildings. No recorded drainage infrastructure. Roads present with streams passing through (carrying upstream external catchment) - likely several culvert crossings but no data available.

drca40	-	107.86	53.6	Stream 8	Generally undeveloped, although some quarrying activities and isolated buildings within catchment. No recorded drainage infrastructure. Highway present with stream passing through (carrying upstream external catchment) - likely a culvert crossing but no data available.
drca41	-	10.95	20.3	Stream 9	Undeveloped. No recorded drainage infrastructure. Highway present with stream passing through (carrying upstream external catchment) - likely a culvert crossing but no data available.
drca42	-	87.30	52.6	Thomas Brook	Generally undeveloped. Land largely consists of ski area. Existing drainage ditch shown with outfall at bottom of hillside, no obvious discharge location though.
drca43	-	129.29	50.8	Tonkawatla Creek	Mostly undeveloped, but with small area of residential and light industrial (quarrying?). No recorded drainage infrastructure. Highways present with several natural watercourses passing through (carrying upstream external catchment) - likely several culvert crossings but no data available.
drca44	-	91.77	79.4	Turtle Creek	Ongoing development of Revelstoke Mountain resort within sub-catchment. New storm drainage infrastructure recently built or under construction. Drainage system generally consists of roadside ditches, and pipe infrastructure (diameters typically less than 450 mm), 1500 mm diameter culvert crossing of Camozzi Rd, and 750 mm diameter culvert further upstream. Ultimate discharge from northern section is to Williamson Lake, southern section to Columbia River.
MODIFIED SUB-CATCHMENTS (INCLUDED IN EPA-SWMM MODELLING):					
drca3	S3-A	8.55	63.0	Columbia 10	City catchment area drca3 sub-divided for modelling purposes. Predominantly residential landuse, with some commercial and institutional. Primary drainage route along Pearson Street.
	S3-B	1.98	61.7		
	S3-C	3.57	60.7		
	S3-D	2.14	80.0		
	S3-E	5.94	75.6		
	S3-F	1.96	57.6		
	S3-G	3.37	60.3		
-	S3-Z1	241.48			External drainage area contributng to flow in drca3 infrastructure.
drca4	S4-A	3.79	76.9	Columbia 11	City catchment area drca4 sub-divided for modelling purposes. Predominantly residential landuse, with some commercial and institutional. Primary drainage route along Wynn Street.
	S4-B	4.10	79.7		
	S4-C	6.79	73.4		
drca5	S5-A	9.07	64.0	Columbia 12	City catchment area drca5 sub-divided for modelling purposes. Predominantly impervious (commercial) landuse types associated with downtowm core. Primary drainage route along Campbell Avenue.
	S5-B	1.72	80.0		
	S5-C	2.50	80.0		
	S5-D	1.21	80.0		
	S5-E	4.16	79.5		
	S5-F	0.98	80.0		
	S5-G	4.06	77.1		
	S5-H	3.73	72.8		
	S5-I	10.21	70.8		
	S5-J	5.89	59.5		
	S5-K	28.62	31.3		
-	S5-Z1	87.74			External drainage area contributng to flow in drca5 infrastructure.
drca7	S7-A	7.44	55.8	Columbia 14	City catchment area drca7 sub-divided for modelling purposes. Residential and park landuses.
	S7-B	3.84	21.8		
drca13	S13-A	34.22	63.1	Columbia 6	City catchment area drca13 sub-divided for modelling purposes. Predominantly residential landuse, with some higher impervious commercial landuses adjacent to TCH and Fraser Drive.
	S13-B	19.24	62.7		
	S13-C	5.10	66.5		
	S13-D	2.86	76.8		
	S13-E	5.09	67.5		
	S13-F	7.50	50.1		
	S13-G	1.54	47.9		
	S13-H	1.41	56.6		
-	S13-Z1	8.45			External drainage area contributng to flow in drca13 infrastructure.
drca23	S23-A	15.91	69.5	Illecillewaet 7	City catchment area drca23 sub-divided for modelling purposes. Predominantly residential landuse.
	S23-B	3.96	63.0		
	S23-C	7.88	45.2		
	S23-D	6.05	46.1		
drca25	S25-A	22.59	60.6	Illecillewaet 9	City catchment area drca25 sub-divided for modelling purposes. Predominantly residential landuses, with commercial timber yard at westerm end of catchment. Storm drainage network drains to dyke system alongside Illicilliwaet River.
	S25-B	6.80	54.9		
	S25-C	7.32	52.2		
	S25-D	10.65	54.6		
	S25-E	10.10	48.8		
	S25-F	41.61	44.2		
	S25-G	3.44	49.3		
	S25-H	3.43	40.6		
	S25-I	19.93	67.3		
	S25-J	24.23	71.6		
	S25-K	64.60	47.3		
drca32	S32-A	54.37	67.1	Stream 11	City catchment area drca32 sub-divided for modelling purposes. Big Eddy residential and light industrial/commercial area. Drainage infrastructure within developed areas is generally informal (ditches with some pipes/culverts) - system drains to flood protection dyke system.
	S32-B	5.37	76.1		
	S32-C	121.15	56.3		
drca38	S38-A	16.49	78.9	Stream 6	City catchment area drca38 sub-divided for modelling purposes. Consists of land around Trans-Canada Highway and Victoria Street that drains to outfall adjacent to TCH bridge. Mix of residential, commercial and right-of-way landuses.
	S38-B	18.35	76.2		
	S38-C	8.40	79.1		
	S38-D	4.53	73.0		
-	S38-Z1	136.38			External drainage area contributng to flow in drca38 infrastructure.
-	S38-Z2	5.66			External drainage area contributng to flow in drca38 infrastructure.

APPENDIX B

IDF Climate Change Analysis



CURVES DEVELOPED FROM CITY OF REVELSTOKE AIRPORT
ATMOSPHERIC ENVIRONMENT SERVICE – ENVIRONMENT CANADA

City of Revelstoke	Title: IDF CURVES	
STANDARD DETAIL DRAWINGS	JUNE 2007	DWG No. COR-S21

REVELSTOKE STORMWATER MANAGEMENT PLAN

ANALYSIS OF CURRENT CITY OF REVELSTOKE IDF CURVES (Standard Detail Drawing COR-S21, June 2007)

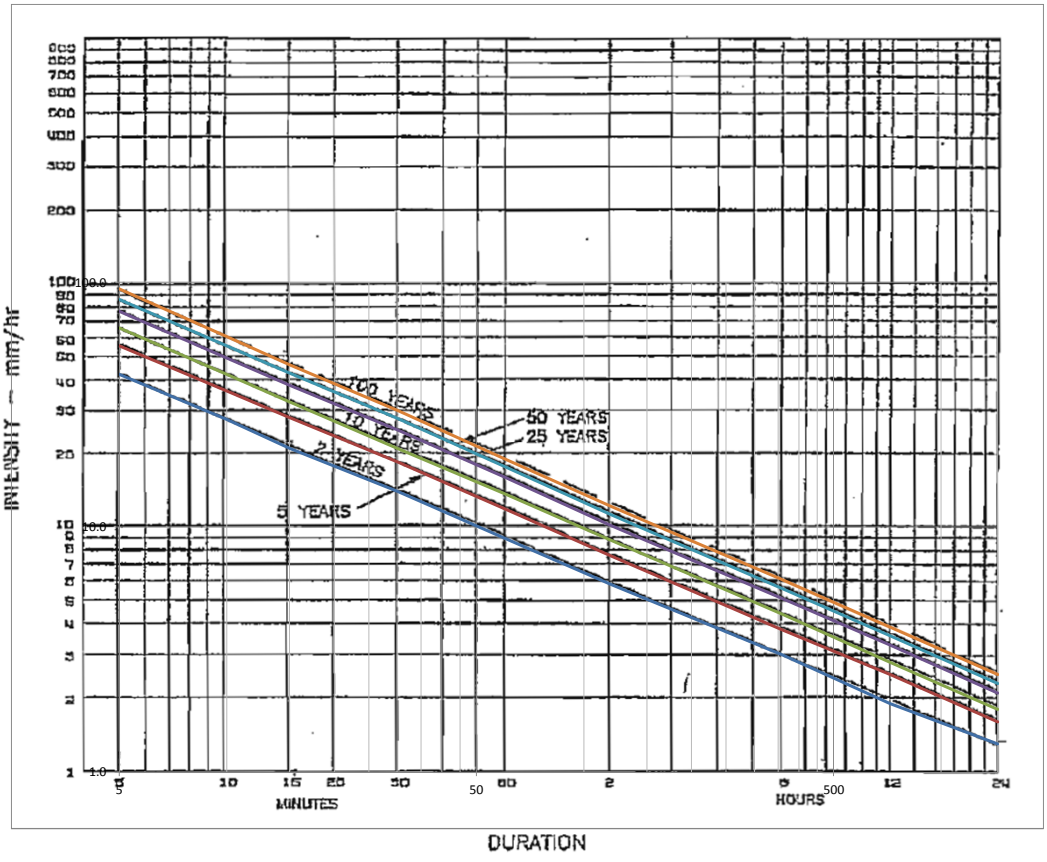
INTERPOLATED INTENSITIES* (mm/hr):

	T (years)	2	5	10	25	50	100
5	5 min	42.0	55.0	65.0	76.0	85.0	94.0
10	10 min	27.5	36.0	42.0	49.0	55.0	60.0
15	15 min	21.0	28.0	32.5	38.0	42.5	46.0
30	30 min	14.0	18.5	21.0	25.0	27.8	30.0
60	1 h	9.0	11.9	13.7	16.0	17.7	19.0
120	2 h	5.8	7.6	8.8	10.1	11.2	12.1
360	6 h	3.0	3.8	4.4	5.1	5.6	6.1
720	12 h	1.9	2.5	2.8	3.3	3.6	3.9
1440	24 h	1.3	1.6	1.8	2.1	2.3	2.5

** Estimated manually in order to recreate IDF plots overlaid on scan*

CORRESPONDING TOTAL PRECIPITATION (mm):

	T (years)	2	5	10	25	50	100
5	5 min	3.5	4.6	5.4	6.3	7.1	7.8
10	10 min	4.6	6.0	7.0	8.2	9.2	10.0
15	15 min	5.3	7.0	8.1	9.5	10.6	11.5
30	30 min	7.0	9.3	10.5	12.5	13.9	15.0
60	1 h	9.0	11.9	13.7	16.0	17.7	19.0
120	2 h	11.6	15.2	17.6	20.2	22.4	24.2
360	6 h	18.0	22.8	26.4	30.6	33.6	36.6
720	12 h	22.8	30.0	33.6	39.6	43.2	46.8
1440	24 h	31.2	38.4	43.2	50.4	55.2	60.0



REVELSTOKE STORMWATER MANAGEMENT PLAN

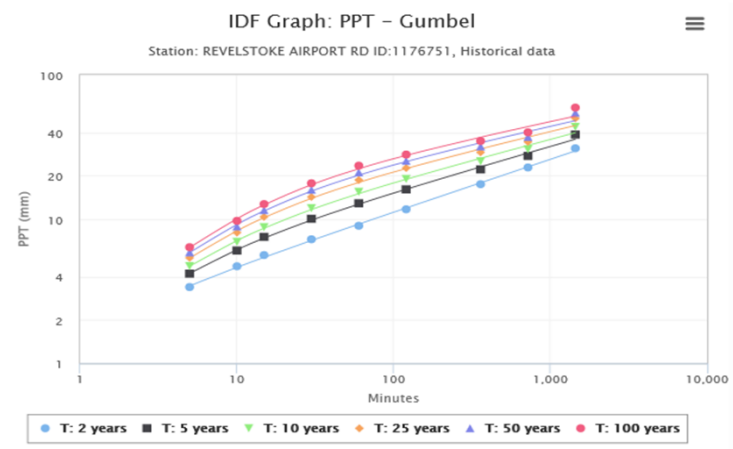
PROJECTED IDF RAINFALL CHANGES DUE TO CLIMATE CHANGE
Results Extracted From: Computerized Tool for the Development of Intensity-Duration-Frequency Curves under Climate Change
Source: www.idf-cc-uwo.ca (Western University, London, Ontario)
Station: REVELSTOKE AIRPORT RD (ID:1176751)

ANALYSIS OF HISTORICAL DATA

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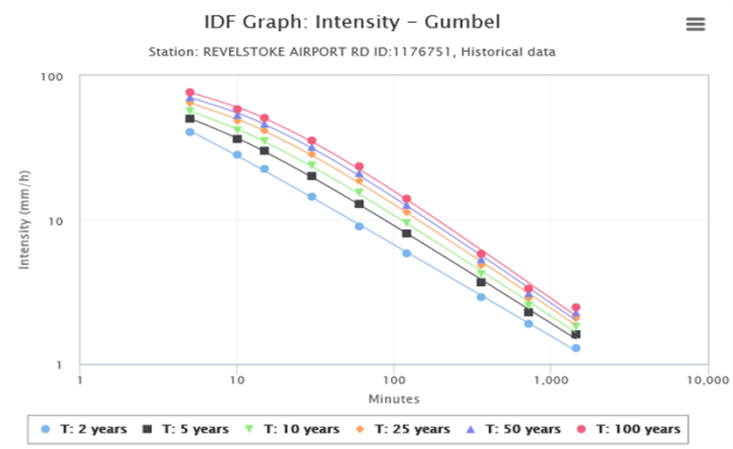
TOTAL PRECIPATION (mm)

T (years)	2	5	10	25	50	100
5 min	3.38	4.18	4.72	5.39	5.89	6.39
10 min	4.71	6.05	6.94	8.07	8.90	9.73
15 min	5.63	7.53	8.78	10.37	11.54	12.71
30 min	7.25	10.05	11.91	14.25	16.00	17.72
1 h	8.99	12.87	15.44	18.69	21.10	23.49
2 h	11.70	16.07	18.97	22.63	25.34	28.04
6 h	17.46	22.11	25.18	29.07	31.95	34.81
12 h	22.82	27.42	30.47	34.32	37.17	40.01
24 h	30.98	38.57	43.60	49.95	54.66	59.34



INTENSITY RATES (MM/hr)

T (years)	2	5	10	25	50	100
5 min	40.55	50.22	56.61	64.69	70.69	76.64
10 min	28.25	36.31	41.65	48.39	53.40	58.36
15 min	22.52	30.11	35.12	41.47	46.17	50.84
30 min	14.49	20.10	23.82	28.51	31.99	35.45
1 h	8.99	12.87	15.44	18.69	21.10	23.49
2 h	5.85	8.04	9.48	11.31	12.67	14.02
6 h	2.91	3.68	4.20	4.84	5.32	5.80
12 h	1.90	2.29	2.54	2.86	3.10	3.33
24 h	1.29	1.61	1.82	2.08	2.28	2.47



INTERPOLATION EQUATIONS:

T (years)	Coefficient A	Coefficient B	Coefficient t_0
2	9.3	-0.635	0.012
5	13.2	-0.686	0.058
10	15.9	-0.712	0.085
25	19.5	-0.738	0.114
50	22.2	-0.754	0.133
100	24.9	-0.768	0.149

Use the coefficients provided in the table above with the following equation:

$$i\left(\frac{mm}{h}\right) = A \cdot (t + t_0)^B$$

Where:

i is the precipitation intensity rate in mm/hr

A, B and t_0, are the coefficients for each return period (T) in years

t is the time (duration) of the precipitation event in hours (h)

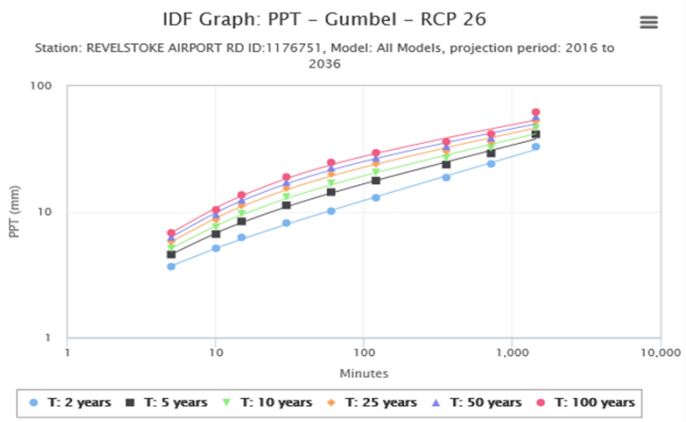
REVELSTOKE STORMWATER MANAGEMENT PLAN

PROJECTED IDF RAINFALL CHANGES DUE TO CLIMATE CHANGE
Results Extracted From: Computerized Tool for the Development of Intensity-Duration-Frequency Curves under Climate Change
Source: www.idf-cc-uwo.ca (Western University, London, Ontario)
Station: REVELSTOKE AIRPORT RD (ID:1176751)

ANALYSIS TIME PERIOD 2016 - 2036
SCENARIO RCP 2.6

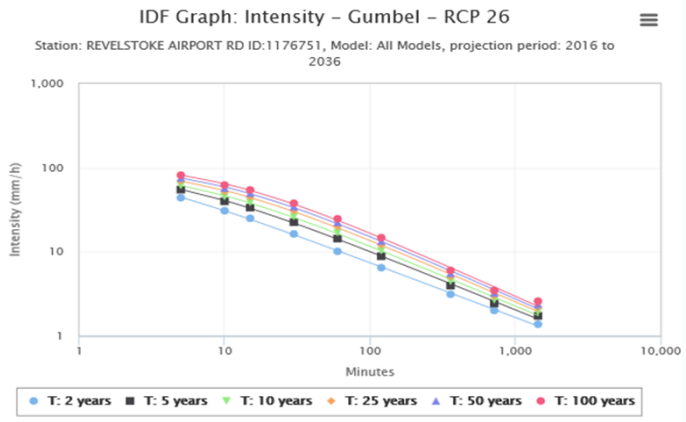
TOTAL PRECIPITATION (mm)

T (years)	2	5	10	25	50	100
5 min	3.66	4.57	5.11	5.78	6.29	6.81
10 min	5.13	6.64	7.54	8.66	9.53	10.37
15 min	6.26	8.38	9.64	11.21	12.43	13.62
30 min	8.15	11.26	13.11	15.40	17.20	18.94
1 h	10.11	14.33	16.85	19.96	22.38	24.72
2 h	12.91	17.69	20.54	24.07	26.80	29.46
6 h	18.70	23.70	26.68	30.36	33.20	36.00
12 h	24.03	29.10	32.14	35.90	38.76	41.64
24 h	32.96	41.35	46.37	52.59	57.33	62.09



INTENSITY RATES (mm/hr)

T (years)	2	5	10	25	50	100
5 min	43.98	54.82	61.27	69.32	75.51	81.68
10 min	30.77	39.83	45.23	51.94	57.18	62.21
15 min	25.03	33.52	38.57	44.84	49.74	54.49
30 min	16.29	22.51	26.21	30.81	34.41	37.87
1 h	10.11	14.33	16.85	19.96	22.38	24.72
2 h	6.46	8.85	10.27	12.04	13.40	14.73
6 h	3.12	3.95	4.45	5.06	5.53	6.00
12 h	2.00	2.43	2.68	2.99	3.23	3.47
24 h	1.37	1.72	1.93	2.19	2.39	2.59



INTERPOLATION EQUATIONS:

T (years)	Coefficient A	Coefficient B	Coefficient t_0
2	10.4	-0.654	0.025
5	14.8	-0.704	0.071
10	17.5	-0.726	0.094
25	20.9	-0.748	0.118
50	23.6	-0.763	0.135
100	26.3	-0.774	0.147

% CHANGE COMPARED TO BASELINE HISTORICAL INTENSITIES

T (years)	2	5	10	25	50	100
5 min	8.5%	9.2%	8.2%	7.2%	6.8%	6.6%
10 min	8.9%	9.7%	8.6%	7.3%	7.1%	6.6%
15 min	11.1%	11.3%	9.8%	8.1%	7.7%	7.2%
30 min	12.4%	12.0%	10.0%	8.1%	7.6%	6.8%
1 h	12.5%	11.3%	9.1%	6.8%	6.1%	5.2%
2 h	10.4%	10.1%	8.3%	6.5%	5.8%	5.1%
6 h	7.2%	7.3%	6.0%	4.5%	3.9%	3.4%
12 h	5.3%	6.1%	5.5%	4.5%	4.2%	4.2%
24 h	6.2%	6.8%	6.0%	5.3%	4.8%	4.9%

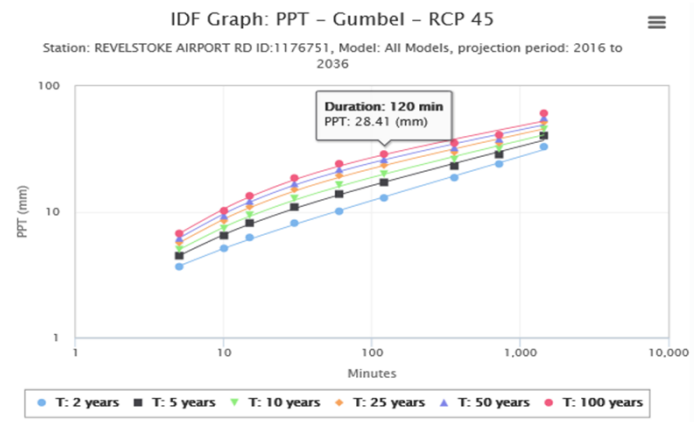
REVELSTOKE STORMWATER MANAGEMENT PLAN

PROJECTED IDF RAINFALL CHANGES DUE TO CLIMATE CHANGE
Results Extracted From: Computerized Tool for the Development of Intensity-Duration-Frequency Curves under Climate Change
Source: www.idf-cc-uwo.ca (Western University, London, Ontario)
Station: REVELSTOKE AIRPORT RD (ID:1176751)

ANALYSIS TIME PERIOD 2016 - 2036
SCENARIO RCP 4.5

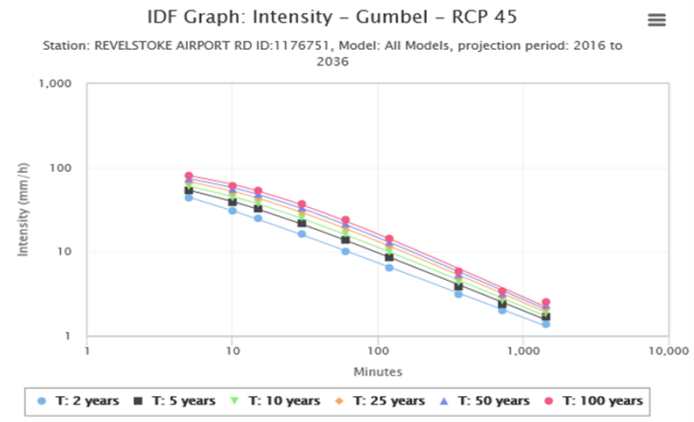
TOTAL PRECIPITATION (mm)

T (years)	2	5	10	25	50	100
5 min	3.66	4.47	5.01	5.68	6.20	6.72
10 min	5.12	6.47	7.36	8.49	9.33	10.19
15 min	6.25	8.14	9.40	10.99	12.18	13.39
30 min	8.13	10.91	12.74	15.07	16.80	18.57
1 h	10.09	13.84	16.32	19.45	21.78	24.12
2 h	12.89	17.13	19.94	23.49	26.12	28.76
6 h	18.68	23.10	26.02	29.72	32.47	35.20
12 h	24.00	28.51	31.49	35.26	38.06	40.84
24 h	32.91	40.37	45.30	51.54	56.17	60.78



INTENSITY RATES (mm/hr)

T (years)	2	5	10	25	50	100
5 min	43.92	53.64	60.07	68.20	74.35	80.69
10 min	30.72	38.82	44.18	50.95	56.00	61.12
15 min	24.99	32.58	37.60	43.95	48.70	53.58
30 min	16.26	21.81	25.49	30.13	33.60	37.15
1 h	10.09	13.84	16.32	19.45	21.78	24.12
2 h	6.44	8.56	9.97	11.74	13.06	14.38
6 h	3.11	3.85	4.34	4.95	5.41	5.87
12 h	2.00	2.38	2.62	2.94	3.17	3.40
24 h	1.37	1.68	1.89	2.15	2.34	2.53



INTERPOLATION EQUATIONS:

T (years)	Coefficient A	Coefficient B	Coefficient t_0
2	10.4	-0.654	0.025
5	14.3	-0.699	0.066
10	16.9	-0.722	0.089
25	20.3	-0.745	0.114
50	22.9	-0.759	0.129
100	25.6	-0.772	0.143

% CHANGE COMPARED TO BASELINE HISTORICAL INTENSITIES

T (years)	2	5	10	25	50	100
5 min	8.3%	6.8%	6.1%	5.4%	5.2%	5.3%
10 min	8.7%	6.9%	6.1%	5.3%	4.9%	4.7%
15 min	11.0%	8.2%	7.1%	6.0%	5.5%	5.4%
30 min	12.2%	8.5%	7.0%	5.7%	5.0%	4.8%
1 h	12.2%	7.5%	5.7%	4.1%	3.2%	2.7%
2 h	10.1%	6.5%	5.2%	3.8%	3.1%	2.6%
6 h	6.9%	4.6%	3.3%	2.3%	1.7%	1.2%
12 h	5.3%	3.9%	3.1%	2.8%	2.3%	2.1%
24 h	6.2%	4.3%	3.8%	3.4%	2.6%	2.4%

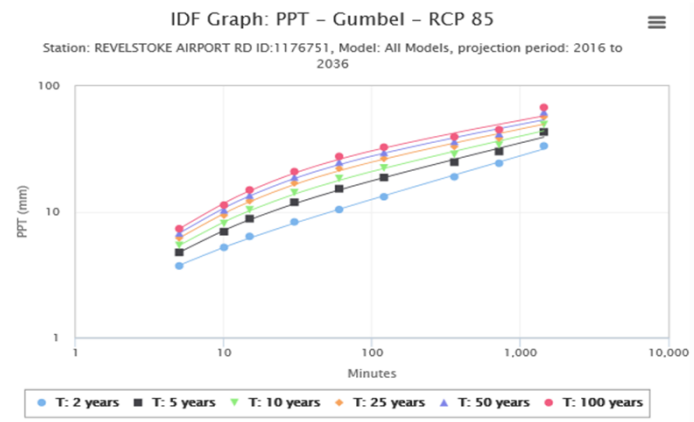
REVELSTOKE STORMWATER MANAGEMENT PLAN

PROJECTED IDF RAINFALL CHANGES DUE TO CLIMATE CHANGE
Results Extracted From: Computerized Tool for the Development of Intensity-Duration-Frequency Curves under Climate Change
Source: www.idf-cc-uwo.ca (Western University, London, Ontario)
Station: REVELSTOKE AIRPORT RD (ID:1176751)

ANALYSIS TIME PERIOD 2016 - 2036
SCENARIO RCP 8.5

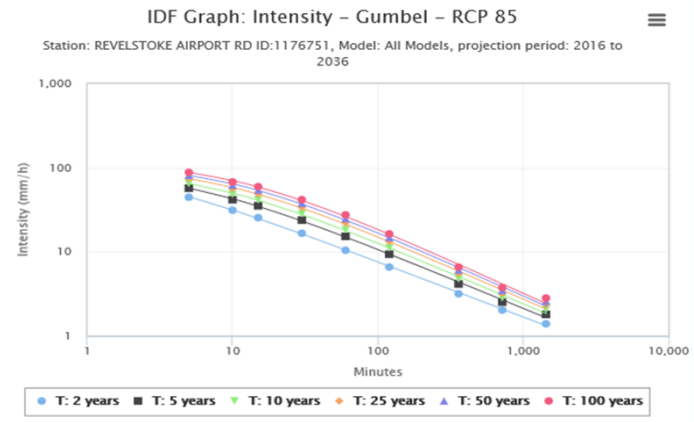
TOTAL PRECIPITATION (mm)

T (years)	2	5	10	25	50	100
5 min	3.71	4.75	5.41	6.20	6.77	7.34
10 min	5.21	6.94	8.06	9.38	10.35	11.30
15 min	6.37	8.81	10.37	12.23	13.57	14.91
30 min	8.31	11.90	14.20	16.93	18.91	20.88
1 h	10.42	15.24	18.39	22.13	24.88	27.53
2 h	13.16	18.71	22.28	26.53	29.64	32.64
6 h	18.96	24.80	28.55	33.01	36.29	39.42
12 h	24.29	30.17	33.97	38.47	41.79	44.97
24 h	33.39	43.10	49.39	56.83	62.33	67.58



INTENSITY RATES (mm/hr)

T (years)	2	5	10	25	50	100
5 min	44.55	57.03	64.94	74.42	81.23	88.06
10 min	31.25	41.67	48.34	56.30	62.08	67.79
15 min	25.48	35.25	41.48	48.92	54.28	59.65
30 min	16.62	23.81	28.39	33.87	37.82	41.76
1 h	10.42	15.24	18.39	22.13	24.88	27.53
2 h	6.58	9.36	11.14	13.26	14.82	16.32
6 h	3.16	4.13	4.76	5.50	6.05	6.57
12 h	2.02	2.51	2.83	3.21	3.48	3.75
24 h	1.39	1.80	2.06	2.37	2.60	2.82



INTERPOLATION EQUATIONS:

T (years)	Coefficient A	Coefficient B	Coefficient t_0
2	10.7	-0.658	0.029
5	15.7	-0.712	0.08
10	19.2	-0.737	0.108
25	23.3	-0.761	0.135
50	26.4	-0.774	0.152
100	29.5	-0.786	0.166

% CHANGE COMPARED TO BASELINE HISTORICAL INTENSITIES

T (years)	2	5	10	25	50	100
5 min	9.9%	13.6%	14.7%	15.0%	14.9%	14.9%
10 min	10.6%	14.8%	16.1%	16.3%	16.3%	16.2%
15 min	13.1%	17.1%	18.1%	18.0%	17.6%	17.3%
30 min	14.7%	18.5%	19.2%	18.8%	18.2%	17.8%
1 h	15.9%	18.4%	19.1%	18.4%	17.9%	17.2%
2 h	12.5%	16.4%	17.5%	17.2%	17.0%	16.4%
6 h	8.6%	12.2%	13.3%	13.6%	13.7%	13.3%
12 h	6.3%	9.6%	11.4%	12.2%	12.3%	12.6%
24 h	7.8%	11.8%	13.2%	13.9%	14.0%	14.2%

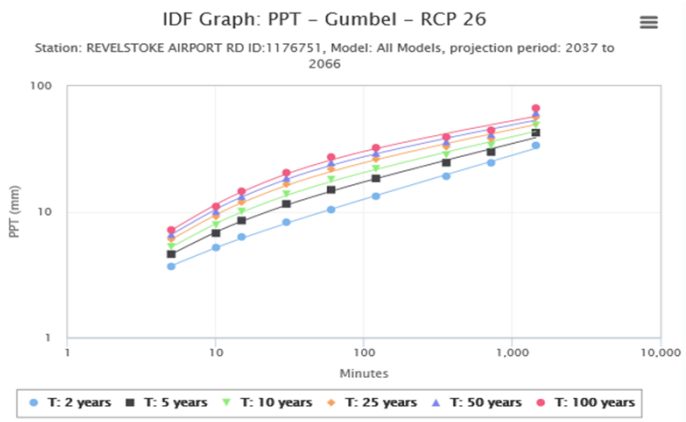
REVELSTOKE STORMWATER MANAGEMENT PLAN

PROJECTED IDF RAINFALL CHANGES DUE TO CLIMATE CHANGE
Results Extracted From: Computerized Tool for the Development of Intensity-Duration-Frequency Curves under Climate Change
Source: www.idf-cc-uwo.ca (Western University, London, Ontario)
Station: REVELSTOKE AIRPORT RD (ID:1176751)

ANALYSIS TIME PERIOD 2037 - 2066
SCENARIO RCP 2.6

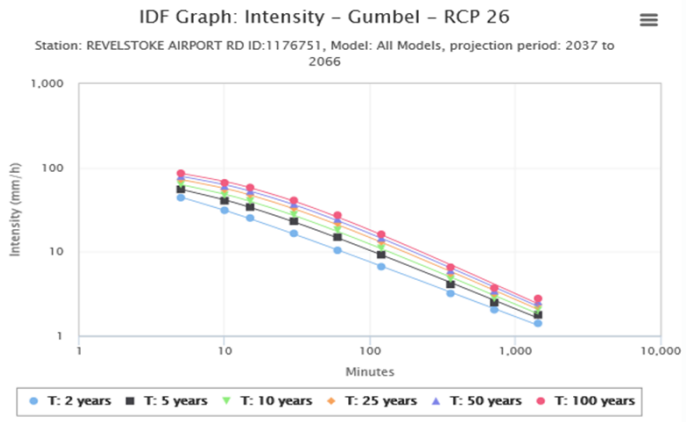
TOTAL PRECIPITATION (mm)

T (years)	2	5	10	25	50	100
5 min	3.67	4.60	5.26	6.05	6.62	7.17
10 min	5.20	6.75	7.84	9.17	10.12	11.04
15 min	6.32	8.52	10.05	11.93	13.26	14.56
30 min	8.26	11.55	13.79	16.56	18.54	20.46
1 h	10.40	14.95	18.05	21.89	24.62	27.27
2 h	13.29	18.41	21.91	26.23	29.32	32.30
6 h	19.15	24.53	28.30	32.89	36.17	39.34
12 h	24.49	29.83	33.56	38.11	41.35	44.50
24 h	33.73	42.53	48.69	56.20	61.56	66.75



INTENSITY RATES (mm/hr)

T (years)	2	5	10	25	50	100
5 min	44.06	55.26	63.10	72.65	79.47	86.06
10 min	31.18	40.52	47.06	55.03	60.72	66.22
15 min	25.28	34.06	40.21	47.71	53.06	58.24
30 min	16.53	23.10	27.58	33.13	37.09	40.92
1 h	10.40	14.95	18.05	21.89	24.62	27.27
2 h	6.64	9.21	10.95	13.12	14.66	16.15
6 h	3.19	4.09	4.72	5.48	6.03	6.56
12 h	2.04	2.49	2.80	3.18	3.45	3.71
24 h	1.41	1.77	2.03	2.34	2.57	2.78



INTERPOLATION EQUATIONS:

T (years)	Coefficient A	Coefficient B	Coefficient t_0
2	10.7	-0.655	0.029
5	15.4	-0.708	0.081
10	18.8	-0.733	0.109
25	23	-0.759	0.138
50	26.2	-0.774	0.156
100	29.2	-0.786	0.171

% CHANGE COMPARED TO BASELINE HISTORICAL INTENSITIES

T (years)	2	5	10	25	50	100
5 min	8.7%	10.0%	11.5%	12.3%	12.4%	12.3%
10 min	10.4%	11.6%	13.0%	13.7%	13.7%	13.5%
15 min	12.3%	13.1%	14.5%	15.0%	14.9%	14.6%
30 min	14.1%	14.9%	15.8%	16.2%	15.9%	15.4%
1 h	15.7%	16.2%	16.9%	17.1%	16.7%	16.1%
2 h	13.5%	14.6%	15.5%	16.0%	15.7%	15.2%
6 h	9.6%	11.1%	12.4%	13.2%	13.3%	13.1%
12 h	7.4%	8.7%	10.2%	11.2%	11.3%	11.4%
24 h	9.3%	9.9%	11.5%	12.5%	12.7%	12.6%

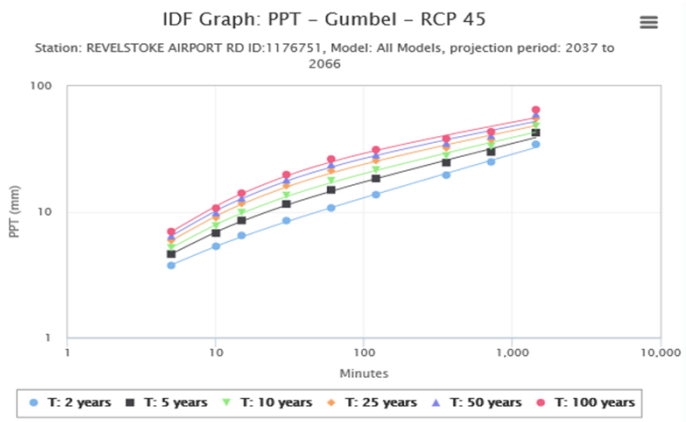
REVELSTOKE STORMWATER MANAGEMENT PLAN

PROJECTED IDF RAINFALL CHANGES DUE TO CLIMATE CHANGE
Results Extracted From: Computerized Tool for the Development of Intensity-Duration-Frequency Curves under Climate Change
Source: www.idf-cc-uwo.ca (Western University, London, Ontario)
Station: REVELSTOKE AIRPORT RD (ID:1176751)

ANALYSIS TIME PERIOD 2037 - 2066
SCENARIO RCP 4.5

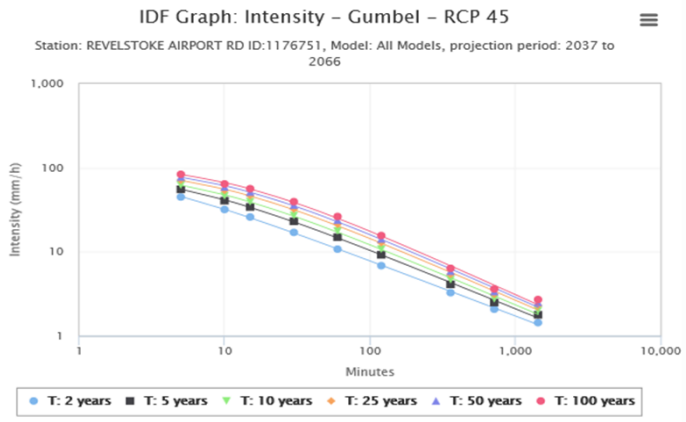
TOTAL PRECIPITATION (mm)

T (years)	2	5	10	25	50	100
5 min	3.74	4.61	5.17	5.92	6.45	6.97
10 min	5.31	6.76	7.70	8.95	9.84	10.70
15 min	6.48	8.53	9.86	11.62	12.87	14.08
30 min	8.51	11.53	13.50	16.10	17.96	19.75
1 h	10.74	14.92	17.65	21.25	23.81	26.29
2 h	13.67	18.38	21.45	25.51	28.40	31.19
6 h	19.55	24.56	27.82	32.13	35.19	38.16
12 h	24.89	29.85	33.08	37.35	40.39	43.33
24 h	34.39	42.58	47.91	54.95	59.97	64.82



INTENSITY RATES (mm/hr)

T (years)	2	5	10	25	50	100
5 min	44.90	55.32	62.10	71.06	77.44	83.61
10 min	31.88	40.57	46.23	53.71	59.03	64.18
15 min	25.94	34.11	39.43	46.46	51.47	56.31
30 min	17.02	23.06	27.00	32.21	35.91	39.49
1 h	10.74	14.92	17.65	21.25	23.81	26.29
2 h	6.83	9.19	10.73	12.76	14.20	15.60
6 h	3.26	4.09	4.64	5.35	5.87	6.36
12 h	2.07	2.49	2.76	3.11	3.37	3.61
24 h	1.43	1.77	2.00	2.29	2.50	2.70



INTERPOLATION EQUATIONS:

T (years)	Coefficient A	Coefficient B	Coefficient t_0
2	11	-0.66	0.034
5	15.4	-0.707	0.08
10	18.3	-0.73	0.105
25	22.3	-0.755	0.134
50	25.2	-0.769	0.151
100	28.1	-0.781	0.165

% CHANGE COMPARED TO BASELINE HISTORICAL INTENSITIES

T (years)	2	5	10	25	50	100
5 min	10.7%	10.2%	9.7%	9.8%	9.5%	9.1%
10 min	12.8%	11.7%	11.0%	11.0%	10.5%	10.0%
15 min	15.2%	13.3%	12.3%	12.0%	11.5%	10.8%
30 min	17.5%	14.7%	13.4%	13.0%	12.3%	11.4%
1 h	19.5%	15.9%	14.3%	13.7%	12.8%	11.9%
2 h	16.8%	14.3%	13.2%	12.8%	12.1%	11.3%
6 h	12.0%	11.1%	10.5%	10.5%	10.3%	9.7%
12 h	8.9%	8.7%	8.7%	8.7%	8.7%	8.4%
24 h	10.9%	9.9%	9.9%	10.1%	9.6%	9.3%

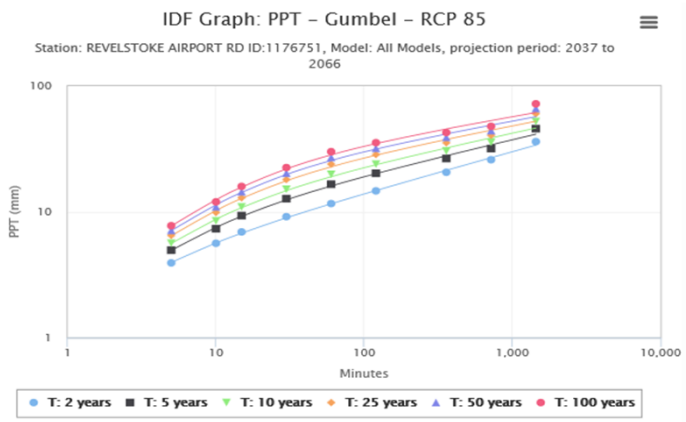
REVELSTOKE STORMWATER MANAGEMENT PLAN

PROJECTED IDF RAINFALL CHANGES DUE TO CLIMATE CHANGE
Results Extracted From: Computerized Tool for the Development of Intensity-Duration-Frequency Curves under Climate Change
Source: www.idf-cc-uwo.ca (Western University, London, Ontario)
Station: REVELSTOKE AIRPORT RD (ID:1176751)

ANALYSIS TIME PERIOD 2037 - 2066
SCENARIO RCP 8.5

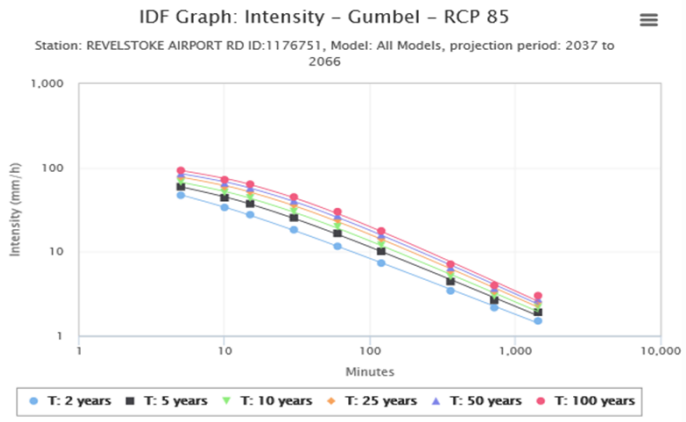
TOTAL PRECIPITATION (mm)

T (years)	2	5	10	25	50	100
5 min	3.92	4.95	5.63	6.48	7.12	7.75
10 min	5.62	7.33	8.46	9.89	10.95	12.00
15 min	6.91	9.32	10.92	12.94	14.43	15.92
30 min	9.14	12.71	15.07	18.06	20.27	22.47
1 h	11.62	16.55	19.82	23.95	27.02	30.06
2 h	14.66	20.22	23.91	28.56	32.01	35.44
6 h	20.61	26.51	30.42	35.36	39.03	42.66
12 h	25.94	31.79	35.66	40.56	44.19	47.79
24 h	36.11	45.77	52.17	60.25	66.24	72.19



INTENSITY RATES (mm/hr)

T (years)	2	5	10	25	50	100
5 min	47.09	59.38	67.52	77.79	85.42	92.99
10 min	33.71	43.96	50.75	59.32	65.69	72.00
15 min	27.65	37.30	43.68	51.75	57.73	63.67
30 min	18.29	25.42	30.15	36.12	40.54	44.94
1 h	11.62	16.55	19.82	23.95	27.02	30.06
2 h	7.33	10.11	11.95	14.28	16.01	17.72
6 h	3.43	4.42	5.07	5.89	6.50	7.11
12 h	2.16	2.65	2.97	3.38	3.68	3.98
24 h	1.50	1.91	2.17	2.51	2.76	3.01



INTERPOLATION EQUATIONS:

T (years)	Coefficient A	Coefficient B	Coefficient t_0
2	11.9	-0.671	0.044
5	17.1	-0.721	0.095
10	20.7	-0.746	0.123
25	25.4	-0.77	0.152
50	28.9	-0.785	0.169
100	32.4	-0.797	0.185

% CHANGE COMPARED TO BASELINE HISTORICAL INTENSITIES

T (years)	2	5	10	25	50	100
5 min	16.1%	18.2%	19.3%	20.3%	20.8%	21.3%
10 min	19.3%	21.1%	21.8%	22.6%	23.0%	23.4%
15 min	22.8%	23.9%	24.4%	24.8%	25.0%	25.2%
30 min	26.2%	26.5%	26.6%	26.7%	26.7%	26.8%
1 h	29.3%	28.6%	28.4%	28.1%	28.1%	28.0%
2 h	25.3%	25.7%	26.1%	26.3%	26.4%	26.4%
6 h	17.9%	20.1%	20.7%	21.7%	22.2%	22.6%
12 h	13.7%	15.7%	16.9%	18.2%	18.7%	19.5%
24 h	16.3%	18.6%	19.2%	20.7%	21.1%	21.9%

APPENDIX C

EPA-SWMM Input and Output Files (Existing Conditions)

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.007)
--------------------------------------------------------------

WARNING 02: maximum depth increased for Node J77

***********************************************************
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 ..... LPS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... DYNWAVE
Starting Date ..... NOV-05-2015 00:00:00
Ending Date ..... NOV-05-2015 03:00:00
Antecedent Dry Days ..... 0.0
Report Time Step ..... 00:05:00
Wet Time Step ..... 00:05:00
Dry Time Step ..... 00:05:00
Routing Time Step ..... 30.00 sec
Variable Time Step ..... YES
Maximum Trials ..... 8
Head Tolerance ..... 0.004921 m


*************
Element Count
*************
Number of rain gages ..... 1
Number of subcatchments ... 55
Number of nodes ..... 100
```



```
Number of links ..... 91
Number of pollutants ..... 0
Number of land uses ..... 0


****************
Raingage Summary
****************
                                                  Data       Recording
Name                 Data Source                  Type       Interval
------------------------------------------------------------------------
_Current             CityIDF_AES_1hr_5yr          VOLUME      5 min.


*******************
Subcatchment Summary
*******************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
------------------------------------------------------------------------------------------
S13-A                      14.43   1550.00     70.00    2.5000 _Current             STMH286
S13-B                      14.18   1060.00     70.00    1.9000 _Current             STMH188
S13-C                       5.03    705.00     66.00    1.1000 _Current             STMH165
S13-D                       2.85    632.00     77.00    3.2000 _Current             STMH161
S13-E                       5.22    727.00     68.00    2.1000 _Current             STMH54
S13-F                       7.67    569.00     50.00    0.5000 _Current             STMH178
S13-G                       1.35    351.00     48.00    2.0000 _Current             STMH177
S13-H                       1.52    473.00     57.00    3.1000 _Current             STMH398
S23-A                      15.82   1095.00     69.00    1.6000 _Current             STMH116
S23-B                       3.94    770.00     63.00    2.6000 _Current             DRCB64
S23-C                       7.93    966.00     45.00    2.1000 _Current             DRCB40
S25-A                      22.61    902.00     61.00    1.3000 _Current             STMH37
S25-B                       6.70    737.00     55.00    1.7000 _Current             STMH225
S25-C                       7.26    921.00     52.00    1.0000 _Current             STMH202
S25-D                      10.70   1063.00     55.00    1.2000 _Current             STMH38
S25-E                      10.16   1039.00     49.00    1.7000 _Current             J74
S25-F                      41.71   2239.00     44.00    0.8000 _Current             J73
S25-G                       3.30    633.00     49.00    1.9000 _Current             STMH205
S25-H                       3.45    674.00     41.00    1.2000 _Current             STMH244
S25-I                      20.24   1568.00     67.00    2.1000 _Current             J75
S25-J                      24.53   1501.00     72.00    1.3000 _Current             J84
S32-A                      54.37    400.00     50.00    0.5000 _Current             DRCB258
S32-B                       5.37    400.00     50.00    0.5000 _Current             DRCB258
S38-A                      16.25   1798.00     79.00    4.1000 _Current             J83
S38-B                      18.36   1574.00     76.00    5.9000 _Current             J22
```



```
S38-C                       8.37    802.00     79.00    4.5000 _Current             STMH78
S38-D                       4.72    558.00     73.00    1.5000 _Current             STMH79
S38-Z1                    136.40   7480.00     10.00   30.3000 _Current             J83
S38-Z2                      5.70   1120.00     10.00   10.4000 _Current             J83
S3-A                        8.53    955.00     63.00    2.9000 _Current             STMH12
S3-B                        1.98    392.00     62.00    1.5000 _Current             STMH7
S3-C                        3.55    735.00     61.00    1.3000 _Current             STMH6
S3-D                        2.11    617.00     80.00    2.1000 _Current             STMH138
S3-E                        5.92    588.00     76.00   17.2000 _Current             STMH246-DIV
S3-F                        1.92    586.00     58.00   13.7000 _Current             J33
S3-G                        3.26    655.00     60.00   13.0000 _Current             J87
S3-Z1                     241.50   6550.00     10.00   34.0000 _Current             J33
S4-A                        3.83    547.00     77.00   19.1000 _Current             J34
S4-B                        4.08    379.00     80.00    1.5000 _Current             J37
S4-C                        6.76    577.00     73.00    3.3000 _Current             STMH93
S5-A                        8.95    974.00     64.00    2.6000 _Current             STMH133
S5-B                        1.74    288.00     80.00    0.9000 _Current             STMH135
S5-C                        2.50    464.00     80.00    0.6000 _Current             STMH131
S5-D                        1.28    206.00     80.00    1.2000 _Current             STMH196
S5-E                        4.01    610.00     79.00    2.3000 _Current             STMH4
S5-F                        1.02    184.00     80.00    6.0000 _Current             STMH15
S5-G                        4.10    727.00     77.00    0.3000 _Current             STMH2
S5-H                        3.71    473.00     73.00    0.4000 _Current             STMH147
S5-I                       10.27    885.00     71.00    6.2000 _Current             STMH212
S5-J                        5.91    831.00     60.00    9.1000 _Current             J56
S5-K                       28.67   1446.00     54.00   11.9000 _Current             J46
S5-Z1                      87.70   4910.00     10.00   36.0000 _Current             J46
S7-A                        7.47    684.00     56.00    0.9000 _Current             STMH23
S7-B                        3.90    411.00     22.00    7.3000 _Current             STMH297
S13-I                       2.12    370.00     60.00    1.0000 _Current             J1


************
Node Summary
************
                                    Invert      Max.    Ponded    External
Name                 Type            Elev.     Depth      Area    Inflow
------------------------------------------------------------------------
J1                   JUNCTION       444.92      2.90       0.0
STMH286              JUNCTION       444.31      3.40       0.0
STMH56               JUNCTION       443.98      3.20       0.0
STMH54               JUNCTION       442.97      4.10       0.0
STMH178              JUNCTION       441.29      3.20       0.0
STMH177              JUNCTION       440.78      2.60       0.0
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STMH398              JUNCTION       440.42      3.10       0.0
STMH188              JUNCTION       446.02      3.40       0.0
STMH64               JUNCTION       445.56      3.40       0.0
STMH161              JUNCTION       444.09      3.00       0.0
STMH165              JUNCTION       443.56      3.60       0.0
STMH63               JUNCTION       445.08      3.30       0.0
STMH62               JUNCTION       444.98      2.80       0.0
STMH77               JUNCTION       454.15      2.20       0.0
STMH74               JUNCTION       452.88      3.20       0.0
STMH83               JUNCTION       441.98      3.00       0.0
STMH79               JUNCTION       441.38      2.60       0.0
STMH235              JUNCTION       442.44      1.90       0.0
J22                  JUNCTION       442.75      1.90       0.0
STMH139              JUNCTION       455.33      1.80       0.0
STMH138              JUNCTION       454.88      1.60       0.0
STMH183              JUNCTION       454.27      1.60       0.0
STMH6                JUNCTION       453.29      2.16       0.0
STMH7                JUNCTION       452.73      3.27       0.0
STMH184              JUNCTION       451.89      4.40       0.0
STMH185              JUNCTION       451.75      4.44       0.0
STMH12               JUNCTION       451.69      4.40       0.0
J33                  JUNCTION       459.08      2.50       0.0
J34                  JUNCTION       455.36      2.50       0.0
STMH17               JUNCTION       453.99      1.60       0.0
STMH254              JUNCTION       453.24      2.60       0.0
STMH93               JUNCTION       451.88      3.90       0.0
J37                  JUNCTION       453.49      2.00       0.0
J38                  JUNCTION       454.36      2.50       0.0
STMH190              JUNCTION       449.72      4.70       0.0
STMH133              JUNCTION       450.28      4.40       0.0
STMH135              JUNCTION       451.01      3.80       0.0
STMH131              JUNCTION       451.21      3.70       0.0
STMH196              JUNCTION       451.69      3.00       0.0
STMH137              JUNCTION       453.28      2.60       0.0
STMH15               JUNCTION       454.27      1.80       0.0
J46                  JUNCTION       455.31      5.00       0.0
STMH4                JUNCTION       452.57      3.10       0.0
STMH216              JUNCTION       452.15      3.10       0.0
STMH197              JUNCTION       451.95      2.70       0.0
STMH2                JUNCTION       453.06      1.80       0.0
STMH28               JUNCTION       453.20      1.90       0.0
STMH147              JUNCTION       453.75      2.90       0.0
STMH194              JUNCTION       454.00      1.80       0.0
STMH253              JUNCTION       454.49      2.00       0.0
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J56	JUNCTION	455.38	2.60	0.0
STMH212	JUNCTION	454.85	1.20	0.0
STMH298	JUNCTION	440.27	1.60	0.0
STMH297	JUNCTION	440.64	3.90	0.0
STMH26	JUNCTION	452.49	5.00	0.0
STMH22	JUNCTION	454.19	3.70	0.0
STMH23	JUNCTION	454.38	3.30	0.0
STMH225	JUNCTION	450.19	2.44	0.0
STMH226	JUNCTION	448.06	3.04	0.0
STMH202	JUNCTION	446.71	3.02	0.0
STMH38	JUNCTION	444.70	2.75	0.0
STMH205	JUNCTION	441.90	3.20	0.0
STMH204	JUNCTION	441.59	3.16	0.0
STMH109	JUNCTION	440.60	1.70	0.0
STMH37	JUNCTION	450.62	2.50	0.0
STMH244	JUNCTION	440.10	1.50	0.0
STMH362	JUNCTION	439.80	1.70	0.0
J73	JUNCTION	439.28	1.50	0.0
J74	JUNCTION	438.27	1.50	0.0
J75	JUNCTION	437.62	1.50	0.0
J76	JUNCTION	437.10	1.80	0.0
J77	JUNCTION	442.00	2.00	0.0
J78	JUNCTION	438.00	1.50	0.0
J79	JUNCTION	454.78	4.70	0.0
STMH116	JUNCTION	454.00	2.30	0.0
DRCB64	JUNCTION	451.36	2.50	0.0
DRCB40	JUNCTION	445.61	2.50	0.0
J83	JUNCTION	458.49	2.80	0.0
J84	JUNCTION	437.36	1.50	0.0
J85	JUNCTION	457.37	2.50	0.0
STMH78	JUNCTION	446.63	2.90	0.0
J86	JUNCTION	458.46	2.50	0.0
J87	JUNCTION	458.57	2.50	0.0
J88	JUNCTION	458.25	2.50	0.0
J89	JUNCTION	456.77	2.50	0.0
J90	JUNCTION	459.23	2.50	0.0
J91	JUNCTION	457.00	2.50	0.0
DRCB258	JUNCTION	439.79	1.50	0.0
DRCB260	JUNCTION	438.95	1.50	0.0
J94	JUNCTION	436.84	1.50	0.0
STMH246-DIV	JUNCTION	455.92	2.50	0.0
DROF13	OUTFALL	440.21	0.90	0.0
DROF38	OUTFALL	440.85	1.05	0.0
DROF3	OUTFALL	451.34	0.75	0.0

DROF4	OUTFALL	451.61	0.75	0.0
DROF5	OUTFALL	449.45	1.20	0.0
DROF7	OUTFALL	440.02	0.60	0.0
DROF25	OUTFALL	440.00	2.00	0.0
DROF23	OUTFALL	443.90	0.35	0.0
DRFI2017	OUTFALL	436.42	1.00	0.0

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Link Summary
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Name	From Node	To Node	Type	Length	%Slope	Roughness
C100	STMH235	STMH83	CONDUIT	61.4	0.1515	0.0100
C101	STMH83	STMH79	CONDUIT	153.1	0.3430	0.0100
C102	STMH79	DROF38	CONDUIT	137.0	0.3831	0.0100
C103	STMH74	STMH78	CONDUIT	159.2	3.9237	0.0100
C104	STMH78	STMH83	CONDUIT	132.9	3.4096	0.0100
C105	J86	J85	CONDUIT	70.6	1.5447	0.0100
C106	J87	J88	CONDUIT	31.5	1.0172	0.0100
C107	J88	J85	CONDUIT	88.2	0.9974	0.0100
C108	J89	J34	CONDUIT	101.2	1.3931	0.0100
C109	J90	J91	CONDUIT	52.0	4.2949	0.0100
C110	J91	J34	CONDUIT	104.7	1.5661	0.0100
C93	J46	J79	CONDUIT	35.5	1.4931	0.0100
C96	J83	STMH77	CONDUIT	202.0	2.1231	0.0100
C98	J33	J86	CONDUIT	16.4	3.7740	0.0100
C99	J85	STMH246-DIV	CONDUIT	79.7	1.8201	0.0100
DRDI117	J94	DRFI2017	CONDUIT	41.6	1.0097	0.0100
DRDI27	J73	J74	CONDUIT	251.8	0.4012	0.0100
DRDI28	J74	J78	CONDUIT	67.3	0.4013	0.0100
DRDI4	J75	J76	CONDUIT	175.3	0.2966	0.0100
DRDI5	J84	J76	CONDUIT	65.5	0.3966	0.0100
DRDI6	J77	DROF25	CONDUIT	153.4	1.3036	0.0100
STMP10	STMH188	STMH64	CONDUIT	45.5	1.0110	0.0100
STMP100	STMH196	STMH131	CONDUIT	86.4	0.5557	0.0100
STMP101	STMH131	STMH135	CONDUIT	90.9	0.2201	0.0100
STMP103	STMH197	STMH196	CONDUIT	47.1	0.5524	0.0100
STMP106	STMH135	STMH133	CONDUIT	89.7	0.8139	0.0100
STMP107	STMH133	STMH190	CONDUIT	86.0	0.6511	0.0100
STMP1086	DRCB40	DROF23	CONDUIT	262.5	0.6514	0.0100
STMP11	STMH64	STMH63	CONDUIT	47.9	1.0026	0.0100
STMP1170	DRCB260	J94	CONDUIT	241.7	0.8730	0.0100
STMP118	STMH28	STMH2	CONDUIT	116.3	0.1204	0.0100

STMP12	STMH63	STMH62	CONDUIT	10.2	0.9824	0.0100
STMP120	STMH147	STMH28	CONDUIT	110.1	0.4994	0.0100
STMP123	STMH2	STMH197	CONDUIT	88.5	1.2548	0.0100
STMP1289	STMH26	STMH297	CONDUIT	27.8	47.1005	0.0100
STMP13	STMH62	STMH161	CONDUIT	89.3	0.9962	0.0100
STMP131	STMH190	DROF5	CONDUIT	54.9	0.4920	0.0100
STMP14	STMH161	STMH54	CONDUIT	92.7	1.2078	0.0100
STMP150	STMH37	STMH225	CONDUIT	86.2	0.4990	0.0100
STMP1513	DRCB258	DRCB260	CONDUIT	24.9	3.3754	0.0100
STMP1516	STMH362	J73	CONDUIT	33.6	0.4161	0.0100
STMP155	STMH23	STMH22	CONDUIT	82.8	0.2294	0.0100
STMP156A	STMH298	DROF7	CONDUIT	50.2	0.4979	0.0100
STMP156B	STMH297	STMH298	CONDUIT	136.3	0.2715	0.0100
STMP1604	STMH398	DROF13	CONDUIT	20.4	1.0300	0.0100
STMP161	STMH22	STMH26	CONDUIT	57.4	2.9625	0.0100
STMP170	J78	J75	CONDUIT	31.2	1.2184	0.0100
STMP183	STMH38	STMH205	CONDUIT	133.6	2.0956	0.0100
STMP184	STMH204	STMH109	CONDUIT	96.4	1.0273	0.0100
STMP20	J1	STMH286	CONDUIT	121.6	0.5014	0.0100
STMP248	STMH109	STMH244	CONDUIT	132.7	0.3768	0.0100
STMP249	STMH244	STMH362	CONDUIT	69.7	0.4307	0.0100
STMP274	J56	STMH253	CONDUIT	178.1	0.4998	0.0100
STMP276	STMH254	STMH93	CONDUIT	140.0	0.9714	0.0100
STMP29	STMH77	STMH74	CONDUIT	35.8	3.4248	0.0100
STMP308	STMH116	DRCB64	CONDUIT	71.1	3.7156	0.0100
STMP309	DRCB64	DRCB40	CONDUIT	215.4	2.6704	0.0100
STMP393	STMH177	STMH398	CONDUIT	105.6	0.3409	0.0100
STMP394	STMH178	STMH177	CONDUIT	124.0	0.4112	0.0100
STMP427	STMH56	STMH165	CONDUIT	112.2	0.3745	0.0100
STMP428	STMH165	STMH54	CONDUIT	92.0	0.6415	0.0100
STMP435	STMH54	STMH178	CONDUIT	132.3	1.2698	0.0100
STMP521	STMH139	STMH138	CONDUIT	19.0	2.3653	0.0100
STMP524	J38	STMH17	CONDUIT	16.1	2.3002	0.0100
STMP525	J34	J38	CONDUIT	41.6	2.4063	0.0100
STMP554	STMH6	STMH7	CONDUIT	75.5	0.7417	0.0100
STMP555	STMH138	STMH183	CONDUIT	46.0	1.3271	0.0100
STMP556	STMH183	STMH6	CONDUIT	54.9	1.7850	0.0100
STMP591	STMH7	STMH184	CONDUIT	43.1	1.9502	0.0100
STMP594	STMH184	STMH185	CONDUIT	34.9	0.4014	0.0100
STMP595	STMH185	STMH12	CONDUIT	14.4	0.4170	0.0100
STMP692	STMH194	STMH147	CONDUIT	49.5	0.5054	0.0100
STMP749	STMH205	STMH204	CONDUIT	13.4	2.3175	0.0100
STMP77	STMH246-DIV	STMH139	CONDUIT	27.8	2.1197	0.0100
STMP79	STMH17	J37	CONDUIT	94.2	0.5307	0.0100

STMP800	STMH253	STMH194	CONDUIT	97.4	0.5029	0.0100
STMP801	STMH212	STMH253	CONDUIT	72.7	0.4952	0.0100
STMP823	STMH216	STMH196	CONDUIT	67.8	0.6789	0.0100
STMP824	STMH4	STMH216	CONDUIT	62.6	0.6710	0.0100
STMP850	J79	STMH15	CONDUIT	33.9	1.5042	0.0100
STMP88	J37	STMH254	CONDUIT	45.8	0.5460	0.0100
STMP89	STMH93	DROF4	CONDUIT	27.1	0.9949	0.0100
STMP9	STMH286	STMH56	CONDUIT	62.1	0.5310	0.0100
STMP90	STMH12	DROF3	CONDUIT	69.3	0.5051	0.0100
STMP914	STMH225	STMH226	CONDUIT	43.8	1.6658	0.0100
STMP915	STMH226	STMH202	CONDUIT	128.5	1.0510	0.0100
STMP964	J22	STMH235	CONDUIT	89.5	0.2929	0.0100
STMP98	STMH15	STMH137	CONDUIT	29.4	3.3716	0.0100
STMP99	STMH137	STMH196	CONDUIT	97.5	1.6318	0.0100
SYMP182	STMH202	STMH38	CONDUIT	141.2	1.4237	0.0100
STMP187_PUMP	J76	J77	IDEAL PUMP			

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C100	CIRCULAR	0.45	0.16	0.11	0.45	1	144.26
C101	CIRCULAR	1.20	1.13	0.30	1.20	1	2968.54
C102	CIRCULAR	1.05	0.87	0.26	1.05	1	2197.46
C103	CIRCULAR	1.05	0.87	0.26	1.05	1	7032.30
C104	CIRCULAR	1.05	0.87	0.26	1.05	1	6555.37
C105	CIRCULAR	0.75	0.44	0.19	0.75	1	1798.88
C106	CIRCULAR	0.75	0.44	0.19	0.75	1	1459.75
C107	CIRCULAR	0.75	0.44	0.19	0.75	1	1445.50
C108	CIRCULAR	0.90	0.64	0.23	0.90	1	2777.92
C109	CIRCULAR	0.90	0.64	0.23	0.90	1	4877.52
C110	CIRCULAR	0.90	0.64	0.23	0.90	1	2945.34
C93	CIRCULAR	0.60	0.28	0.15	0.60	2	975.43
C96	CIRCULAR	1.05	0.87	0.26	1.05	1	5172.85
C98	CIRCULAR	0.90	0.64	0.23	0.90	1	4572.17
C99	TRAPEZOIDAL	2.00	5.00	0.83	4.00	1	59738.45
DRDI117	TRAPEZOIDAL	1.00	3.60	0.52	6.60	1	23389.71
DRDI27	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76654.24
DRDI28	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76659.66
DRDI4	TRAPEZOIDAL	1.50	14.25	0.98	14.00	1	76761.44
DRDI5	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76218.52

DRDI6	TRAPEZOIDAL	2.00	12.00	0.95	12.00	1	132287.57
STMP10	CIRCULAR	0.60	0.28	0.15	0.60	1	802.66
STMP100	CIRCULAR	1.20	1.13	0.30	1.20	1	3778.42
STMP101	CIRCULAR	1.20	1.13	0.30	1.20	1	2378.05
STMP103	CIRCULAR	0.90	0.64	0.23	0.90	1	1749.20
STMP106	CIRCULAR	1.20	1.13	0.30	1.20	1	4572.62
STMP107	CIRCULAR	1.20	1.13	0.30	1.20	1	4089.94
STMP1086	CIRCULAR	0.35	0.10	0.09	0.35	1	153.05
STMP11	CIRCULAR	0.60	0.28	0.15	0.60	1	799.28
STMP1170	CIRCULAR	0.60	0.28	0.15	0.60	1	745.86
STMP118	CIRCULAR	0.60	0.28	0.15	0.60	1	276.99
STMP12	CIRCULAR	0.60	0.28	0.15	0.60	1	791.19
STMP120	CIRCULAR	0.40	0.13	0.10	0.40	1	191.34
STMP123	CIRCULAR	0.75	0.44	0.19	0.75	1	1621.26
STMP1289	CIRCULAR	0.40	0.13	0.10	0.40	1	1858.16
STMP13	CIRCULAR	0.60	0.28	0.15	0.60	1	796.76
STMP131	CIRCULAR	1.20	1.13	0.30	1.20	1	3555.25
STMP14	CIRCULAR	0.60	0.28	0.15	0.60	1	877.28
STMP150	CIRCULAR	0.60	0.28	0.15	0.60	1	563.87
STMP1513	CIRCULAR	0.80	0.50	0.20	0.80	1	3158.49
STMP1516	CIRCULAR	0.60	0.28	0.15	0.60	1	514.90
STMP155	CIRCULAR	0.50	0.20	0.12	0.50	1	235.13
STMP156A	CIRCULAR	0.60	0.28	0.15	0.60	1	563.28
STMP156B	CIRCULAR	0.60	0.28	0.15	0.60	1	415.93
STMP1604	CIRCULAR	0.90	0.64	0.23	0.90	1	2388.56
STMP161	CIRCULAR	0.50	0.20	0.12	0.50	1	844.93
STMP170	CIRCULAR	0.80	0.50	0.20	0.80	3	1897.65
STMP183	CIRCULAR	0.60	0.28	0.15	0.60	1	1155.59
STMP184	CIRCULAR	0.60	0.28	0.15	0.60	1	809.10
STMP20	CIRCULAR	0.50	0.20	0.12	0.50	1	347.62
STMP248	CIRCULAR	0.60	0.28	0.15	0.60	1	489.98
STMP249	CIRCULAR	0.60	0.28	0.15	0.60	1	523.90
STMP274	CIRCULAR	0.60	0.28	0.15	0.60	1	564.32
STMP276	CIRCULAR	0.75	0.44	0.19	0.75	1	1426.50
STMP29	CIRCULAR	1.05	0.87	0.26	1.05	1	6569.95
STMP308	CIRCULAR	0.45	0.16	0.11	0.45	1	714.48
STMP309	CIRCULAR	0.60	0.28	0.15	0.60	1	1304.47
STMP393	CIRCULAR	0.90	0.64	0.23	0.90	1	1374.18
STMP394	CIRCULAR	0.90	0.64	0.23	0.90	1	1509.26
STMP427	CIRCULAR	0.68	0.36	0.17	0.68	1	668.74
STMP428	CIRCULAR	0.68	0.36	0.17	0.68	1	875.31
STMP435	CIRCULAR	0.68	0.36	0.17	0.68	1	1231.44
STMP521	CIRCULAR	0.75	0.44	0.19	0.75	1	2225.98
STMP524	CIRCULAR	0.75	0.44	0.19	0.75	1	2195.09

STMP525	CIRCULAR	0.75	0.44	0.19	0.75	1	2245.15
STMP554	CIRCULAR	0.75	0.44	0.19	0.75	1	1246.52
STMP555	CIRCULAR	0.75	0.44	0.19	0.75	1	1667.32
STMP556	CIRCULAR	0.75	0.44	0.19	0.75	1	1933.72
STMP591	CIRCULAR	0.75	0.44	0.19	0.75	1	2021.23
STMP594	CIRCULAR	0.75	0.44	0.19	0.75	1	916.96
STMP595	CIRCULAR	0.75	0.44	0.19	0.75	1	934.59
STMP692	CIRCULAR	0.50	0.20	0.12	0.50	1	348.98
STMP749	CIRCULAR	0.60	0.28	0.15	0.60	1	1215.23
STMP77	CIRCULAR	0.90	0.64	0.23	0.90	1	3426.60
STMP79	CIRCULAR	0.75	0.44	0.19	0.75	1	1054.36
STMP800	CIRCULAR	0.50	0.20	0.12	0.50	1	348.14
STMP801	CIRCULAR	0.50	0.20	0.12	0.50	1	345.45
STMP823	CIRCULAR	0.60	0.28	0.15	0.60	1	657.72
STMP824	CIRCULAR	0.60	0.28	0.15	0.60	1	653.92
STMP850	CIRCULAR	0.60	0.28	0.15	0.60	1	979.02
STMP88	CIRCULAR	0.75	0.44	0.19	0.75	1	1069.45
STMP89	CIRCULAR	0.75	0.44	0.19	0.75	1	1443.65
STMP9	CIRCULAR	0.68	0.36	0.17	0.68	1	796.33
STMP90	CIRCULAR	0.75	0.44	0.19	0.75	1	1028.59
STMP914	CIRCULAR	0.60	0.28	0.15	0.60	1	1030.27
STMP915	CIRCULAR	0.60	0.28	0.15	0.60	1	818.35
STMP964	CIRCULAR	0.45	0.16	0.11	0.45	1	200.59
STMP98	CIRCULAR	0.60	0.28	0.15	0.60	1	1465.75
STMP99	CIRCULAR	0.60	0.28	0.15	0.60	1	1019.72
SYMP182	CIRCULAR	0.60	0.28	0.15	0.60	1	952.46

****
Control Actions Taken
****

********** Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	11.159	11.910
Evaporation Loss	0.000	0.000
Infiltration Loss	7.199	7.684
Surface Runoff	3.543	3.782
Final Surface Storage	0.521	0.557
Continuity Error (%)	-0.940	

********** Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	3.541	35.407
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	3.022	30.219
Internal Outflow	0.517	5.170
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.005	0.046
Continuity Error (%)	-0.077	

****
Time-Step Critical Elements
****
Link STMP749 (35.96%)
Link STMP12 (21.40%)
Link C98 (16.52%)
Link STMP1513 (8.64%)
Link STMP1604 (4.26%)

****
Highest Flow Instability Indexes
****
Link STMP101 (21)
Link STMP595 (18)
Link STMP1516 (13)
Link STMP594 (13)
Link STMP1513 (11)

****
Routing Time Step Summary
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Minimum Time Step : 0.50 sec
Average Time Step : 4.52 sec
Maximum Time Step : 30.00 sec

Percent in Steady State : 0.00
Average Iterations per Step : 4.67
Percent Not Converging : 29.33

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
S13-A	11.91	0.00	0.00	3.57	7.52	1.09	1101.81	0.632
S13-B	11.91	0.00	0.00	3.57	7.48	1.06	919.77	0.628
S13-C	11.91	0.00	0.00	4.05	7.09	0.36	354.01	0.595
S13-D	11.91	0.00	0.00	2.74	8.31	0.24	269.81	0.698
S13-E	11.91	0.00	0.00	3.81	7.32	0.38	405.12	0.614
S13-F	11.91	0.00	0.00	5.96	5.32	0.41	304.69	0.446
S13-G	11.91	0.00	0.00	6.19	5.20	0.07	81.42	0.437
S13-H	11.91	0.00	0.00	5.12	6.20	0.09	109.49	0.521
S23-A	11.91	0.00	0.00	3.69	7.36	1.16	949.59	0.618
S23-B	11.91	0.00	0.00	4.41	6.80	0.27	304.43	0.571
S23-C	11.91	0.00	0.00	6.55	4.85	0.38	426.29	0.407
S25-A	11.91	0.00	0.00	4.64	6.44	1.46	906.73	0.541
S25-B	11.91	0.00	0.00	5.36	5.91	0.40	409.04	0.497
S25-C	11.91	0.00	0.00	5.72	5.59	0.41	412.37	0.469
S25-D	11.91	0.00	0.00	5.36	5.90	0.63	606.06	0.495
S25-E	11.91	0.00	0.00	6.07	5.27	0.54	557.97	0.443
S25-F	11.91	0.00	0.00	6.67	4.68	1.95	1487.03	0.393
S25-G	11.91	0.00	0.00	6.07	5.29	0.17	199.53	0.444
S25-H	11.91	0.00	0.00	7.03	4.43	0.15	174.09	0.372
S25-I	11.91	0.00	0.00	3.93	7.17	1.45	1320.42	0.602
S25-J	11.91	0.00	0.00	3.33	7.64	1.87	1346.74	0.642
S32-A	11.91	0.00	0.00	5.96	4.64	2.52	662.13	0.389
S32-B	11.91	0.00	0.00	5.96	5.32	0.29	213.76	0.446
S38-A	11.91	0.00	0.00	2.50	8.50	1.38	1451.66	0.714
S38-B	11.91	0.00	0.00	2.86	8.18	1.50	1566.27	0.686
S38-C	11.91	0.00	0.00	2.50	8.49	0.71	731.68	0.713
S38-D	11.91	0.00	0.00	3.22	7.83	0.37	355.11	0.658
S38-Z1	11.91	0.00	0.00	10.72	1.13	1.54	1732.17	0.095
S38-Z2	11.91	0.00	0.00	10.72	1.15	0.07	72.39	0.096
S3-A	11.91	0.00	0.00	4.41	6.78	0.58	615.67	0.569

S3-B	11.91	0.00	0.00	4.53	6.68	0.13	146.59	0.561
S3-C	11.91	0.00	0.00	4.64	6.57	0.23	258.23	0.552
S3-D	11.91	0.00	0.00	2.38	8.64	0.18	207.99	0.725
S3-E	11.91	0.00	0.00	2.86	8.21	0.49	555.35	0.689
S3-F	11.91	0.00	0.00	5.00	6.44	0.12	141.39	0.541
S3-G	11.91	0.00	0.00	4.76	6.57	0.21	247.89	0.551
S3-Z1	11.91	0.00	0.00	10.72	1.10	2.66	3065.02	0.093
S4-A	11.91	0.00	0.00	2.74	8.36	0.32	371.22	0.702
S4-B	11.91	0.00	0.00	2.38	8.55	0.35	298.23	0.718
S4-C	11.91	0.00	0.00	3.22	7.84	0.53	519.18	0.658
S5-A	11.91	0.00	0.00	4.29	6.88	0.62	643.06	0.578
S5-B	11.91	0.00	0.00	2.38	8.58	0.15	142.99	0.721
S5-C	11.91	0.00	0.00	2.38	8.57	0.21	199.59	0.720
S5-D	11.91	0.00	0.00	2.38	8.59	0.11	108.87	0.721
S5-E	11.91	0.00	0.00	2.50	8.50	0.34	360.39	0.714
S5-F	11.91	0.00	0.00	2.38	8.64	0.09	100.86	0.726
S5-G	11.91	0.00	0.00	2.74	8.21	0.34	273.90	0.690
S5-H	11.91	0.00	0.00	3.22	7.77	0.29	220.76	0.652
S5-I	11.91	0.00	0.00	3.45	7.64	0.78	835.16	0.642
S5-J	11.91	0.00	0.00	4.76	6.50	0.38	444.25	0.546
S5-K	11.91	0.00	0.00	5.48	5.81	1.67	1794.36	0.488
S5-Z1	11.91	0.00	0.00	10.72	1.13	0.99	1113.72	0.095
S7-A	11.91	0.00	0.00	5.24	5.99	0.45	395.72	0.503
S7-B	11.91	0.00	0.00	9.29	2.41	0.09	108.79	0.203
S13-I	11.91	0.00	0.00	0.85	8.95	0.19	151.97	0.752

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Node Depth Summary
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J1	JUNCTION	0.41	2.90	447.82	0 00:18
STMH286	JUNCTION	0.60	3.40	447.71	0 00:18
STMH56	JUNCTION	0.64	3.20	447.18	0 00:18
STMH54	JUNCTION	0.74	4.10	447.07	0 00:18
STMH178	JUNCTION	0.50	3.20	444.49	0 00:18
STMH177	JUNCTION	0.46	2.60	443.38	0 00:19
STMH398	JUNCTION	0.31	0.73	441.15	0 00:19
STMH188	JUNCTION	0.42	3.40	449.42	0 00:18

STMH64	JUNCTION	0.44	3.23	448.79	0	00:19
STMH161	JUNCTION	0.54	3.00	447.09	0	00:18
STMH165	JUNCTION	0.67	3.60	447.16	0	00:18
STMH63	JUNCTION	0.46	2.99	448.07	0	00:19
STMH62	JUNCTION	0.47	2.80	447.78	0	00:19
STMH77	JUNCTION	0.18	0.52	454.67	0	00:20
STMH74	JUNCTION	0.18	0.50	453.38	0	00:20
STMH83	JUNCTION	0.51	3.00	444.98	0	00:18
STMH79	JUNCTION	0.56	2.60	443.98	0	00:18
STMH235	JUNCTION	0.60	1.90	444.34	0	00:14
J22	JUNCTION	0.83	1.90	444.65	0	00:14
STMH139	JUNCTION	0.46	1.80	457.13	0	00:16
STMH138	JUNCTION	0.50	1.60	456.48	0	00:16
STMH183	JUNCTION	0.50	1.60	455.87	0	00:16
STMH6	JUNCTION	0.68	2.16	455.45	0	00:15
STMH7	JUNCTION	0.58	2.11	454.84	0	00:15
STMH184	JUNCTION	0.77	2.41	454.30	0	00:15
STMH185	JUNCTION	0.69	2.09	453.84	0	00:20
STMH12	JUNCTION	0.67	1.99	453.68	0	00:19
J33	JUNCTION	0.26	2.20	461.28	0	00:19
J34	JUNCTION	0.07	0.20	455.56	0	00:20
STMH17	JUNCTION	0.11	0.31	454.30	0	00:20
STMH254	JUNCTION	0.14	0.35	453.59	0	00:21
STMH93	JUNCTION	0.18	0.49	452.37	0	00:21
J37	JUNCTION	0.16	0.42	453.91	0	00:21
J38	JUNCTION	0.07	0.21	454.57	0	00:20
STMH190	JUNCTION	0.41	0.92	450.64	0	00:20
STMH133	JUNCTION	0.38	0.86	451.14	0	00:20
STMH135	JUNCTION	0.33	0.71	451.72	0	00:21
STMH131	JUNCTION	0.45	0.95	452.16	0	00:21
STMH196	JUNCTION	0.36	0.78	452.47	0	00:20
STMH137	JUNCTION	0.50	2.00	455.28	0	00:16
STMH15	JUNCTION	0.42	1.80	456.07	0	00:16
J46	JUNCTION	0.62	5.00	460.31	0	00:18
STMH4	JUNCTION	0.11	0.33	452.90	0	00:20
STMH216	JUNCTION	0.12	0.40	452.55	0	00:20
STMH197	JUNCTION	0.24	0.50	452.45	0	00:18
STMH2	JUNCTION	0.18	0.33	453.39	0	00:20
STMH28	JUNCTION	0.30	0.51	453.71	0	00:21
STMH147	JUNCTION	0.91	2.63	456.38	0	00:16
STMH194	JUNCTION	0.82	1.80	455.80	0	00:16
STMH253	JUNCTION	0.70	2.00	456.49	0	00:17
J56	JUNCTION	0.32	2.60	457.98	0	00:18
STMH212	JUNCTION	0.54	1.20	456.05	0	00:16

STMH298	JUNCTION	0.16	0.43	440.70	0	00:21
STMH297	JUNCTION	0.19	0.56	441.20	0	00:20
STMH26	JUNCTION	0.05	0.13	452.62	0	00:20
STMH22	JUNCTION	0.11	0.26	454.45	0	00:20
STMH23	JUNCTION	0.20	1.45	455.83	0	00:19
STMH225	JUNCTION	0.42	2.44	452.63	0	00:19
STMH226	JUNCTION	0.82	3.04	451.10	0	00:19
STMH202	JUNCTION	0.86	3.02	449.73	0	00:18
STMH38	JUNCTION	0.89	2.75	447.45	0	00:18
STMH205	JUNCTION	1.08	3.20	445.10	0	00:17
STMH204	JUNCTION	1.13	3.16	444.75	0	00:17
STMH109	JUNCTION	0.85	1.70	442.30	0	00:17
STMH37	JUNCTION	0.53	2.50	453.12	0	00:19
STMH244	JUNCTION	0.60	1.50	441.60	0	00:17
STMH362	JUNCTION	0.44	1.70	441.50	0	00:18
J73	JUNCTION	0.12	0.24	439.52	0	00:20
J74	JUNCTION	0.13	0.29	438.56	0	00:21
J75	JUNCTION	0.15	0.33	437.95	0	00:21
J76	JUNCTION	0.00	0.00	437.10	0	00:00
J77	JUNCTION	0.34	0.60	442.60	0	00:22
J78	JUNCTION	0.20	0.40	438.40	0	00:22
J79	JUNCTION	0.69	4.66	459.44	0	00:19
STMH116	JUNCTION	0.25	2.30	456.30	0	00:19
DRCB64	JUNCTION	0.19	2.50	453.86	0	00:20
DRCB40	JUNCTION	1.34	2.50	448.11	0	00:16
J83	JUNCTION	0.21	0.61	459.09	0	00:20
J84	JUNCTION	0.08	0.18	437.54	0	00:20
J85	JUNCTION	0.13	0.41	457.78	0	00:20
STMH78	JUNCTION	0.21	0.63	447.26	0	00:20
J86	JUNCTION	0.36	2.50	460.96	0	00:18
J87	JUNCTION	0.07	0.21	458.78	0	00:20
J88	JUNCTION	0.07	0.21	458.46	0	00:20
J89	JUNCTION	0.00	0.00	456.77	0	00:00
J90	JUNCTION	0.00	0.00	459.23	0	00:00
J91	JUNCTION	0.00	0.00	457.00	0	00:00
DRCB258	JUNCTION	0.20	0.34	440.13	0	00:35
DRCB260	JUNCTION	0.47	1.19	440.14	0	00:34
J94	JUNCTION	0.16	0.22	437.06	0	00:35
STMH246-DIV	JUNCTION	0.38	1.85	457.77	0	00:20
DROF13	OUTFALL	0.31	0.71	440.92	0	00:19
DROF38	OUTFALL	0.47	1.05	441.90	0	00:17
DROF3	OUTFALL	0.42	0.75	452.09	0	00:14
DROF4	OUTFALL	0.18	0.49	452.10	0	00:21
DROF5	OUTFALL	0.40	0.92	450.37	0	00:20

DROF7	OUTFALL	0.16	0.43	440.45	0	00:21
DROF25	OUTFALL	0.34	0.60	440.60	0	00:22
DROF23	OUTFALL	0.27	0.35	444.25	0	00:15
DRFI2017	OUTFALL	0.16	0.22	436.64	0	00:35

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	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	151.84	465.27	0 00:18	0.19	0.203	-0.559
STMH286	JUNCTION	1100.91	1100.91	0 00:20	1.09	1.26	-0.045
STMH56	JUNCTION	0.00	1009.18	0 00:22	0	1.24	0.018
STMH54	JUNCTION	404.80	1779.03	0 00:20	0.382	2.99	-0.010
STMH178	JUNCTION	304.43	2083.04	0 00:20	0.408	3.39	0.001
STMH177	JUNCTION	81.37	2164.47	0 00:20	0.0703	3.46	-0.032
STMH398	JUNCTION	109.41	2273.72	0 00:20	0.0944	3.56	0.006
STMH188	JUNCTION	918.99	918.99	0 00:20	1.06	1.06	-0.055
STMH64	JUNCTION	0.00	919.02	0 00:20	0	1.06	-0.033
STMH161	JUNCTION	269.60	959.49	0 00:20	0.237	1.26	-0.051
STMH165	JUNCTION	353.72	962.76	0 00:18	0.357	1.43	-0.064
STMH63	JUNCTION	0.00	919.73	0 00:20	0	1.06	-0.070
STMH62	JUNCTION	0.00	921.04	0 00:20	0	1.06	0.008
STMH77	JUNCTION	0.00	3213.38	0 00:20	0	2.98	0.002
STMH74	JUNCTION	0.00	3228.82	0 00:20	0	2.98	-0.010
STMH83	JUNCTION	0.00	3925.83	0 00:21	0	4.55	-0.034
STMH79	JUNCTION	354.81	4064.32	0 00:21	0.37	4.9	-0.097
STMH235	JUNCTION	0.00	417.56	0 00:17	0	0.907	-0.231
J22	JUNCTION	1564.99	1564.99	0 00:20	1.5	1.5	0.202
STMH139	JUNCTION	0.00	3555.98	0 00:21	0	3.46	-0.015
STMH138	JUNCTION	207.84	2882.69	0 00:20	0.182	3.47	-0.018
STMH183	JUNCTION	0.00	1667.25	0 00:27	0	2.92	-0.029
STMH6	JUNCTION	258.03	1576.87	0 00:30	0.233	2.92	0.009
STMH7	JUNCTION	146.47	1627.32	0 00:30	0.132	3.04	-0.016
STMH184	JUNCTION	0.00	1627.42	0 00:30	0	3.04	0.005
STMH185	JUNCTION	0.00	1627.31	0 00:30	0	3.04	-0.006
STMH12	JUNCTION	615.17	2177.86	0 00:20	0.579	3.62	0.015
J33	JUNCTION	3204.37	3204.37	0 00:20	2.79	2.79	-0.011

J34	JUNCTION	370.95	370.95	0	00:20	0.32	0.32	0.028
STMH17	JUNCTION	0.00	364.54	0	00:20	0	0.32	-0.032
STMH254	JUNCTION	0.00	643.13	0	00:21	0	0.668	0.061
STMH93	JUNCTION	518.75	1102.85	0	00:21	0.53	1.2	0.002
J37	JUNCTION	297.98	648.72	0	00:20	0.349	0.669	0.026
J38	JUNCTION	0.00	362.57	0	00:20	0	0.32	0.002
STMH190	JUNCTION	0.00	3297.95	0	00:22	0	4.97	0.018
STMH133	JUNCTION	642.53	3304.70	0	00:21	0.616	4.97	0.003
STMH135	JUNCTION	142.87	2941.15	0	00:21	0.149	4.35	0.019
STMH131	JUNCTION	199.43	2597.79	0	00:20	0.214	4.21	0.021
STMH196	JUNCTION	108.78	2414.29	0	00:21	0.11	3.99	-0.017
STMH137	JUNCTION	0.00	1377.56	0	00:16	0	2.28	0.011
STMH15	JUNCTION	100.78	2613.89	0	00:20	0.0882	2.72	-0.010
J46	JUNCTION	2906.02	2906.02	0	00:20	2.66	2.66	0.004
STMH4	JUNCTION	360.10	360.10	0	00:20	0.341	0.341	-0.008
STMH216	JUNCTION	0.00	361.92	0	00:20	0	0.341	0.025
STMH197	JUNCTION	0.00	633.24	0	00:20	0	1.26	0.050
STMH2	JUNCTION	273.66	639.50	0	00:20	0.337	1.26	0.025
STMH28	JUNCTION	0.00	371.96	0	00:20	0	0.927	0.058
STMH147	JUNCTION	220.57	371.98	0	00:20	0.288	0.928	0.018
STMH194	JUNCTION	0.00	351.92	0	00:16	0	0.685	-0.100
STMH253	JUNCTION	0.00	679.92	0	00:17	0	0.718	-0.138
J56	JUNCTION	443.93	443.93	0	00:20	0.384	0.384	-0.246
STMH212	JUNCTION	834.49	985.72	0	00:20	0.785	0.815	0.049
STMH298	JUNCTION	0.00	479.19	0	00:21	0	0.541	0.062
STMH297	JUNCTION	108.72	498.72	0	00:20	0.0942	0.541	-0.009
STMH26	JUNCTION	0.00	394.31	0	00:20	0	0.447	0.008
STMH22	JUNCTION	0.00	395.30	0	00:20	0	0.447	0.031
STMH23	JUNCTION	395.39	395.39	0	00:20	0.447	0.447	0.007
STMH225	JUNCTION	408.71	1241.96	0	00:20	0.396	1.84	0.103
STMH226	JUNCTION	0.00	1241.93	0	00:20	0	1.84	-0.122
STMH202	JUNCTION	412.03	1222.02	0	00:20	0.406	2.09	0.000
STMH38	JUNCTION	605.56	1615.89	0	00:20	0.631	2.67	-0.027
STMH205	JUNCTION	199.37	1266.73	0	00:20	0.175	2.61	-0.052
STMH204	JUNCTION	0.00	1266.57	0	00:20	0	2.61	-0.013
STMH109	JUNCTION	0.00	1267.01	0	00:20	0	2.61	0.030
STMH37	JUNCTION	906.21	906.21	0	00:20	1.45	1.46	0.036
STMH244	JUNCTION	173.96	843.53	0	00:20	0.153	2.1	0.002
STMH362	JUNCTION	0.00	843.59	0	00:20	0	2.1	0.009
J73	JUNCTION	1485.75	2329.09	0	00:20	1.95	4.05	0.054
J74	JUNCTION	557.51	2902.97	0	00:20	0.536	4.59	0.136
J75	JUNCTION	1319.30	3935.97	0	00:21	1.45	6.03	0.074
J76	JUNCTION	0.00	5231.77	0	00:22	0	7.9	0.000
J77	JUNCTION	0.00	5231.77	0	00:22	0	7.9	0.017

J78	JUNCTION	0.00	2814.58	0	00:21	0	4.58	0.095
J79	JUNCTION	0.00	2513.30	0	00:20	0	2.63	0.001
STMH116	JUNCTION	948.78	948.78	0	00:20	1.16	1.16	-0.004
DRCB64	JUNCTION	304.20	1224.65	0	00:20	0.268	1.43	-0.005
DRCB40	JUNCTION	425.96	1559.05	0	00:20	0.385	1.81	-0.019
J83	JUNCTION	3254.03	3254.03	0	00:20	2.99	2.98	0.010
J84	JUNCTION	1345.58	1345.58	0	00:20	1.87	1.87	-0.162
J85	JUNCTION	0.00	3044.22	0	00:20	0	2.98	-0.050
STMH78	JUNCTION	731.08	3909.93	0	00:20	0.711	3.7	0.170
J86	JUNCTION	0.00	3204.50	0	00:20	0	2.79	-0.004
J87	JUNCTION	247.72	247.72	0	00:20	0.214	0.214	-0.006
J88	JUNCTION	0.00	248.47	0	00:20	0	0.214	0.057
J89	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
J90	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
J91	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
DRCB258	JUNCTION	764.85	764.85	0	00:35	2.79	2.79	0.020
DRCB260	JUNCTION	0.00	766.99	0	00:33	0	2.79	0.151
J94	JUNCTION	0.00	764.93	0	00:35	0	2.78	0.106
STMH246-DIV	JUNCTION	554.93	3582.76	0	00:20	0.486	3.46	0.070
DROF13	OUTFALL	0.00	2307.63	0	00:19	0	3.56	0.000
DROF38	OUTFALL	0.00	4064.57	0	00:21	0	4.9	0.000
DROF3	OUTFALL	0.00	2178.26	0	00:20	0	3.62	0.000
DROF4	OUTFALL	0.00	1104.75	0	00:21	0	1.2	0.000
DROF5	OUTFALL	0.00	3304.55	0	00:20	0	4.97	0.000
DROF7	OUTFALL	0.00	478.93	0	00:21	0	0.541	0.000
DROF25	OUTFALL	0.00	5267.35	0	00:22	0	7.9	0.000
DROF23	OUTFALL	0.00	229.95	0	00:24	0	0.755	0.000
DRFI2017	OUTFALL	0.00	768.24	0	00:35	0	2.78	0.000

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Node Surcharge Summary
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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
J1	JUNCTION	0.19	2.400	0.000
STMH286	JUNCTION	0.24	2.725	0.000
STMH56	JUNCTION	0.27	2.525	0.000
STMH54	JUNCTION	0.32	3.425	0.000

STMH178	JUNCTION	0.19	2.300	0.000
STMH177	JUNCTION	0.17	1.700	0.000
STMH188	JUNCTION	0.15	2.800	0.000
STMH64	JUNCTION	0.17	2.635	0.165
STMH161	JUNCTION	0.23	2.400	0.000
STMH165	JUNCTION	0.29	2.925	0.000
STMH63	JUNCTION	0.19	2.392	0.308
STMH62	JUNCTION	0.20	2.200	0.000
STMH83	JUNCTION	0.10	1.800	0.000
STMH79	JUNCTION	0.15	1.325	0.000
STMH235	JUNCTION	0.53	1.400	0.000
J22	JUNCTION	0.56	1.450	0.000
STMH139	JUNCTION	0.26	0.900	0.000
STMH138	JUNCTION	0.28	0.850	0.000
STMH183	JUNCTION	0.29	0.850	0.000
STMH6	JUNCTION	0.32	1.410	0.000
STMH7	JUNCTION	0.33	1.363	1.157
STMH184	JUNCTION	0.44	1.658	1.992
STMH185	JUNCTION	0.43	1.344	2.346
STMH12	JUNCTION	0.44	1.237	2.413
J33	JUNCTION	0.08	1.304	0.296
STMH137	JUNCTION	0.25	1.395	0.605
STMH15	JUNCTION	0.23	1.200	0.000
J46	JUNCTION	0.21	4.400	0.000
STMH147	JUNCTION	0.64	2.129	0.271
STMH194	JUNCTION	0.59	1.300	0.000
STMH253	JUNCTION	0.51	1.400	0.000
J56	JUNCTION	0.34	2.000	0.000
STMH212	JUNCTION	0.50	0.700	0.000
STMH23	JUNCTION	0.06	0.949	1.851
STMH225	JUNCTION	0.22	1.840	0.000
STMH226	JUNCTION	0.26	1.040	0.000
STMH202	JUNCTION	0.35	2.420	0.000
STMH38	JUNCTION	0.38	2.150	0.000
STMH205	JUNCTION	0.47	2.600	0.000
STMH204	JUNCTION	0.51	2.560	0.000
STMH109	JUNCTION	0.55	1.100	0.000
STMH37	JUNCTION	0.24	1.900	0.000
STMH244	JUNCTION	0.54	0.900	0.000
STMH362	JUNCTION	0.51	1.100	0.000
J79	JUNCTION	0.24	4.057	0.043
STMH116	JUNCTION	0.10	1.850	0.000
DRCB64	JUNCTION	0.04	1.900	0.000
DRCB40	JUNCTION	0.65	1.900	0.000

J86	JUNCTION	0.10	1.600	0.000
DRCB260	JUNCTION	0.14	0.392	0.308

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

Node	Hours Flooded	Maximum Rate LPS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
J1	0.06	435.79	0 00:18	0.029	0.000
STMH286	0.05	303.59	0 00:18	0.010	0.000
STMH56	0.13	571.60	0 00:20	0.162	0.000
STMH54	0.01	237.62	0 00:18	0.000	0.000
STMH178	0.01	382.90	0 00:18	0.001	0.000
STMH177	0.01	425.41	0 00:19	0.002	0.000
STMH188	0.01	258.60	0 00:18	0.002	0.000
STMH161	0.12	406.37	0 00:18	0.086	0.000
STMH165	0.01	340.69	0 00:18	0.001	0.000
STMH62	0.08	297.76	0 00:19	0.040	0.000
STMH83	0.01	624.91	0 00:18	0.003	0.000
STMH79	0.01	836.94	0 00:18	0.005	0.000
STMH235	0.07	407.88	0 00:21	0.054	0.000
J22	0.37	1340.23	0 00:20	0.604	0.000
STMH139	0.09	881.05	0 00:21	0.177	0.000
STMH138	0.18	1215.18	0 00:20	0.545	0.000
STMH183	0.24	401.43	0 00:21	0.236	0.000
STMH6	0.06	129.70	0 00:15	0.011	0.000
STMH15	0.17	1262.46	0 00:20	0.442	0.000
J46	0.04	389.67	0 00:20	0.028	0.000
STMH194	0.21	182.72	0 00:16	0.046	0.000
STMH253	0.01	460.27	0 00:17	0.003	0.000
J56	0.01	292.72	0 00:18	0.002	0.000
STMH212	0.39	984.73	0 00:20	0.480	0.000
STMH225	0.01	203.61	0 00:19	0.001	0.000
STMH226	0.18	480.54	0 00:19	0.160	0.000
STMH202	0.15	461.70	0 00:18	0.054	0.000
STMH38	0.25	548.63	0 00:20	0.232	0.000
STMH205	0.01	297.15	0 00:17	0.001	0.000

STMH204	0.01	221.39	0	00:17	0.001	0.000
STMH109	0.44	597.13	0	00:20	0.658	0.000
STMH37	0.05	72.63	0	00:20	0.007	0.000
STMH244	0.01	210.62	0	00:17	0.001	0.000
STMH362	0.01	195.58	0	00:18	0.000	0.000
STMH116	0.03	78.60	0	00:20	0.004	0.000
DRCB64	0.01	55.57	0	00:20	0.000	0.000
DRCB40	0.56	1328.99	0	00:20	1.058	0.000
J86	0.04	399.35	0	00:20	0.026	0.000

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
DROF13	99.54	772.63	2307.63	3.557
DROF38	99.54	1074.57	4064.57	4.900
DROF3	99.54	806.93	2178.26	3.620
DROF4	99.54	261.06	1104.75	1.198
DROF5	99.50	1083.25	3304.55	4.969
DROF7	99.29	117.74	478.93	0.541
DROF25	99.54	1672.68	5267.35	7.900
DROF23	99.46	153.42	229.95	0.755
DRFI2017	99.33	465.98	768.24	2.780
System	99.48	6408.25	19041.28	30.219

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Link Flow Summary
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Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days	hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C100	CONDUIT	417.63	0	00:17	2.64	2.90	1.00
C101	CONDUIT	3738.14	0	00:21	3.31	1.26	1.00

C102	CONDUIT	4064.57	0	00:21	4.69	1.85	1.00
C103	CONDUIT	3221.48	0	00:20	6.84	0.46	0.54
C104	CONDUIT	3925.83	0	00:21	5.34	0.60	0.80
C105	CONDUIT	2802.28	0	00:20	7.62	1.56	0.78
C106	CONDUIT	248.47	0	00:20	2.48	0.17	0.28
C107	CONDUIT	242.29	0	00:20	1.40	0.17	0.41
C108	CONDUIT	0.00	0	00:00	0.00	0.00	0.11
C109	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C110	CONDUIT	0.00	0	00:00	0.00	0.00	0.11
C93	CONDUIT	2513.30	0	00:20	4.44	1.29	1.00
C96	CONDUIT	3213.38	0	00:20	6.33	0.62	0.57
C98	CONDUIT	3204.50	0	00:20	5.04	0.70	1.00
C99	CONDUIT	3042.58	0	00:20	3.29	0.05	0.57
DRDI117	CONDUIT	768.24	0	00:35	2.72	0.03	0.22
DRDI27	CONDUIT	2375.53	0	00:20	1.98	0.03	0.17
DRDI28	CONDUIT	2814.58	0	00:21	1.68	0.04	0.23
DRDI4	CONDUIT	3985.04	0	00:22	4.41	0.05	0.11
DRDI5	CONDUIT	1355.35	0	00:20	3.57	0.02	0.06
DRDI6	CONDUIT	5267.35	0	00:22	4.92	0.04	0.30
STMP10	CONDUIT	919.02	0	00:20	3.25	1.14	1.00
STMP100	CONDUIT	2416.92	0	00:22	2.92	0.64	0.72
STMP101	CONDUIT	2809.97	0	00:21	3.44	1.18	0.68
STMP103	CONDUIT	640.76	0	00:21	1.74	0.37	0.70
STMP106	CONDUIT	2762.77	0	00:21	3.71	0.60	0.65
STMP107	CONDUIT	3297.95	0	00:22	3.72	0.81	0.74
STMP1086	CONDUIT	229.95	0	00:24	2.39	1.50	1.00
STMP11	CONDUIT	919.73	0	00:20	3.25	1.15	1.00
STMP1170	CONDUIT	764.93	0	00:35	3.94	1.03	0.69
STMP118	CONDUIT	383.27	0	00:18	1.96	1.38	0.69
STMP12	CONDUIT	921.04	0	00:20	3.26	1.16	1.00
STMP120	CONDUIT	371.96	0	00:20	2.96	1.94	1.00
STMP123	CONDUIT	633.24	0	00:20	2.80	0.39	0.54
STMP1289	CONDUIT	394.16	0	00:20	4.51	0.21	0.66
STMP13	CONDUIT	701.53	0	00:23	2.69	0.88	1.00
STMP131	CONDUIT	3304.55	0	00:20	3.57	0.93	0.76
STMP14	CONDUIT	737.84	0	00:25	2.61	0.84	1.00
STMP150	CONDUIT	870.16	0	00:22	3.08	1.54	1.00
STMP1513	CONDUIT	766.99	0	00:33	3.04	0.24	0.71
STMP1516	CONDUIT	843.41	0	00:20	3.01	1.64	0.97
STMP155	CONDUIT	395.30	0	00:20	2.46	1.68	0.76
STMP156A	CONDUIT	478.93	0	00:21	2.24	0.85	0.71
STMP156B	CONDUIT	479.19	0	00:21	1.96	1.15	0.82
STMP1604	CONDUIT	2307.63	0	00:19	4.28	0.97	0.79
STMP161	CONDUIT	394.31	0	00:20	5.59	0.47	0.39

STMP170	CONDUIT	2802.89	0	00:22	4.22	0.49	0.45
STMP183	CONDUIT	1134.46	0	00:32	4.04	0.98	1.00
STMP184	CONDUIT	1267.01	0	00:20	4.48	1.57	1.00
STMP20	CONDUIT	343.10	0	00:18	1.80	0.99	1.00
STMP248	CONDUIT	740.00	0	00:44	2.62	1.51	1.00
STMP249	CONDUIT	843.59	0	00:20	2.98	1.61	1.00
STMP274	CONDUIT	443.87	0	00:20	1.57	0.79	1.00
STMP276	CONDUIT	636.33	0	00:21	2.49	0.45	0.56
STMP29	CONDUIT	3228.82	0	00:20	7.58	0.49	0.50
STMP308	CONDUIT	920.51	0	00:19	5.79	1.29	1.00
STMP309	CONDUIT	1146.88	0	00:20	4.16	0.88	1.00
STMP393	CONDUIT	2164.62	0	00:20	3.62	1.58	0.91
STMP394	CONDUIT	2083.10	0	00:20	3.27	1.38	1.00
STMP427	CONDUIT	707.48	0	00:18	2.02	1.06	1.00
STMP428	CONDUIT	915.79	0	00:18	2.56	1.05	1.00
STMP435	CONDUIT	1778.92	0	00:20	4.97	1.44	1.00
STMP521	CONDUIT	2674.92	0	00:23	6.05	1.20	1.00
STMP524	CONDUIT	364.54	0	00:20	2.68	0.17	0.35
STMP525	CONDUIT	362.57	0	00:20	3.67	0.16	0.28
STMP554	CONDUIT	1576.96	0	00:30	3.60	1.27	1.00
STMP555	CONDUIT	1667.25	0	00:27	4.35	1.00	1.00
STMP556	CONDUIT	1487.95	0	00:30	3.71	0.77	1.00
STMP591	CONDUIT	1627.42	0	00:30	3.68	0.81	1.00
STMP594	CONDUIT	1627.31	0	00:30	3.68	1.77	1.00
STMP595	CONDUIT	1627.51	0	00:30	3.68	1.74	1.00
STMP692	CONDUIT	271.56	0	00:40	1.45	0.78	1.00
STMP749	CONDUIT	1266.57	0	00:20	4.48	1.04	1.00
STMP77	CONDUIT	3555.98	0	00:21	5.59	1.04	1.00
STMP79	CONDUIT	366.97	0	00:20	1.73	0.35	0.49
STMP800	CONDUIT	351.92	0	00:16	1.94	1.01	1.00
STMP801	CONDUIT	457.88	0	00:17	2.33	1.33	1.00
STMP823	CONDUIT	346.53	0	00:21	1.40	0.53	0.83
STMP824	CONDUIT	361.92	0	00:20	2.18	0.55	0.59
STMP850	CONDUIT	2513.12	0	00:19	8.89	2.57	1.00
STMP88	CONDUIT	643.13	0	00:21	2.83	0.60	0.51
STMP89	CONDUIT	1104.75	0	00:21	3.60	0.77	0.66
STMP9	CONDUIT	1009.18	0	00:22	2.82	1.27	1.00
STMP90	CONDUIT	2178.26	0	00:20	4.93	2.12	1.00
STMP914	CONDUIT	1241.93	0	00:20	4.39	1.21	1.00
STMP915	CONDUIT	836.26	0	00:29	3.03	1.02	1.00
STMP964	CONDUIT	417.56	0	00:17	2.63	2.08	1.00
STMP98	CONDUIT	1377.56	0	00:16	4.87	0.94	1.00
STMP99	CONDUIT	1377.56	0	00:16	4.87	1.35	1.00
SYMP182	CONDUIT	1014.37	0	00:27	3.59	1.06	1.00

STMP187_PUMP	PUMP	5231.77	0	00:22			

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Flow Classification Summary
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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
C100	1.00	0.00	0.00	0.00	0.15	0.00	0.00	0.84	0.00	0.00
C101	1.00	0.00	0.00	0.00	0.20	0.09	0.00	0.71	0.02	0.00
C102	1.00	0.00	0.00	0.00	0.23	0.76	0.00	0.00	0.72	0.00
C103	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.92	0.00
C104	1.00	0.00	0.00	0.00	0.00	0.60	0.00	0.40	0.23	0.00
C105	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.00
C106	1.00	0.00	0.00	0.00	0.08	0.91	0.00	0.00	0.89	0.00
C107	1.00	0.00	0.00	0.00	0.46	0.54	0.00	0.00	0.54	0.00
C108	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C109	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C110	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C93	1.00	0.00	0.00	0.00	0.18	0.81	0.00	0.00	0.83	0.00
C96	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C98	1.00	0.00	0.00	0.00	0.07	0.93	0.00	0.00	0.89	0.00
C99	1.00	0.00	0.00	0.00	0.43	0.57	0.00	0.00	0.96	0.00
DRDI117	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.77	0.00
DRDI27	1.00	0.00	0.00	0.00	0.07	0.93	0.00	0.00	0.89	0.00
DRDI28	1.00	0.00	0.00	0.00	0.85	0.15	0.00	0.00	0.74	0.00
DRDI4	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
DRDI5	1.00	0.01	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
DRDI6	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.84	0.00
STMP10	1.00	0.00	0.00	0.00	0.13	0.86	0.00	0.00	0.60	0.00
STMP100	1.00	0.00	0.00	0.00	0.10	0.90	0.00	0.00	0.76	0.00
STMP101	1.00	0.00	0.00	0.00	0.04	0.96	0.00	0.00	0.20	0.00
STMP103	1.00	0.00	0.00	0.00	0.50	0.49	0.00	0.00	0.73	0.00
STMP106	1.00	0.00	0.00	0.00	0.02	0.98	0.00	0.00	0.86	0.00
STMP107	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.83	0.00
STMP1086	1.00	0.00	0.00	0.00	0.65	0.35	0.00	0.00	0.46	0.00
STMP11	1.00	0.00	0.00	0.00	0.15	0.85	0.00	0.00	0.75	0.00
STMP1170	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
STMP118	1.00	0.00	0.00	0.00	0.32	0.68	0.00	0.00	0.04	0.00
STMP12	1.00	0.01	0.00	0.00	0.17	0.83	0.00	0.00	0.46	0.00

STMP120	1.00	0.00	0.00	0.00	0.80	0.20	0.00	0.00	0.70	0.00
STMP123	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.92	0.00
STMP1289	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.97	0.00
STMP13	1.00	0.00	0.00	0.00	0.19	0.80	0.00	0.00	0.43	0.00
STMP131	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.77	0.00
STMP14	1.00	0.00	0.00	0.00	0.27	0.73	0.00	0.00	0.83	0.00
STMP150	1.00	0.00	0.00	0.00	0.21	0.79	0.00	0.00	0.13	0.00
STMP1513	1.00	0.00	0.00	0.00	0.17	0.83	0.00	0.00	0.89	0.00
STMP1516	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
STMP155	1.00	0.00	0.00	0.00	0.03	0.97	0.00	0.00	0.00	0.00
STMP156A	1.00	0.00	0.00	0.00	0.01	0.98	0.00	0.00	0.72	0.00
STMP156B	1.00	0.00	0.00	0.00	0.21	0.79	0.00	0.00	0.10	0.00
STMP1604	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.77	0.00
STMP161	1.00	0.01	0.00	0.00	0.00	0.99	0.00	0.00	0.02	0.00
STMP170	1.00	0.00	0.00	0.00	0.04	0.95	0.00	0.00	0.16	0.00
STMP183	1.00	0.00	0.00	0.00	0.34	0.66	0.00	0.00	0.28	0.00
STMP184	1.00	0.00	0.00	0.00	0.46	0.54	0.00	0.00	0.74	0.00
STMP20	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.90	0.00
STMP248	1.00	0.00	0.00	0.00	0.55	0.45	0.00	0.00	0.38	0.00
STMP249	1.00	0.00	0.00	0.00	0.49	0.51	0.00	0.00	0.72	0.00
STMP274	1.00	0.00	0.00	0.00	0.97	0.03	0.00	0.00	0.78	0.00
STMP276	1.00	0.00	0.00	0.00	0.04	0.96	0.00	0.00	0.93	0.00
STMP29	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
STMP308	1.00	0.00	0.00	0.00	0.06	0.94	0.00	0.00	0.89	0.00
STMP309	1.00	0.00	0.00	0.00	0.36	0.64	0.00	0.00	0.89	0.00
STMP393	1.00	0.00	0.00	0.00	0.03	0.97	0.00	0.00	0.19	0.00
STMP394	1.00	0.00	0.00	0.00	0.32	0.68	0.00	0.00	0.81	0.00
STMP427	1.00	0.00	0.00	0.00	0.32	0.68	0.00	0.00	0.61	0.00
STMP428	1.00	0.00	0.00	0.00	0.31	0.69	0.00	0.00	0.82	0.00
STMP435	1.00	0.00	0.00	0.00	0.27	0.73	0.00	0.00	0.81	0.00
STMP521	1.00	0.00	0.00	0.00	0.22	0.77	0.00	0.00	0.80	0.00
STMP524	1.00	0.00	0.00	0.00	0.04	0.95	0.00	0.00	0.93	0.00
STMP525	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.91	0.00
STMP554	1.00	0.00	0.00	0.00	0.28	0.72	0.00	0.00	0.10	0.00
STMP555	1.00	0.00	0.00	0.00	0.23	0.76	0.00	0.00	0.17	0.00
STMP556	1.00	0.00	0.00	0.00	0.25	0.75	0.00	0.00	0.83	0.00
STMP591	1.00	0.00	0.00	0.00	0.30	0.70	0.00	0.00	0.79	0.00
STMP594	1.00	0.00	0.00	0.00	0.47	0.53	0.00	0.00	0.35	0.00
STMP595	1.00	0.00	0.00	0.00	0.53	0.46	0.00	0.00	0.57	0.00
STMP692	1.00	0.00	0.00	0.00	0.85	0.15	0.00	0.00	0.73	0.00
STMP749	1.00	0.00	0.00	0.00	0.43	0.57	0.00	0.00	0.71	0.00
STMP77	1.00	0.00	0.00	0.00	0.20	0.79	0.00	0.00	0.83	0.00
STMP79	1.00	0.00	0.00	0.00	0.86	0.14	0.00	0.00	0.91	0.00
STMP800	1.00	0.01	0.00	0.00	0.54	0.46	0.00	0.00	0.72	0.00

STMP801	1.00	0.00	0.00	0.00	0.83	0.17	0.00	0.00	0.73	0.00
STMP823	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.92	0.00
STMP824	1.00	0.00	0.00	0.00	0.02	0.97	0.00	0.00	0.90	0.00
STMP850	1.00	0.00	0.00	0.00	0.18	0.82	0.00	0.00	0.08	0.00
STMP88	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.21	0.00
STMP89	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.63	0.00
STMP9	1.00	0.00	0.00	0.00	0.28	0.72	0.00	0.00	0.79	0.00
STMP90	1.00	0.00	0.00	0.00	0.41	0.59	0.00	0.00	0.60	0.00
STMP914	1.00	0.00	0.00	0.00	0.20	0.03	0.00	0.77	0.01	0.00
STMP915	1.00	0.00	0.00	0.00	0.28	0.71	0.00	0.00	0.32	0.00
STMP964	1.00	0.00	0.00	0.00	0.57	0.00	0.00	0.42	0.04	0.00
STMP98	1.00	0.00	0.00	0.00	0.18	0.82	0.00	0.00	0.85	0.00
STMP99	1.00	0.00	0.00	0.00	0.33	0.67	0.00	0.00	0.84	0.00
SYMP182	1.00	0.00	0.00	0.00	0.30	0.70	0.00	0.00	0.29	0.00

****
Conduit Surcharge Summary
****

Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C100	0.18	0.18	0.19	0.62	0.14
C101	0.10	0.10	0.10	0.09	0.08
C102	0.20	0.20	0.20	0.23	0.20
C105	0.01	0.01	0.01	0.13	0.01
C93	0.21	0.21	0.21	0.26	0.09
C98	0.08	0.08	0.08	0.01	0.01
STMP10	0.15	0.15	0.15	0.05	0.05
STMP101	0.01	0.01	0.01	0.10	0.01
STMP1086	0.80	0.80	0.80	0.83	0.80
STMP11	0.17	0.17	0.17	0.05	0.05
STMP1170	0.01	0.01	0.01	0.08	0.01
STMP118	0.01	0.01	0.01	0.53	0.01
STMP12	0.19	0.19	0.19	0.05	0.05
STMP120	0.52	0.52	0.52	0.67	0.52
STMP13	0.20	0.20	0.20	0.01	0.01
STMP14	0.23	0.23	0.23	0.01	0.01
STMP150	0.22	0.22	0.22	0.27	0.22
STMP1516	0.01	0.01	0.01	0.58	0.01
STMP155	0.01	0.01	0.01	0.16	0.01

STMP156B	0.01	0.01	0.01	0.06	0.01
STMP170	0.01	0.01	0.01	0.20	0.01
STMP183	0.38	0.38	0.38	0.01	0.01
STMP184	0.51	0.51	0.51	0.42	0.42
STMP20	0.19	0.19	0.19	0.01	0.01
STMP248	0.54	0.54	0.54	0.57	0.54
STMP249	0.51	0.51	0.51	0.57	0.50
STMP274	0.34	0.34	0.34	0.01	0.01
STMP308	0.07	0.07	0.07	0.11	0.07
STMP309	0.04	0.04	0.04	0.01	0.01
STMP393	0.01	0.01	0.01	0.32	0.01
STMP394	0.17	0.17	0.17	0.26	0.17
STMP427	0.27	0.27	0.27	0.01	0.01
STMP428	0.28	0.28	0.29	0.01	0.01
STMP435	0.32	0.32	0.32	0.33	0.31
STMP521	0.27	0.27	0.27	0.12	0.12
STMP554	0.32	0.32	0.32	0.34	0.32
STMP555	0.28	0.28	0.28	0.01	0.01
STMP556	0.29	0.29	0.29	0.01	0.01
STMP591	0.33	0.33	0.33	0.01	0.01
STMP594	0.43	0.43	0.43	0.45	0.43
STMP595	0.43	0.43	0.43	0.44	0.42
STMP692	0.59	0.59	0.59	0.01	0.01
STMP749	0.47	0.47	0.47	0.10	0.11
STMP77	0.18	0.18	0.18	0.03	0.04
STMP800	0.54	0.54	0.54	0.01	0.01
STMP801	0.49	0.49	0.49	0.01	0.01
STMP850	0.22	0.22	0.23	0.26	0.22
STMP9	0.24	0.24	0.24	0.09	0.09
STMP90	0.44	0.44	0.44	0.47	0.44
STMP914	0.22	0.22	0.22	0.11	0.10
STMP915	0.34	0.34	0.34	0.17	0.18
STMP964	0.53	0.53	0.53	0.58	0.53
STMP98	0.23	0.23	0.23	0.01	0.01
STMP99	0.24	0.24	0.24	0.27	0.24
SYMP182	0.35	0.35	0.35	0.20	0.20

****
Pumping Summary
****

	Min	Avg	Max	Total	Power	% Time Off

Pump	Percent Utilized	Number of Start-Ups	Flow LPS	Flow LPS	Flow LPS	Volume 10^6 ltr	Usage Kw-hr	Pump Curve Low	Pump Curve High
STMP187_PUMP	97.50	1	0.00	1673.03	5231.77	7.901	115.13	0.0	0.0

Analysis begun on: Thu Sep 01 15:36:32 2016
Analysis ended on: Thu Sep 01 15:36:32 2016
Total elapsed time: < 1 sec

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EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.007)
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WARNING 02: maximum depth increased for Node J77

***********************************************************
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 ..... LPS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... DYNWAVE
Starting Date ..... NOV-05-2015 00:00:00
Ending Date ..... NOV-05-2015 03:00:00
Antecedent Dry Days ..... 0.0
Report Time Step ..... 00:05:00
Wet Time Step ..... 00:05:00
Dry Time Step ..... 00:05:00
Routing Time Step ..... 30.00 sec
Variable Time Step ..... YES
Maximum Trials ..... 8
Head Tolerance ..... 0.004921 m


*************
Element Count
*************
Number of rain gages ..... 1
Number of subcatchments ... 55
Number of nodes ..... 100
```



```
Number of links ..... 91
Number of pollutants ..... 0
Number of land uses ..... 0


****************
Raingage Summary
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Name	Data Source	Data Type	Recording Interval
_Current	CityIDF_AES_1hr_100yr	VOLUME	5 min.

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********************
Subcatchment Summary
********************
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Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
S13-A	14.43	1550.00	70.00	2.5000	_Current	STMH286
S13-B	14.18	1060.00	70.00	1.9000	_Current	STMH188
S13-C	5.03	705.00	66.00	1.1000	_Current	STMH165
S13-D	2.85	632.00	77.00	3.2000	_Current	STMH161
S13-E	5.22	727.00	68.00	2.1000	_Current	STMH54
S13-F	7.67	569.00	50.00	0.5000	_Current	STMH178
S13-G	1.35	351.00	48.00	2.0000	_Current	STMH177
S13-H	1.52	473.00	57.00	3.1000	_Current	STMH398
S23-A	15.82	1095.00	69.00	1.6000	_Current	STMH116
S23-B	3.94	770.00	63.00	2.6000	_Current	DRCB64
S23-C	7.93	966.00	45.00	2.1000	_Current	DRCB40
S25-A	22.61	902.00	61.00	1.3000	_Current	STMH37
S25-B	6.70	737.00	55.00	1.7000	_Current	STMH225
S25-C	7.26	921.00	52.00	1.0000	_Current	STMH202
S25-D	10.70	1063.00	55.00	1.2000	_Current	STMH38
S25-E	10.16	1039.00	49.00	1.7000	_Current	J74
S25-F	41.71	2239.00	44.00	0.8000	_Current	J73
S25-G	3.30	633.00	49.00	1.9000	_Current	STMH205
S25-H	3.45	674.00	41.00	1.2000	_Current	STMH244
S25-I	20.24	1568.00	67.00	2.1000	_Current	J75
S25-J	24.53	1501.00	72.00	1.3000	_Current	J84
S32-A	54.37	400.00	50.00	0.5000	_Current	DRCB258
S32-B	5.37	400.00	50.00	0.5000	_Current	DRCB258
S38-A	16.25	1798.00	79.00	4.1000	_Current	J83
S38-B	18.36	1574.00	76.00	5.9000	_Current	J22

S38-C	8.37	802.00	79.00	4.5000	_Current	STMH78
S38-D	4.72	558.00	73.00	1.5000	_Current	STMH79
S38-Z1	136.40	7480.00	10.00	30.3000	_Current	J83
S38-Z2	5.70	1120.00	10.00	10.4000	_Current	J83
S3-A	8.53	955.00	63.00	2.9000	_Current	STMH12
S3-B	1.98	392.00	62.00	1.5000	_Current	STMH7
S3-C	3.55	735.00	61.00	1.3000	_Current	STMH6
S3-D	2.11	617.00	80.00	2.1000	_Current	STMH138
S3-E	5.92	588.00	76.00	17.2000	_Current	STMH246-DIV
S3-F	1.92	586.00	58.00	13.7000	_Current	J33
S3-G	3.26	655.00	60.00	13.0000	_Current	J87
S3-Z1	241.50	6550.00	10.00	34.0000	_Current	J33
S4-A	3.83	547.00	77.00	19.1000	_Current	J34
S4-B	4.08	379.00	80.00	1.5000	_Current	J37
S4-C	6.76	577.00	73.00	3.3000	_Current	STMH93
S5-A	8.95	974.00	64.00	2.6000	_Current	STMH133
S5-B	1.74	288.00	80.00	0.9000	_Current	STMH135
S5-C	2.50	464.00	80.00	0.6000	_Current	STMH131
S5-D	1.28	206.00	80.00	1.2000	_Current	STMH196
S5-E	4.01	610.00	79.00	2.3000	_Current	STMH4
S5-F	1.02	184.00	80.00	6.0000	_Current	STMH15
S5-G	4.10	727.00	77.00	0.3000	_Current	STMH2
S5-H	3.71	473.00	73.00	0.4000	_Current	STMH147
S5-I	10.27	885.00	71.00	6.2000	_Current	STMH212
S5-J	5.91	831.00	60.00	9.1000	_Current	J56
S5-K	28.67	1446.00	54.00	11.9000	_Current	J46
S5-Z1	87.70	4910.00	10.00	36.0000	_Current	J46
S7-A	7.47	684.00	56.00	0.9000	_Current	STMH23
S7-B	3.90	411.00	22.00	7.3000	_Current	STMH297
S13-I	2.12	370.00	60.00	1.0000	_Current	J1

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Node Summary
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Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J1	JUNCTION	444.92	2.90	0.0	
STMH286	JUNCTION	444.31	3.40	0.0	
STMH56	JUNCTION	443.98	3.20	0.0	
STMH54	JUNCTION	442.97	4.10	0.0	
STMH178	JUNCTION	441.29	3.20	0.0	
STMH177	JUNCTION	440.78	2.60	0.0	

STMH398	JUNCTION	440.42	3.10	0.0
STMH188	JUNCTION	446.02	3.40	0.0
STMH64	JUNCTION	445.56	3.40	0.0
STMH161	JUNCTION	444.09	3.00	0.0
STMH165	JUNCTION	443.56	3.60	0.0
STMH63	JUNCTION	445.08	3.30	0.0
STMH62	JUNCTION	444.98	2.80	0.0
STMH77	JUNCTION	454.15	2.20	0.0
STMH74	JUNCTION	452.88	3.20	0.0
STMH83	JUNCTION	441.98	3.00	0.0
STMH79	JUNCTION	441.38	2.60	0.0
STMH235	JUNCTION	442.44	1.90	0.0
J22	JUNCTION	442.75	1.90	0.0
STMH139	JUNCTION	455.33	1.80	0.0
STMH138	JUNCTION	454.88	1.60	0.0
STMH183	JUNCTION	454.27	1.60	0.0
STMH6	JUNCTION	453.29	2.16	0.0
STMH7	JUNCTION	452.73	3.27	0.0
STMH184	JUNCTION	451.89	4.40	0.0
STMH185	JUNCTION	451.75	4.44	0.0
STMH12	JUNCTION	451.69	4.40	0.0
J33	JUNCTION	459.08	2.50	0.0
J34	JUNCTION	455.36	2.50	0.0
STMH17	JUNCTION	453.99	1.60	0.0
STMH254	JUNCTION	453.24	2.60	0.0
STMH93	JUNCTION	451.88	3.90	0.0
J37	JUNCTION	453.49	2.00	0.0
J38	JUNCTION	454.36	2.50	0.0
STMH190	JUNCTION	449.72	4.70	0.0
STMH133	JUNCTION	450.28	4.40	0.0
STMH135	JUNCTION	451.01	3.80	0.0
STMH131	JUNCTION	451.21	3.70	0.0
STMH196	JUNCTION	451.69	3.00	0.0
STMH137	JUNCTION	453.28	2.60	0.0
STMH15	JUNCTION	454.27	1.80	0.0
J46	JUNCTION	455.31	5.00	0.0
STMH4	JUNCTION	452.57	3.10	0.0
STMH216	JUNCTION	452.15	3.10	0.0
STMH197	JUNCTION	451.95	2.70	0.0
STMH2	JUNCTION	453.06	1.80	0.0
STMH28	JUNCTION	453.20	1.90	0.0
STMH147	JUNCTION	453.75	2.90	0.0
STMH194	JUNCTION	454.00	1.80	0.0
STMH253	JUNCTION	454.49	2.00	0.0

J56	JUNCTION	455.38	2.60	0.0
STMH212	JUNCTION	454.85	1.20	0.0
STMH298	JUNCTION	440.27	1.60	0.0
STMH297	JUNCTION	440.64	3.90	0.0
STMH26	JUNCTION	452.49	5.00	0.0
STMH22	JUNCTION	454.19	3.70	0.0
STMH23	JUNCTION	454.38	3.30	0.0
STMH225	JUNCTION	450.19	2.44	0.0
STMH226	JUNCTION	448.06	3.04	0.0
STMH202	JUNCTION	446.71	3.02	0.0
STMH38	JUNCTION	444.70	2.75	0.0
STMH205	JUNCTION	441.90	3.20	0.0
STMH204	JUNCTION	441.59	3.16	0.0
STMH109	JUNCTION	440.60	1.70	0.0
STMH37	JUNCTION	450.62	2.50	0.0
STMH244	JUNCTION	440.10	1.50	0.0
STMH362	JUNCTION	439.80	1.70	0.0
J73	JUNCTION	439.28	1.50	0.0
J74	JUNCTION	438.27	1.50	0.0
J75	JUNCTION	437.62	1.50	0.0
J76	JUNCTION	437.10	1.80	0.0
J77	JUNCTION	442.00	2.00	0.0
J78	JUNCTION	438.00	1.50	0.0
J79	JUNCTION	454.78	4.70	0.0
STMH116	JUNCTION	454.00	2.30	0.0
DRCB64	JUNCTION	451.36	2.50	0.0
DRCB40	JUNCTION	445.61	2.50	0.0
J83	JUNCTION	458.49	2.80	0.0
J84	JUNCTION	437.36	1.50	0.0
J85	JUNCTION	457.37	2.50	0.0
STMH78	JUNCTION	446.63	2.90	0.0
J86	JUNCTION	458.46	2.50	0.0
J87	JUNCTION	458.57	2.50	0.0
J88	JUNCTION	458.25	2.50	0.0
J89	JUNCTION	456.77	2.50	0.0
J90	JUNCTION	459.23	2.50	0.0
J91	JUNCTION	457.00	2.50	0.0
DRCB258	JUNCTION	439.79	1.50	0.0
DRCB260	JUNCTION	438.95	1.50	0.0
J94	JUNCTION	436.84	1.50	0.0
STMH246-DIV	JUNCTION	455.92	2.50	0.0
DROF13	OUTFALL	440.21	0.90	0.0
DROF38	OUTFALL	440.85	1.05	0.0
DROF3	OUTFALL	451.34	0.75	0.0

DROF4	OUTFALL	451.61	0.75	0.0
DROF5	OUTFALL	449.45	1.20	0.0
DROF7	OUTFALL	440.02	0.60	0.0
DROF25	OUTFALL	440.00	2.00	0.0
DROF23	OUTFALL	443.90	0.35	0.0
DRFI2017	OUTFALL	436.42	1.00	0.0

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Link Summary
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Name	From Node	To Node	Type	Length	%Slope	Roughness
C100	STMH235	STMH83	CONDUIT	61.4	0.1515	0.0100
C101	STMH83	STMH79	CONDUIT	153.1	0.3430	0.0100
C102	STMH79	DROF38	CONDUIT	137.0	0.3831	0.0100
C103	STMH74	STMH78	CONDUIT	159.2	3.9237	0.0100
C104	STMH78	STMH83	CONDUIT	132.9	3.4096	0.0100
C105	J86	J85	CONDUIT	70.6	1.5447	0.0100
C106	J87	J88	CONDUIT	31.5	1.0172	0.0100
C107	J88	J85	CONDUIT	88.2	0.9974	0.0100
C108	J89	J34	CONDUIT	101.2	1.3931	0.0100
C109	J90	J91	CONDUIT	52.0	4.2949	0.0100
C110	J91	J34	CONDUIT	104.7	1.5661	0.0100
C93	J46	J79	CONDUIT	35.5	1.4931	0.0100
C96	J83	STMH77	CONDUIT	202.0	2.1231	0.0100
C98	J33	J86	CONDUIT	16.4	3.7740	0.0100
C99	J85	STMH246-DIV	CONDUIT	79.7	1.8201	0.0100
DRDI117	J94	DRFI2017	CONDUIT	41.6	1.0097	0.0100
DRDI27	J73	J74	CONDUIT	251.8	0.4012	0.0100
DRDI28	J74	J78	CONDUIT	67.3	0.4013	0.0100
DRDI4	J75	J76	CONDUIT	175.3	0.2966	0.0100
DRDI5	J84	J76	CONDUIT	65.5	0.3966	0.0100
DRDI6	J77	DROF25	CONDUIT	153.4	1.3036	0.0100
STMP10	STMH188	STMH64	CONDUIT	45.5	1.0110	0.0100
STMP100	STMH196	STMH131	CONDUIT	86.4	0.5557	0.0100
STMP101	STMH131	STMH135	CONDUIT	90.9	0.2201	0.0100
STMP103	STMH197	STMH196	CONDUIT	47.1	0.5524	0.0100
STMP106	STMH135	STMH133	CONDUIT	89.7	0.8139	0.0100
STMP107	STMH133	STMH190	CONDUIT	86.0	0.6511	0.0100
STMP1086	DRCB40	DROF23	CONDUIT	262.5	0.6514	0.0100
STMP11	STMH64	STMH63	CONDUIT	47.9	1.0026	0.0100
STMP1170	DRCB260	J94	CONDUIT	241.7	0.8730	0.0100
STMP118	STMH28	STMH2	CONDUIT	116.3	0.1204	0.0100

STMP12	STMH63	STMH62	CONDUIT	10.2	0.9824	0.0100
STMP120	STMH147	STMH28	CONDUIT	110.1	0.4994	0.0100
STMP123	STMH2	STMH197	CONDUIT	88.5	1.2548	0.0100
STMP1289	STMH26	STMH297	CONDUIT	27.8	47.1005	0.0100
STMP13	STMH62	STMH161	CONDUIT	89.3	0.9962	0.0100
STMP131	STMH190	DROF5	CONDUIT	54.9	0.4920	0.0100
STMP14	STMH161	STMH54	CONDUIT	92.7	1.2078	0.0100
STMP150	STMH37	STMH225	CONDUIT	86.2	0.4990	0.0100
STMP1513	DRCB258	DRCB260	CONDUIT	24.9	3.3754	0.0100
STMP1516	STMH362	J73	CONDUIT	33.6	0.4161	0.0100
STMP155	STMH23	STMH22	CONDUIT	82.8	0.2294	0.0100
STMP156A	STMH298	DROF7	CONDUIT	50.2	0.4979	0.0100
STMP156B	STMH297	STMH298	CONDUIT	136.3	0.2715	0.0100
STMP1604	STMH398	DROF13	CONDUIT	20.4	1.0300	0.0100
STMP161	STMH22	STMH26	CONDUIT	57.4	2.9625	0.0100
STMP170	J78	J75	CONDUIT	31.2	1.2184	0.0100
STMP183	STMH38	STMH205	CONDUIT	133.6	2.0956	0.0100
STMP184	STMH204	STMH109	CONDUIT	96.4	1.0273	0.0100
STMP20	J1	STMH286	CONDUIT	121.6	0.5014	0.0100
STMP248	STMH109	STMH244	CONDUIT	132.7	0.3768	0.0100
STMP249	STMH244	STMH362	CONDUIT	69.7	0.4307	0.0100
STMP274	J56	STMH253	CONDUIT	178.1	0.4998	0.0100
STMP276	STMH254	STMH93	CONDUIT	140.0	0.9714	0.0100
STMP29	STMH77	STMH74	CONDUIT	35.8	3.4248	0.0100
STMP308	STMH116	DRCB64	CONDUIT	71.1	3.7156	0.0100
STMP309	DRCB64	DRCB40	CONDUIT	215.4	2.6704	0.0100
STMP393	STMH177	STMH398	CONDUIT	105.6	0.3409	0.0100
STMP394	STMH178	STMH177	CONDUIT	124.0	0.4112	0.0100
STMP427	STMH56	STMH165	CONDUIT	112.2	0.3745	0.0100
STMP428	STMH165	STMH54	CONDUIT	92.0	0.6415	0.0100
STMP435	STMH54	STMH178	CONDUIT	132.3	1.2698	0.0100
STMP521	STMH139	STMH138	CONDUIT	19.0	2.3653	0.0100
STMP524	J38	STMH17	CONDUIT	16.1	2.3002	0.0100
STMP525	J34	J38	CONDUIT	41.6	2.4063	0.0100
STMP554	STMH6	STMH7	CONDUIT	75.5	0.7417	0.0100
STMP555	STMH138	STMH183	CONDUIT	46.0	1.3271	0.0100
STMP556	STMH183	STMH6	CONDUIT	54.9	1.7850	0.0100
STMP591	STMH7	STMH184	CONDUIT	43.1	1.9502	0.0100
STMP594	STMH184	STMH185	CONDUIT	34.9	0.4014	0.0100
STMP595	STMH185	STMH12	CONDUIT	14.4	0.4170	0.0100
STMP692	STMH194	STMH147	CONDUIT	49.5	0.5054	0.0100
STMP749	STMH205	STMH204	CONDUIT	13.4	2.3175	0.0100
STMP77	STMH246-DIV	STMH139	CONDUIT	27.8	2.1197	0.0100
STMP79	STMH17	J37	CONDUIT	94.2	0.5307	0.0100

STMP800	STMH253	STMH194	CONDUIT	97.4	0.5029	0.0100
STMP801	STMH212	STMH253	CONDUIT	72.7	0.4952	0.0100
STMP823	STMH216	STMH196	CONDUIT	67.8	0.6789	0.0100
STMP824	STMH4	STMH216	CONDUIT	62.6	0.6710	0.0100
STMP850	J79	STMH15	CONDUIT	33.9	1.5042	0.0100
STMP88	J37	STMH254	CONDUIT	45.8	0.5460	0.0100
STMP89	STMH93	DROF4	CONDUIT	27.1	0.9949	0.0100
STMP9	STMH286	STMH56	CONDUIT	62.1	0.5310	0.0100
STMP90	STMH12	DROF3	CONDUIT	69.3	0.5051	0.0100
STMP914	STMH225	STMH226	CONDUIT	43.8	1.6658	0.0100
STMP915	STMH226	STMH202	CONDUIT	128.5	1.0510	0.0100
STMP964	J22	STMH235	CONDUIT	89.5	0.2929	0.0100
STMP98	STMH15	STMH137	CONDUIT	29.4	3.3716	0.0100
STMP99	STMH137	STMH196	CONDUIT	97.5	1.6318	0.0100
SYMP182	STMH202	STMH38	CONDUIT	141.2	1.4237	0.0100
STMP187_PUMP	J76	J77	IDEAL PUMP			

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C100	CIRCULAR	0.45	0.16	0.11	0.45	1	144.26
C101	CIRCULAR	1.20	1.13	0.30	1.20	1	2968.54
C102	CIRCULAR	1.05	0.87	0.26	1.05	1	2197.46
C103	CIRCULAR	1.05	0.87	0.26	1.05	1	7032.30
C104	CIRCULAR	1.05	0.87	0.26	1.05	1	6555.37
C105	CIRCULAR	0.75	0.44	0.19	0.75	1	1798.88
C106	CIRCULAR	0.75	0.44	0.19	0.75	1	1459.75
C107	CIRCULAR	0.75	0.44	0.19	0.75	1	1445.50
C108	CIRCULAR	0.90	0.64	0.23	0.90	1	2777.92
C109	CIRCULAR	0.90	0.64	0.23	0.90	1	4877.52
C110	CIRCULAR	0.90	0.64	0.23	0.90	1	2945.34
C93	CIRCULAR	0.60	0.28	0.15	0.60	2	975.43
C96	CIRCULAR	1.05	0.87	0.26	1.05	1	5172.85
C98	CIRCULAR	0.90	0.64	0.23	0.90	1	4572.17
C99	TRAPEZOIDAL	2.00	5.00	0.83	4.00	1	59738.45
DRDI117	TRAPEZOIDAL	1.00	3.60	0.52	6.60	1	23389.71
DRDI27	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76654.24
DRDI28	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76659.66
DRDI4	TRAPEZOIDAL	1.50	14.25	0.98	14.00	1	76761.44
DRDI5	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76218.52

DRDI6	TRAPEZOIDAL	2.00	12.00	0.95	12.00	1	132287.57
STMP10	CIRCULAR	0.60	0.28	0.15	0.60	1	802.66
STMP100	CIRCULAR	1.20	1.13	0.30	1.20	1	3778.42
STMP101	CIRCULAR	1.20	1.13	0.30	1.20	1	2378.05
STMP103	CIRCULAR	0.90	0.64	0.23	0.90	1	1749.20
STMP106	CIRCULAR	1.20	1.13	0.30	1.20	1	4572.62
STMP107	CIRCULAR	1.20	1.13	0.30	1.20	1	4089.94
STMP1086	CIRCULAR	0.35	0.10	0.09	0.35	1	153.05
STMP11	CIRCULAR	0.60	0.28	0.15	0.60	1	799.28
STMP1170	CIRCULAR	0.60	0.28	0.15	0.60	1	745.86
STMP118	CIRCULAR	0.60	0.28	0.15	0.60	1	276.99
STMP12	CIRCULAR	0.60	0.28	0.15	0.60	1	791.19
STMP120	CIRCULAR	0.40	0.13	0.10	0.40	1	191.34
STMP123	CIRCULAR	0.75	0.44	0.19	0.75	1	1621.26
STMP1289	CIRCULAR	0.40	0.13	0.10	0.40	1	1858.16
STMP13	CIRCULAR	0.60	0.28	0.15	0.60	1	796.76
STMP131	CIRCULAR	1.20	1.13	0.30	1.20	1	3555.25
STMP14	CIRCULAR	0.60	0.28	0.15	0.60	1	877.28
STMP150	CIRCULAR	0.60	0.28	0.15	0.60	1	563.87
STMP1513	CIRCULAR	0.80	0.50	0.20	0.80	1	3158.49
STMP1516	CIRCULAR	0.60	0.28	0.15	0.60	1	514.90
STMP155	CIRCULAR	0.50	0.20	0.12	0.50	1	235.13
STMP156A	CIRCULAR	0.60	0.28	0.15	0.60	1	563.28
STMP156B	CIRCULAR	0.60	0.28	0.15	0.60	1	415.93
STMP1604	CIRCULAR	0.90	0.64	0.23	0.90	1	2388.56
STMP161	CIRCULAR	0.50	0.20	0.12	0.50	1	844.93
STMP170	CIRCULAR	0.80	0.50	0.20	0.80	3	1897.65
STMP183	CIRCULAR	0.60	0.28	0.15	0.60	1	1155.59
STMP184	CIRCULAR	0.60	0.28	0.15	0.60	1	809.10
STMP20	CIRCULAR	0.50	0.20	0.12	0.50	1	347.62
STMP248	CIRCULAR	0.60	0.28	0.15	0.60	1	489.98
STMP249	CIRCULAR	0.60	0.28	0.15	0.60	1	523.90
STMP274	CIRCULAR	0.60	0.28	0.15	0.60	1	564.32
STMP276	CIRCULAR	0.75	0.44	0.19	0.75	1	1426.50
STMP29	CIRCULAR	1.05	0.87	0.26	1.05	1	6569.95
STMP308	CIRCULAR	0.45	0.16	0.11	0.45	1	714.48
STMP309	CIRCULAR	0.60	0.28	0.15	0.60	1	1304.47
STMP393	CIRCULAR	0.90	0.64	0.23	0.90	1	1374.18
STMP394	CIRCULAR	0.90	0.64	0.23	0.90	1	1509.26
STMP427	CIRCULAR	0.68	0.36	0.17	0.68	1	668.74
STMP428	CIRCULAR	0.68	0.36	0.17	0.68	1	875.31
STMP435	CIRCULAR	0.68	0.36	0.17	0.68	1	1231.44
STMP521	CIRCULAR	0.75	0.44	0.19	0.75	1	2225.98
STMP524	CIRCULAR	0.75	0.44	0.19	0.75	1	2195.09

STMP525	CIRCULAR	0.75	0.44	0.19	0.75	1	2245.15
STMP554	CIRCULAR	0.75	0.44	0.19	0.75	1	1246.52
STMP555	CIRCULAR	0.75	0.44	0.19	0.75	1	1667.32
STMP556	CIRCULAR	0.75	0.44	0.19	0.75	1	1933.72
STMP591	CIRCULAR	0.75	0.44	0.19	0.75	1	2021.23
STMP594	CIRCULAR	0.75	0.44	0.19	0.75	1	916.96
STMP595	CIRCULAR	0.75	0.44	0.19	0.75	1	934.59
STMP692	CIRCULAR	0.50	0.20	0.12	0.50	1	348.98
STMP749	CIRCULAR	0.60	0.28	0.15	0.60	1	1215.23
STMP77	CIRCULAR	0.90	0.64	0.23	0.90	1	3426.60
STMP79	CIRCULAR	0.75	0.44	0.19	0.75	1	1054.36
STMP800	CIRCULAR	0.50	0.20	0.12	0.50	1	348.14
STMP801	CIRCULAR	0.50	0.20	0.12	0.50	1	345.45
STMP823	CIRCULAR	0.60	0.28	0.15	0.60	1	657.72
STMP824	CIRCULAR	0.60	0.28	0.15	0.60	1	653.92
STMP850	CIRCULAR	0.60	0.28	0.15	0.60	1	979.02
STMP88	CIRCULAR	0.75	0.44	0.19	0.75	1	1069.45
STMP89	CIRCULAR	0.75	0.44	0.19	0.75	1	1443.65
STMP9	CIRCULAR	0.68	0.36	0.17	0.68	1	796.33
STMP90	CIRCULAR	0.75	0.44	0.19	0.75	1	1028.59
STMP914	CIRCULAR	0.60	0.28	0.15	0.60	1	1030.27
STMP915	CIRCULAR	0.60	0.28	0.15	0.60	1	818.35
STMP964	CIRCULAR	0.45	0.16	0.11	0.45	1	200.59
STMP98	CIRCULAR	0.60	0.28	0.15	0.60	1	1465.75
STMP99	CIRCULAR	0.60	0.28	0.15	0.60	1	1019.72
SYMP182	CIRCULAR	0.60	0.28	0.15	0.60	1	952.46

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Control Actions Taken
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********** Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	17.802	19.000
Evaporation Loss	0.000	0.000
Infiltration Loss	11.484	12.257
Surface Runoff	5.981	6.384
Final Surface Storage	0.526	0.561
Continuity Error (%)	-1.061	

********** Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	5.978	59.780
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	4.337	43.374
Internal Outflow	1.637	16.371
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.005	0.049
Continuity Error (%)	-0.024	

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Time-Step Critical Elements
****
Link STMP749 (31.63%)
Link C98 (20.12%)
Link STMP1513 (14.03%)
Link STMP12 (13.85%)
Link STMP1604 (4.86%)

****
Highest Flow Instability Indexes
****
Link STMP595 (24)
Link STMP594 (18)
Link STMP101 (16)
Link STMP1516 (16)
Link STMP591 (13)

****
Routing Time Step Summary
****
Minimum Time Step : 0.50 sec
Average Time Step : 4.01 sec
Maximum Time Step : 30.00 sec

Percent in Steady State : 0.00
Average Iterations per Step : 5.01
Percent Not Converging : 33.00

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Subcatchment Runoff Summary
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Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
S13-A	19.00	0.00	0.00	5.70	12.69	1.83	1927.05	0.668
S13-B	19.00	0.00	0.00	5.70	12.61	1.79	1726.30	0.664
S13-C	19.00	0.00	0.00	6.46	11.95	0.60	626.04	0.629
S13-D	19.00	0.00	0.00	4.37	14.09	0.40	440.76	0.742
S13-E	19.00	0.00	0.00	6.08	12.35	0.64	692.03	0.650
S13-F	19.00	0.00	0.00	9.50	8.96	0.69	602.35	0.472
S13-G	19.00	0.00	0.00	9.88	8.82	0.12	131.01	0.464
S13-H	19.00	0.00	0.00	8.17	10.50	0.16	175.41	0.553
S23-A	19.00	0.00	0.00	5.89	12.40	1.96	1823.25	0.653
S23-B	19.00	0.00	0.00	7.03	11.52	0.45	498.14	0.606
S23-C	19.00	0.00	0.00	10.45	8.20	0.65	709.29	0.432
S25-A	19.00	0.00	0.00	7.41	10.87	2.46	1885.26	0.572
S25-B	19.00	0.00	0.00	8.55	9.98	0.67	709.11	0.525
S25-C	19.00	0.00	0.00	9.12	9.42	0.68	720.72	0.496
S25-D	19.00	0.00	0.00	8.55	9.94	1.06	1089.19	0.523
S25-E	19.00	0.00	0.00	9.69	8.89	0.90	962.44	0.468
S25-F	19.00	0.00	0.00	10.64	7.89	3.29	2922.11	0.415
S25-G	19.00	0.00	0.00	9.69	8.97	0.30	325.16	0.472
S25-H	19.00	0.00	0.00	11.21	7.50	0.26	284.20	0.395
S25-I	19.00	0.00	0.00	6.27	12.09	2.45	2430.55	0.636
S25-J	19.00	0.00	0.00	5.32	12.89	3.16	2694.64	0.678
S32-A	19.00	0.00	0.00	9.50	8.13	4.42	1333.29	0.428
S32-B	19.00	0.00	0.00	9.50	8.96	0.48	422.33	0.472
S38-A	19.00	0.00	0.00	3.99	14.34	2.33	2492.16	0.755
S38-B	19.00	0.00	0.00	4.56	13.79	2.53	2699.50	0.726
S38-C	19.00	0.00	0.00	3.99	14.33	1.20	1270.47	0.754
S38-D	19.00	0.00	0.00	5.13	13.20	0.62	637.97	0.695
S38-Z1	19.00	0.00	0.00	17.10	1.85	2.52	2764.35	0.097
S38-Z2	19.00	0.00	0.00	17.10	1.85	0.11	115.50	0.097
S3-A	19.00	0.00	0.00	7.03	11.45	0.98	1049.49	0.603

S3-B	19.00	0.00	0.00	7.22	11.30	0.22	243.97	0.595
S3-C	19.00	0.00	0.00	7.41	11.12	0.39	430.12	0.585
S3-D	19.00	0.00	0.00	3.80	14.64	0.31	339.28	0.771
S3-E	19.00	0.00	0.00	4.56	13.91	0.82	904.82	0.732
S3-F	19.00	0.00	0.00	7.98	10.72	0.21	225.68	0.564
S3-G	19.00	0.00	0.00	7.60	11.07	0.36	396.26	0.583
S3-Z1	19.00	0.00	0.00	17.10	1.85	4.46	4893.91	0.097
S4-A	19.00	0.00	0.00	4.37	14.16	0.54	596.52	0.745
S4-B	19.00	0.00	0.00	3.80	14.40	0.59	562.68	0.758
S4-C	19.00	0.00	0.00	5.13	13.21	0.89	923.99	0.695
S5-A	19.00	0.00	0.00	6.84	11.62	1.04	1108.23	0.611
S5-B	19.00	0.00	0.00	3.80	14.46	0.25	257.27	0.761
S5-C	19.00	0.00	0.00	3.80	14.45	0.36	363.66	0.760
S5-D	19.00	0.00	0.00	3.80	14.48	0.19	192.80	0.762
S5-E	19.00	0.00	0.00	3.99	14.35	0.58	616.70	0.755
S5-F	19.00	0.00	0.00	3.80	14.65	0.15	164.18	0.771
S5-G	19.00	0.00	0.00	4.37	13.84	0.57	526.38	0.728
S5-H	19.00	0.00	0.00	5.13	13.10	0.49	433.00	0.689
S5-I	19.00	0.00	0.00	5.51	12.90	1.33	1423.85	0.679
S5-J	19.00	0.00	0.00	7.60	11.02	0.65	716.35	0.580
S5-K	19.00	0.00	0.00	8.74	9.82	2.82	3038.99	0.517
S5-Z1	19.00	0.00	0.00	17.10	1.85	1.62	1777.38	0.097
S7-A	19.00	0.00	0.00	8.36	10.09	0.75	736.86	0.531
S7-B	19.00	0.00	0.00	14.82	4.06	0.16	173.84	0.214
S13-I	19.00	0.00	0.00	0.85	16.25	0.34	286.28	0.855

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Node Depth Summary
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J1	JUNCTION	0.76	2.90	447.82	0 00:16
STMH286	JUNCTION	0.99	3.40	447.71	0 00:15
STMH56	JUNCTION	1.00	3.20	447.18	0 00:15
STMH54	JUNCTION	1.15	4.00	446.97	0 00:16
STMH178	JUNCTION	0.71	3.20	444.49	0 00:16
STMH177	JUNCTION	0.59	2.60	443.38	0 00:16
STMH398	JUNCTION	0.38	1.09	441.51	0 00:18
STMH188	JUNCTION	0.80	3.40	449.42	0 00:16

STMH64	JUNCTION	0.79	3.40	448.96	0	00:16
STMH161	JUNCTION	0.89	3.00	447.09	0	00:15
STMH165	JUNCTION	1.06	3.60	447.16	0	00:15
STMH63	JUNCTION	0.78	3.14	448.22	0	00:16
STMH62	JUNCTION	0.78	2.80	447.78	0	00:16
STMH77	JUNCTION	0.22	0.73	454.88	0	00:20
STMH74	JUNCTION	0.21	0.76	453.63	0	00:20
STMH83	JUNCTION	0.74	3.00	444.98	0	00:15
STMH79	JUNCTION	0.76	2.60	443.98	0	00:15
STMH235	JUNCTION	0.73	1.90	444.34	0	00:12
J22	JUNCTION	0.94	1.90	444.65	0	00:11
STMH139	JUNCTION	0.63	1.80	457.13	0	00:13
STMH138	JUNCTION	0.65	1.60	456.48	0	00:13
STMH183	JUNCTION	0.66	1.60	455.87	0	00:13
STMH6	JUNCTION	0.88	2.16	455.45	0	00:12
STMH7	JUNCTION	0.77	3.27	456.00	0	00:13
STMH184	JUNCTION	0.97	3.15	455.04	0	00:13
STMH185	JUNCTION	0.86	2.97	454.72	0	00:13
STMH12	JUNCTION	0.82	3.30	454.99	0	00:13
J33	JUNCTION	0.43	2.50	461.58	0	00:18
J34	JUNCTION	0.09	0.26	455.62	0	00:20
STMH17	JUNCTION	0.13	0.40	454.39	0	00:20
STMH254	JUNCTION	0.17	0.54	453.78	0	00:21
STMH93	JUNCTION	0.25	1.47	453.35	0	00:19
J37	JUNCTION	0.20	0.64	454.13	0	00:20
J38	JUNCTION	0.09	0.28	454.64	0	00:20
STMH190	JUNCTION	0.49	1.68	451.40	0	00:19
STMH133	JUNCTION	0.46	2.07	452.35	0	00:19
STMH135	JUNCTION	0.38	1.04	452.05	0	00:21
STMH131	JUNCTION	0.51	1.27	452.48	0	00:21
STMH196	JUNCTION	0.41	0.91	452.60	0	00:21
STMH137	JUNCTION	0.70	2.03	455.31	0	00:13
STMH15	JUNCTION	0.61	1.80	456.07	0	00:13
J46	JUNCTION	1.09	5.00	460.31	0	00:15
STMH4	JUNCTION	0.15	1.69	454.26	0	00:19
STMH216	JUNCTION	0.17	1.31	453.46	0	00:19
STMH197	JUNCTION	0.27	0.66	452.61	0	00:20
STMH2	JUNCTION	0.20	0.39	453.45	0	00:20
STMH28	JUNCTION	0.32	0.55	453.75	0	00:21
STMH147	JUNCTION	1.02	2.90	456.65	0	00:13
STMH194	JUNCTION	0.91	1.80	455.80	0	00:14
STMH253	JUNCTION	0.80	2.00	456.49	0	00:14
J56	JUNCTION	0.45	2.60	457.98	0	00:15
STMH212	JUNCTION	0.60	1.20	456.05	0	00:13

STMH298	JUNCTION	0.22	1.60	441.87	0	00:18
STMH297	JUNCTION	0.32	3.31	443.95	0	00:17
STMH26	JUNCTION	0.06	0.17	452.66	0	00:20
STMH22	JUNCTION	0.13	0.40	454.59	0	00:20
STMH23	JUNCTION	0.33	2.42	456.80	0	00:16
STMH225	JUNCTION	0.66	2.44	452.63	0	00:16
STMH226	JUNCTION	1.15	3.04	451.10	0	00:16
STMH202	JUNCTION	1.17	3.02	449.73	0	00:15
STMH38	JUNCTION	1.16	2.75	447.45	0	00:15
STMH205	JUNCTION	1.34	3.20	445.10	0	00:14
STMH204	JUNCTION	1.38	3.16	444.75	0	00:14
STMH109	JUNCTION	0.93	1.70	442.30	0	00:14
STMH37	JUNCTION	0.84	2.50	453.12	0	00:16
STMH244	JUNCTION	0.67	1.50	441.60	0	00:14
STMH362	JUNCTION	0.47	1.70	441.50	0	00:15
J73	JUNCTION	0.13	0.31	439.59	0	00:20
J74	JUNCTION	0.15	0.39	438.66	0	00:21
J75	JUNCTION	0.18	0.43	438.05	0	00:21
J76	JUNCTION	0.00	0.00	437.10	0	00:00
J77	JUNCTION	0.38	0.74	442.74	0	00:20
J78	JUNCTION	0.23	0.54	438.54	0	00:21
J79	JUNCTION	1.13	4.66	459.44	0	00:22
STMH116	JUNCTION	0.51	2.30	456.30	0	00:16
DRCB64	JUNCTION	0.33	2.50	453.86	0	00:17
DRCB40	JUNCTION	1.44	2.50	448.11	0	00:13
J83	JUNCTION	0.25	0.89	459.38	0	00:20
J84	JUNCTION	0.10	0.26	437.62	0	00:20
J85	JUNCTION	0.16	0.43	457.80	0	00:20
STMH78	JUNCTION	0.31	2.90	449.54	0	00:19
J86	JUNCTION	0.54	2.50	460.96	0	00:15
J87	JUNCTION	0.09	0.27	458.84	0	00:20
J88	JUNCTION	0.09	0.27	458.52	0	00:20
J89	JUNCTION	0.00	0.00	456.77	0	00:00
J90	JUNCTION	0.00	0.00	459.23	0	00:00
J91	JUNCTION	0.00	0.00	457.00	0	00:00
DRCB258	JUNCTION	0.48	1.34	441.13	0	00:19
DRCB260	JUNCTION	0.93	1.50	440.45	0	00:18
J94	JUNCTION	0.18	0.23	437.07	0	00:19
STMH246-DIV	JUNCTION	0.55	2.09	458.01	0	00:20
DROF13	OUTFALL	0.37	0.90	441.11	0	00:17
DROF38	OUTFALL	0.53	1.05	441.90	0	00:14
DROF3	OUTFALL	0.44	0.75	452.09	0	00:13
DROF4	OUTFALL	0.24	0.75	452.36	0	00:18
DROF5	OUTFALL	0.48	1.20	450.65	0	00:18

DROF7	OUTFALL	0.21	0.60	440.62	0	00:18
DROF25	OUTFALL	0.38	0.74	440.74	0	00:20
DROF23	OUTFALL	0.27	0.35	444.25	0	00:12
DRFI2017	OUTFALL	0.18	0.23	436.65	0	00:20

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	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	286.04	502.68	0 00:16	0.344	0.36	-0.299
STMH286	JUNCTION	1925.46	2060.37	0 00:20	1.83	2.12	-0.031
STMH56	JUNCTION	0.00	1009.18	0 00:26	0	1.8	0.007
STMH54	JUNCTION	691.48	1771.64	0 00:17	0.645	3.93	0.007
STMH178	JUNCTION	601.79	2299.65	0 00:20	0.687	4.62	-0.002
STMH177	JUNCTION	130.93	2430.76	0 00:20	0.119	4.74	-0.013
STMH398	JUNCTION	175.30	2605.74	0 00:20	0.16	4.9	0.009
STMH188	JUNCTION	1724.75	1724.75	0 00:20	1.79	1.79	-0.015
STMH64	JUNCTION	0.00	1005.03	0 00:22	0	1.61	-0.095
STMH161	JUNCTION	440.45	1141.99	0 00:20	0.402	1.8	-0.031
STMH165	JUNCTION	625.52	942.28	0 00:15	0.601	1.86	-0.018
STMH63	JUNCTION	0.00	1004.86	0 00:22	0	1.61	0.008
STMH62	JUNCTION	0.00	1005.48	0 00:19	0	1.61	-0.034
STMH77	JUNCTION	0.00	5319.96	0 00:20	0	4.95	0.001
STMH74	JUNCTION	0.00	5349.60	0 00:20	0	4.95	-0.001
STMH83	JUNCTION	0.00	6512.63	0 00:20	0	7	0.114
STMH79	JUNCTION	637.42	4732.18	0 00:20	0.623	7.05	-0.105
STMH235	JUNCTION	0.00	596.44	0 00:20	0	1.15	-0.215
J22	JUNCTION	2697.33	2697.33	0 00:20	2.53	2.53	0.155
STMH139	JUNCTION	0.00	4122.72	0 00:20	0	5.25	-0.010
STMH138	JUNCTION	339.04	3013.96	0 00:20	0.309	4.93	0.004
STMH183	JUNCTION	0.00	1667.25	0 00:23	0	3.73	-0.019
STMH6	JUNCTION	429.80	1695.62	0 00:20	0.395	3.64	0.014
STMH7	JUNCTION	243.78	1627.60	0 00:39	0.224	3.72	-0.043
STMH184	JUNCTION	0.00	1627.59	0 00:39	0	3.72	0.001
STMH185	JUNCTION	0.00	1627.66	0 00:39	0	3.72	-0.023
STMH12	JUNCTION	1048.66	2462.17	0 00:20	0.977	4.7	0.013
J33	JUNCTION	5116.56	5116.56	0 00:20	4.67	4.67	-0.002

J34	JUNCTION	596.13	596.13	0	00:20	0.543	0.542	0.018
STMH17	JUNCTION	0.00	587.27	0	00:20	0	0.542	-0.016
STMH254	JUNCTION	0.00	1105.99	0	00:20	0	1.13	0.050
STMH93	JUNCTION	923.21	1938.93	0	00:20	0.893	2.02	-0.004
J37	JUNCTION	562.18	1122.98	0	00:20	0.588	1.13	0.013
J38	JUNCTION	0.00	584.27	0	00:20	0	0.542	0.002
STMH190	JUNCTION	0.00	4384.02	0	00:21	0	7.01	0.011
STMH133	JUNCTION	1107.34	4383.36	0	00:21	1.04	7.01	0.008
STMH135	JUNCTION	257.05	3452.83	0	00:21	0.252	5.97	0.021
STMH131	JUNCTION	363.34	3297.08	0	00:20	0.361	5.72	0.008
STMH196	JUNCTION	192.64	2958.27	0	00:20	0.185	5.37	-0.016
STMH137	JUNCTION	0.00	1385.68	0	00:14	0	2.95	0.013
STMH15	JUNCTION	164.06	2677.06	0	00:20	0.149	3.98	-0.011
J46	JUNCTION	4812.98	4812.98	0	00:20	4.44	4.44	0.001
STMH4	JUNCTION	616.21	616.21	0	00:20	0.576	0.575	0.001
STMH216	JUNCTION	0.00	616.29	0	00:20	0	0.575	-0.028
STMH197	JUNCTION	0.00	881.50	0	00:20	0	1.65	0.036
STMH2	JUNCTION	525.90	892.89	0	00:20	0.567	1.65	0.011
STMH28	JUNCTION	0.00	374.84	0	00:17	0	1.08	0.059
STMH147	JUNCTION	432.60	432.60	0	00:20	0.486	1.09	0.026
STMH194	JUNCTION	0.00	441.96	0	00:20	0	0.818	-0.079
STMH253	JUNCTION	0.00	715.83	0	00:20	0	0.944	-0.017
J56	JUNCTION	715.88	715.88	0	00:20	0.652	0.651	-0.175
STMH212	JUNCTION	1422.73	1756.45	0	00:20	1.33	1.45	0.021
STMH298	JUNCTION	0.00	897.84	0	00:20	0	0.912	-0.001
STMH297	JUNCTION	173.74	897.89	0	00:20	0.158	0.912	0.008
STMH26	JUNCTION	0.00	730.68	0	00:20	0	0.754	0.004
STMH22	JUNCTION	0.00	736.12	0	00:20	0	0.754	0.018
STMH23	JUNCTION	736.20	736.20	0	00:20	0.754	0.754	-0.002
STMH225	JUNCTION	708.54	1409.72	0	00:20	0.669	2.61	0.108
STMH226	JUNCTION	0.00	1409.82	0	00:20	0	2.6	-0.131
STMH202	JUNCTION	720.13	1544.50	0	00:20	0.684	2.8	-0.009
STMH38	JUNCTION	1088.26	2102.63	0	00:20	1.06	3.64	0.004
STMH205	JUNCTION	324.93	1383.48	0	00:20	0.296	3.27	-0.022
STMH204	JUNCTION	0.00	1291.08	0	00:22	0	3.26	-0.003
STMH109	JUNCTION	0.00	1272.80	0	00:22	0	3.25	0.034
STMH37	JUNCTION	1883.44	1883.44	0	00:20	2.46	2.46	0.024
STMH244	JUNCTION	284.00	896.38	0	00:20	0.259	2.49	-0.020
STMH362	JUNCTION	0.00	896.31	0	00:20	0	2.49	-0.006
J73	JUNCTION	2919.39	3815.91	0	00:20	3.29	5.78	0.032
J74	JUNCTION	961.67	4690.83	0	00:20	0.904	6.68	0.102
J75	JUNCTION	2428.41	6606.83	0	00:21	2.45	9.12	0.050
J76	JUNCTION	0.00	9071.27	0	00:21	0	12.3	0.000
J77	JUNCTION	0.00	9071.27	0	00:21	0	12.3	0.005

J78	JUNCTION	0.00	4576.92	0	00:21	0	6.68	0.075
J79	JUNCTION	0.00	2513.45	0	00:22	0	3.84	0.000
STMH116	JUNCTION	1821.58	1821.58	0	00:20	1.96	1.96	-0.003
DRCB64	JUNCTION	497.78	1248.01	0	00:20	0.454	2.08	-0.036
DRCB40	JUNCTION	708.77	1956.69	0	00:20	0.651	2.73	0.037
J83	JUNCTION	5368.35	5368.35	0	00:20	4.96	4.96	0.050
J84	JUNCTION	2692.10	2692.10	0	00:20	3.16	3.16	0.020
J85	JUNCTION	0.00	3201.16	0	00:20	0	4.42	-0.031
STMH78	JUNCTION	1269.44	6512.51	0	00:20	1.2	6.15	0.100
J86	JUNCTION	0.00	4570.54	0	00:20	0	4.63	-0.003
J87	JUNCTION	396.02	396.02	0	00:20	0.361	0.361	-0.007
J88	JUNCTION	0.00	396.93	0	00:20	0	0.361	0.042
J89	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
J90	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
J91	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
DRCB258	JUNCTION	1524.75	1524.75	0	00:30	4.88	4.88	0.011
DRCB260	JUNCTION	0.00	1524.87	0	00:30	0	4.88	0.072
J94	JUNCTION	0.00	810.92	0	00:20	0	3.75	0.092
STMH246-DIV	JUNCTION	904.20	4089.22	0	00:20	0.824	5.25	0.042
DROF13	OUTFALL	0.00	2607.43	0	00:20	0	4.9	0.000
DROF38	OUTFALL	0.00	4368.67	0	00:24	0	6.96	0.000
DROF3	OUTFALL	0.00	2462.44	0	00:20	0	4.7	0.000
DROF4	OUTFALL	0.00	1938.93	0	00:20	0	2.02	0.000
DROF5	OUTFALL	0.00	4384.19	0	00:21	0	7.01	0.000
DROF7	OUTFALL	0.00	897.71	0	00:20	0	0.912	0.000
DROF25	OUTFALL	0.00	9172.38	0	00:20	0	12.3	0.000
DROF23	OUTFALL	0.00	229.95	0	00:46	0	0.846	0.000
DRFI2017	OUTFALL	0.00	820.63	0	00:20	0	3.75	0.000

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Node Surcharge Summary
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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
J1	JUNCTION	0.38	2.400	0.000
STMH286	JUNCTION	0.43	2.725	0.000
STMH56	JUNCTION	0.45	2.525	0.000
STMH54	JUNCTION	0.50	3.327	0.098

STMH178	JUNCTION	0.38	2.300	0.000
STMH177	JUNCTION	0.36	1.700	0.000
STMH398	JUNCTION	0.07	0.185	2.015
STMH188	JUNCTION	0.34	2.800	0.000
STMH64	JUNCTION	0.36	2.800	0.000
STMH161	JUNCTION	0.42	2.400	0.000
STMH165	JUNCTION	0.47	2.925	0.000
STMH63	JUNCTION	0.38	2.542	0.158
STMH62	JUNCTION	0.39	2.200	0.000
STMH83	JUNCTION	0.24	1.800	0.000
STMH79	JUNCTION	0.31	1.325	0.000
STMH235	JUNCTION	0.64	1.400	0.000
J22	JUNCTION	0.66	1.450	0.000
STMH139	JUNCTION	0.46	0.900	0.000
STMH138	JUNCTION	0.48	0.850	0.000
STMH183	JUNCTION	0.49	0.850	0.000
STMH6	JUNCTION	0.51	1.410	0.000
STMH7	JUNCTION	0.51	2.520	0.000
STMH184	JUNCTION	0.57	2.399	1.251
STMH185	JUNCTION	0.57	2.225	1.465
STMH12	JUNCTION	0.58	2.548	1.102
J33	JUNCTION	0.18	1.600	0.000
STMH93	JUNCTION	0.08	0.716	2.434
STMH190	JUNCTION	0.11	0.479	3.021
STMH133	JUNCTION	0.08	0.872	2.328
STMH131	JUNCTION	0.01	0.069	2.431
STMH137	JUNCTION	0.45	1.428	0.572
STMH15	JUNCTION	0.42	1.200	0.000
J46	JUNCTION	0.40	4.400	0.000
STMH4	JUNCTION	0.02	1.094	1.406
STMH216	JUNCTION	0.07	0.708	1.792
STMH147	JUNCTION	0.75	2.400	0.000
STMH194	JUNCTION	0.71	1.300	0.000
STMH253	JUNCTION	0.64	1.400	0.000
J56	JUNCTION	0.49	2.000	0.000
STMH212	JUNCTION	0.62	0.700	0.000
STMH298	JUNCTION	0.10	1.000	0.000
STMH297	JUNCTION	0.14	2.709	0.591
STMH23	JUNCTION	0.21	1.916	0.884
STMH225	JUNCTION	0.42	1.840	0.000
STMH226	JUNCTION	0.45	1.040	0.000
STMH202	JUNCTION	0.52	2.420	0.000
STMH38	JUNCTION	0.55	2.150	0.000
STMH205	JUNCTION	0.60	2.600	0.000

STMH204	JUNCTION	0.64	2.560	0.000
STMH109	JUNCTION	0.68	1.100	0.000
STMH37	JUNCTION	0.43	1.900	0.000
STMH244	JUNCTION	0.67	0.900	0.000
STMH362	JUNCTION	0.63	1.100	0.000
J79	JUNCTION	0.44	4.060	0.040
STMH116	JUNCTION	0.28	1.850	0.000
DRCB64	JUNCTION	0.20	1.900	0.000
DRCB40	JUNCTION	0.79	1.900	0.000
STMH78	JUNCTION	0.05	1.850	0.000
J86	JUNCTION	0.22	1.600	0.000
DRCB258	JUNCTION	0.39	0.543	0.157
DRCB260	JUNCTION	0.73	0.700	0.000
STMH246-DIV	JUNCTION	0.02	0.090	0.410

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

Node	Hours Flooded	Maximum Rate LPS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
J1	0.19	481.98	0 00:16	0.076	0.000
STMH286	0.18	1049.53	0 00:20	0.296	0.000
STMH56	0.31	847.37	0 00:21	0.550	0.000
STMH178	0.01	315.78	0 00:16	0.001	0.000
STMH177	0.01	298.29	0 00:16	0.001	0.000
STMH188	0.15	718.93	0 00:20	0.177	0.000
STMH64	0.01	213.23	0 00:16	0.001	0.000
STMH161	0.29	749.74	0 00:20	0.351	0.000
STMH165	0.07	291.02	0 00:15	0.020	0.000
STMH62	0.24	336.63	0 00:16	0.210	0.000
STMH83	0.11	2038.26	0 00:20	0.401	0.000
STMH79	0.11	776.45	0 00:15	0.095	0.000
STMH235	0.17	596.44	0 00:20	0.292	0.000
J22	0.54	2475.55	0 00:20	1.549	0.000
STMH139	0.19	1447.28	0 00:20	0.628	0.000
STMH138	0.38	1346.28	0 00:20	1.197	0.000
STMH183	0.44	401.43	0 00:24	0.480	0.000

STMH6	0.16	525.07	0	00:20	0.144	0.000
STMH7	0.01	440.42	0	00:13	0.001	0.000
J33	0.04	539.09	0	00:20	0.034	0.000
STMH15	0.35	1350.15	0	00:20	1.033	0.000
J46	0.15	2294.09	0	00:20	0.600	0.000
STMH147	0.01	104.09	0	00:13	0.000	0.000
STMH194	0.41	441.48	0	00:20	0.216	0.000
STMH253	0.01	429.36	0	00:14	0.003	0.000
J56	0.01	277.65	0	00:15	0.002	0.000
STMH212	0.54	1754.32	0	00:20	1.160	0.000
STMH298	0.01	104.79	0	00:18	0.000	0.000
STMH225	0.01	119.80	0	00:16	0.000	0.000
STMH226	0.38	810.07	0	00:16	0.486	0.000
STMH202	0.33	529.40	0	00:20	0.229	0.000
STMH38	0.43	1043.07	0	00:20	0.663	0.000
STMH205	0.09	257.28	0	00:14	0.015	0.000
STMH204	0.11	198.42	0	00:14	0.007	0.000
STMH109	0.59	660.31	0	00:20	1.018	0.000
STMH37	0.28	1181.81	0	00:20	0.520	0.000
STMH244	0.01	260.34	0	00:14	0.001	0.000
STMH362	0.01	242.87	0	00:15	0.000	0.000
STMH116	0.20	1069.72	0	00:20	0.340	0.000
DRCB64	0.01	126.31	0	00:17	0.000	0.000
DRCB40	0.68	1725.77	0	00:20	1.880	0.000
STMH78	0.01	437.19	0	00:19	0.002	0.000
J86	0.15	1760.74	0	00:19	0.571	0.000
DRCB260	0.65	714.55	0	00:30	1.120	0.000

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
DROF13	99.59	979.54	2607.43	4.898
DROF38	99.59	1404.58	4368.67	6.962
DROF3	99.59	956.52	2462.44	4.700
DROF4	99.59	405.18	1938.93	2.022
DROF5	99.55	1407.63	4384.19	7.011
DROF7	99.41	182.54	897.71	0.912

DROF25	99.63	2418.81	9172.38	12.272
DROF23	99.55	158.15	229.95	0.846
DRFI2017	99.44	586.98	820.63	3.751
System	99.55	8499.93	26634.78	43.374

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Link Flow Summary
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Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C100	CONDUIT	417.52	0 00:14	2.64	2.89	1.00
C101	CONDUIT	4096.96	0 00:24	3.62	1.38	1.00
C102	CONDUIT	4368.67	0 00:24	5.05	1.99	1.00
C103	CONDUIT	5361.74	0 00:20	6.89	0.76	0.86
C104	CONDUIT	6512.63	0 00:20	7.52	0.99	1.00
C105	CONDUIT	2811.20	0 00:20	7.63	1.56	0.78
C106	CONDUIT	396.93	0 00:20	2.82	0.27	0.36
C107	CONDUIT	390.29	0 00:20	1.96	0.27	0.46
C108	CONDUIT	0.00	0 00:00	0.00	0.00	0.15
C109	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
C110	CONDUIT	0.00	0 00:00	0.00	0.00	0.15
C93	CONDUIT	2513.45	0 00:22	4.44	1.29	1.00
C96	CONDUIT	5319.96	0 00:20	7.02	1.03	0.93
C98	CONDUIT	4570.54	0 00:20	7.18	1.00	1.00
C99	CONDUIT	3198.60	0 00:20	3.29	0.05	0.61
DRDI117	CONDUIT	820.63	0 00:20	2.77	0.04	0.23
DRDI27	CONDUIT	3795.02	0 00:20	2.19	0.05	0.23
DRDI28	CONDUIT	4576.92	0 00:21	1.86	0.06	0.31
DRDI4	CONDUIT	6621.50	0 00:21	5.48	0.09	0.14
DRDI5	CONDUIT	2710.45	0 00:20	4.86	0.04	0.09
DRDI6	CONDUIT	9172.38	0 00:20	5.66	0.07	0.37
STMP10	CONDUIT	1005.03	0 00:22	3.55	1.25	1.00
STMP100	CONDUIT	2952.49	0 00:20	3.03	0.78	0.88
STMP101	CONDUIT	3226.16	0 00:21	3.48	1.36	0.93
STMP103	CONDUIT	904.56	0 00:21	1.76	0.52	0.86
STMP106	CONDUIT	3487.61	0 00:22	3.72	0.76	0.93
STMP107	CONDUIT	4384.02	0 00:21	3.88	1.07	1.00
STMP1086	CONDUIT	229.95	0 00:46	2.39	1.50	1.00

STMP11	CONDUIT	1004.86	0	00:22	3.55	1.26	1.00
STMP1170	CONDUIT	810.92	0	00:20	3.96	1.09	0.69
STMP118	CONDUIT	397.41	0	00:16	1.96	1.43	0.79
STMP12	CONDUIT	1005.48	0	00:19	3.56	1.27	1.00
STMP120	CONDUIT	374.84	0	00:17	2.98	1.96	1.00
STMP123	CONDUIT	881.50	0	00:20	2.80	0.54	0.70
STMP1289	CONDUIT	730.31	0	00:20	7.56	0.39	0.72
STMP13	CONDUIT	701.53	0	00:29	2.60	0.88	1.00
STMP131	CONDUIT	4384.19	0	00:21	3.88	1.23	1.00
STMP14	CONDUIT	738.94	0	00:33	2.61	0.84	1.00
STMP150	CONDUIT	918.02	0	00:33	3.25	1.63	1.00
STMP1513	CONDUIT	1524.87	0	00:30	3.27	0.48	1.00
STMP1516	CONDUIT	896.52	0	00:20	3.19	1.74	0.97
STMP155	CONDUIT	736.12	0	00:20	3.96	3.13	0.90
STMP156A	CONDUIT	897.71	0	00:20	3.17	1.59	1.00
STMP156B	CONDUIT	897.84	0	00:20	3.18	2.16	1.00
STMP1604	CONDUIT	2607.43	0	00:20	4.28	1.09	1.00
STMP161	CONDUIT	730.68	0	00:20	6.32	0.86	0.58
STMP170	CONDUIT	4545.75	0	00:21	4.76	0.80	0.61
STMP183	CONDUIT	1134.84	0	00:41	4.02	0.98	1.00
STMP184	CONDUIT	1272.80	0	00:22	4.50	1.57	1.00
STMP20	CONDUIT	369.55	0	00:16	1.92	1.06	1.00
STMP248	CONDUIT	742.60	0	00:50	2.63	1.52	1.00
STMP249	CONDUIT	896.31	0	00:20	3.17	1.71	1.00
STMP274	CONDUIT	715.83	0	00:20	2.53	1.27	1.00
STMP276	CONDUIT	1114.35	0	00:21	2.78	0.78	0.86
STMP29	CONDUIT	5349.60	0	00:20	8.51	0.81	0.69
STMP308	CONDUIT	921.02	0	00:16	5.79	1.29	1.00
STMP309	CONDUIT	1247.92	0	00:20	4.41	0.96	1.00
STMP393	CONDUIT	2430.44	0	00:20	3.82	1.77	1.00
STMP394	CONDUIT	2299.83	0	00:20	3.62	1.52	1.00
STMP427	CONDUIT	677.63	0	00:15	2.01	1.01	1.00
STMP428	CONDUIT	930.05	0	00:15	2.60	1.06	1.00
STMP435	CONDUIT	1771.48	0	00:17	4.95	1.44	1.00
STMP521	CONDUIT	2674.92	0	00:21	6.05	1.20	1.00
STMP524	CONDUIT	587.27	0	00:20	3.05	0.27	0.45
STMP525	CONDUIT	584.27	0	00:20	4.12	0.26	0.36
STMP554	CONDUIT	1577.38	0	00:39	3.57	1.27	1.00
STMP555	CONDUIT	1667.25	0	00:23	4.17	1.00	1.00
STMP556	CONDUIT	1488.75	0	00:39	3.51	0.77	1.00
STMP591	CONDUIT	1627.59	0	00:39	3.68	0.81	1.00
STMP594	CONDUIT	1627.66	0	00:39	3.68	1.78	1.00
STMP595	CONDUIT	1627.99	0	00:39	3.68	1.74	1.00
STMP692	CONDUIT	294.35	0	00:13	1.58	0.84	1.00

STMP749	CONDUIT	1291.08	0	00:22	4.57	1.06	1.00
STMP77	CONDUIT	4122.72	0	00:20	6.48	1.20	1.00
STMP79	CONDUIT	585.97	0	00:20	1.80	0.56	0.69
STMP800	CONDUIT	386.66	0	00:14	1.99	1.11	1.00
STMP801	CONDUIT	434.42	0	00:14	2.21	1.26	1.00
STMP823	CONDUIT	616.37	0	00:20	2.18	0.94	1.00
STMP824	CONDUIT	616.29	0	00:20	2.24	0.94	1.00
STMP850	CONDUIT	2513.15	0	00:18	8.89	2.57	1.00
STMP88	CONDUIT	1105.99	0	00:20	3.07	1.03	0.79
STMP89	CONDUIT	1938.93	0	00:20	4.39	1.34	1.00
STMP9	CONDUIT	1009.18	0	00:26	2.82	1.27	1.00
STMP90	CONDUIT	2462.44	0	00:20	5.57	2.39	1.00
STMP914	CONDUIT	1409.82	0	00:20	4.99	1.37	1.00
STMP915	CONDUIT	841.17	0	00:39	2.98	1.03	1.00
STMP964	CONDUIT	417.62	0	00:14	2.63	2.08	1.00
STMP98	CONDUIT	1385.68	0	00:14	4.90	0.95	1.00
STMP99	CONDUIT	1385.57	0	00:14	4.91	1.36	1.00
SYMP182	CONDUIT	1014.37	0	00:23	3.59	1.06	1.00
STMP187_PUMP	PUMP	9071.27	0	00:21			

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Flow Classification Summary
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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
C100	1.00	0.00	0.00	0.00	0.28	0.00	0.00	0.72	0.00	0.00
C101	1.00	0.00	0.00	0.00	0.33	0.07	0.00	0.60	0.03	0.00
C102	1.00	0.00	0.00	0.00	0.36	0.64	0.00	0.00	0.68	0.00
C103	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.91	0.00
C104	1.00	0.00	0.00	0.00	0.04	0.63	0.00	0.33	0.26	0.00
C105	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.00
C106	1.00	0.00	0.00	0.00	0.11	0.88	0.00	0.00	0.89	0.00
C107	1.00	0.00	0.00	0.00	0.42	0.57	0.00	0.00	0.54	0.00
C108	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C109	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C110	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C93	1.00	0.00	0.00	0.00	0.31	0.68	0.00	0.00	0.78	0.00
C96	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C98	1.00	0.00	0.00	0.00	0.14	0.86	0.00	0.00	0.83	0.00

C99	1.00	0.00	0.00	0.00	0.59	0.41	0.00	0.00	0.95	0.00
DRDI117	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.65	0.00
DRDI27	1.00	0.00	0.00	0.00	0.08	0.91	0.00	0.00	0.90	0.00
DRDI28	1.00	0.00	0.00	0.00	0.83	0.17	0.00	0.00	0.72	0.00
DRDI4	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
DRDI5	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
DRDI6	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.83	0.00
STMP10	1.00	0.00	0.00	0.00	0.26	0.74	0.00	0.00	0.58	0.00
STMP100	1.00	0.00	0.00	0.00	0.17	0.83	0.00	0.00	0.73	0.00
STMP101	1.00	0.00	0.00	0.00	0.07	0.92	0.00	0.00	0.18	0.00
STMP103	1.00	0.00	0.00	0.00	0.52	0.48	0.00	0.00	0.68	0.00
STMP106	1.00	0.00	0.00	0.00	0.09	0.91	0.00	0.00	0.81	0.00
STMP107	1.00	0.00	0.00	0.00	0.09	0.90	0.00	0.00	0.78	0.00
STMP1086	1.00	0.00	0.00	0.00	0.69	0.31	0.00	0.00	0.41	0.00
STMP11	1.00	0.00	0.00	0.00	0.28	0.72	0.00	0.00	0.75	0.00
STMP1170	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.01	0.00
STMP118	1.00	0.00	0.00	0.00	0.45	0.55	0.00	0.00	0.04	0.00
STMP12	1.00	0.00	0.00	0.00	0.29	0.71	0.00	0.00	0.44	0.00
STMP120	1.00	0.00	0.00	0.00	0.83	0.16	0.00	0.00	0.67	0.00
STMP123	1.00	0.00	0.00	0.00	0.02	0.97	0.00	0.00	0.92	0.00
STMP1289	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.97	0.00
STMP13	1.00	0.00	0.00	0.00	0.31	0.68	0.00	0.00	0.44	0.00
STMP131	1.00	0.00	0.00	0.00	0.11	0.89	0.00	0.00	0.75	0.00
STMP14	1.00	0.00	0.00	0.00	0.38	0.61	0.00	0.00	0.78	0.00
STMP150	1.00	0.00	0.00	0.00	0.33	0.67	0.00	0.00	0.08	0.00
STMP1513	1.00	0.00	0.00	0.00	0.55	0.45	0.00	0.00	0.69	0.00
STMP1516	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
STMP155	1.00	0.00	0.00	0.00	0.02	0.98	0.00	0.00	0.00	0.00
STMP156A	1.00	0.00	0.00	0.00	0.11	0.89	0.00	0.00	0.71	0.00
STMP156B	1.00	0.00	0.00	0.00	0.32	0.67	0.00	0.00	0.06	0.00
STMP1604	1.00	0.00	0.00	0.00	0.07	0.93	0.00	0.00	0.72	0.00
STMP161	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.01	0.00
STMP170	1.00	0.00	0.00	0.00	0.04	0.95	0.00	0.00	0.20	0.00
STMP183	1.00	0.00	0.00	0.00	0.43	0.57	0.00	0.00	0.26	0.00
STMP184	1.00	0.00	0.00	0.00	0.51	0.48	0.00	0.00	0.71	0.00
STMP20	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.83	0.00
STMP248	1.00	0.00	0.00	0.00	0.60	0.40	0.00	0.00	0.37	0.00
STMP249	1.00	0.00	0.00	0.00	0.53	0.46	0.00	0.00	0.69	0.00
STMP274	1.00	0.00	0.00	0.00	0.97	0.02	0.00	0.00	0.73	0.00
STMP276	1.00	0.00	0.00	0.00	0.08	0.91	0.00	0.00	0.92	0.00
STMP29	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
STMP308	1.00	0.00	0.00	0.00	0.17	0.83	0.00	0.00	0.83	0.00
STMP309	1.00	0.00	0.00	0.00	0.44	0.56	0.00	0.00	0.82	0.00
STMP393	1.00	0.00	0.00	0.00	0.11	0.89	0.00	0.00	0.19	0.00

STMP394	1.00	0.00	0.00	0.00	0.42	0.58	0.00	0.00	0.76	0.00
STMP427	1.00	0.00	0.00	0.00	0.43	0.56	0.00	0.00	0.56	0.00
STMP428	1.00	0.00	0.00	0.00	0.41	0.58	0.00	0.00	0.76	0.00
STMP435	1.00	0.00	0.00	0.00	0.38	0.62	0.00	0.00	0.76	0.00
STMP521	1.00	0.00	0.00	0.00	0.35	0.65	0.00	0.00	0.76	0.00
STMP524	1.00	0.00	0.00	0.00	0.04	0.96	0.00	0.00	0.89	0.00
STMP525	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.90	0.00
STMP554	1.00	0.00	0.00	0.00	0.39	0.61	0.00	0.00	0.10	0.00
STMP555	1.00	0.00	0.00	0.00	0.35	0.64	0.00	0.00	0.14	0.00
STMP556	1.00	0.00	0.00	0.00	0.37	0.63	0.00	0.00	0.78	0.00
STMP591	1.00	0.00	0.00	0.00	0.40	0.60	0.00	0.00	0.75	0.00
STMP594	1.00	0.00	0.00	0.00	0.51	0.49	0.00	0.00	0.37	0.00
STMP595	1.00	0.00	0.00	0.00	0.61	0.38	0.00	0.00	0.55	0.00
STMP692	1.00	0.00	0.00	0.00	0.93	0.07	0.00	0.00	0.68	0.00
STMP749	1.00	0.00	0.00	0.00	0.49	0.51	0.00	0.00	0.66	0.00
STMP77	1.00	0.00	0.00	0.00	0.33	0.66	0.00	0.00	0.78	0.00
STMP79	1.00	0.00	0.00	0.00	0.94	0.06	0.00	0.00	0.91	0.00
STMP800	1.00	0.00	0.00	0.00	0.58	0.42	0.00	0.00	0.69	0.00
STMP801	1.00	0.00	0.00	0.00	0.88	0.11	0.00	0.00	0.71	0.00
STMP823	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.86	0.00
STMP824	1.00	0.00	0.00	0.00	0.10	0.90	0.00	0.00	0.87	0.00
STMP850	1.00	0.00	0.00	0.00	0.31	0.69	0.00	0.00	0.07	0.00
STMP88	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.25	0.00
STMP89	1.00	0.00	0.00	0.00	0.07	0.92	0.00	0.00	0.65	0.00
STMP9	1.00	0.00	0.00	0.00	0.39	0.61	0.00	0.00	0.75	0.00
STMP90	1.00	0.00	0.00	0.00	0.45	0.55	0.00	0.00	0.57	0.00
STMP914	1.00	0.00	0.00	0.00	0.32	0.03	0.00	0.65	0.01	0.00
STMP915	1.00	0.00	0.00	0.00	0.38	0.61	0.00	0.00	0.27	0.00
STMP964	1.00	0.00	0.00	0.00	0.60	0.00	0.00	0.39	0.03	0.00
STMP98	1.00	0.00	0.00	0.00	0.31	0.69	0.00	0.00	0.79	0.00
STMP99	1.00	0.00	0.00	0.00	0.49	0.51	0.00	0.00	0.78	0.00
SYMP182	1.00	0.00	0.00	0.00	0.41	0.59	0.00	0.00	0.25	0.00

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Conduit Surcharge Summary
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Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C100	0.36	0.36	0.36	0.72	0.21

C101	0.24	0.24	0.24	0.21	0.20
C102	0.39	0.39	0.39	0.42	0.39
C104	0.05	0.05	0.06	0.01	0.01
C105	0.01	0.01	0.01	0.26	0.01
C93	0.40	0.40	0.40	0.46	0.21
C96	0.01	0.01	0.01	0.01	0.01
C98	0.18	0.18	0.18	0.01	0.01
STMP10	0.34	0.34	0.34	0.20	0.20
STMP101	0.01	0.01	0.01	0.25	0.01
STMP107	0.08	0.08	0.08	0.07	0.06
STMP1086	0.95	0.95	0.96	0.98	0.95
STMP11	0.36	0.36	0.36	0.20	0.20
STMP1170	0.01	0.01	0.01	0.70	0.01
STMP118	0.01	0.01	0.01	0.64	0.01
STMP12	0.38	0.38	0.38	0.21	0.21
STMP120	0.63	0.63	0.63	0.78	0.63
STMP13	0.39	0.39	0.39	0.01	0.01
STMP131	0.11	0.11	0.11	0.14	0.11
STMP14	0.42	0.42	0.42	0.01	0.01
STMP150	0.42	0.42	0.42	0.46	0.42
STMP1513	0.39	0.39	0.39	0.01	0.01
STMP1516	0.01	0.01	0.01	0.70	0.01
STMP155	0.01	0.01	0.01	0.33	0.01
STMP156A	0.10	0.10	0.10	0.12	0.10
STMP156B	0.10	0.10	0.10	0.20	0.10
STMP1604	0.07	0.07	0.07	0.10	0.07
STMP170	0.01	0.01	0.01	0.39	0.01
STMP183	0.55	0.55	0.55	0.01	0.01
STMP184	0.64	0.64	0.65	0.59	0.58
STMP20	0.39	0.39	0.39	0.01	0.01
STMP248	0.67	0.67	0.67	0.70	0.66
STMP249	0.63	0.63	0.63	0.70	0.63
STMP274	0.49	0.49	0.49	0.07	0.07
STMP308	0.23	0.23	0.23	0.28	0.23
STMP309	0.20	0.20	0.20	0.01	0.01
STMP393	0.07	0.07	0.07	0.51	0.07
STMP394	0.36	0.36	0.36	0.45	0.35
STMP427	0.45	0.45	0.45	0.01	0.01
STMP428	0.47	0.47	0.47	0.01	0.01
STMP435	0.50	0.50	0.50	0.52	0.50
STMP521	0.47	0.47	0.47	0.26	0.26
STMP554	0.51	0.51	0.51	0.48	0.46
STMP555	0.48	0.48	0.48	0.01	0.01
STMP556	0.49	0.49	0.49	0.01	0.01

STMP591	0.51	0.51	0.51	0.01	0.01
STMP594	0.56	0.56	0.57	0.57	0.56
STMP595	0.56	0.56	0.57	0.56	0.56
STMP692	0.71	0.71	0.71	0.01	0.01
STMP749	0.60	0.60	0.60	0.25	0.23
STMP77	0.37	0.37	0.37	0.14	0.14
STMP800	0.67	0.67	0.67	0.04	0.04
STMP801	0.62	0.62	0.62	0.01	0.01
STMP823	0.07	0.07	0.07	0.01	0.01
STMP824	0.02	0.02	0.02	0.01	0.01
STMP850	0.42	0.42	0.42	0.46	0.42
STMP88	0.01	0.01	0.01	0.03	0.01
STMP89	0.08	0.08	0.08	0.10	0.08
STMP9	0.43	0.43	0.43	0.24	0.24
STMP90	0.57	0.57	0.57	0.59	0.57
STMP914	0.42	0.42	0.42	0.32	0.31
STMP915	0.51	0.51	0.51	0.37	0.39
STMP964	0.64	0.64	0.64	0.69	0.64
STMP98	0.42	0.42	0.42	0.01	0.01
STMP99	0.43	0.43	0.44	0.47	0.43
SYMP182	0.52	0.52	0.52	0.39	0.40

****
Pumping Summary
****

Pump	Percent Utilized	Number of Start-Ups	Min Flow LPS	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr	Power Usage Kw-hr	% Time Off Pump Curve Low	% Time Off Pump Curve High
STMP187_PUMP	97.50	1	0.00	2417.88	9071.27	12.272	182.05	0.0	0.0

Analysis begun on: Thu Sep 01 15:48:09 2016
Analysis ended on: Thu Sep 01 15:48:10 2016
Total elapsed time: 00:00:01

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.007)
--------------------------------------------------------------

WARNING 02: maximum depth increased for Node J77

**********************************************************
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 ..... LPS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... DYNWAVE
Starting Date ..... NOV-05-2015 00:00:00
Ending Date ..... NOV-05-2015 03:00:00
Antecedent Dry Days ..... 0.0
Report Time Step ..... 00:05:00
Wet Time Step ..... 00:05:00
Dry Time Step ..... 00:05:00
Routing Time Step ..... 30.00 sec
Variable Time Step ..... YES
Maximum Trials ..... 8
Head Tolerance ..... 0.004921 m


*************
Element Count
*************
Number of rain gages ..... 1
Number of subcatchments ... 55
Number of nodes ..... 100
```



```
Number of links ..... 91
Number of pollutants ..... 0
Number of land uses ..... 0


****************
Raingage Summary
****************
                                                  Data       Recording
Name                 Data Source                  Type       Interval
-----------------------------------------------------------------------
_Current             CC1_AES_1hr_5yr              VOLUME       5 min.


*******************
Subcatchment Summary
*******************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
-----------------------------------------------------------------------------------------------
S13-A                      14.43   1550.00     70.00    2.5000 _Current             STMH286
S13-B                      14.18   1060.00     70.00    1.9000 _Current             STMH188
S13-C                       5.03    705.00     66.00    1.1000 _Current             STMH165
S13-D                       2.85    632.00     77.00    3.2000 _Current             STMH161
S13-E                       5.22    727.00     68.00    2.1000 _Current             STMH54
S13-F                       7.67    569.00     50.00    0.5000 _Current             STMH178
S13-G                       1.35    351.00     48.00    2.0000 _Current             STMH177
S13-H                       1.52    473.00     57.00    3.1000 _Current             STMH398
S23-A                      15.82   1095.00     69.00    1.6000 _Current             STMH116
S23-B                       3.94    770.00     63.00    2.6000 _Current             DRCB64
S23-C                       7.93    966.00     45.00    2.1000 _Current             DRCB40
S25-A                      22.61    902.00     61.00    1.3000 _Current             STMH37
S25-B                       6.70    737.00     55.00    1.7000 _Current             STMH225
S25-C                       7.26    921.00     52.00    1.0000 _Current             STMH202
S25-D                      10.70   1063.00     55.00    1.2000 _Current             STMH38
S25-E                      10.16   1039.00     49.00    1.7000 _Current             J74
S25-F                      41.71   2239.00     44.00    0.8000 _Current             J73
S25-G                       3.30    633.00     49.00    1.9000 _Current             STMH205
S25-H                       3.45    674.00     41.00    1.2000 _Current             STMH244
S25-I                      20.24   1568.00     67.00    2.1000 _Current             J75
S25-J                      24.53   1501.00     72.00    1.3000 _Current             J84
S32-A                      54.37    400.00     50.00    0.5000 _Current             DRCB258
S32-B                       5.37    400.00     50.00    0.5000 _Current             DRCB258
S38-A                      16.25   1798.00     79.00    4.1000 _Current             J83
S38-B                      18.36   1574.00     76.00    5.9000 _Current             J22
```



```
S38-C                       8.37    802.00     79.00    4.5000 _Current             STMH78
S38-D                       4.72    558.00     73.00    1.5000 _Current             STMH79
S38-Z1                    136.40   7480.00     10.00   30.3000 _Current             J83
S38-Z2                      5.70   1120.00     10.00   10.4000 _Current             J83
S3-A                        8.53    955.00     63.00    2.9000 _Current             STMH12
S3-B                        1.98    392.00     62.00    1.5000 _Current             STMH7
S3-C                        3.55    735.00     61.00    1.3000 _Current             STMH6
S3-D                        2.11    617.00     80.00    2.1000 _Current             STMH138
S3-E                        5.92    588.00     76.00   17.2000 _Current             STMH246-DIV
S3-F                        1.92    586.00     58.00   13.7000 _Current             J33
S3-G                        3.26    655.00     60.00   13.0000 _Current             J87
S3-Z1                     241.50   6550.00     10.00   34.0000 _Current             J33
S4-A                        3.83    547.00     77.00   19.1000 _Current             J34
S4-B                        4.08    379.00     80.00    1.5000 _Current             J37
S4-C                        6.76    577.00     73.00    3.3000 _Current             STMH93
S5-A                        8.95    974.00     64.00    2.6000 _Current             STMH133
S5-B                        1.74    288.00     80.00    0.9000 _Current             STMH135
S5-C                        2.50    464.00     80.00    0.6000 _Current             STMH131
S5-D                        1.28    206.00     80.00    1.2000 _Current             STMH196
S5-E                        4.01    610.00     79.00    2.3000 _Current             STMH4
S5-F                        1.02    184.00     80.00    6.0000 _Current             STMH15
S5-G                        4.10    727.00     77.00    0.3000 _Current             STMH2
S5-H                        3.71    473.00     73.00    0.4000 _Current             STMH147
S5-I                       10.27    885.00     71.00    6.2000 _Current             STMH212
S5-J                        5.91    831.00     60.00    9.1000 _Current             J56
S5-K                       28.67   1446.00     54.00   11.9000 _Current             J46
S5-Z1                      87.70   4910.00     10.00   36.0000 _Current             J46
S7-A                        7.47    684.00     56.00    0.9000 _Current             STMH23
S7-B                        3.90    411.00     22.00    7.3000 _Current             STMH297
S13-I                       2.12    370.00     60.00    1.0000 _Current             J1


************
Node Summary
************
                                    Invert      Max.    Ponded    External
Name                 Type            Elev.     Depth      Area    Inflow
-----------------------------------------------------------------------
J1                   JUNCTION       444.92      2.90       0.0
STMH286              JUNCTION       444.31      3.40       0.0
STMH56               JUNCTION       443.98      3.20       0.0
STMH54               JUNCTION       442.97      4.10       0.0
STMH178              JUNCTION       441.29      3.20       0.0
STMH177              JUNCTION       440.78      2.60       0.0
```



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STMH398              JUNCTION       440.42      3.10       0.0
STMH188              JUNCTION       446.02      3.40       0.0
STMH64               JUNCTION       445.56      3.40       0.0
STMH161              JUNCTION       444.09      3.00       0.0
STMH165              JUNCTION       443.56      3.60       0.0
STMH63               JUNCTION       445.08      3.30       0.0
STMH62               JUNCTION       444.98      2.80       0.0
STMH77               JUNCTION       454.15      2.20       0.0
STMH74               JUNCTION       452.88      3.20       0.0
STMH83               JUNCTION       441.98      3.00       0.0
STMH79               JUNCTION       441.38      2.60       0.0
STMH235              JUNCTION       442.44      1.90       0.0
J22                  JUNCTION       442.75      1.90       0.0
STMH139              JUNCTION       455.33      1.80       0.0
STMH138              JUNCTION       454.88      1.60       0.0
STMH183              JUNCTION       454.27      1.60       0.0
STMH6                JUNCTION       453.29      2.16       0.0
STMH7                JUNCTION       452.73      3.27       0.0
STMH184              JUNCTION       451.89      4.40       0.0
STMH185              JUNCTION       451.75      4.44       0.0
STMH12               JUNCTION       451.69      4.40       0.0
J33                  JUNCTION       459.08      2.50       0.0
J34                  JUNCTION       455.36      2.50       0.0
STMH17               JUNCTION       453.99      1.60       0.0
STMH254              JUNCTION       453.24      2.60       0.0
STMH93               JUNCTION       451.88      3.90       0.0
J37                  JUNCTION       453.49      2.00       0.0
J38                  JUNCTION       454.36      2.50       0.0
STMH190              JUNCTION       449.72      4.70       0.0
STMH133              JUNCTION       450.28      4.40       0.0
STMH135              JUNCTION       451.01      3.80       0.0
STMH131              JUNCTION       451.21      3.70       0.0
STMH196              JUNCTION       451.69      3.00       0.0
STMH137              JUNCTION       453.28      2.60       0.0
STMH15               JUNCTION       454.27      1.80       0.0
J46                  JUNCTION       455.31      5.00       0.0
STMH4                JUNCTION       452.57      3.10       0.0
STMH216              JUNCTION       452.15      3.10       0.0
STMH197              JUNCTION       451.95      2.70       0.0
STMH2                JUNCTION       453.06      1.80       0.0
STMH28               JUNCTION       453.20      1.90       0.0
STMH147              JUNCTION       453.75      2.90       0.0
STMH194              JUNCTION       454.00      1.80       0.0
STMH253              JUNCTION       454.49      2.00       0.0
```

J56	JUNCTION	455.38	2.60	0.0
STMH212	JUNCTION	454.85	1.20	0.0
STMH298	JUNCTION	440.27	1.60	0.0
STMH297	JUNCTION	440.64	3.90	0.0
STMH26	JUNCTION	452.49	5.00	0.0
STMH22	JUNCTION	454.19	3.70	0.0
STMH23	JUNCTION	454.38	3.30	0.0
STMH225	JUNCTION	450.19	2.44	0.0
STMH226	JUNCTION	448.06	3.04	0.0
STMH202	JUNCTION	446.71	3.02	0.0
STMH38	JUNCTION	444.70	2.75	0.0
STMH205	JUNCTION	441.90	3.20	0.0
STMH204	JUNCTION	441.59	3.16	0.0
STMH109	JUNCTION	440.60	1.70	0.0
STMH37	JUNCTION	450.62	2.50	0.0
STMH244	JUNCTION	440.10	1.50	0.0
STMH362	JUNCTION	439.80	1.70	0.0
J73	JUNCTION	439.28	1.50	0.0
J74	JUNCTION	438.27	1.50	0.0
J75	JUNCTION	437.62	1.50	0.0
J76	JUNCTION	437.10	1.80	0.0
J77	JUNCTION	442.00	2.00	0.0
J78	JUNCTION	438.00	1.50	0.0
J79	JUNCTION	454.78	4.70	0.0
STMH116	JUNCTION	454.00	2.30	0.0
DRCB64	JUNCTION	451.36	2.50	0.0
DRCB40	JUNCTION	445.61	2.50	0.0
J83	JUNCTION	458.49	2.80	0.0
J84	JUNCTION	437.36	1.50	0.0
J85	JUNCTION	457.37	2.50	0.0
STMH78	JUNCTION	446.63	2.90	0.0
J86	JUNCTION	458.46	2.50	0.0
J87	JUNCTION	458.57	2.50	0.0
J88	JUNCTION	458.25	2.50	0.0
J89	JUNCTION	456.77	2.50	0.0
J90	JUNCTION	459.23	2.50	0.0
J91	JUNCTION	457.00	2.50	0.0
DRCB258	JUNCTION	439.79	1.50	0.0
DRCB260	JUNCTION	438.95	1.50	0.0
J94	JUNCTION	436.84	1.50	0.0
STMH246-DIV	JUNCTION	455.92	2.50	0.0
DROF13	OUTFALL	440.21	0.90	0.0
DROF38	OUTFALL	440.85	1.05	0.0
DROF3	OUTFALL	451.34	0.75	0.0

DROF4	OUTFALL	451.61	0.75	0.0
DROF5	OUTFALL	449.45	1.20	0.0
DROF7	OUTFALL	440.02	0.60	0.0
DROF25	OUTFALL	440.00	2.00	0.0
DROF23	OUTFALL	443.90	0.35	0.0
DRFI2017	OUTFALL	436.42	1.00	0.0

****
Link Summary
****

Name	From Node	To Node	Type	Length	%Slope	Roughness
C100	STMH235	STMH83	CONDUIT	61.4	0.1515	0.0100
C101	STMH83	STMH79	CONDUIT	153.1	0.3430	0.0100
C102	STMH79	DROF38	CONDUIT	137.0	0.3831	0.0100
C103	STMH74	STMH78	CONDUIT	159.2	3.9237	0.0100
C104	STMH78	STMH83	CONDUIT	132.9	3.4096	0.0100
C105	J86	J85	CONDUIT	70.6	1.5447	0.0100
C106	J87	J88	CONDUIT	31.5	1.0172	0.0100
C107	J88	J85	CONDUIT	88.2	0.9974	0.0100
C108	J89	J34	CONDUIT	101.2	1.3931	0.0100
C109	J90	J91	CONDUIT	52.0	4.2949	0.0100
C110	J91	J34	CONDUIT	104.7	1.5661	0.0100
C93	J46	J79	CONDUIT	35.5	1.4931	0.0100
C96	J83	STMH77	CONDUIT	202.0	2.1231	0.0100
C98	J33	J86	CONDUIT	16.4	3.7740	0.0100
C99	J85	STMH246-DIV	CONDUIT	79.7	1.8201	0.0100
DRDI117	J94	DRFI2017	CONDUIT	41.6	1.0097	0.0100
DRDI27	J73	J74	CONDUIT	251.8	0.4012	0.0100
DRDI28	J74	J78	CONDUIT	67.3	0.4013	0.0100
DRDI4	J75	J76	CONDUIT	175.3	0.2966	0.0100
DRDI5	J84	J76	CONDUIT	65.5	0.3966	0.0100
DRDI6	J77	DROF25	CONDUIT	153.4	1.3036	0.0100
STMP10	STMH188	STMH64	CONDUIT	45.5	1.0110	0.0100
STMP100	STMH196	STMH131	CONDUIT	86.4	0.5557	0.0100
STMP101	STMH131	STMH135	CONDUIT	90.9	0.2201	0.0100
STMP103	STMH197	STMH196	CONDUIT	47.1	0.5524	0.0100
STMP106	STMH135	STMH133	CONDUIT	89.7	0.8139	0.0100
STMP107	STMH133	STMH190	CONDUIT	86.0	0.6511	0.0100
STMP1086	DRCB40	DROF23	CONDUIT	262.5	0.6514	0.0100
STMP11	STMH64	STMH63	CONDUIT	47.9	1.0026	0.0100
STMP1170	DRCB260	J94	CONDUIT	241.7	0.8730	0.0100
STMP118	STMH28	STMH2	CONDUIT	116.3	0.1204	0.0100

STMP12	STMH63	STMH62	CONDUIT	10.2	0.9824	0.0100
STMP120	STMH147	STMH28	CONDUIT	110.1	0.4994	0.0100
STMP123	STMH2	STMH197	CONDUIT	88.5	1.2548	0.0100
STMP1289	STMH26	STMH297	CONDUIT	27.8	47.1005	0.0100
STMP13	STMH62	STMH161	CONDUIT	89.3	0.9962	0.0100
STMP131	STMH190	DROF5	CONDUIT	54.9	0.4920	0.0100
STMP14	STMH161	STMH54	CONDUIT	92.7	1.2078	0.0100
STMP150	STMH37	STMH225	CONDUIT	86.2	0.4990	0.0100
STMP1513	DRCB258	DRCB260	CONDUIT	24.9	3.3754	0.0100
STMP1516	STMH362	J73	CONDUIT	33.6	0.4161	0.0100
STMP155	STMH23	STMH22	CONDUIT	82.8	0.2294	0.0100
STMP156A	STMH298	DROF7	CONDUIT	50.2	0.4979	0.0100
STMP156B	STMH297	STMH298	CONDUIT	136.3	0.2715	0.0100
STMP1604	STMH398	DROF13	CONDUIT	20.4	1.0300	0.0100
STMP161	STMH22	STMH26	CONDUIT	57.4	2.9625	0.0100
STMP170	J78	J75	CONDUIT	31.2	1.2184	0.0100
STMP183	STMH38	STMH205	CONDUIT	133.6	2.0956	0.0100
STMP184	STMH204	STMH109	CONDUIT	96.4	1.0273	0.0100
STMP20	J1	STMH286	CONDUIT	121.6	0.5014	0.0100
STMP248	STMH109	STMH244	CONDUIT	132.7	0.3768	0.0100
STMP249	STMH244	STMH362	CONDUIT	69.7	0.4307	0.0100
STMP274	J56	STMH253	CONDUIT	178.1	0.4998	0.0100
STMP276	STMH254	STMH93	CONDUIT	140.0	0.9714	0.0100
STMP29	STMH77	STMH74	CONDUIT	35.8	3.4248	0.0100
STMP308	STMH116	DRCB64	CONDUIT	71.1	3.7156	0.0100
STMP309	DRCB64	DRCB40	CONDUIT	215.4	2.6704	0.0100
STMP393	STMH177	STMH398	CONDUIT	105.6	0.3409	0.0100
STMP394	STMH178	STMH177	CONDUIT	124.0	0.4112	0.0100
STMP427	STMH56	STMH165	CONDUIT	112.2	0.3745	0.0100
STMP428	STMH165	STMH54	CONDUIT	92.0	0.6415	0.0100
STMP435	STMH54	STMH178	CONDUIT	132.3	1.2698	0.0100
STMP521	STMH139	STMH138	CONDUIT	19.0	2.3653	0.0100
STMP524	J38	STMH17	CONDUIT	16.1	2.3002	0.0100
STMP525	J34	J38	CONDUIT	41.6	2.4063	0.0100
STMP554	STMH6	STMH7	CONDUIT	75.5	0.7417	0.0100
STMP555	STMH138	STMH183	CONDUIT	46.0	1.3271	0.0100
STMP556	STMH183	STMH6	CONDUIT	54.9	1.7850	0.0100
STMP591	STMH7	STMH184	CONDUIT	43.1	1.9502	0.0100
STMP594	STMH184	STMH185	CONDUIT	34.9	0.4014	0.0100
STMP595	STMH185	STMH12	CONDUIT	14.4	0.4170	0.0100
STMP692	STMH194	STMH147	CONDUIT	49.5	0.5054	0.0100
STMP749	STMH205	STMH204	CONDUIT	13.4	2.3175	0.0100
STMP77	STMH246-DIV	STMH139	CONDUIT	27.8	2.1197	0.0100
STMP79	STMH17	J37	CONDUIT	94.2	0.5307	0.0100

STMP800	STMH253	STMH194	CONDUIT	97.4	0.5029	0.0100
STMP801	STMH212	STMH253	CONDUIT	72.7	0.4952	0.0100
STMP823	STMH216	STMH196	CONDUIT	67.8	0.6789	0.0100
STMP824	STMH4	STMH216	CONDUIT	62.6	0.6710	0.0100
STMP850	J79	STMH15	CONDUIT	33.9	1.5042	0.0100
STMP88	J37	STMH254	CONDUIT	45.8	0.5460	0.0100
STMP89	STMH93	DROF4	CONDUIT	27.1	0.9949	0.0100
STMP9	STMH286	STMH56	CONDUIT	62.1	0.5310	0.0100
STMP90	STMH12	DROF3	CONDUIT	69.3	0.5051	0.0100
STMP914	STMH225	STMH226	CONDUIT	43.8	1.6658	0.0100
STMP915	STMH226	STMH202	CONDUIT	128.5	1.0510	0.0100
STMP964	J22	STMH235	CONDUIT	89.5	0.2929	0.0100
STMP98	STMH15	STMH137	CONDUIT	29.4	3.3716	0.0100
STMP99	STMH137	STMH196	CONDUIT	97.5	1.6318	0.0100
SYMP182	STMH202	STMH38	CONDUIT	141.2	1.4237	0.0100
STMP187_PUMP	J76	J77	IDEAL PUMP			

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C100	CIRCULAR	0.45	0.16	0.11	0.45	1	144.26
C101	CIRCULAR	1.20	1.13	0.30	1.20	1	2968.54
C102	CIRCULAR	1.05	0.87	0.26	1.05	1	2197.46
C103	CIRCULAR	1.05	0.87	0.26	1.05	1	7032.30
C104	CIRCULAR	1.05	0.87	0.26	1.05	1	6555.37
C105	CIRCULAR	0.75	0.44	0.19	0.75	1	1798.88
C106	CIRCULAR	0.75	0.44	0.19	0.75	1	1459.75
C107	CIRCULAR	0.75	0.44	0.19	0.75	1	1445.50
C108	CIRCULAR	0.90	0.64	0.23	0.90	1	2777.92
C109	CIRCULAR	0.90	0.64	0.23	0.90	1	4877.52
C110	CIRCULAR	0.90	0.64	0.23	0.90	1	2945.34
C93	CIRCULAR	0.60	0.28	0.15	0.60	2	975.43
C96	CIRCULAR	1.05	0.87	0.26	1.05	1	5172.85
C98	CIRCULAR	0.90	0.64	0.23	0.90	1	4572.17
C99	TRAPEZOIDAL	2.00	5.00	0.83	4.00	1	59738.45
DRDI117	TRAPEZOIDAL	1.00	3.60	0.52	6.60	1	23389.71
DRDI27	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76654.24
DRDI28	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76659.66
DRDI4	TRAPEZOIDAL	1.50	14.25	0.98	14.00	1	76761.44
DRDI5	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76218.52

DRDI6	TRAPEZOIDAL	2.00	12.00	0.95	12.00	1	132287.57
STMP10	CIRCULAR	0.60	0.28	0.15	0.60	1	802.66
STMP100	CIRCULAR	1.20	1.13	0.30	1.20	1	3778.42
STMP101	CIRCULAR	1.20	1.13	0.30	1.20	1	2378.05
STMP103	CIRCULAR	0.90	0.64	0.23	0.90	1	1749.20
STMP106	CIRCULAR	1.20	1.13	0.30	1.20	1	4572.62
STMP107	CIRCULAR	1.20	1.13	0.30	1.20	1	4089.94
STMP1086	CIRCULAR	0.35	0.10	0.09	0.35	1	153.05
STMP11	CIRCULAR	0.60	0.28	0.15	0.60	1	799.28
STMP1170	CIRCULAR	0.60	0.28	0.15	0.60	1	745.86
STMP118	CIRCULAR	0.60	0.28	0.15	0.60	1	276.99
STMP12	CIRCULAR	0.60	0.28	0.15	0.60	1	791.19
STMP120	CIRCULAR	0.40	0.13	0.10	0.40	1	191.34
STMP123	CIRCULAR	0.75	0.44	0.19	0.75	1	1621.26
STMP1289	CIRCULAR	0.40	0.13	0.10	0.40	1	1858.16
STMP13	CIRCULAR	0.60	0.28	0.15	0.60	1	796.76
STMP131	CIRCULAR	1.20	1.13	0.30	1.20	1	3555.25
STMP14	CIRCULAR	0.60	0.28	0.15	0.60	1	877.28
STMP150	CIRCULAR	0.60	0.28	0.15	0.60	1	563.87
STMP1513	CIRCULAR	0.80	0.50	0.20	0.80	1	3158.49
STMP1516	CIRCULAR	0.60	0.28	0.15	0.60	1	514.90
STMP155	CIRCULAR	0.50	0.20	0.12	0.50	1	235.13
STMP156A	CIRCULAR	0.60	0.28	0.15	0.60	1	563.28
STMP156B	CIRCULAR	0.60	0.28	0.15	0.60	1	415.93
STMP1604	CIRCULAR	0.90	0.64	0.23	0.90	1	2388.56
STMP161	CIRCULAR	0.50	0.20	0.12	0.50	1	844.93
STMP170	CIRCULAR	0.80	0.50	0.20	0.80	3	1897.65
STMP183	CIRCULAR	0.60	0.28	0.15	0.60	1	1155.59
STMP184	CIRCULAR	0.60	0.28	0.15	0.60	1	809.10
STMP20	CIRCULAR	0.50	0.20	0.12	0.50	1	347.62
STMP248	CIRCULAR	0.60	0.28	0.15	0.60	1	489.98
STMP249	CIRCULAR	0.60	0.28	0.15	0.60	1	523.90
STMP274	CIRCULAR	0.60	0.28	0.15	0.60	1	564.32
STMP276	CIRCULAR	0.75	0.44	0.19	0.75	1	1426.50
STMP29	CIRCULAR	1.05	0.87	0.26	1.05	1	6569.95
STMP308	CIRCULAR	0.45	0.16	0.11	0.45	1	714.48
STMP309	CIRCULAR	0.60	0.28	0.15	0.60	1	1304.47
STMP393	CIRCULAR	0.90	0.64	0.23	0.90	1	1374.18
STMP394	CIRCULAR	0.90	0.64	0.23	0.90	1	1509.26
STMP427	CIRCULAR	0.68	0.36	0.17	0.68	1	668.74
STMP428	CIRCULAR	0.68	0.36	0.17	0.68	1	875.31
STMP435	CIRCULAR	0.68	0.36	0.17	0.68	1	1231.44
STMP521	CIRCULAR	0.75	0.44	0.19	0.75	1	2225.98
STMP524	CIRCULAR	0.75	0.44	0.19	0.75	1	2195.09

STMP525	CIRCULAR	0.75	0.44	0.19	0.75	1	2245.15
STMP554	CIRCULAR	0.75	0.44	0.19	0.75	1	1246.52
STMP555	CIRCULAR	0.75	0.44	0.19	0.75	1	1667.32
STMP556	CIRCULAR	0.75	0.44	0.19	0.75	1	1933.72
STMP591	CIRCULAR	0.75	0.44	0.19	0.75	1	2021.23
STMP594	CIRCULAR	0.75	0.44	0.19	0.75	1	916.96
STMP595	CIRCULAR	0.75	0.44	0.19	0.75	1	934.59
STMP692	CIRCULAR	0.50	0.20	0.12	0.50	1	348.98
STMP749	CIRCULAR	0.60	0.28	0.15	0.60	1	1215.23
STMP77	CIRCULAR	0.90	0.64	0.23	0.90	1	3426.60
STMP79	CIRCULAR	0.75	0.44	0.19	0.75	1	1054.36
STMP800	CIRCULAR	0.50	0.20	0.12	0.50	1	348.14
STMP801	CIRCULAR	0.50	0.20	0.12	0.50	1	345.45
STMP823	CIRCULAR	0.60	0.28	0.15	0.60	1	657.72
STMP824	CIRCULAR	0.60	0.28	0.15	0.60	1	653.92
STMP850	CIRCULAR	0.60	0.28	0.15	0.60	1	979.02
STMP88	CIRCULAR	0.75	0.44	0.19	0.75	1	1069.45
STMP89	CIRCULAR	0.75	0.44	0.19	0.75	1	1443.65
STMP9	CIRCULAR	0.68	0.36	0.17	0.68	1	796.33
STMP90	CIRCULAR	0.75	0.44	0.19	0.75	1	1028.59
STMP914	CIRCULAR	0.60	0.28	0.15	0.60	1	1030.27
STMP915	CIRCULAR	0.60	0.28	0.15	0.60	1	818.35
STMP964	CIRCULAR	0.45	0.16	0.11	0.45	1	200.59
STMP98	CIRCULAR	0.60	0.28	0.15	0.60	1	1465.75
STMP99	CIRCULAR	0.60	0.28	0.15	0.60	1	1019.72
SYMP182	CIRCULAR	0.60	0.28	0.15	0.60	1	952.46

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Control Actions Taken
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Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	14.260	15.220
Evaporation Loss	0.000	0.000
Infiltration Loss	9.199	9.819
Surface Runoff	4.691	5.007
Final Surface Storage	0.524	0.559
Continuity Error (%)	-1.082	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	4.688	46.884
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	3.695	36.950
Internal Outflow	0.990	9.904
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.005	0.047
Continuity Error (%)	-0.038	

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Time-Step Critical Elements
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Link STMP749 (33.53%)
Link C98 (18.72%)
Link STMP12 (18.29%)
Link STMP1513 (11.18%)
Link STMP1604 (6.79%)

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Highest Flow Instability Indexes
****
Link STMP595 (21)
Link STMP101 (19)
Link STMP594 (15)
Link STMP98 (14)
Link STMP1516 (13)

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Routing Time Step Summary
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Minimum Time Step : 0.50 sec
Average Time Step : 4.27 sec
Maximum Time Step : 30.00 sec

Percent in Steady State : 0.00
Average Iterations per Step : 4.82
Percent Not Converging : 29.03

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Subcatchment Runoff Summary
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Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
S13-A	15.22	0.00	0.00	4.57	9.94	1.43	1497.99	0.653
S13-B	15.22	0.00	0.00	4.57	9.88	1.40	1302.92	0.649
S13-C	15.22	0.00	0.00	5.17	9.36	0.47	484.50	0.615
S13-D	15.22	0.00	0.00	3.50	11.05	0.31	351.34	0.726
S13-E	15.22	0.00	0.00	4.87	9.68	0.51	542.90	0.636
S13-F	15.22	0.00	0.00	7.61	7.02	0.54	444.20	0.461
S13-G	15.22	0.00	0.00	7.91	6.94	0.09	104.92	0.456
S13-H	15.22	0.00	0.00	6.54	8.28	0.13	140.65	0.544
S23-A	15.22	0.00	0.00	4.72	9.72	1.54	1362.36	0.638
S23-B	15.22	0.00	0.00	5.63	9.03	0.36	396.85	0.593
S23-C	15.22	0.00	0.00	8.37	6.43	0.51	561.86	0.422
S25-A	15.22	0.00	0.00	5.94	8.51	1.92	1358.02	0.559
S25-B	15.22	0.00	0.00	6.85	7.82	0.52	553.15	0.514
S25-C	15.22	0.00	0.00	7.31	7.38	0.54	560.41	0.485
S25-D	15.22	0.00	0.00	6.85	7.79	0.83	837.38	0.512
S25-E	15.22	0.00	0.00	7.76	6.97	0.71	752.23	0.458
S25-F	15.22	0.00	0.00	8.52	6.18	2.58	2160.78	0.406
S25-G	15.22	0.00	0.00	7.76	7.03	0.23	259.39	0.462
S25-H	15.22	0.00	0.00	8.98	5.88	0.20	226.59	0.387
S25-I	15.22	0.00	0.00	5.02	9.47	1.92	1849.87	0.622
S25-J	15.22	0.00	0.00	4.26	10.09	2.48	1976.18	0.663
S32-A	15.22	0.00	0.00	7.61	6.26	3.40	968.00	0.411
S32-B	15.22	0.00	0.00	7.61	7.02	0.38	311.53	0.461
S38-A	15.22	0.00	0.00	3.20	11.24	1.83	1951.39	0.738
S38-B	15.22	0.00	0.00	3.65	10.81	1.98	2110.54	0.710
S38-C	15.22	0.00	0.00	3.20	11.23	0.94	990.42	0.738
S38-D	15.22	0.00	0.00	4.11	10.34	0.49	490.54	0.679
S38-Z1	15.22	0.00	0.00	13.70	1.48	2.01	2218.69	0.097
S38-Z2	15.22	0.00	0.00	13.70	1.48	0.08	92.59	0.097
S3-A	15.22	0.00	0.00	5.63	8.97	0.77	823.98	0.589

S3-B	15.22	0.00	0.00	5.78	8.86	0.18	193.24	0.582
S3-C	15.22	0.00	0.00	5.94	8.71	0.31	340.58	0.572
S3-D	15.22	0.00	0.00	3.04	11.48	0.24	270.57	0.754
S3-E	15.22	0.00	0.00	3.65	10.91	0.65	721.87	0.717
S3-F	15.22	0.00	0.00	6.39	8.53	0.16	181.13	0.560
S3-G	15.22	0.00	0.00	6.09	8.75	0.29	317.92	0.575
S3-Z1	15.22	0.00	0.00	13.70	1.47	3.54	3927.50	0.096
S4-A	15.22	0.00	0.00	3.50	11.14	0.43	477.91	0.732
S4-B	15.22	0.00	0.00	3.04	11.28	0.46	423.71	0.741
S4-C	15.22	0.00	0.00	4.11	10.35	0.70	713.23	0.680
S5-A	15.22	0.00	0.00	5.48	9.10	0.81	866.47	0.598
S5-B	15.22	0.00	0.00	3.04	11.33	0.20	197.70	0.744
S5-C	15.22	0.00	0.00	3.04	11.32	0.28	277.98	0.744
S5-D	15.22	0.00	0.00	3.04	11.35	0.15	149.13	0.745
S5-E	15.22	0.00	0.00	3.20	11.24	0.45	483.48	0.739
S5-F	15.22	0.00	0.00	3.04	11.49	0.12	131.02	0.755
S5-G	15.22	0.00	0.00	3.50	10.84	0.44	393.16	0.712
S5-H	15.22	0.00	0.00	4.11	10.26	0.38	320.46	0.674
S5-I	15.22	0.00	0.00	4.41	10.11	1.04	1117.83	0.664
S5-J	15.22	0.00	0.00	6.09	8.66	0.51	573.34	0.569
S5-K	15.22	0.00	0.00	7.00	7.69	2.21	2391.80	0.505
S5-Z1	15.22	0.00	0.00	13.70	1.48	1.30	1426.55	0.097
S7-A	15.22	0.00	0.00	6.70	7.91	0.59	558.06	0.520
S7-B	15.22	0.00	0.00	11.87	3.21	0.13	139.48	0.211
S13-I	15.22	0.00	0.00	0.85	12.37	0.26	214.26	0.813

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Node Depth Summary
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J1	JUNCTION	0.58	2.90	447.82	0 00:17
STMH286	JUNCTION	0.80	3.40	447.71	0 00:17
STMH56	JUNCTION	0.82	3.20	447.18	0 00:17
STMH54	JUNCTION	0.94	4.10	447.07	0 00:16
STMH178	JUNCTION	0.60	3.20	444.49	0 00:17
STMH177	JUNCTION	0.52	2.60	443.38	0 00:17
STMH398	JUNCTION	0.34	0.81	441.23	0 00:20
STMH188	JUNCTION	0.61	3.40	449.42	0 00:17

STMH64	JUNCTION	0.61	3.22	448.78	0	00:17
STMH161	JUNCTION	0.71	3.00	447.09	0	00:17
STMH165	JUNCTION	0.86	3.60	447.16	0	00:17
STMH63	JUNCTION	0.62	3.06	448.14	0	00:17
STMH62	JUNCTION	0.62	2.80	447.78	0	00:17
STMH77	JUNCTION	0.20	0.62	454.77	0	00:20
STMH74	JUNCTION	0.19	0.59	453.46	0	00:20
STMH83	JUNCTION	0.62	3.00	444.98	0	00:17
STMH79	JUNCTION	0.66	2.60	443.98	0	00:16
STMH235	JUNCTION	0.67	1.90	444.34	0	00:12
J22	JUNCTION	0.90	1.90	444.65	0	00:12
STMH139	JUNCTION	0.56	1.80	457.13	0	00:14
STMH138	JUNCTION	0.59	1.60	456.48	0	00:14
STMH183	JUNCTION	0.60	1.60	455.87	0	00:13
STMH6	JUNCTION	0.80	2.16	455.45	0	00:13
STMH7	JUNCTION	0.69	2.13	454.86	0	00:20
STMH184	JUNCTION	0.88	2.52	454.41	0	00:20
STMH185	JUNCTION	0.79	2.50	454.25	0	00:13
STMH12	JUNCTION	0.75	2.20	453.89	0	00:20
J33	JUNCTION	0.35	2.40	461.48	0	00:20
J34	JUNCTION	0.08	0.23	455.59	0	00:20
STMH17	JUNCTION	0.12	0.36	454.35	0	00:20
STMH254	JUNCTION	0.15	0.42	453.66	0	00:21
STMH93	JUNCTION	0.21	0.71	452.59	0	00:21
J37	JUNCTION	0.18	0.51	454.00	0	00:20
J38	JUNCTION	0.08	0.24	454.60	0	00:20
STMH190	JUNCTION	0.45	1.43	451.15	0	00:20
STMH133	JUNCTION	0.41	1.08	451.36	0	00:21
STMH135	JUNCTION	0.35	0.81	451.82	0	00:21
STMH131	JUNCTION	0.48	0.97	452.18	0	00:22
STMH196	JUNCTION	0.39	0.83	452.52	0	00:20
STMH137	JUNCTION	0.60	1.98	455.26	0	00:14
STMH15	JUNCTION	0.52	1.80	456.07	0	00:14
J46	JUNCTION	0.85	5.00	460.31	0	00:17
STMH4	JUNCTION	0.13	0.41	452.98	0	00:20
STMH216	JUNCTION	0.14	0.56	452.71	0	00:20
STMH197	JUNCTION	0.25	0.54	452.49	0	00:20
STMH2	JUNCTION	0.19	0.36	453.42	0	00:20
STMH28	JUNCTION	0.31	0.54	453.74	0	00:21
STMH147	JUNCTION	0.97	2.90	456.65	0	00:14
STMH194	JUNCTION	0.87	1.80	455.80	0	00:15
STMH253	JUNCTION	0.75	2.00	456.49	0	00:15
J56	JUNCTION	0.38	2.60	457.98	0	00:16
STMH212	JUNCTION	0.57	1.20	456.05	0	00:15

STMH298	JUNCTION	0.19	1.48	441.75	0	00:20
STMH297	JUNCTION	0.24	2.77	443.41	0	00:18
STMH26	JUNCTION	0.06	0.15	452.64	0	00:20
STMH22	JUNCTION	0.12	0.33	454.52	0	00:20
STMH23	JUNCTION	0.25	1.44	455.82	0	00:17
STMH225	JUNCTION	0.56	2.14	452.33	0	00:20
STMH226	JUNCTION	1.00	3.04	451.10	0	00:17
STMH202	JUNCTION	1.03	3.02	449.73	0	00:17
STMH38	JUNCTION	1.03	2.75	447.45	0	00:16
STMH205	JUNCTION	1.22	3.20	445.10	0	00:16
STMH204	JUNCTION	1.26	3.16	444.75	0	00:16
STMH109	JUNCTION	0.89	1.70	442.30	0	00:15
STMH37	JUNCTION	0.71	2.50	453.12	0	00:17
STMH244	JUNCTION	0.63	1.50	441.60	0	00:16
STMH362	JUNCTION	0.46	1.70	441.50	0	00:16
J73	JUNCTION	0.13	0.27	439.55	0	00:20
J74	JUNCTION	0.14	0.34	438.61	0	00:21
J75	JUNCTION	0.17	0.38	438.00	0	00:21
J76	JUNCTION	0.00	0.00	437.10	0	00:00
J77	JUNCTION	0.36	0.67	442.67	0	00:20
J78	JUNCTION	0.21	0.46	438.46	0	00:21
J79	JUNCTION	0.91	4.66	459.44	0	00:21
STMH116	JUNCTION	0.39	2.30	456.30	0	00:17
DRCB64	JUNCTION	0.26	2.50	453.86	0	00:18
DRCB40	JUNCTION	1.39	2.50	448.11	0	00:14
J83	JUNCTION	0.23	0.73	459.22	0	00:20
J84	JUNCTION	0.09	0.23	437.59	0	00:20
J85	JUNCTION	0.15	0.42	457.79	0	00:20
STMH78	JUNCTION	0.23	0.89	447.52	0	00:20
J86	JUNCTION	0.46	2.50	460.96	0	00:16
J87	JUNCTION	0.08	0.24	458.81	0	00:20
J88	JUNCTION	0.08	0.24	458.49	0	00:20
J89	JUNCTION	0.00	0.00	456.77	0	00:00
J90	JUNCTION	0.00	0.00	459.23	0	00:00
J91	JUNCTION	0.00	0.00	457.00	0	00:00
DRCB258	JUNCTION	0.40	0.84	440.63	0	00:21
DRCB260	JUNCTION	0.83	1.50	440.45	0	00:20
J94	JUNCTION	0.18	0.23	437.07	0	00:21
STMH246-DIV	JUNCTION	0.47	1.93	457.85	0	00:20
DROF13	OUTFALL	0.34	0.90	441.11	0	00:19
DROF38	OUTFALL	0.51	1.05	441.90	0	00:16
DROF3	OUTFALL	0.43	0.75	452.09	0	00:13
DROF4	OUTFALL	0.21	0.75	452.36	0	00:20
DROF5	OUTFALL	0.45	1.20	450.65	0	00:19

DROF7	OUTFALL	0.18	0.60	440.62	0	00:19
DROF25	OUTFALL	0.36	0.67	440.67	0	00:21
DROF23	OUTFALL	0.27	0.35	444.25	0	00:13
DRFI2017	OUTFALL	0.18	0.23	436.65	0	00:21

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	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	214.26	528.45	0 00:17	0.262	0.279	-0.251
STMH286	JUNCTION	1497.92	1573.84	0 00:20	1.43	1.67	0.002
STMH56	JUNCTION	0.00	1009.18	0 00:24	0	1.53	0.039
STMH54	JUNCTION	542.87	1791.69	0 00:17	0.505	3.51	-0.004
STMH178	JUNCTION	444.18	2202.02	0 00:20	0.538	4.04	0.003
STMH177	JUNCTION	104.92	2307.03	0 00:20	0.0937	4.14	-0.001
STMH398	JUNCTION	140.64	2447.35	0 00:20	0.126	4.26	-0.001
STMH188	JUNCTION	1302.87	1302.87	0 00:20	1.4	1.4	-0.010
STMH64	JUNCTION	0.00	1004.97	0 00:19	0	1.36	-0.070
STMH161	JUNCTION	351.32	1052.75	0 00:20	0.315	1.54	-0.051
STMH165	JUNCTION	484.47	987.52	0 00:17	0.471	1.66	-0.055
STMH63	JUNCTION	0.00	1004.84	0 00:20	0	1.36	-0.023
STMH62	JUNCTION	0.00	1005.50	0 00:20	0	1.36	-0.004
STMH77	JUNCTION	0.00	4208.08	0 00:20	0	3.92	0.002
STMH74	JUNCTION	0.00	4226.19	0 00:20	0	3.92	-0.007
STMH83	JUNCTION	0.00	5167.21	0 00:21	0	5.72	-0.019
STMH79	JUNCTION	490.52	4544.58	0 00:20	0.488	6.03	-0.059
STMH235	JUNCTION	0.00	596.44	0 00:22	0	1.06	-0.284
J22	JUNCTION	2110.44	2110.44	0 00:20	1.98	1.98	0.216
STMH139	JUNCTION	0.00	3783.96	0 00:20	0	4.4	-0.021
STMH138	JUNCTION	270.56	2945.48	0 00:20	0.242	4.24	0.001
STMH183	JUNCTION	0.00	1667.25	0 00:24	0	3.39	-0.033
STMH6	JUNCTION	340.57	1606.39	0 00:20	0.309	3.34	0.013
STMH7	JUNCTION	193.23	1628.25	0 00:15	0.175	3.45	-0.017
STMH184	JUNCTION	0.00	1628.21	0 00:15	0	3.45	-0.010
STMH185	JUNCTION	0.00	1628.31	0 00:15	0	3.45	-0.005
STMH12	JUNCTION	823.94	2318.34	0 00:20	0.765	4.22	0.005
J33	JUNCTION	4108.40	4108.40	0 00:20	3.71	3.7	-0.005

J34	JUNCTION	477.88	477.88	0	00:20	0.427	0.427	0.023
STMH17	JUNCTION	0.00	470.15	0	00:20	0	0.427	-0.029
STMH254	JUNCTION	0.00	864.66	0	00:20	0	0.887	0.055
STMH93	JUNCTION	713.20	1509.46	0	00:20	0.7	1.59	-0.005
J37	JUNCTION	423.70	870.86	0	00:20	0.46	0.887	0.021
J38	JUNCTION	0.00	467.98	0	00:20	0	0.427	0.003
STMH190	JUNCTION	0.00	3816.98	0	00:22	0	6	0.009
STMH133	JUNCTION	866.43	3852.49	0	00:21	0.815	6	0.005
STMH135	JUNCTION	197.69	3134.15	0	00:21	0.197	5.19	0.022
STMH131	JUNCTION	277.97	2959.34	0	00:21	0.283	4.99	0.016
STMH196	JUNCTION	149.12	2679.15	0	00:20	0.145	4.71	-0.017
STMH137	JUNCTION	0.00	1382.66	0	00:15	0	2.66	0.018
STMH15	JUNCTION	131.01	2644.07	0	00:20	0.117	3.38	-0.006
J46	JUNCTION	3818.16	3818.16	0	00:20	3.5	3.5	0.004
STMH4	JUNCTION	483.46	483.46	0	00:20	0.451	0.451	0.003
STMH216	JUNCTION	0.00	485.78	0	00:20	0	0.451	-0.005
STMH197	JUNCTION	0.00	746.14	0	00:20	0	1.46	0.041
STMH2	JUNCTION	393.15	754.90	0	00:20	0.444	1.46	0.020
STMH28	JUNCTION	0.00	373.67	0	00:19	0	1.01	0.055
STMH147	JUNCTION	320.45	373.71	0	00:19	0.38	1.01	-0.002
STMH194	JUNCTION	0.00	362.93	0	00:15	0	0.749	-0.056
STMH253	JUNCTION	0.00	573.26	0	00:20	0	0.823	-0.052
J56	JUNCTION	573.31	573.31	0	00:20	0.512	0.512	-0.215
STMH212	JUNCTION	1117.78	1361.73	0	00:20	1.04	1.11	0.003
STMH298	JUNCTION	0.00	688.45	0	00:20	0	0.716	0.025
STMH297	JUNCTION	139.48	688.42	0	00:20	0.125	0.716	0.016
STMH26	JUNCTION	0.00	554.38	0	00:20	0	0.59	0.006
STMH22	JUNCTION	0.00	557.98	0	00:20	0	0.591	0.024
STMH23	JUNCTION	558.04	558.04	0	00:20	0.591	0.591	-0.002
STMH225	JUNCTION	553.12	1328.80	0	00:20	0.524	2.26	0.115
STMH226	JUNCTION	0.00	1328.53	0	00:20	0	2.25	-0.094
STMH202	JUNCTION	560.38	1384.70	0	00:20	0.536	2.46	-0.021
STMH38	JUNCTION	837.34	1851.71	0	00:20	0.834	3.17	-0.000
STMH205	JUNCTION	259.38	1317.93	0	00:20	0.232	2.97	-0.022
STMH204	JUNCTION	0.00	1291.08	0	00:20	0	2.96	-0.002
STMH109	JUNCTION	0.00	1272.80	0	00:21	0	2.96	0.042
STMH37	JUNCTION	1358.00	1358.00	0	00:20	1.92	1.92	0.037
STMH244	JUNCTION	226.58	869.39	0	00:20	0.203	2.31	-0.005
STMH362	JUNCTION	0.00	869.23	0	00:20	0	2.31	0.001
J73	JUNCTION	2160.72	3030.15	0	00:20	2.58	4.89	0.040
J74	JUNCTION	752.20	3703.06	0	00:20	0.708	5.6	0.118
J75	JUNCTION	1849.80	5199.29	0	00:21	1.92	7.5	0.060
J76	JUNCTION	0.00	7056.44	0	00:21	0	9.97	0.000
J77	JUNCTION	0.00	7056.44	0	00:21	0	9.97	0.009

J78	JUNCTION	0.00	3628.85	0	00:21	0	5.59	0.083
J79	JUNCTION	0.00	2513.36	0	00:19	0	3.26	0.003
STMH116	JUNCTION	1362.32	1362.32	0	00:20	1.54	1.54	-0.002
DRCB64	JUNCTION	396.83	1232.68	0	00:18	0.356	1.77	-0.030
DRCB40	JUNCTION	561.83	1759.95	0	00:20	0.51	2.28	-0.001
J83	JUNCTION	4262.46	4262.46	0	00:20	3.93	3.92	0.010
J84	JUNCTION	1976.13	1976.13	0	00:20	2.48	2.48	0.015
J85	JUNCTION	0.00	3118.70	0	00:20	0	3.76	-0.034
STMH78	JUNCTION	990.37	5147.87	0	00:20	0.94	4.86	0.147
J86	JUNCTION	0.00	4107.96	0	00:20	0	3.7	-0.005
J87	JUNCTION	317.90	317.90	0	00:20	0.286	0.285	-0.008
J88	JUNCTION	0.00	318.53	0	00:20	0	0.285	0.051
J89	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
J90	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
J91	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
DRCB258	JUNCTION	1100.71	1100.71	0	00:30	3.76	3.76	0.012
DRCB260	JUNCTION	0.00	1101.26	0	00:30	0	3.76	0.125
J94	JUNCTION	0.00	810.89	0	00:21	0	3.39	0.094
STMH246-DIV	JUNCTION	721.83	3825.71	0	00:20	0.646	4.41	0.049
DROF13	OUTFALL	0.00	2427.41	0	00:21	0	4.26	0.000
DROF38	OUTFALL	0.00	4368.66	0	00:22	0	6.01	0.000
DROF3	OUTFALL	0.00	2318.31	0	00:20	0	4.22	0.000
DROF4	OUTFALL	0.00	1483.91	0	00:20	0	1.59	0.000
DROF5	OUTFALL	0.00	3818.00	0	00:22	0	6	0.000
DROF7	OUTFALL	0.00	689.22	0	00:20	0	0.715	0.000
DROF25	OUTFALL	0.00	7100.37	0	00:21	0	9.97	0.000
DROF23	OUTFALL	0.00	229.95	0	00:21	0	0.804	0.000
DRFI2017	OUTFALL	0.00	820.47	0	00:21	0	3.39	0.000

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Node Surcharge Summary
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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
J1	JUNCTION	0.29	2.400	0.000
STMH286	JUNCTION	0.34	2.725	0.000
STMH56	JUNCTION	0.37	2.525	0.000
STMH54	JUNCTION	0.41	3.425	0.000

STMH178	JUNCTION	0.29	2.300	0.000
STMH177	JUNCTION	0.26	1.700	0.000
STMH188	JUNCTION	0.25	2.800	0.000
STMH64	JUNCTION	0.27	2.622	0.178
STMH161	JUNCTION	0.33	2.400	0.000
STMH165	JUNCTION	0.38	2.925	0.000
STMH63	JUNCTION	0.29	2.464	0.236
STMH62	JUNCTION	0.30	2.200	0.000
STMH83	JUNCTION	0.17	1.800	0.000
STMH79	JUNCTION	0.23	1.325	0.000
STMH235	JUNCTION	0.60	1.400	0.000
J22	JUNCTION	0.62	1.450	0.000
STMH139	JUNCTION	0.37	0.900	0.000
STMH138	JUNCTION	0.40	0.850	0.000
STMH183	JUNCTION	0.41	0.850	0.000
STMH6	JUNCTION	0.44	1.410	0.000
STMH7	JUNCTION	0.44	1.377	1.143
STMH184	JUNCTION	0.52	1.768	1.882
STMH185	JUNCTION	0.52	1.745	1.945
STMH12	JUNCTION	0.53	1.448	2.202
J33	JUNCTION	0.14	1.501	0.099
STMH190	JUNCTION	0.05	0.226	3.274
STMH137	JUNCTION	0.37	1.377	0.623
STMH15	JUNCTION	0.33	1.200	0.000
J46	JUNCTION	0.30	4.400	0.000
STMH147	JUNCTION	0.70	2.400	0.000
STMH194	JUNCTION	0.66	1.300	0.000
STMH253	JUNCTION	0.58	1.400	0.000
J56	JUNCTION	0.43	2.000	0.000
STMH212	JUNCTION	0.56	0.700	0.000
STMH298	JUNCTION	0.04	0.884	0.116
STMH297	JUNCTION	0.08	2.173	1.127
STMH23	JUNCTION	0.14	0.943	1.857
STMH225	JUNCTION	0.33	1.544	0.296
STMH226	JUNCTION	0.37	1.040	0.000
STMH202	JUNCTION	0.45	2.420	0.000
STMH38	JUNCTION	0.47	2.150	0.000
STMH205	JUNCTION	0.54	2.600	0.000
STMH204	JUNCTION	0.58	2.560	0.000
STMH109	JUNCTION	0.62	1.100	0.000
STMH37	JUNCTION	0.35	1.900	0.000
STMH244	JUNCTION	0.61	0.900	0.000
STMH362	JUNCTION	0.58	1.100	0.000
J79	JUNCTION	0.35	4.059	0.041

STMH116	JUNCTION	0.19	1.850	0.000
DRCB64	JUNCTION	0.12	1.900	0.000
DRCB40	JUNCTION	0.73	1.900	0.000
J86	JUNCTION	0.15	1.600	0.000
DRCB258	JUNCTION	0.01	0.044	0.656
DRCB260	JUNCTION	0.56	0.700	0.000

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

Node	Hours Flooded	Maximum Rate LPS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
J1	0.11	508.57	0 00:17	0.049	0.000
STMH286	0.11	563.66	0 00:20	0.116	0.000
STMH56	0.21	760.85	0 00:20	0.339	0.000
STMH54	0.01	216.72	0 00:16	0.000	0.000
STMH178	0.01	397.35	0 00:17	0.001	0.000
STMH177	0.01	451.15	0 00:17	0.002	0.000
STMH188	0.08	311.29	0 00:17	0.044	0.000
STMH161	0.20	564.10	0 00:20	0.202	0.000
STMH165	0.01	335.57	0 00:17	0.001	0.000
STMH62	0.17	317.77	0 00:17	0.134	0.000
STMH83	0.05	841.35	0 00:17	0.076	0.000
STMH79	0.06	746.85	0 00:16	0.030	0.000
STMH235	0.12	596.44	0 00:22	0.191	0.000
J22	0.48	1887.92	0 00:20	1.027	0.000
STMH139	0.14	1109.02	0 00:20	0.403	0.000
STMH138	0.28	1277.71	0 00:20	0.855	0.000
STMH183	0.35	401.43	0 00:23	0.358	0.000
STMH6	0.12	304.18	0 00:20	0.061	0.000
STMH15	0.25	1301.38	0 00:20	0.724	0.000
J46	0.10	1298.27	0 00:20	0.236	0.000
STMH147	0.01	68.34	0 00:14	0.000	0.000
STMH194	0.32	275.83	0 00:20	0.116	0.000
STMH253	0.01	329.25	0 00:15	0.002	0.000
J56	0.01	281.20	0 00:16	0.002	0.000
STMH212	0.48	1359.19	0 00:20	0.798	0.000

STMH226	0.29	749.32	0	00:17	0.331	0.000
STMH202	0.24	560.69	0	00:17	0.129	0.000
STMH38	0.35	791.88	0	00:20	0.433	0.000
STMH205	0.04	317.71	0	00:16	0.002	0.000
STMH204	0.06	171.31	0	00:16	0.003	0.000
STMH109	0.52	629.86	0	00:20	0.849	0.000
STMH37	0.19	581.34	0	00:20	0.189	0.000
STMH244	0.01	178.57	0	00:16	0.001	0.000
STMH362	0.01	128.66	0	00:16	0.000	0.000
STMH116	0.12	558.85	0	00:20	0.122	0.000
DRCB64	0.01	111.28	0	00:18	0.000	0.000
DRCB40	0.63	1528.79	0	00:20	1.476	0.000
J86	0.10	1294.56	0	00:20	0.232	0.000
DRCB260	0.49	290.98	0	00:30	0.366	0.000

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
DROF13	99.57	876.97	2427.41	4.261
DROF38	99.57	1245.67	4368.66	6.007
DROF3	99.57	889.13	2318.31	4.219
DROF4	99.57	326.66	1483.91	1.586
DROF5	99.53	1239.08	3818.00	6.002
DROF7	99.37	147.28	689.22	0.715
DROF25	99.57	2007.65	7100.37	9.970
DROF23	99.53	155.76	229.95	0.804
DRFI2017	99.41	549.25	820.47	3.386
System	99.52	7437.46	22936.63	36.950

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Link Flow Summary
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Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days	Time of Max Occurrence hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C100	CONDUIT	417.45	0	00:15	2.64	2.89	1.00
C101	CONDUIT	4096.46	0	00:22	3.62	1.38	1.00
C102	CONDUIT	4368.66	0	00:22	5.05	1.99	1.00
C103	CONDUIT	4218.87	0	00:20	6.87	0.60	0.70
C104	CONDUIT	5167.21	0	00:21	6.23	0.79	0.92
C105	CONDUIT	2806.68	0	00:20	7.63	1.56	0.78
C106	CONDUIT	318.53	0	00:20	2.66	0.22	0.32
C107	CONDUIT	312.34	0	00:20	1.68	0.22	0.44
C108	CONDUIT	0.00	0	00:00	0.00	0.00	0.13
C109	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C110	CONDUIT	0.00	0	00:00	0.00	0.00	0.13
C93	CONDUIT	2513.36	0	00:19	4.44	1.29	1.00
C96	CONDUIT	4208.08	0	00:20	6.72	0.81	0.69
C98	CONDUIT	4107.96	0	00:20	6.46	0.90	1.00
C99	CONDUIT	3116.67	0	00:20	3.30	0.05	0.59
DRDI117	CONDUIT	820.47	0	00:21	2.77	0.04	0.23
DRDI27	CONDUIT	2992.99	0	00:20	2.06	0.04	0.20
DRDI28	CONDUIT	3628.85	0	00:21	1.78	0.05	0.27
DRDI4	CONDUIT	5225.70	0	00:21	4.94	0.07	0.13
DRDI5	CONDUIT	1988.40	0	00:20	4.23	0.03	0.08
DRDI6	CONDUIT	7100.37	0	00:21	5.31	0.05	0.33
STMP10	CONDUIT	1004.97	0	00:19	3.55	1.25	1.00
STMP100	CONDUIT	2705.84	0	00:21	3.02	0.72	0.74
STMP101	CONDUIT	2962.21	0	00:21	3.48	1.25	0.73
STMP103	CONDUIT	747.23	0	00:21	1.76	0.43	0.76
STMP106	CONDUIT	3104.82	0	00:22	3.72	0.68	0.79
STMP107	CONDUIT	3816.98	0	00:22	3.71	0.93	0.95
STMP1086	CONDUIT	229.95	0	00:21	2.39	1.50	1.00
STMP11	CONDUIT	1004.84	0	00:20	3.55	1.26	1.00
STMP1170	CONDUIT	810.89	0	00:21	3.95	1.09	0.69
STMP118	CONDUIT	384.71	0	00:17	1.96	1.39	0.74
STMP12	CONDUIT	1005.50	0	00:20	3.56	1.27	1.00
STMP120	CONDUIT	373.67	0	00:19	2.97	1.95	1.00
STMP123	CONDUIT	746.14	0	00:20	2.80	0.46	0.60
STMP1289	CONDUIT	554.04	0	00:20	6.02	0.30	0.69
STMP13	CONDUIT	701.53	0	00:27	2.69	0.88	1.00
STMP131	CONDUIT	3818.00	0	00:22	3.58	1.07	1.00
STMP14	CONDUIT	739.68	0	00:29	2.62	0.84	1.00
STMP150	CONDUIT	914.81	0	00:29	3.24	1.62	1.00
STMP1513	CONDUIT	1101.26	0	00:30	3.17	0.35	1.00
STMP1516	CONDUIT	869.43	0	00:20	3.10	1.69	0.97

STMP155	CONDUIT	557.98	0	00:20	3.22	2.37	0.83
STMP156A	CONDUIT	689.22	0	00:20	2.44	1.22	1.00
STMP156B	CONDUIT	688.45	0	00:20	2.43	1.66	1.00
STMP1604	CONDUIT	2427.41	0	00:21	4.28	1.02	0.95
STMP161	CONDUIT	554.38	0	00:20	6.05	0.66	0.48
STMP170	CONDUIT	3610.48	0	00:22	4.49	0.63	0.53
STMP183	CONDUIT	1134.45	0	00:37	4.01	0.98	1.00
STMP184	CONDUIT	1272.80	0	00:21	4.50	1.57	1.00
STMP20	CONDUIT	394.22	0	00:17	2.03	1.13	1.00
STMP248	CONDUIT	741.34	0	00:47	2.62	1.51	1.00
STMP249	CONDUIT	869.23	0	00:20	3.07	1.66	1.00
STMP274	CONDUIT	573.26	0	00:20	2.03	1.02	1.00
STMP276	CONDUIT	858.71	0	00:21	2.51	0.60	0.75
STMP29	CONDUIT	4226.19	0	00:20	8.09	0.64	0.58
STMP308	CONDUIT	921.46	0	00:18	5.79	1.29	1.00
STMP309	CONDUIT	1198.12	0	00:20	4.24	0.92	1.00
STMP393	CONDUIT	2306.70	0	00:20	3.74	1.68	0.95
STMP394	CONDUIT	2202.11	0	00:20	3.46	1.46	1.00
STMP427	CONDUIT	715.38	0	00:17	2.02	1.07	1.00
STMP428	CONDUIT	917.27	0	00:17	2.56	1.05	1.00
STMP435	CONDUIT	1791.93	0	00:17	5.01	1.46	1.00
STMP521	CONDUIT	2674.92	0	00:24	6.05	1.20	1.00
STMP524	CONDUIT	470.15	0	00:20	2.87	0.21	0.40
STMP525	CONDUIT	467.98	0	00:20	3.91	0.21	0.32
STMP554	CONDUIT	1576.33	0	00:35	3.57	1.26	1.00
STMP555	CONDUIT	1667.25	0	00:24	4.30	1.00	1.00
STMP556	CONDUIT	1485.95	0	00:35	3.63	0.77	1.00
STMP591	CONDUIT	1628.21	0	00:15	3.69	0.81	1.00
STMP594	CONDUIT	1628.31	0	00:15	3.69	1.78	1.00
STMP595	CONDUIT	1628.48	0	00:15	3.69	1.74	1.00
STMP692	CONDUIT	281.63	0	00:14	1.56	0.81	1.00
STMP749	CONDUIT	1291.08	0	00:20	4.57	1.06	1.00
STMP77	CONDUIT	3783.96	0	00:20	5.95	1.10	1.00
STMP79	CONDUIT	470.16	0	00:20	1.78	0.45	0.58
STMP800	CONDUIT	362.93	0	00:15	1.98	1.04	1.00
STMP801	CONDUIT	333.59	0	00:15	1.80	0.97	1.00
STMP823	CONDUIT	461.54	0	00:21	1.66	0.70	0.97
STMP824	CONDUIT	485.78	0	00:20	2.19	0.74	0.78
STMP850	CONDUIT	2513.14	0	00:23	8.89	2.57	1.00
STMP88	CONDUIT	864.66	0	00:20	3.02	0.81	0.62
STMP89	CONDUIT	1483.91	0	00:20	3.72	1.03	0.97
STMP9	CONDUIT	1009.18	0	00:24	2.82	1.27	1.00
STMP90	CONDUIT	2318.31	0	00:20	5.25	2.25	1.00
STMP914	CONDUIT	1328.53	0	00:20	4.70	1.29	1.00

STMP915	CONDUIT	840.20	0	00:35	2.98	1.03	1.00
STMP964	CONDUIT	417.47	0	00:15	2.62	2.08	1.00
STMP98	CONDUIT	1382.66	0	00:15	4.89	0.94	1.00
STMP99	CONDUIT	1382.49	0	00:15	4.89	1.36	1.00
SYMP182	CONDUIT	1014.37	0	00:25	3.59	1.06	1.00
STMP187_PUMP	PUMP	7056.44	0	00:21			

****
Flow Classification Summary
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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
C100	1.00	0.00	0.00	0.00	0.21	0.00	0.00	0.78	0.00	0.00
C101	1.00	0.00	0.00	0.00	0.26	0.09	0.00	0.64	0.03	0.00
C102	1.00	0.00	0.00	0.00	0.30	0.70	0.00	0.00	0.70	0.00
C103	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.92	0.00
C104	1.00	0.00	0.00	0.00	0.00	0.61	0.00	0.38	0.23	0.00
C105	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.00
C106	1.00	0.00	0.00	0.00	0.10	0.90	0.00	0.00	0.89	0.00
C107	1.00	0.00	0.00	0.00	0.44	0.55	0.00	0.00	0.54	0.00
C108	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C109	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C110	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C93	1.00	0.00	0.00	0.00	0.26	0.74	0.00	0.00	0.80	0.00
C96	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C98	1.00	0.00	0.00	0.00	0.11	0.89	0.00	0.00	0.86	0.00
C99	1.00	0.00	0.00	0.00	0.52	0.48	0.00	0.00	0.95	0.00
DRDI117	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.69	0.00
DRDI27	1.00	0.00	0.00	0.00	0.08	0.92	0.00	0.00	0.89	0.00
DRDI28	1.00	0.00	0.00	0.00	0.83	0.17	0.00	0.00	0.73	0.00
DRDI4	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
DRDI5	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
DRDI6	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.85	0.00
STMP10	1.00	0.00	0.00	0.00	0.20	0.80	0.00	0.00	0.59	0.00
STMP100	1.00	0.00	0.00	0.00	0.10	0.90	0.00	0.00	0.74	0.00
STMP101	1.00	0.00	0.00	0.00	0.03	0.96	0.00	0.00	0.19	0.00
STMP103	1.00	0.00	0.00	0.00	0.51	0.48	0.00	0.00	0.71	0.00
STMP106	1.00	0.00	0.00	0.00	0.02	0.97	0.00	0.00	0.84	0.00
STMP107	1.00	0.00	0.00	0.00	0.05	0.95	0.00	0.00	0.80	0.00

STMP1086	1.00	0.00	0.00	0.00	0.67	0.32	0.00	0.00	0.47	0.00
STMP11	1.00	0.00	0.00	0.00	0.22	0.78	0.00	0.00	0.74	0.00
STMP1170	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.01	0.00
STMP118	1.00	0.00	0.00	0.00	0.38	0.61	0.00	0.00	0.04	0.00
STMP12	1.00	0.00	0.00	0.00	0.23	0.76	0.00	0.00	0.44	0.00
STMP120	1.00	0.00	0.00	0.00	0.82	0.17	0.00	0.00	0.69	0.00
STMP123	1.00	0.00	0.00	0.00	0.02	0.98	0.00	0.00	0.93	0.00
STMP1289	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.97	0.00
STMP13	1.00	0.00	0.00	0.00	0.26	0.74	0.00	0.00	0.43	0.00
STMP131	1.00	0.00	0.00	0.00	0.06	0.93	0.00	0.00	0.75	0.00
STMP14	1.00	0.00	0.00	0.00	0.33	0.67	0.00	0.00	0.80	0.00
STMP150	1.00	0.00	0.00	0.00	0.28	0.72	0.00	0.00	0.10	0.00
STMP1513	1.00	0.00	0.00	0.00	0.46	0.54	0.00	0.00	0.75	0.00
STMP1516	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
STMP155	1.00	0.00	0.00	0.00	0.02	0.97	0.00	0.00	0.00	0.00
STMP156A	1.00	0.00	0.00	0.00	0.06	0.93	0.00	0.00	0.70	0.00
STMP156B	1.00	0.00	0.00	0.00	0.27	0.73	0.00	0.00	0.08	0.00
STMP1604	1.00	0.00	0.00	0.00	0.01	0.99	0.00	0.00	0.76	0.00
STMP161	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.02	0.00
STMP170	1.00	0.00	0.00	0.00	0.04	0.95	0.00	0.00	0.19	0.00
STMP183	1.00	0.00	0.00	0.00	0.38	0.61	0.00	0.00	0.27	0.00
STMP184	1.00	0.00	0.00	0.00	0.48	0.51	0.00	0.00	0.73	0.00
STMP20	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.86	0.00
STMP248	1.00	0.00	0.00	0.00	0.57	0.42	0.00	0.00	0.37	0.00
STMP249	1.00	0.00	0.00	0.00	0.51	0.48	0.00	0.00	0.71	0.00
STMP274	1.00	0.00	0.00	0.00	0.97	0.03	0.00	0.00	0.75	0.00
STMP276	1.00	0.00	0.00	0.00	0.04	0.96	0.00	0.00	0.93	0.00
STMP29	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
STMP308	1.00	0.00	0.00	0.00	0.11	0.88	0.00	0.00	0.86	0.00
STMP309	1.00	0.00	0.00	0.00	0.41	0.59	0.00	0.00	0.86	0.00
STMP393	1.00	0.00	0.00	0.00	0.05	0.94	0.00	0.00	0.20	0.00
STMP394	1.00	0.00	0.00	0.00	0.37	0.63	0.00	0.00	0.79	0.00
STMP427	1.00	0.00	0.00	0.00	0.37	0.63	0.00	0.00	0.57	0.00
STMP428	1.00	0.00	0.00	0.00	0.36	0.64	0.00	0.00	0.79	0.00
STMP435	1.00	0.00	0.00	0.00	0.32	0.67	0.00	0.00	0.79	0.00
STMP521	1.00	0.00	0.00	0.00	0.30	0.69	0.00	0.00	0.78	0.00
STMP524	1.00	0.00	0.00	0.00	0.04	0.95	0.00	0.00	0.91	0.00
STMP525	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.90	0.00
STMP554	1.00	0.00	0.00	0.00	0.35	0.65	0.00	0.00	0.08	0.00
STMP555	1.00	0.00	0.00	0.00	0.31	0.69	0.00	0.00	0.15	0.00
STMP556	1.00	0.00	0.00	0.00	0.32	0.67	0.00	0.00	0.80	0.00
STMP591	1.00	0.00	0.00	0.00	0.36	0.64	0.00	0.00	0.76	0.00
STMP594	1.00	0.00	0.00	0.00	0.49	0.50	0.00	0.00	0.36	0.00
STMP595	1.00	0.00	0.00	0.00	0.58	0.41	0.00	0.00	0.56	0.00

STMP692	1.00	0.00	0.00	0.00	0.89	0.10	0.00	0.00	0.72	0.00
STMP749	1.00	0.00	0.00	0.00	0.46	0.54	0.00	0.00	0.69	0.00
STMP77	1.00	0.00	0.00	0.00	0.28	0.71	0.00	0.00	0.80	0.00
STMP79	1.00	0.00	0.00	0.00	0.92	0.08	0.00	0.00	0.91	0.00
STMP800	1.00	0.00	0.00	0.00	0.56	0.44	0.00	0.00	0.71	0.00
STMP801	1.00	0.00	0.00	0.00	0.86	0.14	0.00	0.00	0.72	0.00
STMP823	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.89	0.00
STMP824	1.00	0.00	0.00	0.00	0.05	0.95	0.00	0.00	0.89	0.00
STMP850	1.00	0.00	0.00	0.00	0.25	0.75	0.00	0.00	0.08	0.00
STMP88	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.23	0.00
STMP89	1.00	0.00	0.00	0.00	0.02	0.97	0.00	0.00	0.66	0.00
STMP9	1.00	0.00	0.00	0.00	0.33	0.66	0.00	0.00	0.77	0.00
STMP90	1.00	0.00	0.00	0.00	0.43	0.56	0.00	0.00	0.58	0.00
STMP914	1.00	0.00	0.00	0.00	0.27	0.03	0.00	0.70	0.01	0.00
STMP915	1.00	0.00	0.00	0.00	0.34	0.66	0.00	0.00	0.29	0.00
STMP964	1.00	0.00	0.00	0.00	0.59	0.00	0.00	0.41	0.03	0.00
STMP98	1.00	0.00	0.00	0.00	0.25	0.75	0.00	0.00	0.81	0.00
STMP99	1.00	0.00	0.00	0.00	0.43	0.57	0.00	0.00	0.81	0.00
SYMP182	1.00	0.00	0.00	0.00	0.35	0.64	0.00	0.00	0.27	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
C100	0.27	0.27	0.27	0.67	0.17
C101	0.17	0.17	0.17	0.14	0.13
C102	0.29	0.29	0.29	0.34	0.29
C105	0.01	0.01	0.01	0.19	0.01
C93	0.30	0.30	0.30	0.38	0.14
C98	0.14	0.14	0.14	0.01	0.01
STMP10	0.25	0.25	0.25	0.13	0.13
STMP101	0.01	0.01	0.01	0.18	0.01
STMP1086	0.89	0.89	0.89	0.91	0.89
STMP11	0.27	0.27	0.27	0.13	0.13
STMP1170	0.01	0.01	0.01	0.54	0.01
STMP118	0.01	0.01	0.01	0.59	0.01
STMP12	0.29	0.29	0.29	0.13	0.13
STMP120	0.59	0.59	0.59	0.73	0.59

STMP13	0.30	0.30	0.30	0.01	0.01
STMP131	0.05	0.05	0.05	0.08	0.04
STMP14	0.33	0.33	0.33	0.01	0.01
STMP150	0.33	0.33	0.33	0.38	0.33
STMP1513	0.01	0.01	0.01	0.01	0.01
STMP1516	0.01	0.01	0.01	0.65	0.01
STMP155	0.01	0.01	0.01	0.24	0.01
STMP156A	0.04	0.04	0.04	0.06	0.04
STMP156B	0.04	0.04	0.04	0.13	0.04
STMP1604	0.01	0.01	0.01	0.03	0.01
STMP170	0.01	0.01	0.01	0.30	0.01
STMP183	0.47	0.47	0.47	0.01	0.01
STMP184	0.58	0.58	0.58	0.51	0.51
STMP20	0.29	0.29	0.29	0.01	0.01
STMP248	0.61	0.61	0.61	0.64	0.61
STMP249	0.58	0.58	0.58	0.64	0.58
STMP274	0.43	0.43	0.43	0.01	0.01
STMP308	0.16	0.16	0.16	0.20	0.15
STMP309	0.12	0.12	0.12	0.01	0.01
STMP393	0.01	0.01	0.01	0.43	0.01
STMP394	0.26	0.26	0.26	0.37	0.26
STMP427	0.37	0.37	0.37	0.01	0.01
STMP428	0.38	0.38	0.39	0.01	0.01
STMP435	0.41	0.41	0.41	0.43	0.41
STMP521	0.38	0.38	0.39	0.19	0.19
STMP554	0.44	0.44	0.44	0.45	0.43
STMP555	0.40	0.40	0.40	0.01	0.01
STMP556	0.41	0.41	0.41	0.01	0.01
STMP591	0.44	0.44	0.44	0.01	0.01
STMP594	0.52	0.52	0.52	0.53	0.51
STMP595	0.52	0.52	0.52	0.52	0.51
STMP692	0.66	0.66	0.66	0.01	0.01
STMP749	0.54	0.54	0.54	0.17	0.18
STMP77	0.28	0.28	0.28	0.10	0.10
STMP800	0.61	0.61	0.61	0.01	0.01
STMP801	0.56	0.56	0.56	0.01	0.01
STMP850	0.33	0.33	0.33	0.38	0.33
STMP89	0.01	0.01	0.01	0.03	0.01
STMP9	0.34	0.34	0.34	0.17	0.16
STMP90	0.53	0.53	0.53	0.55	0.53
STMP914	0.33	0.33	0.33	0.22	0.22
STMP915	0.44	0.44	0.44	0.28	0.30
STMP964	0.60	0.60	0.60	0.64	0.60
STMP98	0.33	0.33	0.33	0.01	0.01

STMP99	0.35	0.35	0.35	0.38	0.35
SYMP182	0.45	0.45	0.45	0.31	0.31

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Pumping Summary
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Pump	Percent Utilized	Number of Start-Ups	Min Flow LPS	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr	Power Usage Kw-hr	% Time Off Pump Curve Low	% Time Off Pump Curve High
STMP187_PUMP	97.50	1	0.00	2007.69	7056.44	9.970	146.62	0.0	0.0

Analysis begun on: Thu Sep 01 15:48:53 2016
Analysis ended on: Thu Sep 01 15:48:53 2016
Total elapsed time: < 1 sec

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EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.007)
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WARNING 02: maximum depth increased for Node J77

***********************************************************
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.
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Analysis Options
****************
Flow Units ..... LPS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... DYNWAVE
Starting Date ..... NOV-05-2015 00:00:00
Ending Date ..... NOV-05-2015 03:00:00
Antecedent Dry Days ..... 0.0
Report Time Step ..... 00:05:00
Wet Time Step ..... 00:05:00
Dry Time Step ..... 00:05:00
Routing Time Step ..... 30.00 sec
Variable Time Step ..... YES
Maximum Trials ..... 8
Head Tolerance ..... 0.004921 m


*************
Element Count
*************
Number of rain gages ..... 1
Number of subcatchments ... 55
Number of nodes ..... 100
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Number of links ..... 91
Number of pollutants ..... 0
Number of land uses ..... 0


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Raingage Summary
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Name	Data Source	Data Type	Recording Interval
_Current	CC1_AES_1hr_100yr	VOLUME	5 min.

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********************
Subcatchment Summary
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Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
S13-A	14.43	1550.00	70.00	2.5000	_Current	STMH286
S13-B	14.18	1060.00	70.00	1.9000	_Current	STMH188
S13-C	5.03	705.00	66.00	1.1000	_Current	STMH165
S13-D	2.85	632.00	77.00	3.2000	_Current	STMH161
S13-E	5.22	727.00	68.00	2.1000	_Current	STMH54
S13-F	7.67	569.00	50.00	0.5000	_Current	STMH178
S13-G	1.35	351.00	48.00	2.0000	_Current	STMH177
S13-H	1.52	473.00	57.00	3.1000	_Current	STMH398
S23-A	15.82	1095.00	69.00	1.6000	_Current	STMH116
S23-B	3.94	770.00	63.00	2.6000	_Current	DRCB64
S23-C	7.93	966.00	45.00	2.1000	_Current	DRCB40
S25-A	22.61	902.00	61.00	1.3000	_Current	STMH37
S25-B	6.70	737.00	55.00	1.7000	_Current	STMH225
S25-C	7.26	921.00	52.00	1.0000	_Current	STMH202
S25-D	10.70	1063.00	55.00	1.2000	_Current	STMH38
S25-E	10.16	1039.00	49.00	1.7000	_Current	J74
S25-F	41.71	2239.00	44.00	0.8000	_Current	J73
S25-G	3.30	633.00	49.00	1.9000	_Current	STMH205
S25-H	3.45	674.00	41.00	1.2000	_Current	STMH244
S25-I	20.24	1568.00	67.00	2.1000	_Current	J75
S25-J	24.53	1501.00	72.00	1.3000	_Current	J84
S32-A	54.37	400.00	50.00	0.5000	_Current	DRCB258
S32-B	5.37	400.00	50.00	0.5000	_Current	DRCB258
S38-A	16.25	1798.00	79.00	4.1000	_Current	J83
S38-B	18.36	1574.00	76.00	5.9000	_Current	J22

S38-C	8.37	802.00	79.00	4.5000	_Current	STMH78
S38-D	4.72	558.00	73.00	1.5000	_Current	STMH79
S38-Z1	136.40	7480.00	10.00	30.3000	_Current	J83
S38-Z2	5.70	1120.00	10.00	10.4000	_Current	J83
S3-A	8.53	955.00	63.00	2.9000	_Current	STMH12
S3-B	1.98	392.00	62.00	1.5000	_Current	STMH7
S3-C	3.55	735.00	61.00	1.3000	_Current	STMH6
S3-D	2.11	617.00	80.00	2.1000	_Current	STMH138
S3-E	5.92	588.00	76.00	17.2000	_Current	STMH246-DIV
S3-F	1.92	586.00	58.00	13.7000	_Current	J33
S3-G	3.26	655.00	60.00	13.0000	_Current	J87
S3-Z1	241.50	6550.00	10.00	34.0000	_Current	J33
S4-A	3.83	547.00	77.00	19.1000	_Current	J34
S4-B	4.08	379.00	80.00	1.5000	_Current	J37
S4-C	6.76	577.00	73.00	3.3000	_Current	STMH93
S5-A	8.95	974.00	64.00	2.6000	_Current	STMH133
S5-B	1.74	288.00	80.00	0.9000	_Current	STMH135
S5-C	2.50	464.00	80.00	0.6000	_Current	STMH131
S5-D	1.28	206.00	80.00	1.2000	_Current	STMH196
S5-E	4.01	610.00	79.00	2.3000	_Current	STMH4
S5-F	1.02	184.00	80.00	6.0000	_Current	STMH15
S5-G	4.10	727.00	77.00	0.3000	_Current	STMH2
S5-H	3.71	473.00	73.00	0.4000	_Current	STMH147
S5-I	10.27	885.00	71.00	6.2000	_Current	STMH212
S5-J	5.91	831.00	60.00	9.1000	_Current	J56
S5-K	28.67	1446.00	54.00	11.9000	_Current	J46
S5-Z1	87.70	4910.00	10.00	36.0000	_Current	J46
S7-A	7.47	684.00	56.00	0.9000	_Current	STMH23
S7-B	3.90	411.00	22.00	7.3000	_Current	STMH297
S13-I	2.12	370.00	60.00	1.0000	_Current	J1

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Node Summary
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Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J1	JUNCTION	444.92	2.90	0.0	
STMH286	JUNCTION	444.31	3.40	0.0	
STMH56	JUNCTION	443.98	3.20	0.0	
STMH54	JUNCTION	442.97	4.10	0.0	
STMH178	JUNCTION	441.29	3.20	0.0	
STMH177	JUNCTION	440.78	2.60	0.0	

STMH398	JUNCTION	440.42	3.10	0.0
STMH188	JUNCTION	446.02	3.40	0.0
STMH64	JUNCTION	445.56	3.40	0.0
STMH161	JUNCTION	444.09	3.00	0.0
STMH165	JUNCTION	443.56	3.60	0.0
STMH63	JUNCTION	445.08	3.30	0.0
STMH62	JUNCTION	444.98	2.80	0.0
STMH77	JUNCTION	454.15	2.20	0.0
STMH74	JUNCTION	452.88	3.20	0.0
STMH83	JUNCTION	441.98	3.00	0.0
STMH79	JUNCTION	441.38	2.60	0.0
STMH235	JUNCTION	442.44	1.90	0.0
J22	JUNCTION	442.75	1.90	0.0
STMH139	JUNCTION	455.33	1.80	0.0
STMH138	JUNCTION	454.88	1.60	0.0
STMH183	JUNCTION	454.27	1.60	0.0
STMH6	JUNCTION	453.29	2.16	0.0
STMH7	JUNCTION	452.73	3.27	0.0
STMH184	JUNCTION	451.89	4.40	0.0
STMH185	JUNCTION	451.75	4.44	0.0
STMH12	JUNCTION	451.69	4.40	0.0
J33	JUNCTION	459.08	2.50	0.0
J34	JUNCTION	455.36	2.50	0.0
STMH17	JUNCTION	453.99	1.60	0.0
STMH254	JUNCTION	453.24	2.60	0.0
STMH93	JUNCTION	451.88	3.90	0.0
J37	JUNCTION	453.49	2.00	0.0
J38	JUNCTION	454.36	2.50	0.0
STMH190	JUNCTION	449.72	4.70	0.0
STMH133	JUNCTION	450.28	4.40	0.0
STMH135	JUNCTION	451.01	3.80	0.0
STMH131	JUNCTION	451.21	3.70	0.0
STMH196	JUNCTION	451.69	3.00	0.0
STMH137	JUNCTION	453.28	2.60	0.0
STMH15	JUNCTION	454.27	1.80	0.0
J46	JUNCTION	455.31	5.00	0.0
STMH4	JUNCTION	452.57	3.10	0.0
STMH216	JUNCTION	452.15	3.10	0.0
STMH197	JUNCTION	451.95	2.70	0.0
STMH2	JUNCTION	453.06	1.80	0.0
STMH28	JUNCTION	453.20	1.90	0.0
STMH147	JUNCTION	453.75	2.90	0.0
STMH194	JUNCTION	454.00	1.80	0.0
STMH253	JUNCTION	454.49	2.00	0.0

J56	JUNCTION	455.38	2.60	0.0
STMH212	JUNCTION	454.85	1.20	0.0
STMH298	JUNCTION	440.27	1.60	0.0
STMH297	JUNCTION	440.64	3.90	0.0
STMH26	JUNCTION	452.49	5.00	0.0
STMH22	JUNCTION	454.19	3.70	0.0
STMH23	JUNCTION	454.38	3.30	0.0
STMH225	JUNCTION	450.19	2.44	0.0
STMH226	JUNCTION	448.06	3.04	0.0
STMH202	JUNCTION	446.71	3.02	0.0
STMH38	JUNCTION	444.70	2.75	0.0
STMH205	JUNCTION	441.90	3.20	0.0
STMH204	JUNCTION	441.59	3.16	0.0
STMH109	JUNCTION	440.60	1.70	0.0
STMH37	JUNCTION	450.62	2.50	0.0
STMH244	JUNCTION	440.10	1.50	0.0
STMH362	JUNCTION	439.80	1.70	0.0
J73	JUNCTION	439.28	1.50	0.0
J74	JUNCTION	438.27	1.50	0.0
J75	JUNCTION	437.62	1.50	0.0
J76	JUNCTION	437.10	1.80	0.0
J77	JUNCTION	442.00	2.00	0.0
J78	JUNCTION	438.00	1.50	0.0
J79	JUNCTION	454.78	4.70	0.0
STMH116	JUNCTION	454.00	2.30	0.0
DRCB64	JUNCTION	451.36	2.50	0.0
DRCB40	JUNCTION	445.61	2.50	0.0
J83	JUNCTION	458.49	2.80	0.0
J84	JUNCTION	437.36	1.50	0.0
J85	JUNCTION	457.37	2.50	0.0
STMH78	JUNCTION	446.63	2.90	0.0
J86	JUNCTION	458.46	2.50	0.0
J87	JUNCTION	458.57	2.50	0.0
J88	JUNCTION	458.25	2.50	0.0
J89	JUNCTION	456.77	2.50	0.0
J90	JUNCTION	459.23	2.50	0.0
J91	JUNCTION	457.00	2.50	0.0
DRCB258	JUNCTION	439.79	1.50	0.0
DRCB260	JUNCTION	438.95	1.50	0.0
J94	JUNCTION	436.84	1.50	0.0
STMH246-DIV	JUNCTION	455.92	2.50	0.0
DROF13	OUTFALL	440.21	0.90	0.0
DROF38	OUTFALL	440.85	1.05	0.0
DROF3	OUTFALL	451.34	0.75	0.0

DROF4	OUTFALL	451.61	0.75	0.0
DROF5	OUTFALL	449.45	1.20	0.0
DROF7	OUTFALL	440.02	0.60	0.0
DROF25	OUTFALL	440.00	2.00	0.0
DROF23	OUTFALL	443.90	0.35	0.0
DRFI2017	OUTFALL	436.42	1.00	0.0

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Link Summary
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Name	From Node	To Node	Type	Length	%Slope	Roughness
C100	STMH235	STMH83	CONDUIT	61.4	0.1515	0.0100
C101	STMH83	STMH79	CONDUIT	153.1	0.3430	0.0100
C102	STMH79	DROF38	CONDUIT	137.0	0.3831	0.0100
C103	STMH74	STMH78	CONDUIT	159.2	3.9237	0.0100
C104	STMH78	STMH83	CONDUIT	132.9	3.4096	0.0100
C105	J86	J85	CONDUIT	70.6	1.5447	0.0100
C106	J87	J88	CONDUIT	31.5	1.0172	0.0100
C107	J88	J85	CONDUIT	88.2	0.9974	0.0100
C108	J89	J34	CONDUIT	101.2	1.3931	0.0100
C109	J90	J91	CONDUIT	52.0	4.2949	0.0100
C110	J91	J34	CONDUIT	104.7	1.5661	0.0100
C93	J46	J79	CONDUIT	35.5	1.4931	0.0100
C96	J83	STMH77	CONDUIT	202.0	2.1231	0.0100
C98	J33	J86	CONDUIT	16.4	3.7740	0.0100
C99	J85	STMH246-DIV	CONDUIT	79.7	1.8201	0.0100
DRDI117	J94	DRFI2017	CONDUIT	41.6	1.0097	0.0100
DRDI27	J73	J74	CONDUIT	251.8	0.4012	0.0100
DRDI28	J74	J78	CONDUIT	67.3	0.4013	0.0100
DRDI4	J75	J76	CONDUIT	175.3	0.2966	0.0100
DRDI5	J84	J76	CONDUIT	65.5	0.3966	0.0100
DRDI6	J77	DROF25	CONDUIT	153.4	1.3036	0.0100
STMP10	STMH188	STMH64	CONDUIT	45.5	1.0110	0.0100
STMP100	STMH196	STMH131	CONDUIT	86.4	0.5557	0.0100
STMP101	STMH131	STMH135	CONDUIT	90.9	0.2201	0.0100
STMP103	STMH197	STMH196	CONDUIT	47.1	0.5524	0.0100
STMP106	STMH135	STMH133	CONDUIT	89.7	0.8139	0.0100
STMP107	STMH133	STMH190	CONDUIT	86.0	0.6511	0.0100
STMP1086	DRCB40	DROF23	CONDUIT	262.5	0.6514	0.0100
STMP11	STMH64	STMH63	CONDUIT	47.9	1.0026	0.0100
STMP1170	DRCB260	J94	CONDUIT	241.7	0.8730	0.0100
STMP118	STMH28	STMH2	CONDUIT	116.3	0.1204	0.0100

STMP12	STMH63	STMH62	CONDUIT	10.2	0.9824	0.0100
STMP120	STMH147	STMH28	CONDUIT	110.1	0.4994	0.0100
STMP123	STMH2	STMH197	CONDUIT	88.5	1.2548	0.0100
STMP1289	STMH26	STMH297	CONDUIT	27.8	47.1005	0.0100
STMP13	STMH62	STMH161	CONDUIT	89.3	0.9962	0.0100
STMP131	STMH190	DROF5	CONDUIT	54.9	0.4920	0.0100
STMP14	STMH161	STMH54	CONDUIT	92.7	1.2078	0.0100
STMP150	STMH37	STMH225	CONDUIT	86.2	0.4990	0.0100
STMP1513	DRCB258	DRCB260	CONDUIT	24.9	3.3754	0.0100
STMP1516	STMH362	J73	CONDUIT	33.6	0.4161	0.0100
STMP155	STMH23	STMH22	CONDUIT	82.8	0.2294	0.0100
STMP156A	STMH298	DROF7	CONDUIT	50.2	0.4979	0.0100
STMP156B	STMH297	STMH298	CONDUIT	136.3	0.2715	0.0100
STMP1604	STMH398	DROF13	CONDUIT	20.4	1.0300	0.0100
STMP161	STMH22	STMH26	CONDUIT	57.4	2.9625	0.0100
STMP170	J78	J75	CONDUIT	31.2	1.2184	0.0100
STMP183	STMH38	STMH205	CONDUIT	133.6	2.0956	0.0100
STMP184	STMH204	STMH109	CONDUIT	96.4	1.0273	0.0100
STMP20	J1	STMH286	CONDUIT	121.6	0.5014	0.0100
STMP248	STMH109	STMH244	CONDUIT	132.7	0.3768	0.0100
STMP249	STMH244	STMH362	CONDUIT	69.7	0.4307	0.0100
STMP274	J56	STMH253	CONDUIT	178.1	0.4998	0.0100
STMP276	STMH254	STMH93	CONDUIT	140.0	0.9714	0.0100
STMP29	STMH77	STMH74	CONDUIT	35.8	3.4248	0.0100
STMP308	STMH116	DRCB64	CONDUIT	71.1	3.7156	0.0100
STMP309	DRCB64	DRCB40	CONDUIT	215.4	2.6704	0.0100
STMP393	STMH177	STMH398	CONDUIT	105.6	0.3409	0.0100
STMP394	STMH178	STMH177	CONDUIT	124.0	0.4112	0.0100
STMP427	STMH56	STMH165	CONDUIT	112.2	0.3745	0.0100
STMP428	STMH165	STMH54	CONDUIT	92.0	0.6415	0.0100
STMP435	STMH54	STMH178	CONDUIT	132.3	1.2698	0.0100
STMP521	STMH139	STMH138	CONDUIT	19.0	2.3653	0.0100
STMP524	J38	STMH17	CONDUIT	16.1	2.3002	0.0100
STMP525	J34	J38	CONDUIT	41.6	2.4063	0.0100
STMP554	STMH6	STMH7	CONDUIT	75.5	0.7417	0.0100
STMP555	STMH138	STMH183	CONDUIT	46.0	1.3271	0.0100
STMP556	STMH183	STMH6	CONDUIT	54.9	1.7850	0.0100
STMP591	STMH7	STMH184	CONDUIT	43.1	1.9502	0.0100
STMP594	STMH184	STMH185	CONDUIT	34.9	0.4014	0.0100
STMP595	STMH185	STMH12	CONDUIT	14.4	0.4170	0.0100
STMP692	STMH194	STMH147	CONDUIT	49.5	0.5054	0.0100
STMP749	STMH205	STMH204	CONDUIT	13.4	2.3175	0.0100
STMP77	STMH246-DIV	STMH139	CONDUIT	27.8	2.1197	0.0100
STMP79	STMH17	J37	CONDUIT	94.2	0.5307	0.0100

STMP800	STMH253	STMH194	CONDUIT	97.4	0.5029	0.0100
STMP801	STMH212	STMH253	CONDUIT	72.7	0.4952	0.0100
STMP823	STMH216	STMH196	CONDUIT	67.8	0.6789	0.0100
STMP824	STMH4	STMH216	CONDUIT	62.6	0.6710	0.0100
STMP850	J79	STMH15	CONDUIT	33.9	1.5042	0.0100
STMP88	J37	STMH254	CONDUIT	45.8	0.5460	0.0100
STMP89	STMH93	DROF4	CONDUIT	27.1	0.9949	0.0100
STMP9	STMH286	STMH56	CONDUIT	62.1	0.5310	0.0100
STMP90	STMH12	DROF3	CONDUIT	69.3	0.5051	0.0100
STMP914	STMH225	STMH226	CONDUIT	43.8	1.6658	0.0100
STMP915	STMH226	STMH202	CONDUIT	128.5	1.0510	0.0100
STMP964	J22	STMH235	CONDUIT	89.5	0.2929	0.0100
STMP98	STMH15	STMH137	CONDUIT	29.4	3.3716	0.0100
STMP99	STMH137	STMH196	CONDUIT	97.5	1.6318	0.0100
SYMP182	STMH202	STMH38	CONDUIT	141.2	1.4237	0.0100
STMP187_PUMP	J76	J77	IDEAL PUMP			

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C100	CIRCULAR	0.45	0.16	0.11	0.45	1	144.26
C101	CIRCULAR	1.20	1.13	0.30	1.20	1	2968.54
C102	CIRCULAR	1.05	0.87	0.26	1.05	1	2197.46
C103	CIRCULAR	1.05	0.87	0.26	1.05	1	7032.30
C104	CIRCULAR	1.05	0.87	0.26	1.05	1	6555.37
C105	CIRCULAR	0.75	0.44	0.19	0.75	1	1798.88
C106	CIRCULAR	0.75	0.44	0.19	0.75	1	1459.75
C107	CIRCULAR	0.75	0.44	0.19	0.75	1	1445.50
C108	CIRCULAR	0.90	0.64	0.23	0.90	1	2777.92
C109	CIRCULAR	0.90	0.64	0.23	0.90	1	4877.52
C110	CIRCULAR	0.90	0.64	0.23	0.90	1	2945.34
C93	CIRCULAR	0.60	0.28	0.15	0.60	2	975.43
C96	CIRCULAR	1.05	0.87	0.26	1.05	1	5172.85
C98	CIRCULAR	0.90	0.64	0.23	0.90	1	4572.17
C99	TRAPEZOIDAL	2.00	5.00	0.83	4.00	1	59738.45
DRDI117	TRAPEZOIDAL	1.00	3.60	0.52	6.60	1	23389.71
DRDI27	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76654.24
DRDI28	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76659.66
DRDI4	TRAPEZOIDAL	1.50	14.25	0.98	14.00	1	76761.44
DRDI5	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76218.52

DRDI6	TRAPEZOIDAL	2.00	12.00	0.95	12.00	1	132287.57
STMP10	CIRCULAR	0.60	0.28	0.15	0.60	1	802.66
STMP100	CIRCULAR	1.20	1.13	0.30	1.20	1	3778.42
STMP101	CIRCULAR	1.20	1.13	0.30	1.20	1	2378.05
STMP103	CIRCULAR	0.90	0.64	0.23	0.90	1	1749.20
STMP106	CIRCULAR	1.20	1.13	0.30	1.20	1	4572.62
STMP107	CIRCULAR	1.20	1.13	0.30	1.20	1	4089.94
STMP1086	CIRCULAR	0.35	0.10	0.09	0.35	1	153.05
STMP11	CIRCULAR	0.60	0.28	0.15	0.60	1	799.28
STMP1170	CIRCULAR	0.60	0.28	0.15	0.60	1	745.86
STMP118	CIRCULAR	0.60	0.28	0.15	0.60	1	276.99
STMP12	CIRCULAR	0.60	0.28	0.15	0.60	1	791.19
STMP120	CIRCULAR	0.40	0.13	0.10	0.40	1	191.34
STMP123	CIRCULAR	0.75	0.44	0.19	0.75	1	1621.26
STMP1289	CIRCULAR	0.40	0.13	0.10	0.40	1	1858.16
STMP13	CIRCULAR	0.60	0.28	0.15	0.60	1	796.76
STMP131	CIRCULAR	1.20	1.13	0.30	1.20	1	3555.25
STMP14	CIRCULAR	0.60	0.28	0.15	0.60	1	877.28
STMP150	CIRCULAR	0.60	0.28	0.15	0.60	1	563.87
STMP1513	CIRCULAR	0.80	0.50	0.20	0.80	1	3158.49
STMP1516	CIRCULAR	0.60	0.28	0.15	0.60	1	514.90
STMP155	CIRCULAR	0.50	0.20	0.12	0.50	1	235.13
STMP156A	CIRCULAR	0.60	0.28	0.15	0.60	1	563.28
STMP156B	CIRCULAR	0.60	0.28	0.15	0.60	1	415.93
STMP1604	CIRCULAR	0.90	0.64	0.23	0.90	1	2388.56
STMP161	CIRCULAR	0.50	0.20	0.12	0.50	1	844.93
STMP170	CIRCULAR	0.80	0.50	0.20	0.80	3	1897.65
STMP183	CIRCULAR	0.60	0.28	0.15	0.60	1	1155.59
STMP184	CIRCULAR	0.60	0.28	0.15	0.60	1	809.10
STMP20	CIRCULAR	0.50	0.20	0.12	0.50	1	347.62
STMP248	CIRCULAR	0.60	0.28	0.15	0.60	1	489.98
STMP249	CIRCULAR	0.60	0.28	0.15	0.60	1	523.90
STMP274	CIRCULAR	0.60	0.28	0.15	0.60	1	564.32
STMP276	CIRCULAR	0.75	0.44	0.19	0.75	1	1426.50
STMP29	CIRCULAR	1.05	0.87	0.26	1.05	1	6569.95
STMP308	CIRCULAR	0.45	0.16	0.11	0.45	1	714.48
STMP309	CIRCULAR	0.60	0.28	0.15	0.60	1	1304.47
STMP393	CIRCULAR	0.90	0.64	0.23	0.90	1	1374.18
STMP394	CIRCULAR	0.90	0.64	0.23	0.90	1	1509.26
STMP427	CIRCULAR	0.68	0.36	0.17	0.68	1	668.74
STMP428	CIRCULAR	0.68	0.36	0.17	0.68	1	875.31
STMP435	CIRCULAR	0.68	0.36	0.17	0.68	1	1231.44
STMP521	CIRCULAR	0.75	0.44	0.19	0.75	1	2225.98
STMP524	CIRCULAR	0.75	0.44	0.19	0.75	1	2195.09

STMP525	CIRCULAR	0.75	0.44	0.19	0.75	1	2245.15
STMP554	CIRCULAR	0.75	0.44	0.19	0.75	1	1246.52
STMP555	CIRCULAR	0.75	0.44	0.19	0.75	1	1667.32
STMP556	CIRCULAR	0.75	0.44	0.19	0.75	1	1933.72
STMP591	CIRCULAR	0.75	0.44	0.19	0.75	1	2021.23
STMP594	CIRCULAR	0.75	0.44	0.19	0.75	1	916.96
STMP595	CIRCULAR	0.75	0.44	0.19	0.75	1	934.59
STMP692	CIRCULAR	0.50	0.20	0.12	0.50	1	348.98
STMP749	CIRCULAR	0.60	0.28	0.15	0.60	1	1215.23
STMP77	CIRCULAR	0.90	0.64	0.23	0.90	1	3426.60
STMP79	CIRCULAR	0.75	0.44	0.19	0.75	1	1054.36
STMP800	CIRCULAR	0.50	0.20	0.12	0.50	1	348.14
STMP801	CIRCULAR	0.50	0.20	0.12	0.50	1	345.45
STMP823	CIRCULAR	0.60	0.28	0.15	0.60	1	657.72
STMP824	CIRCULAR	0.60	0.28	0.15	0.60	1	653.92
STMP850	CIRCULAR	0.60	0.28	0.15	0.60	1	979.02
STMP88	CIRCULAR	0.75	0.44	0.19	0.75	1	1069.45
STMP89	CIRCULAR	0.75	0.44	0.19	0.75	1	1443.65
STMP9	CIRCULAR	0.68	0.36	0.17	0.68	1	796.33
STMP90	CIRCULAR	0.75	0.44	0.19	0.75	1	1028.59
STMP914	CIRCULAR	0.60	0.28	0.15	0.60	1	1030.27
STMP915	CIRCULAR	0.60	0.28	0.15	0.60	1	818.35
STMP964	CIRCULAR	0.45	0.16	0.11	0.45	1	200.59
STMP98	CIRCULAR	0.60	0.28	0.15	0.60	1	1465.75
STMP99	CIRCULAR	0.60	0.28	0.15	0.60	1	1019.72
SYMP182	CIRCULAR	0.60	0.28	0.15	0.60	1	952.46

****
Control Actions Taken
****

********** Runoff Quantity Continuity **********	Volume hectare-m	Depth mm
Total Precipitation	25.794	27.530
Evaporation Loss	0.000	0.000
Infiltration Loss	16.638	17.758
Surface Runoff	8.854	9.450
Final Surface Storage	0.529	0.565
Continuity Error (%)	-0.881	

********** Flow Routing Continuity **********	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	8.850	88.504
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	5.551	55.508
Internal Outflow	3.297	32.975
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.005	0.051
Continuity Error (%)	-0.033	

****
Time-Step Critical Elements
****
Link STMP749 (28.87%)
Link C98 (17.47%)
Link STMP1513 (14.78%)
Link STMP12 (11.23%)
Link STMP1289 (10.39%)

****
Highest Flow Instability Indexes
****
Link STMP595 (24)
Link STMP1516 (21)
Link C93 (20)
Link STMP12 (18)
Link STMP594 (18)

****
Routing Time Step Summary
****
Minimum Time Step : 0.50 sec
Average Time Step : 3.77 sec
Maximum Time Step : 30.00 sec

Percent in Steady State : 0.00
Average Iterations per Step : 5.19
Percent Not Converging : 38.18

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
S13-A	27.53	0.00	0.00	8.26	18.80	2.71	2877.39	0.683
S13-B	27.53	0.00	0.00	8.26	18.73	2.66	2671.65	0.680
S13-C	27.53	0.00	0.00	9.36	17.72	0.89	939.43	0.643
S13-D	27.53	0.00	0.00	6.33	20.73	0.59	642.06	0.753
S13-E	27.53	0.00	0.00	8.81	18.28	0.95	1023.24	0.664
S13-F	27.53	0.00	0.00	13.76	13.33	1.02	962.62	0.484
S13-G	27.53	0.00	0.00	14.32	12.91	0.17	190.13	0.469
S13-H	27.53	0.00	0.00	11.84	15.32	0.23	254.35	0.556
S23-A	27.53	0.00	0.00	8.53	18.43	2.92	2859.97	0.670
S23-B	27.53	0.00	0.00	10.19	16.96	0.67	725.96	0.616
S23-C	27.53	0.00	0.00	15.14	12.11	0.96	1038.92	0.440
S25-A	27.53	0.00	0.00	10.74	16.19	3.66	3122.45	0.588
S25-B	27.53	0.00	0.00	12.39	14.78	0.99	1054.78	0.537
S25-C	27.53	0.00	0.00	13.21	13.97	1.01	1075.83	0.507
S25-D	27.53	0.00	0.00	12.39	14.75	1.58	1647.03	0.536
S25-E	27.53	0.00	0.00	14.04	13.17	1.34	1428.62	0.478
S25-F	27.53	0.00	0.00	15.42	11.74	4.90	4651.38	0.426
S25-G	27.53	0.00	0.00	14.04	13.19	0.44	473.35	0.479
S25-H	27.53	0.00	0.00	16.24	11.04	0.38	413.92	0.401
S25-I	27.53	0.00	0.00	9.08	17.95	3.63	3721.14	0.652
S25-J	27.53	0.00	0.00	7.71	19.18	4.70	4341.56	0.697
S32-A	27.53	0.00	0.00	13.77	12.38	6.73	2271.35	0.450
S32-B	27.53	0.00	0.00	13.77	13.33	0.72	674.65	0.484
S38-A	27.53	0.00	0.00	5.78	21.23	3.45	3692.25	0.771
S38-B	27.53	0.00	0.00	6.61	20.42	3.75	4005.75	0.742
S38-C	27.53	0.00	0.00	5.78	21.22	1.78	1891.09	0.771
S38-D	27.53	0.00	0.00	7.43	19.58	0.92	964.56	0.711
S38-Z1	27.53	0.00	0.00	24.78	2.68	3.65	4005.54	0.097
S38-Z2	27.53	0.00	0.00	24.78	2.67	0.15	167.38	0.097
S3-A	27.53	0.00	0.00	10.19	16.94	1.44	1550.54	0.615

S3-B	27.53	0.00	0.00	10.46	16.68	0.33	357.37	0.606
S3-C	27.53	0.00	0.00	10.74	16.41	0.58	630.24	0.596
S3-D	27.53	0.00	0.00	5.51	21.53	0.45	494.03	0.782
S3-E	27.53	0.00	0.00	6.61	20.46	1.21	1317.13	0.743
S3-F	27.53	0.00	0.00	11.56	15.54	0.30	327.02	0.565
S3-G	27.53	0.00	0.00	11.01	16.11	0.53	574.35	0.585
S3-Z1	27.53	0.00	0.00	24.78	2.68	6.48	7091.75	0.097
S4-A	27.53	0.00	0.00	6.33	20.71	0.79	865.45	0.752
S4-B	27.53	0.00	0.00	5.51	21.40	0.87	873.47	0.777
S4-C	27.53	0.00	0.00	7.43	19.59	1.32	1390.66	0.712
S5-A	27.53	0.00	0.00	9.91	17.20	1.54	1644.44	0.625
S5-B	27.53	0.00	0.00	5.51	21.45	0.37	389.25	0.779
S5-C	27.53	0.00	0.00	5.51	21.44	0.54	553.74	0.779
S5-D	27.53	0.00	0.00	5.51	21.47	0.27	289.51	0.780
S5-E	27.53	0.00	0.00	5.78	21.24	0.85	912.49	0.771
S5-F	27.53	0.00	0.00	5.51	21.53	0.22	238.93	0.782
S5-G	27.53	0.00	0.00	6.33	20.57	0.84	826.15	0.747
S5-H	27.53	0.00	0.00	7.43	19.47	0.72	688.41	0.707
S5-I	27.53	0.00	0.00	7.98	19.09	1.96	2103.75	0.693
S5-J	27.53	0.00	0.00	11.01	16.14	0.95	1040.09	0.586
S5-K	27.53	0.00	0.00	12.66	14.52	4.16	4478.97	0.528
S5-Z1	27.53	0.00	0.00	24.78	2.68	2.35	2575.05	0.097
S7-A	27.53	0.00	0.00	12.11	14.99	1.12	1135.27	0.544
S7-B	27.53	0.00	0.00	21.47	5.91	0.23	251.95	0.215
S13-I	27.53	0.00	0.00	0.85	24.93	0.53	456.85	0.905

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Node Depth Summary
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days	hr:min
J1	JUNCTION	0.98	2.90	447.82	0	00:13
STMH286	JUNCTION	1.23	3.40	447.71	0	00:13
STMH56	JUNCTION	1.21	3.20	447.18	0	00:13
STMH54	JUNCTION	1.40	4.10	447.07	0	00:13
STMH178	JUNCTION	0.87	3.20	444.49	0	00:13
STMH177	JUNCTION	0.69	2.60	443.38	0	00:14
STMH398	JUNCTION	0.42	1.11	441.53	0	00:16
STMH188	JUNCTION	1.06	3.40	449.42	0	00:14

STMH64	JUNCTION	1.03	3.24	448.80	0	00:14
STMH161	JUNCTION	1.09	3.00	447.09	0	00:13
STMH165	JUNCTION	1.30	3.60	447.16	0	00:13
STMH63	JUNCTION	0.99	3.30	448.38	0	00:13
STMH62	JUNCTION	0.99	2.80	447.78	0	00:14
STMH77	JUNCTION	0.25	0.83	454.98	0	00:18
STMH74	JUNCTION	0.25	0.92	453.80	0	00:18
STMH83	JUNCTION	0.91	3.00	444.98	0	00:14
STMH79	JUNCTION	0.89	2.60	443.98	0	00:14
STMH235	JUNCTION	0.80	1.90	444.34	0	00:11
J22	JUNCTION	0.96	1.90	444.65	0	00:11
STMH139	JUNCTION	0.72	1.80	457.13	0	00:12
STMH138	JUNCTION	0.71	1.60	456.48	0	00:12
STMH183	JUNCTION	0.71	1.60	455.87	0	00:12
STMH6	JUNCTION	0.95	2.16	455.45	0	00:12
STMH7	JUNCTION	0.86	3.27	456.00	0	00:12
STMH184	JUNCTION	1.06	4.40	456.29	0	00:12
STMH185	JUNCTION	0.96	4.44	456.19	0	00:12
STMH12	JUNCTION	0.92	4.40	456.09	0	00:12
J33	JUNCTION	0.57	2.50	461.58	0	00:15
J34	JUNCTION	0.10	0.40	455.76	0	00:21
STMH17	JUNCTION	0.19	1.60	455.59	0	00:19
STMH254	JUNCTION	0.24	2.34	455.58	0	00:18
STMH93	JUNCTION	0.32	1.55	453.43	0	00:20
J37	JUNCTION	0.28	2.00	455.49	0	00:18
J38	JUNCTION	0.14	1.82	456.18	0	00:19
STMH190	JUNCTION	0.56	1.80	451.52	0	00:18
STMH133	JUNCTION	0.55	2.57	452.85	0	00:18
STMH135	JUNCTION	0.47	2.88	453.89	0	00:18
STMH131	JUNCTION	0.60	3.24	454.45	0	00:18
STMH196	JUNCTION	0.49	3.00	454.69	0	00:18
STMH137	JUNCTION	0.81	2.53	455.81	0	00:18
STMH15	JUNCTION	0.71	1.80	456.07	0	00:12
J46	JUNCTION	1.45	5.00	460.31	0	00:13
STMH4	JUNCTION	0.27	3.10	455.67	0	00:18
STMH216	JUNCTION	0.28	3.10	455.25	0	00:18
STMH197	JUNCTION	0.36	2.70	454.65	0	00:18
STMH2	JUNCTION	0.25	1.80	454.86	0	00:19
STMH28	JUNCTION	0.36	1.90	455.10	0	00:19
STMH147	JUNCTION	1.07	2.90	456.65	0	00:12
STMH194	JUNCTION	0.94	1.80	455.80	0	00:13
STMH253	JUNCTION	0.84	2.00	456.49	0	00:12
J56	JUNCTION	0.57	2.60	457.98	0	00:13
STMH212	JUNCTION	0.62	1.20	456.05	0	00:12

STMH298	JUNCTION	0.29	1.60	441.87	0	00:16
STMH297	JUNCTION	0.52	3.90	444.54	0	00:18
STMH26	JUNCTION	0.07	0.19	452.68	0	00:19
STMH22	JUNCTION	0.18	1.49	455.68	0	00:18
STMH23	JUNCTION	0.52	3.30	457.68	0	00:18
STMH225	JUNCTION	0.81	2.44	452.63	0	00:14
STMH226	JUNCTION	1.29	3.04	451.10	0	00:14
STMH202	JUNCTION	1.31	3.02	449.73	0	00:13
STMH38	JUNCTION	1.25	2.75	447.45	0	00:13
STMH205	JUNCTION	1.44	3.20	445.10	0	00:13
STMH204	JUNCTION	1.47	3.16	444.75	0	00:13
STMH109	JUNCTION	0.96	1.70	442.30	0	00:13
STMH37	JUNCTION	0.99	2.50	453.12	0	00:14
STMH244	JUNCTION	0.71	1.50	441.60	0	00:13
STMH362	JUNCTION	0.49	1.70	441.50	0	00:13
J73	JUNCTION	0.15	0.39	439.67	0	00:20
J74	JUNCTION	0.18	0.51	438.78	0	00:21
J75	JUNCTION	0.20	0.53	438.15	0	00:21
J76	JUNCTION	0.00	0.00	437.10	0	00:00
J77	JUNCTION	0.41	0.87	442.87	0	00:20
J78	JUNCTION	0.26	0.79	438.79	0	00:22
J79	JUNCTION	1.44	4.66	459.44	0	00:19
STMH116	JUNCTION	0.69	2.30	456.30	0	00:14
DRCB64	JUNCTION	0.47	2.50	453.86	0	00:15
DRCB40	JUNCTION	1.53	2.50	448.11	0	00:12
J83	JUNCTION	0.39	2.80	461.29	0	00:17
J84	JUNCTION	0.12	0.34	437.70	0	00:20
J85	JUNCTION	0.18	0.51	457.88	0	00:20
STMH78	JUNCTION	0.47	2.90	449.54	0	00:16
J86	JUNCTION	0.68	2.50	460.96	0	00:12
J87	JUNCTION	0.10	0.33	458.90	0	00:20
J88	JUNCTION	0.10	0.33	458.58	0	00:20
J89	JUNCTION	0.00	0.00	456.77	0	00:00
J90	JUNCTION	0.00	0.00	459.23	0	00:00
J91	JUNCTION	0.00	0.00	457.00	0	00:00
DRCB258	JUNCTION	0.65	1.50	441.29	0	00:16
DRCB260	JUNCTION	1.03	1.50	440.45	0	00:16
J94	JUNCTION	0.19	0.23	437.07	0	00:17
STMH246-DIV	JUNCTION	0.67	2.28	458.20	0	00:21
DROF13	OUTFALL	0.41	0.90	441.11	0	00:14
DROF38	OUTFALL	0.56	1.05	441.90	0	00:14
DROF3	OUTFALL	0.44	0.75	452.09	0	00:12
DROF4	OUTFALL	0.27	0.75	452.36	0	00:16
DROF5	OUTFALL	0.53	1.20	450.65	0	00:16

DROF7	OUTFALL	0.23	0.60	440.62	0	00:16
DROF25	OUTFALL	0.41	0.86	440.86	0	00:20
DROF23	OUTFALL	0.27	0.35	444.25	0	00:12
DRFI2017	OUTFALL	0.19	0.23	436.65	0	00:17

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	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	456.85	526.50	0	00:13	0.528	0.546	-0.172
STMH286	JUNCTION	2877.37	3024.35	0	00:20	2.71	3.07	0.005
STMH56	JUNCTION	0.00	1009.18	0	00:32	0	2.22	0.035
STMH54	JUNCTION	1023.23	1792.75	0	00:14	0.954	4.47	0.007
STMH178	JUNCTION	962.61	2538.04	0	00:20	1.02	5.49	-0.004
STMH177	JUNCTION	190.13	2727.99	0	00:20	0.174	5.67	-0.035
STMH398	JUNCTION	254.35	2982.19	0	00:20	0.233	5.9	-0.005
STMH188	JUNCTION	2671.64	2671.64	0	00:20	2.66	2.66	-0.006
STMH64	JUNCTION	0.00	1004.91	0	00:26	0	2.02	-0.004
STMH161	JUNCTION	642.06	1343.59	0	00:20	0.591	2.26	-0.023
STMH165	JUNCTION	939.43	1096.53	0	00:20	0.891	2.16	-0.052
STMH63	JUNCTION	0.00	1004.94	0	00:17	0	2.02	-0.037
STMH62	JUNCTION	0.00	1005.58	0	00:29	0	2.02	0.014
STMH77	JUNCTION	0.00	6137.83	0	00:22	0	7.03	0.004
STMH74	JUNCTION	0.00	6147.29	0	00:18	0	7.03	-0.010
STMH83	JUNCTION	0.00	6576.58	0	00:23	0	9.23	0.249
STMH79	JUNCTION	964.56	5061.50	0	00:20	0.924	8.78	-0.246
STMH235	JUNCTION	0.00	596.44	0	00:17	0	1.28	-0.330
J22	JUNCTION	4005.72	4005.72	0	00:20	3.75	3.75	0.140
STMH139	JUNCTION	0.00	4597.92	0	00:21	0	6.83	-0.010
STMH138	JUNCTION	494.03	3168.95	0	00:20	0.454	6.05	0.006
STMH183	JUNCTION	0.00	1746.59	0	00:12	0	4.2	-0.034
STMH6	JUNCTION	630.23	1896.05	0	00:20	0.583	4.12	0.004
STMH7	JUNCTION	357.37	1892.98	0	00:12	0.33	4.04	-0.044
STMH184	JUNCTION	0.00	1628.03	0	00:44	0	4.04	-0.005
STMH185	JUNCTION	0.00	1628.02	0	00:44	0	4.04	-0.025
STMH12	JUNCTION	1550.53	2752.56	0	00:20	1.45	5.48	-0.009
J33	JUNCTION	7418.72	7418.72	0	00:20	6.78	6.78	-0.126

J34	JUNCTION	865.44	865.44	0	00:20	0.793	0.793	0.017
STMH17	JUNCTION	0.00	784.11	0	00:22	0	0.793	-0.063
STMH254	JUNCTION	0.00	1506.56	0	00:21	0	1.66	0.025
STMH93	JUNCTION	1390.65	2817.61	0	00:20	1.32	2.98	-0.002
J37	JUNCTION	873.46	1506.46	0	00:21	0.873	1.66	0.004
J38	JUNCTION	0.00	817.35	0	00:19	0	0.793	-0.058
STMH190	JUNCTION	0.00	5826.18	0	00:20	0	8.85	0.003
STMH133	JUNCTION	1644.43	5824.92	0	00:20	1.54	8.85	0.007
STMH135	JUNCTION	389.25	4197.16	0	00:20	0.373	7.32	0.016
STMH131	JUNCTION	553.74	3818.32	0	00:20	0.536	6.94	0.008
STMH196	JUNCTION	289.51	3278.33	0	00:20	0.275	6.41	-0.019
STMH137	JUNCTION	0.00	1387.45	0	00:13	0	3.27	0.023
STMH15	JUNCTION	238.93	2751.90	0	00:20	0.22	5.02	-0.009
J46	JUNCTION	7053.97	7053.97	0	00:20	6.51	6.51	-0.001
STMH4	JUNCTION	912.49	912.49	0	00:20	0.852	0.852	0.003
STMH216	JUNCTION	0.00	888.22	0	00:20	0	0.85	-0.017
STMH197	JUNCTION	0.00	1103.88	0	00:20	0	2.02	-0.021
STMH2	JUNCTION	826.15	1108.84	0	00:20	0.843	2.01	-0.037
STMH28	JUNCTION	0.00	379.79	0	00:19	0	1.17	0.040
STMH147	JUNCTION	688.41	688.41	0	00:20	0.722	1.27	0.011
STMH194	JUNCTION	0.00	798.83	0	00:20	0	1.02	-0.121
STMH253	JUNCTION	0.00	816.47	0	00:12	0	1.17	-0.022
J56	JUNCTION	1040.08	1040.08	0	00:20	0.954	0.954	-0.082
STMH212	JUNCTION	2103.74	2456.41	0	00:20	1.96	2.21	0.027
STMH298	JUNCTION	0.00	1117.96	0	00:20	0	1.31	0.016
STMH297	JUNCTION	251.94	1118.00	0	00:20	0.23	1.31	-0.011
STMH26	JUNCTION	0.00	866.12	0	00:19	0	1.08	0.004
STMH22	JUNCTION	0.00	885.25	0	00:18	0	1.08	0.014
STMH23	JUNCTION	1135.27	1135.27	0	00:20	1.12	1.12	0.003
STMH225	JUNCTION	1054.78	1656.85	0	00:20	0.99	3.18	0.081
STMH226	JUNCTION	0.00	1491.44	0	00:21	0	3.16	-0.073
STMH202	JUNCTION	1075.82	1900.20	0	00:20	1.01	3.41	0.002
STMH38	JUNCTION	1647.02	2661.39	0	00:20	1.58	4.49	-0.001
STMH205	JUNCTION	473.35	1531.90	0	00:20	0.435	3.73	-0.030
STMH204	JUNCTION	0.00	1291.08	0	00:24	0	3.66	0.010
STMH109	JUNCTION	0.00	1272.80	0	00:23	0	3.65	0.010
STMH37	JUNCTION	3122.43	3122.43	0	00:20	3.66	3.66	0.017
STMH244	JUNCTION	413.91	993.69	0	00:20	0.381	2.77	-0.008
STMH362	JUNCTION	0.00	921.82	0	00:19	0	2.76	-0.010
J73	JUNCTION	4651.35	5573.14	0	00:20	4.89	7.65	0.012
J74	JUNCTION	1428.61	6904.20	0	00:20	1.34	8.99	0.079
J75	JUNCTION	3721.11	10068.55	0	00:21	3.63	12.6	0.038
J76	JUNCTION	0.00	13669.53	0	00:20	0	17.3	0.000
J77	JUNCTION	0.00	13669.53	0	00:20	0	17.3	0.001

J78	JUNCTION	0.00	6736.94	0	00:21	0	8.98	0.068
J79	JUNCTION	0.00	2513.38	0	00:26	0	4.8	0.004
STMH116	JUNCTION	2859.95	2859.95	0	00:20	2.92	2.92	-0.000
DRCB64	JUNCTION	725.96	1412.61	0	00:20	0.668	2.59	-0.015
DRCB40	JUNCTION	1038.91	2343.15	0	00:20	0.96	3.54	0.021
J83	JUNCTION	7865.11	7865.11	0	00:20	7.25	7.25	0.040
J84	JUNCTION	4341.54	4341.54	0	00:20	4.7	4.7	0.014
J85	JUNCTION	0.00	3410.63	0	00:20	0	5.61	-0.032
STMH78	JUNCTION	1891.07	8019.54	0	00:20	1.78	8.8	0.066
J86	JUNCTION	0.00	4570.54	0	00:23	0	6.14	0.029
J87	JUNCTION	574.34	574.34	0	00:20	0.525	0.525	-0.005
J88	JUNCTION	0.00	575.39	0	00:20	0	0.525	0.039
J89	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
J90	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
J91	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
DRCB258	JUNCTION	2602.22	2602.22	0	00:25	7.42	7.42	0.001
DRCB260	JUNCTION	0.00	2602.95	0	00:25	0	7.42	0.054
J94	JUNCTION	0.00	810.83	0	00:17	0	4.23	0.089
STMH246-DIV	JUNCTION	1317.12	4596.53	0	00:21	1.21	6.83	0.025
DROF13	OUTFALL	0.00	2982.12	0	00:20	0	5.9	0.000
DROF38	OUTFALL	0.00	4368.67	0	00:25	0	8.53	0.000
DROF3	OUTFALL	0.00	2752.27	0	00:20	0	5.48	0.000
DROF4	OUTFALL	0.00	2817.60	0	00:20	0	2.98	0.000
DROF5	OUTFALL	0.00	5826.86	0	00:20	0	8.85	0.000
DROF7	OUTFALL	0.00	1117.94	0	00:20	0	1.31	0.000
DROF25	OUTFALL	0.00	13909.86	0	00:20	0	17.3	0.000
DROF23	OUTFALL	0.00	229.95	0	00:42	0	0.912	0.000
DRFI2017	OUTFALL	0.00	819.67	0	00:17	0	4.23	0.000

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Node Surcharge Summary
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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
J1	JUNCTION	0.51	2.400	0.000
STMH286	JUNCTION	0.55	2.725	0.000
STMH56	JUNCTION	0.57	2.525	0.000
STMH54	JUNCTION	0.60	3.425	0.000

STMH178	JUNCTION	0.51	2.300	0.000
STMH177	JUNCTION	0.49	1.700	0.000
STMH398	JUNCTION	0.18	0.206	1.994
STMH188	JUNCTION	0.47	2.800	0.000
STMH64	JUNCTION	0.49	2.638	0.162
STMH161	JUNCTION	0.54	2.400	0.000
STMH165	JUNCTION	0.58	2.925	0.000
STMH63	JUNCTION	0.51	2.700	0.000
STMH62	JUNCTION	0.52	2.200	0.000
STMH83	JUNCTION	0.40	1.800	0.000
STMH79	JUNCTION	0.45	1.325	0.000
STMH235	JUNCTION	0.70	1.400	0.000
J22	JUNCTION	0.72	1.450	0.000
STMH139	JUNCTION	0.56	0.900	0.000
STMH138	JUNCTION	0.58	0.850	0.000
STMH183	JUNCTION	0.58	0.850	0.000
STMH6	JUNCTION	0.59	1.410	0.000
STMH7	JUNCTION	0.59	2.520	0.000
STMH184	JUNCTION	0.62	3.650	0.000
STMH185	JUNCTION	0.62	3.690	0.000
STMH12	JUNCTION	0.63	3.650	0.000
J33	JUNCTION	0.30	1.600	0.000
STMH17	JUNCTION	0.07	0.850	0.000
STMH254	JUNCTION	0.09	1.594	0.256
STMH93	JUNCTION	0.17	0.798	2.352
J37	JUNCTION	0.10	1.250	0.000
J38	JUNCTION	0.05	1.067	0.683
STMH190	JUNCTION	0.21	0.598	2.902
STMH133	JUNCTION	0.18	1.371	1.829
STMH135	JUNCTION	0.09	1.681	0.919
STMH131	JUNCTION	0.13	2.043	0.457
STMH196	JUNCTION	0.09	1.800	0.000
STMH137	JUNCTION	0.56	1.931	0.069
STMH15	JUNCTION	0.53	1.200	0.000
J46	JUNCTION	0.51	4.400	0.000
STMH4	JUNCTION	0.13	2.500	0.000
STMH216	JUNCTION	0.17	2.500	0.000
STMH197	JUNCTION	0.10	1.800	0.000
STMH2	JUNCTION	0.05	1.050	0.000
STMH28	JUNCTION	0.08	1.300	0.000
STMH147	JUNCTION	0.83	2.400	0.000
STMH194	JUNCTION	0.79	1.300	0.000
STMH253	JUNCTION	0.71	1.400	0.000
J56	JUNCTION	0.57	2.000	0.000

STMH212	JUNCTION	0.70	0.700	0.000
STMH298	JUNCTION	0.21	1.000	0.000
STMH297	JUNCTION	0.26	3.300	0.000
STMH22	JUNCTION	0.08	0.992	2.208
STMH23	JUNCTION	0.35	2.800	0.000
STMH225	JUNCTION	0.53	1.840	0.000
STMH226	JUNCTION	0.56	1.040	0.000
STMH202	JUNCTION	0.62	2.420	0.000
STMH38	JUNCTION	0.64	2.150	0.000
STMH205	JUNCTION	0.68	2.600	0.000
STMH204	JUNCTION	0.72	2.560	0.000
STMH109	JUNCTION	0.75	1.100	0.000
STMH37	JUNCTION	0.55	1.900	0.000
STMH244	JUNCTION	0.74	0.900	0.000
STMH362	JUNCTION	0.71	1.100	0.000
J79	JUNCTION	0.54	4.060	0.040
STMH116	JUNCTION	0.42	1.850	0.000
DRCB64	JUNCTION	0.34	1.900	0.000
DRCB40	JUNCTION	0.92	1.900	0.000
J83	JUNCTION	0.09	1.750	0.000
STMH78	JUNCTION	0.13	1.850	0.000
J86	JUNCTION	0.35	1.600	0.000
DRCB258	JUNCTION	0.62	0.700	0.000
DRCB260	JUNCTION	0.91	0.700	0.000
STMH246-DIV	JUNCTION	0.11	0.275	0.225

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

Node	Hours Flooded	Maximum Rate LPS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
J1	0.35	514.16	0 00:13	0.190	0.000
STMH286	0.31	2010.58	0 00:20	0.833	0.000
STMH56	0.46	862.04	0 00:24	0.946	0.000
STMH54	0.01	442.28	0 00:13	0.001	0.000
STMH178	0.01	508.62	0 00:13	0.001	0.000
STMH177	0.01	748.28	0 00:14	0.003	0.000

STMH188	0.26	1663.32	0	00:20	0.632	0.000
STMH161	0.43	1157.84	0	00:20	0.726	0.000
STMH165	0.15	714.37	0	00:20	0.181	0.000
STMH63	0.01	444.01	0	00:13	0.000	0.000
STMH62	0.39	316.34	0	00:14	0.353	0.000
STMH83	0.18	2102.19	0	00:18	1.058	0.000
STMH79	0.19	1034.90	0	00:14	0.272	0.000
STMH235	0.28	596.44	0	00:17	0.504	0.000
J22	0.62	3780.31	0	00:20	2.757	0.000
STMH139	0.32	1922.89	0	00:21	1.233	0.000
STMH138	0.50	1500.92	0	00:20	1.851	0.000
STMH183	0.54	410.12	0	00:12	0.657	0.000
STMH6	0.29	1050.19	0	00:20	0.416	0.000
STMH7	0.01	540.77	0	00:12	0.002	0.000
STMH184	0.01	154.74	0	00:12	0.000	0.000
STMH185	0.01	178.94	0	00:12	0.001	0.000
STMH12	0.01	502.68	0	00:12	0.001	0.000
J33	0.13	2837.34	0	00:20	0.641	0.000
STMH17	0.03	217.56	0	00:19	0.007	0.000
J37	0.01	27.72	0	00:18	0.000	0.000
STMH196	0.01	130.95	0	00:18	0.000	0.000
STMH15	0.48	1762.58	0	00:20	1.743	0.000
J46	0.25	4529.79	0	00:20	1.714	0.000
STMH4	0.02	49.06	0	00:20	0.002	0.000
STMH216	0.01	19.69	0	00:18	0.000	0.000
STMH197	0.01	280.50	0	00:18	0.001	0.000
STMH2	0.01	352.22	0	00:19	0.005	0.000
STMH28	0.01	66.60	0	00:19	0.000	0.000
STMH147	0.01	161.35	0	00:12	0.000	0.000
STMH194	0.52	798.60	0	00:20	0.474	0.000
STMH253	0.01	407.21	0	00:12	0.002	0.000
J56	0.10	310.97	0	00:13	0.051	0.000
STMH212	0.61	2452.91	0	00:20	1.939	0.000
STMH298	0.01	111.63	0	00:16	0.000	0.000
STMH297	0.01	1.20	0	00:18	0.000	0.000
STMH23	0.07	267.58	0	00:20	0.036	0.000
STMH225	0.05	163.70	0	00:20	0.015	0.000
STMH226	0.51	667.07	0	00:21	0.762	0.000
STMH202	0.47	884.11	0	00:20	0.499	0.000
STMH38	0.54	1600.31	0	00:20	1.197	0.000
STMH205	0.17	417.60	0	00:13	0.071	0.000
STMH204	0.18	72.20	0	00:13	0.012	0.000
STMH109	0.68	693.04	0	00:21	1.258	0.000
STMH37	0.43	2517.25	0	00:20	1.474	0.000

STMH244	0.07	448.17	0	00:13	0.010	0.000
STMH362	0.01	328.89	0	00:13	0.001	0.000
STMH116	0.33	2169.46	0	00:20	0.994	0.000
DRCB64	0.05	121.24	0	00:15	0.010	0.000
DRCB40	0.77	2111.49	0	00:20	2.629	0.000
J83	0.07	1714.76	0	00:20	0.224	0.000
STMH78	0.10	1440.05	0	00:20	0.351	0.000
J86	0.24	1760.52	0	00:16	1.052	0.000
DRCB258	0.01	174.22	0	00:16	0.000	0.000
DRCB260	0.85	1791.97	0	00:25	3.183	0.000

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
DROF13	99.62	1103.73	2982.12	5.900
DROF38	99.62	1605.84	4368.67	8.526
DROF3	99.62	1038.08	2752.27	5.482
DROF4	99.62	558.70	2817.60	2.983
DROF5	99.62	1660.64	5826.86	8.853
DROF7	99.41	246.60	1117.94	1.314
DROF25	99.65	3212.67	13909.86	17.308
DROF23	99.58	160.75	229.95	0.912
DRFI2017	99.55	623.22	819.67	4.229
System	99.59	10210.24	34430.07	55.508

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Link Flow Summary
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Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C100	CONDUIT	418.49	0 00:13	2.64	2.90	1.00

C101	CONDUIT	4096.96	0	00:26	3.62	1.38	1.00
C102	CONDUIT	4368.67	0	00:25	5.05	1.99	1.00
C103	CONDUIT	6206.05	0	00:18	7.40	0.88	0.94
C104	CONDUIT	6576.58	0	00:23	7.60	1.00	1.00
C105	CONDUIT	2861.07	0	00:21	7.62	1.59	0.84
C106	CONDUIT	575.39	0	00:20	3.11	0.39	0.44
C107	CONDUIT	567.04	0	00:20	2.38	0.39	0.55
C108	CONDUIT	0.00	0	00:00	0.00	0.00	0.22
C109	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C110	CONDUIT	0.00	0	00:00	0.00	0.00	0.22
C93	CONDUIT	2513.38	0	00:26	4.44	1.29	1.00
C96	CONDUIT	6137.83	0	00:22	7.17	1.19	1.00
C98	CONDUIT	4570.54	0	00:23	7.18	1.00	1.00
C99	CONDUIT	3547.24	0	00:21	3.23	0.06	0.63
DRDI117	CONDUIT	819.67	0	00:17	2.76	0.04	0.23
DRDI27	CONDUIT	5580.74	0	00:20	2.40	0.07	0.30
DRDI28	CONDUIT	6736.94	0	00:21	1.90	0.09	0.43
DRDI4	CONDUIT	9735.01	0	00:22	6.52	0.13	0.18
DRDI5	CONDUIT	4365.38	0	00:20	6.03	0.06	0.11
DRDI6	CONDUIT	13909.86	0	00:20	6.27	0.11	0.43
STMP10	CONDUIT	1004.91	0	00:26	3.55	1.25	1.00
STMP100	CONDUIT	3279.90	0	00:20	3.01	0.87	1.00
STMP101	CONDUIT	3818.64	0	00:20	3.47	1.61	1.00
STMP103	CONDUIT	1105.64	0	00:20	1.75	0.63	1.00
STMP106	CONDUIT	4197.48	0	00:20	3.71	0.92	1.00
STMP107	CONDUIT	5826.18	0	00:20	5.15	1.42	1.00
STMP1086	CONDUIT	229.95	0	00:42	2.39	1.50	1.00
STMP11	CONDUIT	1004.94	0	00:17	3.55	1.26	1.00
STMP1170	CONDUIT	810.83	0	00:17	3.97	1.09	0.69
STMP118	CONDUIT	390.74	0	00:15	1.96	1.41	1.00
STMP12	CONDUIT	1005.58	0	00:29	3.56	1.27	1.00
STMP120	CONDUIT	379.79	0	00:19	3.02	1.98	1.00
STMP123	CONDUIT	1103.88	0	00:20	2.80	0.68	1.00
STMP1289	CONDUIT	866.11	0	00:19	8.69	0.47	0.74
STMP13	CONDUIT	701.53	0	00:27	2.64	0.88	1.00
STMP131	CONDUIT	5826.86	0	00:20	5.15	1.64	1.00
STMP14	CONDUIT	738.49	0	00:39	2.61	0.84	1.00
STMP150	CONDUIT	918.37	0	00:40	3.25	1.63	1.00
STMP1513	CONDUIT	2602.95	0	00:25	5.18	0.82	1.00
STMP1516	CONDUIT	921.94	0	00:19	3.28	1.79	0.98
STMP155	CONDUIT	885.25	0	00:18	4.51	3.76	1.00
STMP156A	CONDUIT	1117.94	0	00:20	3.95	1.98	1.00
STMP156B	CONDUIT	1117.96	0	00:20	3.95	2.69	1.00
STMP1604	CONDUIT	2982.12	0	00:20	4.69	1.25	1.00

STMP161	CONDUIT	866.12	0	00:19	6.46	1.03	0.69
STMP170	CONDUIT	6918.85	0	00:21	5.26	1.22	0.82
STMP183	CONDUIT	1136.01	0	00:46	4.06	0.98	1.00
STMP184	CONDUIT	1272.80	0	00:23	4.50	1.57	1.00
STMP20	CONDUIT	394.82	0	00:13	2.04	1.14	1.00
STMP248	CONDUIT	798.95	0	00:13	2.83	1.63	1.00
STMP249	CONDUIT	921.82	0	00:19	3.26	1.76	1.00
STMP274	CONDUIT	745.92	0	00:22	2.64	1.32	1.00
STMP276	CONDUIT	1506.89	0	00:21	3.41	1.06	1.00
STMP29	CONDUIT	6147.29	0	00:18	8.67	0.94	0.80
STMP308	CONDUIT	917.19	0	00:14	5.77	1.28	1.00
STMP309	CONDUIT	1304.24	0	00:21	4.61	1.00	1.00
STMP393	CONDUIT	2727.84	0	00:20	4.29	1.99	1.00
STMP394	CONDUIT	2537.86	0	00:20	3.99	1.68	1.00
STMP427	CONDUIT	729.61	0	00:13	2.04	1.09	1.00
STMP428	CONDUIT	947.00	0	00:13	2.65	1.08	1.00
STMP435	CONDUIT	1793.84	0	00:14	5.01	1.46	1.00
STMP521	CONDUIT	2674.92	0	00:24	6.05	1.20	1.00
STMP524	CONDUIT	784.11	0	00:22	3.15	0.36	1.00
STMP525	CONDUIT	817.35	0	00:19	4.30	0.36	0.77
STMP554	CONDUIT	1806.28	0	00:12	4.10	1.45	1.00
STMP555	CONDUIT	1746.59	0	00:12	4.08	1.05	1.00
STMP556	CONDUIT	1648.50	0	00:12	3.73	0.85	1.00
STMP591	CONDUIT	1628.03	0	00:44	3.69	0.81	1.00
STMP594	CONDUIT	1628.02	0	00:44	3.69	1.78	1.00
STMP595	CONDUIT	1628.24	0	00:44	3.69	1.74	1.00
STMP692	CONDUIT	405.57	0	00:20	2.07	1.16	1.00
STMP749	CONDUIT	1291.08	0	00:24	4.57	1.06	1.00
STMP77	CONDUIT	4597.92	0	00:21	7.23	1.34	1.00
STMP79	CONDUIT	785.05	0	00:22	1.86	0.74	1.00
STMP800	CONDUIT	523.48	0	00:13	2.69	1.50	1.00
STMP801	CONDUIT	551.27	0	00:12	2.81	1.60	1.00
STMP823	CONDUIT	888.19	0	00:20	3.14	1.35	1.00
STMP824	CONDUIT	888.22	0	00:20	3.14	1.36	1.00
STMP850	CONDUIT	2513.17	0	00:27	8.89	2.57	1.00
STMP88	CONDUIT	1506.56	0	00:21	3.41	1.41	1.00
STMP89	CONDUIT	2817.60	0	00:20	6.38	1.95	1.00
STMP9	CONDUIT	1009.18	0	00:32	2.82	1.27	1.00
STMP90	CONDUIT	2752.27	0	00:20	6.23	2.68	1.00
STMP914	CONDUIT	1491.44	0	00:21	5.27	1.45	1.00
STMP915	CONDUIT	843.42	0	00:44	2.98	1.03	1.00
STMP964	CONDUIT	467.00	0	00:11	2.94	2.33	1.00
STMP98	CONDUIT	1387.45	0	00:13	4.91	0.95	1.00
STMP99	CONDUIT	1387.25	0	00:13	4.92	1.36	1.00

SYMP182	CONDUIT	1014.37	0	00:33	3.59	1.06	1.00
STMP187_PUMP	PUMP	13669.53	0	00:20			

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Flow Classification Summary
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	Adjusted	Fraction of Time in Flow Class							
	/Actual		Up	Down	Sub	Sup	Up	Down	Norm	Inlet
Conduit	Length	Dry	Dry	Dry	Crit	Crit	Crit	Crit	Ltd	Ctrl
C100	1.00	0.00	0.00	0.00	0.34	0.00	0.00	0.66	0.00	0.00
C101	1.00	0.00	0.00	0.00	0.37	0.06	0.00	0.56	0.02	0.00
C102	1.00	0.00	0.00	0.00	0.40	0.60	0.00	0.00	0.64	0.00
C103	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.89	0.00
C104	1.00	0.00	0.00	0.00	0.09	0.57	0.00	0.33	0.24	0.00
C105	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
C106	1.00	0.00	0.00	0.00	0.13	0.86	0.00	0.00	0.89	0.00
C107	1.00	0.00	0.00	0.00	0.38	0.62	0.00	0.00	0.52	0.00
C108	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C109	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C110	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C93	1.00	0.00	0.00	0.00	0.37	0.63	0.00	0.00	0.76	0.00
C96	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C98	1.00	0.00	0.00	0.00	0.21	0.78	0.00	0.00	0.80	0.00
C99	1.00	0.00	0.00	0.00	0.66	0.33	0.00	0.00	0.93	0.00
DRDI117	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.60	0.00
DRDI27	1.00	0.00	0.00	0.00	0.09	0.90	0.00	0.00	0.89	0.00
DRDI28	1.00	0.00	0.00	0.00	0.82	0.18	0.00	0.00	0.70	0.00
DRDI4	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
DRDI5	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
DRDI6	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.84	0.00
STMP10	1.00	0.00	0.00	0.00	0.33	0.66	0.00	0.00	0.60	0.00
STMP100	1.00	0.00	0.00	0.00	0.27	0.73	0.00	0.00	0.66	0.00
STMP101	1.00	0.00	0.00	0.00	0.13	0.87	0.00	0.00	0.17	0.00
STMP103	1.00	0.00	0.00	0.00	0.52	0.48	0.00	0.00	0.65	0.00
STMP106	1.00	0.00	0.00	0.00	0.15	0.85	0.00	0.00	0.79	0.00
STMP107	1.00	0.00	0.00	0.00	0.16	0.84	0.00	0.00	0.74	0.00
STMP1086	1.00	0.00	0.00	0.00	0.69	0.30	0.00	0.00	0.40	0.00
STMP11	1.00	0.00	0.00	0.00	0.35	0.65	0.00	0.00	0.73	0.00
STMP1170	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
STMP118	1.00	0.00	0.00	0.00	0.53	0.47	0.00	0.00	0.04	0.00

STMP12	1.00	0.00	0.00	0.00	0.36	0.64	0.00	0.00	0.46	0.00
STMP120	1.00	0.00	0.00	0.00	0.86	0.13	0.00	0.00	0.64	0.00
STMP123	1.00	0.00	0.00	0.00	0.07	0.93	0.00	0.00	0.87	0.00
STMP1289	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.97	0.00
STMP13	1.00	0.00	0.00	0.00	0.38	0.62	0.00	0.00	0.46	0.00
STMP131	1.00	0.00	0.00	0.00	0.17	0.83	0.00	0.00	0.73	0.00
STMP14	1.00	0.00	0.00	0.00	0.43	0.56	0.00	0.00	0.74	0.00
STMP150	1.00	0.00	0.00	0.00	0.38	0.61	0.00	0.00	0.08	0.00
STMP1513	1.00	0.00	0.00	0.00	0.63	0.37	0.00	0.00	0.64	0.00
STMP1516	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
STMP155	1.00	0.00	0.00	0.00	0.08	0.92	0.00	0.00	0.00	0.00
STMP156A	1.00	0.00	0.00	0.00	0.18	0.82	0.00	0.00	0.70	0.00
STMP156B	1.00	0.00	0.00	0.00	0.42	0.58	0.00	0.00	0.07	0.00
STMP1604	1.00	0.00	0.00	0.00	0.14	0.86	0.00	0.00	0.72	0.00
STMP161	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.00
STMP170	1.00	0.00	0.00	0.00	0.04	0.95	0.00	0.00	0.22	0.00
STMP183	1.00	0.00	0.00	0.00	0.45	0.54	0.00	0.00	0.24	0.00
STMP184	1.00	0.00	0.00	0.00	0.53	0.47	0.00	0.00	0.69	0.00
STMP20	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.79	0.00
STMP248	1.00	0.00	0.00	0.00	0.62	0.38	0.00	0.00	0.39	0.00
STMP249	1.00	0.00	0.00	0.00	0.55	0.44	0.00	0.00	0.67	0.00
STMP274	1.00	0.00	0.00	0.00	0.98	0.02	0.00	0.00	0.70	0.00
STMP276	1.00	0.00	0.00	0.00	0.15	0.84	0.00	0.00	0.90	0.00
STMP29	1.00	0.00	0.00	0.00	0.00	0.06	0.00	0.94	0.00	0.00
STMP308	1.00	0.00	0.00	0.00	0.25	0.74	0.00	0.00	0.79	0.00
STMP309	1.00	0.00	0.00	0.00	0.51	0.48	0.00	0.00	0.78	0.00
STMP393	1.00	0.00	0.00	0.00	0.18	0.82	0.00	0.00	0.17	0.00
STMP394	1.00	0.00	0.00	0.00	0.46	0.54	0.00	0.00	0.74	0.00
STMP427	1.00	0.00	0.00	0.00	0.48	0.51	0.00	0.00	0.51	0.00
STMP428	1.00	0.00	0.00	0.00	0.46	0.54	0.00	0.00	0.73	0.00
STMP435	1.00	0.00	0.00	0.00	0.42	0.57	0.00	0.00	0.73	0.00
STMP521	1.00	0.00	0.00	0.00	0.39	0.61	0.00	0.00	0.75	0.00
STMP524	1.00	0.00	0.00	0.00	0.09	0.91	0.00	0.00	0.88	0.00
STMP525	1.00	0.00	0.00	0.00	0.03	0.97	0.00	0.00	0.88	0.00
STMP554	1.00	0.00	0.00	0.00	0.41	0.59	0.00	0.00	0.08	0.00
STMP555	1.00	0.00	0.00	0.00	0.40	0.60	0.00	0.00	0.12	0.00
STMP556	1.00	0.00	0.00	0.00	0.40	0.59	0.00	0.00	0.75	0.00
STMP591	1.00	0.00	0.00	0.00	0.42	0.58	0.00	0.00	0.73	0.00
STMP594	1.00	0.00	0.00	0.00	0.51	0.49	0.00	0.00	0.38	0.00
STMP595	1.00	0.00	0.00	0.00	0.64	0.35	0.00	0.00	0.53	0.00
STMP692	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.67	0.00
STMP749	1.00	0.00	0.00	0.00	0.51	0.49	0.00	0.00	0.63	0.00
STMP77	1.00	0.00	0.00	0.00	0.38	0.62	0.00	0.00	0.75	0.00
STMP79	1.00	0.00	0.00	0.00	0.97	0.02	0.00	0.00	0.89	0.00

STMP800	1.00	0.00	0.00	0.00	0.59	0.41	0.00	0.00	0.67	0.00
STMP801	1.00	0.00	0.00	0.00	0.92	0.08	0.00	0.00	0.69	0.00
STMP823	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.82	0.00
STMP824	1.00	0.00	0.00	0.00	0.15	0.85	0.00	0.00	0.83	0.00
STMP850	1.00	0.00	0.00	0.00	0.37	0.63	0.00	0.00	0.06	0.00
STMP88	1.00	0.00	0.00	0.00	0.07	0.92	0.00	0.00	0.24	0.00
STMP89	1.00	0.00	0.00	0.00	0.13	0.86	0.00	0.00	0.63	0.00
STMP9	1.00	0.00	0.00	0.00	0.44	0.56	0.00	0.00	0.73	0.00
STMP90	1.00	0.00	0.00	0.00	0.45	0.54	0.00	0.00	0.57	0.00
STMP914	1.00	0.00	0.00	0.00	0.37	0.02	0.00	0.60	0.00	0.00
STMP915	1.00	0.00	0.00	0.00	0.43	0.56	0.00	0.00	0.26	0.00
STMP964	1.00	0.00	0.00	0.00	0.66	0.00	0.00	0.33	0.07	0.00
STMP98	1.00	0.00	0.00	0.00	0.37	0.63	0.00	0.00	0.77	0.00
STMP99	1.00	0.00	0.00	0.00	0.56	0.44	0.00	0.00	0.75	0.00
SYMP182	1.00	0.00	0.00	0.00	0.44	0.56	0.00	0.00	0.24	0.00

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Conduit Surcharge Summary
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	Hours Full			Hours Above Full	Hours Capacity
Conduit	Both Ends	Upstream	Dnstream	Normal Flow	Limited
C100	0.48	0.48	0.48	0.85	0.24
C101	0.40	0.40	0.40	0.34	0.33
C102	0.50	0.50	0.50	0.53	0.50
C104	0.13	0.13	0.13	0.09	0.10
C105	0.01	0.01	0.01	0.40	0.01
C93	0.51	0.51	0.52	0.55	0.35
C96	0.09	0.09	0.09	0.12	0.09
C98	0.30	0.30	0.30	0.01	0.01
STMP10	0.47	0.47	0.47	0.34	0.34
STMP100	0.09	0.09	0.09	0.01	0.01
STMP101	0.09	0.09	0.09	0.38	0.09
STMP103	0.10	0.10	0.10	0.01	0.01
STMP106	0.09	0.09	0.09	0.01	0.01
STMP107	0.18	0.18	0.18	0.17	0.16
STMP1086	1.02	1.02	1.02	1.04	1.02
STMP11	0.49	0.49	0.49	0.34	0.34
STMP1170	0.01	0.01	0.01	0.89	0.01
STMP118	0.07	0.07	0.07	0.71	0.06

STMP12	0.51	0.51	0.51	0.34	0.34
STMP120	0.70	0.70	0.70	0.86	0.70
STMP123	0.05	0.05	0.05	0.01	0.01
STMP13	0.52	0.52	0.52	0.01	0.01
STMP131	0.21	0.21	0.21	0.24	0.21
STMP14	0.54	0.54	0.54	0.01	0.01
STMP150	0.53	0.53	0.53	0.58	0.53
STMP1513	0.62	0.62	0.62	0.01	0.01
STMP1516	0.01	0.01	0.01	0.78	0.01
STMP155	0.08	0.08	0.09	0.48	0.08
STMP156A	0.21	0.21	0.21	0.23	0.21
STMP156B	0.21	0.21	0.21	0.34	0.21
STMP1604	0.18	0.18	0.18	0.21	0.17
STMP161	0.01	0.01	0.01	0.07	0.01
STMP170	0.01	0.01	0.01	0.51	0.01
STMP183	0.64	0.64	0.64	0.01	0.01
STMP184	0.72	0.72	0.72	0.67	0.67
STMP20	0.51	0.51	0.51	0.01	0.01
STMP248	0.74	0.74	0.74	0.78	0.74
STMP249	0.71	0.71	0.71	0.78	0.71
STMP274	0.57	0.57	0.57	0.15	0.15
STMP276	0.09	0.09	0.09	0.05	0.05
STMP308	0.37	0.37	0.37	0.36	0.30
STMP309	0.34	0.34	0.34	0.01	0.01
STMP393	0.18	0.18	0.18	0.60	0.18
STMP394	0.49	0.49	0.49	0.57	0.49
STMP427	0.57	0.57	0.57	0.01	0.01
STMP428	0.58	0.58	0.58	0.01	0.01
STMP435	0.60	0.60	0.60	0.62	0.60
STMP521	0.56	0.56	0.57	0.40	0.40
STMP524	0.05	0.05	0.05	0.01	0.01
STMP554	0.59	0.59	0.59	0.47	0.46
STMP555	0.57	0.57	0.57	0.01	0.01
STMP556	0.58	0.58	0.58	0.01	0.01
STMP591	0.59	0.59	0.59	0.01	0.01
STMP594	0.62	0.62	0.62	0.63	0.62
STMP595	0.62	0.62	0.62	0.62	0.62
STMP692	0.79	0.79	0.79	0.02	0.01
STMP749	0.68	0.68	0.68	0.41	0.38
STMP77	0.49	0.49	0.49	0.23	0.23
STMP79	0.07	0.07	0.07	0.01	0.01
STMP800	0.73	0.73	0.73	0.14	0.13
STMP801	0.69	0.69	0.69	0.11	0.01
STMP823	0.17	0.17	0.17	0.09	0.09

STMP824	0.13	0.13	0.13	0.09	0.09
STMP850	0.53	0.53	0.53	0.56	0.53
STMP88	0.09	0.09	0.09	0.13	0.09
STMP89	0.17	0.17	0.17	0.19	0.17
STMP9	0.55	0.55	0.55	0.41	0.40
STMP90	0.63	0.63	0.63	0.64	0.63
STMP914	0.53	0.53	0.53	0.46	0.45
STMP915	0.61	0.61	0.61	0.50	0.51
STMP964	0.70	0.70	0.71	0.74	0.70
STMP98	0.53	0.53	0.53	0.01	0.01
STMP99	0.53	0.53	0.53	0.56	0.52
SYMP182	0.62	0.62	0.62	0.52	0.52

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Pumping Summary
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Pump	Percent Utilized	Number of Start-Ups	Min Flow LPS	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr	Power Usage Kw-hr	% Time Off Pump Curve Low	% Time Off Pump Curve High
STMP187_PUMP	97.50	1	0.00	3211.80	13669.53	17.308	260.91	0.0	0.0

Analysis begun on: Thu Sep 01 15:49:59 2016
Analysis ended on: Thu Sep 01 15:50:00 2016
Total elapsed time: 00:00:01

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.007)

WARNING 02: maximum depth increased for Node J77

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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.
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Analysis Options
****
Flow Units ..... LPS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... DYNWAVE
Starting Date NOV-05-2015 00:00:00
Ending Date NOV-05-2015 03:00:00
Antecedent Dry Days 0.0
Report Time Step 00:05:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00
Routing Time Step ..... 30.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Head Tolerance ..... 0.004921 m

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Element Count
****
Number of rain gages 1
Number of subcatchments ... 55
Number of nodes 100

Number of links 91
Number of pollutants 0
Number of land uses 0

****
Raingage Summary
****

Name	Data Source	Data Type	Recording Interval
_Current	CC2_AES_1hr_5yr	VOLUME	5 min.

****
Subcatchment Summary
****

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
S13-A	14.43	1550.00	70.00	2.5000	_Current	STMH286
S13-B	14.18	1060.00	70.00	1.9000	_Current	STMH188
S13-C	5.03	705.00	66.00	1.1000	_Current	STMH165
S13-D	2.85	632.00	77.00	3.2000	_Current	STMH161
S13-E	5.22	727.00	68.00	2.1000	_Current	STMH54
S13-F	7.67	569.00	50.00	0.5000	_Current	STMH178
S13-G	1.35	351.00	48.00	2.0000	_Current	STMH177
S13-H	1.52	473.00	57.00	3.1000	_Current	STMH398
S23-A	15.82	1095.00	69.00	1.6000	_Current	STMH116
S23-B	3.94	770.00	63.00	2.6000	_Current	DRCB64
S23-C	7.93	966.00	45.00	2.1000	_Current	DRCB40
S25-A	22.61	902.00	61.00	1.3000	_Current	STMH37
S25-B	6.70	737.00	55.00	1.7000	_Current	STMH225
S25-C	7.26	921.00	52.00	1.0000	_Current	STMH202
S25-D	10.70	1063.00	55.00	1.2000	_Current	STMH38
S25-E	10.16	1039.00	49.00	1.7000	_Current	J74
S25-F	41.71	2239.00	44.00	0.8000	_Current	J73
S25-G	3.30	633.00	49.00	1.9000	_Current	STMH205
S25-H	3.45	674.00	41.00	1.2000	_Current	STMH244
S25-I	20.24	1568.00	67.00	2.1000	_Current	J75
S25-J	24.53	1501.00	72.00	1.3000	_Current	J84
S32-A	54.37	400.00	50.00	0.5000	_Current	DRCB258
S32-B	5.37	400.00	50.00	0.5000	_Current	DRCB258
S38-A	16.25	1798.00	79.00	4.1000	_Current	J83
S38-B	18.36	1574.00	76.00	5.9000	_Current	J22

S38-C	8.37	802.00	79.00	4.5000	_Current	STMH78
S38-D	4.72	558.00	73.00	1.5000	_Current	STMH79
S38-Z1	136.40	7480.00	10.00	30.3000	_Current	J83
S38-Z2	5.70	1120.00	10.00	10.4000	_Current	J83
S3-A	8.53	955.00	63.00	2.9000	_Current	STMH12
S3-B	1.98	392.00	62.00	1.5000	_Current	STMH7
S3-C	3.55	735.00	61.00	1.3000	_Current	STMH6
S3-D	2.11	617.00	80.00	2.1000	_Current	STMH138
S3-E	5.92	588.00	76.00	17.2000	_Current	STMH246-DIV
S3-F	1.92	586.00	58.00	13.7000	_Current	J33
S3-G	3.26	655.00	60.00	13.0000	_Current	J87
S3-Z1	241.50	6550.00	10.00	34.0000	_Current	J33
S4-A	3.83	547.00	77.00	19.1000	_Current	J34
S4-B	4.08	379.00	80.00	1.5000	_Current	J37
S4-C	6.76	577.00	73.00	3.3000	_Current	STMH93
S5-A	8.95	974.00	64.00	2.6000	_Current	STMH133
S5-B	1.74	288.00	80.00	0.9000	_Current	STMH135
S5-C	2.50	464.00	80.00	0.6000	_Current	STMH131
S5-D	1.28	206.00	80.00	1.2000	_Current	STMH196
S5-E	4.01	610.00	79.00	2.3000	_Current	STMH4
S5-F	1.02	184.00	80.00	6.0000	_Current	STMH15
S5-G	4.10	727.00	77.00	0.3000	_Current	STMH2
S5-H	3.71	473.00	73.00	0.4000	_Current	STMH147
S5-I	10.27	885.00	71.00	6.2000	_Current	STMH212
S5-J	5.91	831.00	60.00	9.1000	_Current	J56
S5-K	28.67	1446.00	54.00	11.9000	_Current	J46
S5-Z1	87.70	4910.00	10.00	36.0000	_Current	J46
S7-A	7.47	684.00	56.00	0.9000	_Current	STMH23
S7-B	3.90	411.00	22.00	7.3000	_Current	STMH297
S13-I	2.12	370.00	60.00	1.0000	_Current	J1

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Node Summary
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Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J1	JUNCTION	444.92	2.90	0.0	
STMH286	JUNCTION	444.31	3.40	0.0	
STMH56	JUNCTION	443.98	3.20	0.0	
STMH54	JUNCTION	442.97	4.10	0.0	
STMH178	JUNCTION	441.29	3.20	0.0	
STMH177	JUNCTION	440.78	2.60	0.0	

STMH398	JUNCTION	440.42	3.10	0.0
STMH188	JUNCTION	446.02	3.40	0.0
STMH64	JUNCTION	445.56	3.40	0.0
STMH161	JUNCTION	444.09	3.00	0.0
STMH165	JUNCTION	443.56	3.60	0.0
STMH63	JUNCTION	445.08	3.30	0.0
STMH62	JUNCTION	444.98	2.80	0.0
STMH77	JUNCTION	454.15	2.20	0.0
STMH74	JUNCTION	452.88	3.20	0.0
STMH83	JUNCTION	441.98	3.00	0.0
STMH79	JUNCTION	441.38	2.60	0.0
STMH235	JUNCTION	442.44	1.90	0.0
J22	JUNCTION	442.75	1.90	0.0
STMH139	JUNCTION	455.33	1.80	0.0
STMH138	JUNCTION	454.88	1.60	0.0
STMH183	JUNCTION	454.27	1.60	0.0
STMH6	JUNCTION	453.29	2.16	0.0
STMH7	JUNCTION	452.73	3.27	0.0
STMH184	JUNCTION	451.89	4.40	0.0
STMH185	JUNCTION	451.75	4.44	0.0
STMH12	JUNCTION	451.69	4.40	0.0
J33	JUNCTION	459.08	2.50	0.0
J34	JUNCTION	455.36	2.50	0.0
STMH17	JUNCTION	453.99	1.60	0.0
STMH254	JUNCTION	453.24	2.60	0.0
STMH93	JUNCTION	451.88	3.90	0.0
J37	JUNCTION	453.49	2.00	0.0
J38	JUNCTION	454.36	2.50	0.0
STMH190	JUNCTION	449.72	4.70	0.0
STMH133	JUNCTION	450.28	4.40	0.0
STMH135	JUNCTION	451.01	3.80	0.0
STMH131	JUNCTION	451.21	3.70	0.0
STMH196	JUNCTION	451.69	3.00	0.0
STMH137	JUNCTION	453.28	2.60	0.0
STMH15	JUNCTION	454.27	1.80	0.0
J46	JUNCTION	455.31	5.00	0.0
STMH4	JUNCTION	452.57	3.10	0.0
STMH216	JUNCTION	452.15	3.10	0.0
STMH197	JUNCTION	451.95	2.70	0.0
STMH2	JUNCTION	453.06	1.80	0.0
STMH28	JUNCTION	453.20	1.90	0.0
STMH147	JUNCTION	453.75	2.90	0.0
STMH194	JUNCTION	454.00	1.80	0.0
STMH253	JUNCTION	454.49	2.00	0.0

J56	JUNCTION	455.38	2.60	0.0
STMH212	JUNCTION	454.85	1.20	0.0
STMH298	JUNCTION	440.27	1.60	0.0
STMH297	JUNCTION	440.64	3.90	0.0
STMH26	JUNCTION	452.49	5.00	0.0
STMH22	JUNCTION	454.19	3.70	0.0
STMH23	JUNCTION	454.38	3.30	0.0
STMH225	JUNCTION	450.19	2.44	0.0
STMH226	JUNCTION	448.06	3.04	0.0
STMH202	JUNCTION	446.71	3.02	0.0
STMH38	JUNCTION	444.70	2.75	0.0
STMH205	JUNCTION	441.90	3.20	0.0
STMH204	JUNCTION	441.59	3.16	0.0
STMH109	JUNCTION	440.60	1.70	0.0
STMH37	JUNCTION	450.62	2.50	0.0
STMH244	JUNCTION	440.10	1.50	0.0
STMH362	JUNCTION	439.80	1.70	0.0
J73	JUNCTION	439.28	1.50	0.0
J74	JUNCTION	438.27	1.50	0.0
J75	JUNCTION	437.62	1.50	0.0
J76	JUNCTION	437.10	1.80	0.0
J77	JUNCTION	442.00	2.00	0.0
J78	JUNCTION	438.00	1.50	0.0
J79	JUNCTION	454.78	4.70	0.0
STMH116	JUNCTION	454.00	2.30	0.0
DRCB64	JUNCTION	451.36	2.50	0.0
DRCB40	JUNCTION	445.61	2.50	0.0
J83	JUNCTION	458.49	2.80	0.0
J84	JUNCTION	437.36	1.50	0.0
J85	JUNCTION	457.37	2.50	0.0
STMH78	JUNCTION	446.63	2.90	0.0
J86	JUNCTION	458.46	2.50	0.0
J87	JUNCTION	458.57	2.50	0.0
J88	JUNCTION	458.25	2.50	0.0
J89	JUNCTION	456.77	2.50	0.0
J90	JUNCTION	459.23	2.50	0.0
J91	JUNCTION	457.00	2.50	0.0
DRCB258	JUNCTION	439.79	1.50	0.0
DRCB260	JUNCTION	438.95	1.50	0.0
J94	JUNCTION	436.84	1.50	0.0
STMH246-DIV	JUNCTION	455.92	2.50	0.0
DROF13	OUTFALL	440.21	0.90	0.0
DROF38	OUTFALL	440.85	1.05	0.0
DROF3	OUTFALL	451.34	0.75	0.0

DROF4	OUTFALL	451.61	0.75	0.0
DROF5	OUTFALL	449.45	1.20	0.0
DROF7	OUTFALL	440.02	0.60	0.0
DROF25	OUTFALL	440.00	2.00	0.0
DROF23	OUTFALL	443.90	0.35	0.0
DRFI2017	OUTFALL	436.42	1.00	0.0

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Link Summary
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Name	From Node	To Node	Type	Length	%Slope	Roughness
C100	STMH235	STMH83	CONDUIT	61.4	0.1515	0.0100
C101	STMH83	STMH79	CONDUIT	153.1	0.3430	0.0100
C102	STMH79	DROF38	CONDUIT	137.0	0.3831	0.0100
C103	STMH74	STMH78	CONDUIT	159.2	3.9237	0.0100
C104	STMH78	STMH83	CONDUIT	132.9	3.4096	0.0100
C105	J86	J85	CONDUIT	70.6	1.5447	0.0100
C106	J87	J88	CONDUIT	31.5	1.0172	0.0100
C107	J88	J85	CONDUIT	88.2	0.9974	0.0100
C108	J89	J34	CONDUIT	101.2	1.3931	0.0100
C109	J90	J91	CONDUIT	52.0	4.2949	0.0100
C110	J91	J34	CONDUIT	104.7	1.5661	0.0100
C93	J46	J79	CONDUIT	35.5	1.4931	0.0100
C96	J83	STMH77	CONDUIT	202.0	2.1231	0.0100
C98	J33	J86	CONDUIT	16.4	3.7740	0.0100
C99	J85	STMH246-DIV	CONDUIT	79.7	1.8201	0.0100
DRDI117	J94	DRFI2017	CONDUIT	41.6	1.0097	0.0100
DRDI27	J73	J74	CONDUIT	251.8	0.4012	0.0100
DRDI28	J74	J78	CONDUIT	67.3	0.4013	0.0100
DRDI4	J75	J76	CONDUIT	175.3	0.2966	0.0100
DRDI5	J84	J76	CONDUIT	65.5	0.3966	0.0100
DRDI6	J77	DROF25	CONDUIT	153.4	1.3036	0.0100
STMP10	STMH188	STMH64	CONDUIT	45.5	1.0110	0.0100
STMP100	STMH196	STMH131	CONDUIT	86.4	0.5557	0.0100
STMP101	STMH131	STMH135	CONDUIT	90.9	0.2201	0.0100
STMP103	STMH197	STMH196	CONDUIT	47.1	0.5524	0.0100
STMP106	STMH135	STMH133	CONDUIT	89.7	0.8139	0.0100
STMP107	STMH133	STMH190	CONDUIT	86.0	0.6511	0.0100
STMP1086	DRCB40	DROF23	CONDUIT	262.5	0.6514	0.0100
STMP11	STMH64	STMH63	CONDUIT	47.9	1.0026	0.0100
STMP1170	DRCB260	J94	CONDUIT	241.7	0.8730	0.0100
STMP118	STMH28	STMH2	CONDUIT	116.3	0.1204	0.0100

STMP12	STMH63	STMH62	CONDUIT	10.2	0.9824	0.0100
STMP120	STMH147	STMH28	CONDUIT	110.1	0.4994	0.0100
STMP123	STMH2	STMH197	CONDUIT	88.5	1.2548	0.0100
STMP1289	STMH26	STMH297	CONDUIT	27.8	47.1005	0.0100
STMP13	STMH62	STMH161	CONDUIT	89.3	0.9962	0.0100
STMP131	STMH190	DROF5	CONDUIT	54.9	0.4920	0.0100
STMP14	STMH161	STMH54	CONDUIT	92.7	1.2078	0.0100
STMP150	STMH37	STMH225	CONDUIT	86.2	0.4990	0.0100
STMP1513	DRCB258	DRCB260	CONDUIT	24.9	3.3754	0.0100
STMP1516	STMH362	J73	CONDUIT	33.6	0.4161	0.0100
STMP155	STMH23	STMH22	CONDUIT	82.8	0.2294	0.0100
STMP156A	STMH298	DROF7	CONDUIT	50.2	0.4979	0.0100
STMP156B	STMH297	STMH298	CONDUIT	136.3	0.2715	0.0100
STMP1604	STMH398	DROF13	CONDUIT	20.4	1.0300	0.0100
STMP161	STMH22	STMH26	CONDUIT	57.4	2.9625	0.0100
STMP170	J78	J75	CONDUIT	31.2	1.2184	0.0100
STMP183	STMH38	STMH205	CONDUIT	133.6	2.0956	0.0100
STMP184	STMH204	STMH109	CONDUIT	96.4	1.0273	0.0100
STMP20	J1	STMH286	CONDUIT	121.6	0.5014	0.0100
STMP248	STMH109	STMH244	CONDUIT	132.7	0.3768	0.0100
STMP249	STMH244	STMH362	CONDUIT	69.7	0.4307	0.0100
STMP274	J56	STMH253	CONDUIT	178.1	0.4998	0.0100
STMP276	STMH254	STMH93	CONDUIT	140.0	0.9714	0.0100
STMP29	STMH77	STMH74	CONDUIT	35.8	3.4248	0.0100
STMP308	STMH116	DRCB64	CONDUIT	71.1	3.7156	0.0100
STMP309	DRCB64	DRCB40	CONDUIT	215.4	2.6704	0.0100
STMP393	STMH177	STMH398	CONDUIT	105.6	0.3409	0.0100
STMP394	STMH178	STMH177	CONDUIT	124.0	0.4112	0.0100
STMP427	STMH56	STMH165	CONDUIT	112.2	0.3745	0.0100
STMP428	STMH165	STMH54	CONDUIT	92.0	0.6415	0.0100
STMP435	STMH54	STMH178	CONDUIT	132.3	1.2698	0.0100
STMP521	STMH139	STMH138	CONDUIT	19.0	2.3653	0.0100
STMP524	J38	STMH17	CONDUIT	16.1	2.3002	0.0100
STMP525	J34	J38	CONDUIT	41.6	2.4063	0.0100
STMP554	STMH6	STMH7	CONDUIT	75.5	0.7417	0.0100
STMP555	STMH138	STMH183	CONDUIT	46.0	1.3271	0.0100
STMP556	STMH183	STMH6	CONDUIT	54.9	1.7850	0.0100
STMP591	STMH7	STMH184	CONDUIT	43.1	1.9502	0.0100
STMP594	STMH184	STMH185	CONDUIT	34.9	0.4014	0.0100
STMP595	STMH185	STMH12	CONDUIT	14.4	0.4170	0.0100
STMP692	STMH194	STMH147	CONDUIT	49.5	0.5054	0.0100
STMP749	STMH205	STMH204	CONDUIT	13.4	2.3175	0.0100
STMP77	STMH246-DIV	STMH139	CONDUIT	27.8	2.1197	0.0100
STMP79	STMH17	J37	CONDUIT	94.2	0.5307	0.0100

STMP800	STMH253	STMH194	CONDUIT	97.4	0.5029	0.0100
STMP801	STMH212	STMH253	CONDUIT	72.7	0.4952	0.0100
STMP823	STMH216	STMH196	CONDUIT	67.8	0.6789	0.0100
STMP824	STMH4	STMH216	CONDUIT	62.6	0.6710	0.0100
STMP850	J79	STMH15	CONDUIT	33.9	1.5042	0.0100
STMP88	J37	STMH254	CONDUIT	45.8	0.5460	0.0100
STMP89	STMH93	DROP4	CONDUIT	27.1	0.9949	0.0100
STMP9	STMH286	STMH56	CONDUIT	62.1	0.5310	0.0100
STMP90	STMH12	DROP3	CONDUIT	69.3	0.5051	0.0100
STMP914	STMH225	STMH226	CONDUIT	43.8	1.6658	0.0100
STMP915	STMH226	STMH202	CONDUIT	128.5	1.0510	0.0100
STMP964	J22	STMH235	CONDUIT	89.5	0.2929	0.0100
STMP98	STMH15	STMH137	CONDUIT	29.4	3.3716	0.0100
STMP99	STMH137	STMH196	CONDUIT	97.5	1.6318	0.0100
SYMP182	STMH202	STMH38	CONDUIT	141.2	1.4237	0.0100
STMP187_PUMP	J76	J77	IDEAL PUMP			

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C100	CIRCULAR	0.45	0.16	0.11	0.45	1	144.26
C101	CIRCULAR	1.20	1.13	0.30	1.20	1	2968.54
C102	CIRCULAR	1.05	0.87	0.26	1.05	1	2197.46
C103	CIRCULAR	1.05	0.87	0.26	1.05	1	7032.30
C104	CIRCULAR	1.05	0.87	0.26	1.05	1	6555.37
C105	CIRCULAR	0.75	0.44	0.19	0.75	1	1798.88
C106	CIRCULAR	0.75	0.44	0.19	0.75	1	1459.75
C107	CIRCULAR	0.75	0.44	0.19	0.75	1	1445.50
C108	CIRCULAR	0.90	0.64	0.23	0.90	1	2777.92
C109	CIRCULAR	0.90	0.64	0.23	0.90	1	4877.52
C110	CIRCULAR	0.90	0.64	0.23	0.90	1	2945.34
C93	CIRCULAR	0.60	0.28	0.15	0.60	2	975.43
C96	CIRCULAR	1.05	0.87	0.26	1.05	1	5172.85
C98	CIRCULAR	0.90	0.64	0.23	0.90	1	4572.17
C99	TRAPEZOIDAL	2.00	5.00	0.83	4.00	1	59738.45
DRDI117	TRAPEZOIDAL	1.00	3.60	0.52	6.60	1	23389.71
DRDI27	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76654.24
DRDI28	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76659.66
DRDI4	TRAPEZOIDAL	1.50	14.25	0.98	14.00	1	76761.44
DRDI5	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76218.52

DRDI6	TRAPEZOIDAL	2.00	12.00	0.95	12.00	1	132287.57
STMP10	CIRCULAR	0.60	0.28	0.15	0.60	1	802.66
STMP100	CIRCULAR	1.20	1.13	0.30	1.20	1	3778.42
STMP101	CIRCULAR	1.20	1.13	0.30	1.20	1	2378.05
STMP103	CIRCULAR	0.90	0.64	0.23	0.90	1	1749.20
STMP106	CIRCULAR	1.20	1.13	0.30	1.20	1	4572.62
STMP107	CIRCULAR	1.20	1.13	0.30	1.20	1	4089.94
STMP1086	CIRCULAR	0.35	0.10	0.09	0.35	1	153.05
STMP11	CIRCULAR	0.60	0.28	0.15	0.60	1	799.28
STMP1170	CIRCULAR	0.60	0.28	0.15	0.60	1	745.86
STMP118	CIRCULAR	0.60	0.28	0.15	0.60	1	276.99
STMP12	CIRCULAR	0.60	0.28	0.15	0.60	1	791.19
STMP120	CIRCULAR	0.40	0.13	0.10	0.40	1	191.34
STMP123	CIRCULAR	0.75	0.44	0.19	0.75	1	1621.26
STMP1289	CIRCULAR	0.40	0.13	0.10	0.40	1	1858.16
STMP13	CIRCULAR	0.60	0.28	0.15	0.60	1	796.76
STMP131	CIRCULAR	1.20	1.13	0.30	1.20	1	3555.25
STMP14	CIRCULAR	0.60	0.28	0.15	0.60	1	877.28
STMP150	CIRCULAR	0.60	0.28	0.15	0.60	1	563.87
STMP1513	CIRCULAR	0.80	0.50	0.20	0.80	1	3158.49
STMP1516	CIRCULAR	0.60	0.28	0.15	0.60	1	514.90
STMP155	CIRCULAR	0.50	0.20	0.12	0.50	1	235.13
STMP156A	CIRCULAR	0.60	0.28	0.15	0.60	1	563.28
STMP156B	CIRCULAR	0.60	0.28	0.15	0.60	1	415.93
STMP1604	CIRCULAR	0.90	0.64	0.23	0.90	1	2388.56
STMP161	CIRCULAR	0.50	0.20	0.12	0.50	1	844.93
STMP170	CIRCULAR	0.80	0.50	0.20	0.80	3	1897.65
STMP183	CIRCULAR	0.60	0.28	0.15	0.60	1	1155.59
STMP184	CIRCULAR	0.60	0.28	0.15	0.60	1	809.10
STMP20	CIRCULAR	0.50	0.20	0.12	0.50	1	347.62
STMP248	CIRCULAR	0.60	0.28	0.15	0.60	1	489.98
STMP249	CIRCULAR	0.60	0.28	0.15	0.60	1	523.90
STMP274	CIRCULAR	0.60	0.28	0.15	0.60	1	564.32
STMP276	CIRCULAR	0.75	0.44	0.19	0.75	1	1426.50
STMP29	CIRCULAR	1.05	0.87	0.26	1.05	1	6569.95
STMP308	CIRCULAR	0.45	0.16	0.11	0.45	1	714.48
STMP309	CIRCULAR	0.60	0.28	0.15	0.60	1	1304.47
STMP393	CIRCULAR	0.90	0.64	0.23	0.90	1	1374.18
STMP394	CIRCULAR	0.90	0.64	0.23	0.90	1	1509.26
STMP427	CIRCULAR	0.68	0.36	0.17	0.68	1	668.74
STMP428	CIRCULAR	0.68	0.36	0.17	0.68	1	875.31
STMP435	CIRCULAR	0.68	0.36	0.17	0.68	1	1231.44
STMP521	CIRCULAR	0.75	0.44	0.19	0.75	1	2225.98
STMP524	CIRCULAR	0.75	0.44	0.19	0.75	1	2195.09

STMP525	CIRCULAR	0.75	0.44	0.19	0.75	1	2245.15
STMP554	CIRCULAR	0.75	0.44	0.19	0.75	1	1246.52
STMP555	CIRCULAR	0.75	0.44	0.19	0.75	1	1667.32
STMP556	CIRCULAR	0.75	0.44	0.19	0.75	1	1933.72
STMP591	CIRCULAR	0.75	0.44	0.19	0.75	1	2021.23
STMP594	CIRCULAR	0.75	0.44	0.19	0.75	1	916.96
STMP595	CIRCULAR	0.75	0.44	0.19	0.75	1	934.59
STMP692	CIRCULAR	0.50	0.20	0.12	0.50	1	348.98
STMP749	CIRCULAR	0.60	0.28	0.15	0.60	1	1215.23
STMP77	CIRCULAR	0.90	0.64	0.23	0.90	1	3426.60
STMP79	CIRCULAR	0.75	0.44	0.19	0.75	1	1054.36
STMP800	CIRCULAR	0.50	0.20	0.12	0.50	1	348.14
STMP801	CIRCULAR	0.50	0.20	0.12	0.50	1	345.45
STMP823	CIRCULAR	0.60	0.28	0.15	0.60	1	657.72
STMP824	CIRCULAR	0.60	0.28	0.15	0.60	1	653.92
STMP850	CIRCULAR	0.60	0.28	0.15	0.60	1	979.02
STMP88	CIRCULAR	0.75	0.44	0.19	0.75	1	1069.45
STMP89	CIRCULAR	0.75	0.44	0.19	0.75	1	1443.65
STMP9	CIRCULAR	0.68	0.36	0.17	0.68	1	796.33
STMP90	CIRCULAR	0.75	0.44	0.19	0.75	1	1028.59
STMP914	CIRCULAR	0.60	0.28	0.15	0.60	1	1030.27
STMP915	CIRCULAR	0.60	0.28	0.15	0.60	1	818.35
STMP964	CIRCULAR	0.45	0.16	0.11	0.45	1	200.59
STMP98	CIRCULAR	0.60	0.28	0.15	0.60	1	1465.75
STMP99	CIRCULAR	0.60	0.28	0.15	0.60	1	1019.72
SYMP182	CIRCULAR	0.60	0.28	0.15	0.60	1	952.46

****
Control Actions Taken
****

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	15.516	16.560
Evaporation Loss	0.000	0.000
Infiltration Loss	10.009	10.683
Surface Runoff	5.150	5.496
Final Surface Storage	0.525	0.560
Continuity Error (%)	-1.083	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	5.147	51.470
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	3.936	39.360
Internal Outflow	1.208	12.079
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.005	0.048
Continuity Error (%)	-0.032	

****
Time-Step Critical Elements
****
Link STMP749 (32.57%)
Link C98 (18.74%)
Link STMP12 (16.84%)
Link STMP1513 (11.50%)
Link STMP1604 (6.48%)

****
Highest Flow Instability Indexes
****
Link STMP595 (22)
Link STMP101 (18)
Link STMP594 (17)
Link STMP98 (14)
Link STMP1516 (12)

****
Routing Time Step Summary
****
Minimum Time Step : 0.50 sec
Average Time Step : 4.12 sec
Maximum Time Step : 30.00 sec

Percent in Steady State : 0.00
Average Iterations per Step : 4.87
Percent Not Converging : 30.10

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
S13-A	16.56	0.00	0.00	4.97	10.91	1.58	1649.18	0.659
S13-B	16.56	0.00	0.00	4.97	10.85	1.54	1451.26	0.655
S13-C	16.56	0.00	0.00	5.63	10.28	0.52	534.35	0.621
S13-D	16.56	0.00	0.00	3.81	12.13	0.35	382.76	0.733
S13-E	16.56	0.00	0.00	5.30	10.63	0.55	595.46	0.642
S13-F	16.56	0.00	0.00	8.28	7.71	0.59	499.18	0.465
S13-G	16.56	0.00	0.00	8.61	7.62	0.10	114.07	0.460
S13-H	16.56	0.00	0.00	7.12	9.08	0.14	152.83	0.548
S23-A	16.56	0.00	0.00	5.13	10.67	1.69	1523.34	0.644
S23-B	16.56	0.00	0.00	6.13	9.92	0.39	432.45	0.599
S23-C	16.56	0.00	0.00	9.11	7.06	0.56	613.76	0.426
S25-A	16.56	0.00	0.00	6.46	9.35	2.11	1539.59	0.564
S25-B	16.56	0.00	0.00	7.45	8.58	0.58	608.11	0.518
S25-C	16.56	0.00	0.00	7.95	8.11	0.59	616.90	0.490
S25-D	16.56	0.00	0.00	7.45	8.55	0.92	925.98	0.517
S25-E	16.56	0.00	0.00	8.45	7.65	0.78	826.31	0.462
S25-F	16.56	0.00	0.00	9.27	6.79	2.83	2425.74	0.410
S25-G	16.56	0.00	0.00	8.45	7.73	0.25	282.49	0.467
S25-H	16.56	0.00	0.00	9.77	6.46	0.22	246.83	0.390
S25-I	16.56	0.00	0.00	5.46	10.40	2.10	2053.76	0.628
S25-J	16.56	0.00	0.00	4.64	11.08	2.72	2225.43	0.669
S32-A	16.56	0.00	0.00	8.28	6.92	3.76	1094.02	0.418
S32-B	16.56	0.00	0.00	8.28	7.71	0.41	350.05	0.465
S38-A	16.56	0.00	0.00	3.48	12.34	2.01	2141.95	0.745
S38-B	16.56	0.00	0.00	3.97	11.87	2.18	2318.10	0.717
S38-C	16.56	0.00	0.00	3.48	12.33	1.03	1089.11	0.744
S38-D	16.56	0.00	0.00	4.47	11.35	0.54	542.42	0.686
S38-Z1	16.56	0.00	0.00	14.90	1.61	2.19	2409.68	0.097
S38-Z2	16.56	0.00	0.00	14.90	1.61	0.09	100.64	0.097
S3-A	16.56	0.00	0.00	6.13	9.85	0.84	903.45	0.595

S3-B	16.56	0.00	0.00	6.29	9.73	0.19	211.10	0.587
S3-C	16.56	0.00	0.00	6.46	9.57	0.34	372.10	0.578
S3-D	16.56	0.00	0.00	3.31	12.61	0.27	294.71	0.762
S3-E	16.56	0.00	0.00	3.97	11.99	0.71	786.13	0.724
S3-F	16.56	0.00	0.00	6.96	9.32	0.18	196.72	0.563
S3-G	16.56	0.00	0.00	6.62	9.59	0.31	345.35	0.579
S3-Z1	16.56	0.00	0.00	14.90	1.60	3.87	4265.78	0.097
S4-A	16.56	0.00	0.00	3.81	12.23	0.47	519.48	0.738
S4-B	16.56	0.00	0.00	3.31	12.39	0.51	472.37	0.748
S4-C	16.56	0.00	0.00	4.47	11.36	0.77	787.44	0.686
S5-A	16.56	0.00	0.00	5.96	9.99	0.89	951.67	0.604
S5-B	16.56	0.00	0.00	3.31	12.44	0.22	218.66	0.751
S5-C	16.56	0.00	0.00	3.31	12.43	0.31	308.09	0.750
S5-D	16.56	0.00	0.00	3.31	12.46	0.16	164.51	0.752
S5-E	16.56	0.00	0.00	3.48	12.35	0.50	530.43	0.746
S5-F	16.56	0.00	0.00	3.31	12.62	0.13	142.66	0.762
S5-G	16.56	0.00	0.00	3.81	11.90	0.49	439.68	0.719
S5-H	16.56	0.00	0.00	4.47	11.26	0.42	359.64	0.680
S5-I	16.56	0.00	0.00	4.80	11.10	1.14	1225.68	0.670
S5-J	16.56	0.00	0.00	6.62	9.51	0.56	623.49	0.574
S5-K	16.56	0.00	0.00	7.62	8.45	2.42	2619.83	0.510
S5-Z1	16.56	0.00	0.00	14.90	1.61	1.41	1549.34	0.097
S7-A	16.56	0.00	0.00	7.29	8.68	0.65	620.76	0.524
S7-B	16.56	0.00	0.00	12.92	3.52	0.14	151.51	0.213
S13-I	16.56	0.00	0.00	0.85	13.75	0.29	239.14	0.830

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Node Depth Summary
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J1	JUNCTION	0.66	2.90	447.82	0 00:17
STMH286	JUNCTION	0.89	3.40	447.71	0 00:16
STMH56	JUNCTION	0.90	3.20	447.18	0 00:16
STMH54	JUNCTION	1.04	4.10	447.07	0 00:16
STMH178	JUNCTION	0.65	3.20	444.49	0 00:16
STMH177	JUNCTION	0.55	2.60	443.38	0 00:17
STMH398	JUNCTION	0.36	1.06	441.48	0 00:20
STMH188	JUNCTION	0.70	3.40	449.42	0 00:17

STMH64	JUNCTION	0.70	3.32	448.88	0	00:17
STMH161	JUNCTION	0.80	3.00	447.09	0	00:16
STMH165	JUNCTION	0.96	3.60	447.16	0	00:16
STMH63	JUNCTION	0.70	3.16	448.24	0	00:17
STMH62	JUNCTION	0.70	2.80	447.78	0	00:17
STMH77	JUNCTION	0.21	0.65	454.80	0	00:20
STMH74	JUNCTION	0.20	0.62	453.50	0	00:20
STMH83	JUNCTION	0.69	3.00	444.98	0	00:16
STMH79	JUNCTION	0.72	2.60	443.98	0	00:16
STMH235	JUNCTION	0.70	1.90	444.34	0	00:12
J22	JUNCTION	0.92	1.90	444.65	0	00:12
STMH139	JUNCTION	0.60	1.80	457.13	0	00:13
STMH138	JUNCTION	0.63	1.60	456.48	0	00:13
STMH183	JUNCTION	0.63	1.60	455.87	0	00:13
STMH6	JUNCTION	0.84	2.16	455.45	0	00:13
STMH7	JUNCTION	0.74	3.24	455.97	0	00:13
STMH184	JUNCTION	0.93	2.71	454.60	0	00:13
STMH185	JUNCTION	0.83	2.65	454.40	0	00:13
STMH12	JUNCTION	0.79	2.57	454.26	0	00:13
J33	JUNCTION	0.40	2.49	461.57	0	00:20
J34	JUNCTION	0.08	0.24	455.60	0	00:20
STMH17	JUNCTION	0.12	0.37	454.36	0	00:20
STMH254	JUNCTION	0.16	0.45	453.69	0	00:21
STMH93	JUNCTION	0.23	1.22	453.10	0	00:20
J37	JUNCTION	0.19	0.55	454.04	0	00:20
J38	JUNCTION	0.08	0.25	454.61	0	00:20
STMH190	JUNCTION	0.47	1.45	451.17	0	00:20
STMH133	JUNCTION	0.44	1.44	451.72	0	00:21
STMH135	JUNCTION	0.37	0.87	451.88	0	00:21
STMH131	JUNCTION	0.49	1.00	452.21	0	00:21
STMH196	JUNCTION	0.40	0.85	452.54	0	00:20
STMH137	JUNCTION	0.65	1.98	455.26	0	00:14
STMH15	JUNCTION	0.56	1.80	456.07	0	00:14
J46	JUNCTION	0.97	5.00	460.31	0	00:16
STMH4	JUNCTION	0.13	0.45	453.02	0	00:20
STMH216	JUNCTION	0.15	0.91	453.06	0	00:20
STMH197	JUNCTION	0.26	0.58	452.53	0	00:21
STMH2	JUNCTION	0.20	0.37	453.43	0	00:20
STMH28	JUNCTION	0.32	0.54	453.74	0	00:21
STMH147	JUNCTION	1.00	2.90	456.65	0	00:14
STMH194	JUNCTION	0.90	1.80	455.80	0	00:14
STMH253	JUNCTION	0.78	2.00	456.49	0	00:14
J56	JUNCTION	0.41	2.60	457.98	0	00:16
STMH212	JUNCTION	0.59	1.20	456.05	0	00:15

STMH298	JUNCTION	0.20	1.60	441.87	0	00:19
STMH297	JUNCTION	0.27	2.96	443.60	0	00:18
STMH26	JUNCTION	0.06	0.16	452.65	0	00:20
STMH22	JUNCTION	0.12	0.35	454.54	0	00:20
STMH23	JUNCTION	0.28	1.70	456.08	0	00:20
STMH225	JUNCTION	0.61	2.19	452.38	0	00:20
STMH226	JUNCTION	1.07	3.04	451.10	0	00:17
STMH202	JUNCTION	1.10	3.02	449.73	0	00:16
STMH38	JUNCTION	1.09	2.75	447.45	0	00:16
STMH205	JUNCTION	1.28	3.20	445.10	0	00:15
STMH204	JUNCTION	1.32	3.16	444.75	0	00:15
STMH109	JUNCTION	0.91	1.70	442.30	0	00:15
STMH37	JUNCTION	0.78	2.50	453.12	0	00:16
STMH244	JUNCTION	0.65	1.50	441.60	0	00:15
STMH362	JUNCTION	0.47	1.70	441.50	0	00:15
J73	JUNCTION	0.13	0.28	439.56	0	00:20
J74	JUNCTION	0.15	0.36	438.63	0	00:21
J75	JUNCTION	0.17	0.40	438.02	0	00:21
J76	JUNCTION	0.00	0.00	437.10	0	00:00
J77	JUNCTION	0.37	0.70	442.70	0	00:20
J78	JUNCTION	0.22	0.49	438.49	0	00:22
J79	JUNCTION	1.02	4.66	459.44	0	00:18
STMH116	JUNCTION	0.45	2.30	456.30	0	00:17
DRCB64	JUNCTION	0.29	2.50	453.86	0	00:17
DRCB40	JUNCTION	1.42	2.50	448.11	0	00:14
J83	JUNCTION	0.24	0.78	459.27	0	00:20
J84	JUNCTION	0.09	0.24	437.60	0	00:20
J85	JUNCTION	0.15	0.42	457.79	0	00:20
STMH78	JUNCTION	0.26	2.90	449.54	0	00:20
J86	JUNCTION	0.50	2.50	460.96	0	00:16
J87	JUNCTION	0.08	0.25	458.82	0	00:20
J88	JUNCTION	0.08	0.25	458.50	0	00:20
J89	JUNCTION	0.00	0.00	456.77	0	00:00
J90	JUNCTION	0.00	0.00	459.23	0	00:00
J91	JUNCTION	0.00	0.00	457.00	0	00:00
DRCB258	JUNCTION	0.43	1.25	441.04	0	00:20
DRCB260	JUNCTION	0.88	1.50	440.45	0	00:19
J94	JUNCTION	0.18	0.23	437.07	0	00:20
STMH246-DIV	JUNCTION	0.51	1.96	457.88	0	00:20
DROF13	OUTFALL	0.36	0.90	441.11	0	00:18
DROF38	OUTFALL	0.52	1.05	441.90	0	00:15
DROF3	OUTFALL	0.44	0.75	452.09	0	00:13
DROF4	OUTFALL	0.22	0.75	452.36	0	00:19
DROF5	OUTFALL	0.47	1.20	450.65	0	00:19

DROF7	OUTFALL	0.20	0.60	440.62	0	00:19
DROF25	OUTFALL	0.37	0.69	440.69	0	00:21
DROF23	OUTFALL	0.27	0.35	444.25	0	00:13
DRFI2017	OUTFALL	0.18	0.23	436.65	0	00:21

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	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	239.08	528.10	0 00:17	0.291	0.308	-0.257
STMH286	JUNCTION	1648.77	1754.55	0 00:20	1.58	1.83	0.006
STMH56	JUNCTION	0.00	1009.18	0 00:25	0	1.64	0.001
STMH54	JUNCTION	595.31	1785.24	0 00:17	0.555	3.68	0.001
STMH178	JUNCTION	499.04	2244.34	0 00:20	0.591	4.27	-0.001
STMH177	JUNCTION	114.05	2358.45	0 00:20	0.103	4.37	-0.005
STMH398	JUNCTION	152.80	2511.34	0 00:20	0.138	4.51	0.009
STMH188	JUNCTION	1450.87	1450.87	0 00:20	1.54	1.54	-0.008
STMH64	JUNCTION	0.00	1004.91	0 00:20	0	1.45	-0.063
STMH161	JUNCTION	382.68	1084.19	0 00:20	0.346	1.64	-0.066
STMH165	JUNCTION	534.22	967.56	0 00:16	0.517	1.74	-0.074
STMH63	JUNCTION	0.00	1004.87	0 00:20	0	1.45	-0.026
STMH62	JUNCTION	0.00	1005.55	0 00:20	0	1.45	0.010
STMH77	JUNCTION	0.00	4586.82	0 00:20	0	4.29	0.001
STMH74	JUNCTION	0.00	4606.41	0 00:20	0	4.29	-0.002
STMH83	JUNCTION	0.00	5577.17	0 00:20	0	6.18	0.021
STMH79	JUNCTION	542.28	4622.24	0 00:20	0.536	6.42	-0.058
STMH235	JUNCTION	0.00	596.44	0 00:21	0	1.1	-0.262
J22	JUNCTION	2317.54	2317.54	0 00:20	2.18	2.18	0.200
STMH139	JUNCTION	0.00	3871.08	0 00:20	0	4.72	-0.013
STMH138	JUNCTION	294.65	2969.57	0 00:20	0.266	4.5	-0.010
STMH183	JUNCTION	0.00	1667.25	0 00:26	0	3.53	-0.029
STMH6	JUNCTION	372.02	1637.84	0 00:20	0.34	3.46	0.029
STMH7	JUNCTION	211.05	1627.69	0 00:15	0.193	3.57	-0.032
STMH184	JUNCTION	0.00	1627.53	0 00:36	0	3.57	0.009
STMH185	JUNCTION	0.00	1627.47	0 00:14	0	3.57	-0.003
STMH12	JUNCTION	903.24	2370.43	0 00:20	0.84	4.41	0.011
J33	JUNCTION	4461.74	4461.74	0 00:20	4.05	4.05	-0.005

J34	JUNCTION	519.38	519.38	0	00:20	0.469	0.468	0.020
STMH17	JUNCTION	0.00	511.12	0	00:20	0	0.468	-0.024
STMH254	JUNCTION	0.00	951.14	0	00:20	0	0.974	0.055
STMH93	JUNCTION	787.24	1660.09	0	00:20	0.768	1.74	-0.003
J37	JUNCTION	472.25	958.57	0	00:20	0.505	0.974	0.018
J38	JUNCTION	0.00	508.72	0	00:20	0	0.468	0.002
STMH190	JUNCTION	0.00	4003.80	0	00:22	0	6.38	0.001
STMH133	JUNCTION	951.44	4067.77	0	00:21	0.895	6.38	0.005
STMH135	JUNCTION	218.60	3251.71	0	00:21	0.216	5.49	0.021
STMH131	JUNCTION	308.01	3069.11	0	00:20	0.311	5.27	0.016
STMH196	JUNCTION	164.47	2771.51	0	00:20	0.159	4.97	-0.017
STMH137	JUNCTION	0.00	1383.74	0	00:14	0	2.78	0.017
STMH15	JUNCTION	142.63	2655.47	0	00:20	0.129	3.61	-0.006
J46	JUNCTION	4168.30	4168.30	0	00:20	3.83	3.83	0.002
STMH4	JUNCTION	530.30	530.30	0	00:20	0.495	0.495	0.012
STMH216	JUNCTION	0.00	524.75	0	00:20	0	0.495	-0.022
STMH197	JUNCTION	0.00	793.93	0	00:20	0	1.53	0.038
STMH2	JUNCTION	439.57	804.05	0	00:20	0.488	1.53	0.017
STMH28	JUNCTION	0.00	374.11	0	00:18	0	1.04	0.056
STMH147	JUNCTION	359.54	374.12	0	00:18	0.418	1.04	-0.001
STMH194	JUNCTION	0.00	372.89	0	00:14	0	0.774	-0.078
STMH253	JUNCTION	0.00	623.35	0	00:20	0	0.867	-0.055
J56	JUNCTION	623.37	623.37	0	00:20	0.562	0.562	-0.204
STMH212	JUNCTION	1225.39	1501.65	0	00:20	1.14	1.23	0.007
STMH298	JUNCTION	0.00	762.00	0	00:20	0	0.785	0.012
STMH297	JUNCTION	151.49	762.08	0	00:20	0.137	0.786	0.029
STMH26	JUNCTION	0.00	616.35	0	00:20	0	0.648	0.005
STMH22	JUNCTION	0.00	620.53	0	00:20	0	0.649	0.020
STMH23	JUNCTION	620.60	620.60	0	00:20	0.649	0.648	-0.003
STMH225	JUNCTION	607.96	1358.00	0	00:20	0.575	2.39	0.115
STMH226	JUNCTION	0.00	1357.97	0	00:20	0	2.39	-0.067
STMH202	JUNCTION	616.75	1441.11	0	00:20	0.589	2.59	-0.031
STMH38	JUNCTION	925.75	1940.12	0	00:20	0.915	3.35	0.004
STMH205	JUNCTION	282.43	1340.99	0	00:20	0.255	3.09	-0.029
STMH204	JUNCTION	0.00	1291.08	0	00:21	0	3.08	0.001
STMH109	JUNCTION	0.00	1272.80	0	00:22	0	3.08	0.037
STMH37	JUNCTION	1539.16	1539.16	0	00:20	2.11	2.11	0.032
STMH244	JUNCTION	246.78	878.99	0	00:20	0.223	2.39	-0.004
STMH362	JUNCTION	0.00	878.89	0	00:20	0	2.39	-0.003
J73	JUNCTION	2425.08	3303.94	0	00:20	2.83	5.22	0.036
J74	JUNCTION	826.11	4044.39	0	00:20	0.777	5.99	0.112
J75	JUNCTION	2053.22	5688.58	0	00:21	2.1	8.08	0.056
J76	JUNCTION	0.00	7751.83	0	00:21	0	10.8	0.000
J77	JUNCTION	0.00	7751.83	0	00:21	0	10.8	0.007

J78	JUNCTION	0.00	3955.11	0	00:21	0	5.99	0.079
J79	JUNCTION	0.00	2513.47	0	00:21	0	3.48	0.005
STMH116	JUNCTION	1522.93	1522.93	0	00:20	1.69	1.69	-0.000
DRCB64	JUNCTION	432.36	1236.04	0	00:17	0.391	1.89	-0.036
DRCB40	JUNCTION	613.62	1829.60	0	00:20	0.56	2.45	0.004
J83	JUNCTION	4651.34	4651.34	0	00:20	4.29	4.29	0.011
J84	JUNCTION	2224.82	2224.82	0	00:20	2.72	2.72	0.021
J85	JUNCTION	0.00	3147.58	0	00:20	0	4.01	-0.032
STMH78	JUNCTION	1088.85	5619.52	0	00:20	1.03	5.32	0.119
J86	JUNCTION	0.00	4461.13	0	00:20	0	4.05	0.004
J87	JUNCTION	345.29	345.29	0	00:20	0.313	0.313	-0.007
J88	JUNCTION	0.00	345.92	0	00:20	0	0.313	0.047
J89	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
J90	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
J91	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
DRCB258	JUNCTION	1247.76	1247.76	0	00:30	4.15	4.16	-0.004
DRCB260	JUNCTION	0.00	1248.14	0	00:30	0	4.16	0.109
J94	JUNCTION	0.00	810.94	0	00:21	0	3.54	0.092
STMH246-DIV	JUNCTION	785.97	3918.56	0	00:20	0.71	4.72	0.046
DROF13	OUTFALL	0.00	2507.68	0	00:20	0	4.51	0.000
DROF38	OUTFALL	0.00	4368.67	0	00:23	0	6.38	0.000
DROF3	OUTFALL	0.00	2370.53	0	00:20	0	4.41	0.000
DROF4	OUTFALL	0.00	1660.17	0	00:20	0	1.74	0.000
DROF5	OUTFALL	0.00	4015.21	0	00:21	0	6.38	0.000
DROF7	OUTFALL	0.00	761.92	0	00:20	0	0.785	0.000
DROF25	OUTFALL	0.00	7822.46	0	00:21	0	10.8	0.000
DROF23	OUTFALL	0.00	229.95	0	00:49	0	0.824	0.000
DRFI2017	OUTFALL	0.00	820.90	0	00:21	0	3.54	0.000

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Node Surcharge Summary
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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
J1	JUNCTION	0.33	2.400	0.000
STMH286	JUNCTION	0.37	2.725	0.000
STMH56	JUNCTION	0.40	2.525	0.000
STMH54	JUNCTION	0.45	3.425	0.000

STMH178	JUNCTION	0.33	2.300	0.000
STMH177	JUNCTION	0.29	1.700	0.000
STMH398	JUNCTION	0.03	0.161	2.039
STMH188	JUNCTION	0.28	2.800	0.000
STMH64	JUNCTION	0.30	2.716	0.084
STMH161	JUNCTION	0.36	2.400	0.000
STMH165	JUNCTION	0.42	2.925	0.000
STMH63	JUNCTION	0.32	2.555	0.145
STMH62	JUNCTION	0.33	2.200	0.000
STMH83	JUNCTION	0.20	1.800	0.000
STMH79	JUNCTION	0.26	1.325	0.000
STMH235	JUNCTION	0.61	1.400	0.000
J22	JUNCTION	0.63	1.450	0.000
STMH139	JUNCTION	0.41	0.900	0.000
STMH138	JUNCTION	0.43	0.850	0.000
STMH183	JUNCTION	0.44	0.850	0.000
STMH6	JUNCTION	0.47	1.410	0.000
STMH7	JUNCTION	0.47	2.486	0.034
STMH184	JUNCTION	0.54	1.957	1.693
STMH185	JUNCTION	0.54	1.901	1.789
STMH12	JUNCTION	0.55	1.819	1.831
J33	JUNCTION	0.15	1.594	0.006
STMH93	JUNCTION	0.04	0.466	2.684
STMH190	JUNCTION	0.07	0.254	3.246
STMH133	JUNCTION	0.02	0.243	2.957
STMH137	JUNCTION	0.40	1.384	0.616
STMH15	JUNCTION	0.37	1.200	0.000
J46	JUNCTION	0.34	4.400	0.000
STMH216	JUNCTION	0.02	0.309	2.191
STMH147	JUNCTION	0.72	2.400	0.000
STMH194	JUNCTION	0.68	1.300	0.000
STMH253	JUNCTION	0.60	1.400	0.000
J56	JUNCTION	0.45	2.000	0.000
STMH212	JUNCTION	0.58	0.700	0.000
STMH298	JUNCTION	0.07	1.000	0.000
STMH297	JUNCTION	0.10	2.361	0.939
STMH23	JUNCTION	0.17	1.197	1.603
STMH225	JUNCTION	0.37	1.594	0.246
STMH226	JUNCTION	0.40	1.040	0.000
STMH202	JUNCTION	0.47	2.420	0.000
STMH38	JUNCTION	0.50	2.150	0.000
STMH205	JUNCTION	0.56	2.600	0.000
STMH204	JUNCTION	0.61	2.560	0.000
STMH109	JUNCTION	0.64	1.100	0.000

STMH37	JUNCTION	0.38	1.900	0.000
STMH244	JUNCTION	0.63	0.900	0.000
STMH362	JUNCTION	0.60	1.100	0.000
J79	JUNCTION	0.38	4.060	0.040
STMH116	JUNCTION	0.22	1.850	0.000
DRCB64	JUNCTION	0.15	1.900	0.000
DRCB40	JUNCTION	0.76	1.900	0.000
STMH78	JUNCTION	0.01	1.850	0.000
J86	JUNCTION	0.17	1.600	0.000
DRCB258	JUNCTION	0.01	0.453	0.247
DRCB260	JUNCTION	0.62	0.700	0.000

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

Node	Hours Flooded	Maximum Rate LPS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
J1	0.13	503.98	0 00:17	0.057	0.000
STMH286	0.13	744.79	0 00:20	0.173	0.000
STMH56	0.25	811.89	0 00:20	0.415	0.000
STMH54	0.01	227.94	0 00:16	0.000	0.000
STMH178	0.01	381.82	0 00:16	0.001	0.000
STMH177	0.01	410.31	0 00:17	0.001	0.000
STMH188	0.11	445.64	0 00:20	0.084	0.000
STMH161	0.23	627.74	0 00:20	0.252	0.000
STMH165	0.03	342.29	0 00:16	0.003	0.000
STMH62	0.19	327.34	0 00:17	0.163	0.000
STMH83	0.07	1101.87	0 00:20	0.167	0.000
STMH79	0.08	617.64	0 00:16	0.050	0.000
STMH235	0.14	596.44	0 00:21	0.231	0.000
J22	0.51	2097.11	0 00:20	1.207	0.000
STMH139	0.16	1196.11	0 00:20	0.484	0.000
STMH138	0.32	1302.09	0 00:20	0.977	0.000
STMH183	0.39	401.43	0 00:24	0.405	0.000
STMH6	0.13	381.26	0 00:20	0.087	0.000
STMH15	0.29	1318.20	0 00:20	0.831	0.000
J46	0.12	1652.15	0 00:20	0.352	0.000

STMH147	0.01	83.04	0 00:14	0.000	0.000
STMH194	0.35	333.29	0 00:20	0.149	0.000
STMH253	0.01	319.03	0 00:14	0.002	0.000
J56	0.01	275.51	0 00:16	0.002	0.000
STMH212	0.50	1500.54	0 00:20	0.925	0.000
STMH298	0.01	86.02	0 00:19	0.000	0.000
STMH226	0.33	783.72	0 00:17	0.388	0.000
STMH202	0.28	526.27	0 00:16	0.163	0.000
STMH38	0.38	881.03	0 00:20	0.513	0.000
STMH205	0.06	240.99	0 00:15	0.005	0.000
STMH204	0.08	191.92	0 00:15	0.005	0.000
STMH109	0.55	640.56	0 00:20	0.913	0.000
STMH37	0.22	788.81	0 00:20	0.294	0.000
STMH244	0.01	207.12	0 00:15	0.001	0.000
STMH362	0.01	169.30	0 00:15	0.000	0.000
STMH116	0.15	738.43	0 00:20	0.190	0.000
DRCB64	0.01	113.91	0 00:17	0.000	0.000
DRCB40	0.65	1599.14	0 00:20	1.625	0.000
STMH78	0.01	202.52	0 00:20	0.000	0.000
J86	0.12	1649.87	0 00:20	0.350	0.000
DRCB260	0.55	437.86	0 00:30	0.613	0.000

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
DROF13	99.58	927.76	2507.68	4.508
DROF38	99.58	1329.61	4368.67	6.377
DROF3	99.58	924.93	2370.53	4.409
DROF4	99.58	363.54	1660.17	1.741
DROF5	99.54	1321.73	4015.21	6.382
DROF7	99.39	163.57	761.92	0.785
DROF25	99.58	2195.43	7822.46	10.797
DROF23	99.54	157.56	229.95	0.824
DRFI2017	99.43	566.95	820.90	3.536
System	99.53	7951.06	24244.43	39.360

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Link Flow Summary
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Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C100	CONDUIT	417.61	0 00:14	2.64	2.89	1.00
C101	CONDUIT	4096.93	0 00:23	3.62	1.38	1.00
C102	CONDUIT	4368.67	0 00:23	5.05	1.99	1.00
C103	CONDUIT	4599.40	0 00:20	6.88	0.65	0.79
C104	CONDUIT	5577.17	0 00:20	6.44	0.85	1.00
C105	CONDUIT	2808.28	0 00:20	7.63	1.56	0.78
C106	CONDUIT	345.92	0 00:20	2.72	0.24	0.33
C107	CONDUIT	339.59	0 00:20	1.78	0.23	0.45
C108	CONDUIT	0.00	0 00:00	0.00	0.00	0.13
C109	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
C110	CONDUIT	0.00	0 00:00	0.00	0.00	0.13
C93	CONDUIT	2513.47	0 00:21	4.44	1.29	1.00
C96	CONDUIT	4586.82	0 00:20	6.82	0.89	0.74
C98	CONDUIT	4461.13	0 00:20	7.01	0.98	1.00
C99	CONDUIT	3145.41	0 00:20	3.29	0.05	0.60
DRDI117	CONDUIT	820.90	0 00:21	2.77	0.04	0.23
DRDI27	CONDUIT	3269.97	0 00:20	2.11	0.04	0.21
DRDI28	CONDUIT	3955.11	0 00:21	1.81	0.05	0.28
DRDI4	CONDUIT	5703.69	0 00:21	5.13	0.07	0.13
DRDI5	CONDUIT	2238.64	0 00:20	4.46	0.03	0.08
DRDI6	CONDUIT	7822.46	0 00:21	5.44	0.06	0.35
STMP10	CONDUIT	1004.91	0 00:20	3.55	1.25	1.00
STMP100	CONDUIT	2785.24	0 00:20	3.01	0.74	0.77
STMP101	CONDUIT	3060.20	0 00:21	3.49	1.29	0.77
STMP103	CONDUIT	797.01	0 00:21	1.76	0.46	0.79
STMP106	CONDUIT	3249.56	0 00:22	3.72	0.71	0.86
STMP107	CONDUIT	4003.80	0 00:22	3.71	0.98	1.00
STMP1086	CONDUIT	229.95	0 00:49	2.39	1.50	1.00
STMP11	CONDUIT	1004.87	0 00:20	3.55	1.26	1.00
STMP1170	CONDUIT	810.94	0 00:21	3.95	1.09	0.69
STMP118	CONDUIT	391.27	0 00:16	1.96	1.41	0.76
STMP12	CONDUIT	1005.55	0 00:20	3.56	1.27	1.00
STMP120	CONDUIT	374.11	0 00:18	2.98	1.96	1.00
STMP123	CONDUIT	793.93	0 00:20	2.81	0.49	0.63

STMP1289	CONDUIT	615.93	0	00:20	6.57	0.33	0.70
STMP13	CONDUIT	701.53	0	00:28	2.61	0.88	1.00
STMP131	CONDUIT	4015.21	0	00:21	3.59	1.13	1.00
STMP14	CONDUIT	739.25	0	00:30	2.61	0.84	1.00
STMP150	CONDUIT	917.62	0	00:30	3.25	1.63	1.00
STMP1513	CONDUIT	1248.14	0	00:30	3.20	0.40	1.00
STMP1516	CONDUIT	878.86	0	00:20	3.13	1.71	0.97
STMP155	CONDUIT	620.53	0	00:20	3.49	2.64	0.85
STMP156A	CONDUIT	761.92	0	00:20	2.69	1.35	1.00
STMP156B	CONDUIT	762.00	0	00:20	2.70	1.83	1.00
STMP1604	CONDUIT	2507.68	0	00:20	4.28	1.05	1.00
STMP161	CONDUIT	616.35	0	00:20	6.17	0.73	0.51
STMP170	CONDUIT	3933.41	0	00:22	4.59	0.69	0.55
STMP183	CONDUIT	1134.59	0	00:39	4.01	0.98	1.00
STMP184	CONDUIT	1272.80	0	00:22	4.50	1.57	1.00
STMP20	CONDUIT	391.84	0	00:17	2.03	1.13	1.00
STMP248	CONDUIT	741.82	0	00:48	2.62	1.51	1.00
STMP249	CONDUIT	878.89	0	00:20	3.11	1.68	1.00
STMP274	CONDUIT	623.35	0	00:20	2.20	1.10	1.00
STMP276	CONDUIT	953.53	0	00:21	2.52	0.67	0.80
STMP29	CONDUIT	4606.41	0	00:20	8.24	0.70	0.62
STMP308	CONDUIT	921.33	0	00:17	5.79	1.29	1.00
STMP309	CONDUIT	1215.98	0	00:20	4.30	0.93	1.00
STMP393	CONDUIT	2358.54	0	00:20	3.74	1.72	1.00
STMP394	CONDUIT	2244.40	0	00:20	3.53	1.49	1.00
STMP427	CONDUIT	696.94	0	00:16	1.98	1.04	1.00
STMP428	CONDUIT	946.37	0	00:16	2.64	1.08	1.00
STMP435	CONDUIT	1779.57	0	00:17	4.97	1.45	1.00
STMP521	CONDUIT	2674.92	0	00:22	6.05	1.20	1.00
STMP524	CONDUIT	511.12	0	00:20	2.93	0.23	0.42
STMP525	CONDUIT	508.72	0	00:20	3.99	0.23	0.33
STMP554	CONDUIT	1576.63	0	00:36	3.57	1.26	1.00
STMP555	CONDUIT	1667.25	0	00:26	4.28	1.00	1.00
STMP556	CONDUIT	1487.13	0	00:36	3.47	0.77	1.00
STMP591	CONDUIT	1627.53	0	00:36	3.68	0.81	1.00
STMP594	CONDUIT	1627.47	0	00:14	3.68	1.77	1.00
STMP595	CONDUIT	1627.80	0	00:37	3.68	1.74	1.00
STMP692	CONDUIT	286.15	0	00:14	1.57	0.82	1.00
STMP749	CONDUIT	1291.08	0	00:21	4.57	1.06	1.00
STMP77	CONDUIT	3871.08	0	00:20	6.08	1.13	1.00
STMP79	CONDUIT	511.62	0	00:20	1.80	0.49	0.62
STMP800	CONDUIT	372.89	0	00:14	1.99	1.07	1.00
STMP801	CONDUIT	344.92	0	00:14	1.88	1.00	1.00
STMP823	CONDUIT	507.59	0	00:20	1.80	0.77	1.00

STMP824	CONDUIT	524.75	0	00:20	2.21	0.80	0.88
STMP850	CONDUIT	2513.14	0	00:21	8.89	2.57	1.00
STMP88	CONDUIT	951.14	0	00:20	3.06	0.89	0.67
STMP89	CONDUIT	1660.17	0	00:20	3.76	1.15	1.00
STMP9	CONDUIT	1009.18	0	00:25	2.82	1.27	1.00
STMP90	CONDUIT	2370.53	0	00:20	5.37	2.30	1.00
STMP914	CONDUIT	1357.97	0	00:20	4.80	1.32	1.00
STMP915	CONDUIT	840.77	0	00:37	2.97	1.03	1.00
STMP964	CONDUIT	417.66	0	00:14	2.63	2.08	1.00
STMP98	CONDUIT	1383.74	0	00:14	4.89	0.94	1.00
STMP99	CONDUIT	1383.92	0	00:14	4.90	1.36	1.00
SYMP182	CONDUIT	1014.37	0	00:27	3.59	1.06	1.00
STMP187_PUMP	PUMP	7751.83	0	00:21			

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Flow Classification Summary
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	Adjusted	Fraction of Time in Flow Class							
Conduit	/Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
C100	1.00	0.00	0.00	0.00	0.25	0.00	0.00	0.75	0.00	0.00
C101	1.00	0.00	0.00	0.00	0.30	0.07	0.00	0.62	0.03	0.00
C102	1.00	0.00	0.00	0.00	0.33	0.66	0.00	0.00	0.67	0.00
C103	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.92	0.00
C104	1.00	0.00	0.00	0.00	0.01	0.63	0.00	0.35	0.25	0.00
C105	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.00
C106	1.00	0.00	0.00	0.00	0.10	0.89	0.00	0.00	0.89	0.00
C107	1.00	0.00	0.00	0.00	0.43	0.57	0.00	0.00	0.54	0.00
C108	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C109	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C110	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C93	1.00	0.00	0.00	0.00	0.28	0.71	0.00	0.00	0.79	0.00
C96	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C98	1.00	0.00	0.00	0.00	0.12	0.87	0.00	0.00	0.85	0.00
C99	1.00	0.00	0.00	0.00	0.55	0.44	0.00	0.00	0.95	0.00
DRDI117	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.67	0.00
DRDI27	1.00	0.00	0.00	0.00	0.08	0.92	0.00	0.00	0.89	0.00
DRDI28	1.00	0.00	0.00	0.00	0.83	0.16	0.00	0.00	0.72	0.00
DRDI4	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
DRDI5	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00

DRDI6	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.84	0.00
STMP10	1.00	0.00	0.00	0.00	0.23	0.77	0.00	0.00	0.59	0.00
STMP100	1.00	0.00	0.00	0.00	0.13	0.87	0.00	0.00	0.73	0.00
STMP101	1.00	0.00	0.00	0.00	0.03	0.96	0.00	0.00	0.19	0.00
STMP103	1.00	0.00	0.00	0.00	0.52	0.48	0.00	0.00	0.69	0.00
STMP106	1.00	0.00	0.00	0.00	0.06	0.93	0.00	0.00	0.83	0.00
STMP107	1.00	0.00	0.00	0.00	0.07	0.92	0.00	0.00	0.79	0.00
STMP1086	1.00	0.00	0.00	0.00	0.68	0.31	0.00	0.00	0.44	0.00
STMP11	1.00	0.00	0.00	0.00	0.24	0.75	0.00	0.00	0.74	0.00
STMP1170	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.01	0.00
STMP118	1.00	0.00	0.00	0.00	0.40	0.59	0.00	0.00	0.04	0.00
STMP12	1.00	0.00	0.00	0.00	0.26	0.74	0.00	0.00	0.44	0.00
STMP120	1.00	0.00	0.00	0.00	0.83	0.17	0.00	0.00	0.68	0.00
STMP123	1.00	0.00	0.00	0.00	0.02	0.97	0.00	0.00	0.93	0.00
STMP1289	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.97	0.00
STMP13	1.00	0.00	0.00	0.00	0.28	0.71	0.00	0.00	0.44	0.00
STMP131	1.00	0.00	0.00	0.00	0.08	0.91	0.00	0.00	0.75	0.00
STMP14	1.00	0.00	0.00	0.00	0.35	0.65	0.00	0.00	0.79	0.00
STMP150	1.00	0.00	0.00	0.00	0.30	0.69	0.00	0.00	0.09	0.00
STMP1513	1.00	0.00	0.00	0.00	0.50	0.50	0.00	0.00	0.73	0.00
STMP1516	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
STMP155	1.00	0.00	0.00	0.00	0.02	0.97	0.00	0.00	0.00	0.00
STMP156A	1.00	0.00	0.00	0.00	0.09	0.90	0.00	0.00	0.72	0.00
STMP156B	1.00	0.00	0.00	0.00	0.29	0.70	0.00	0.00	0.07	0.00
STMP1604	1.00	0.00	0.00	0.00	0.05	0.95	0.00	0.00	0.74	0.00
STMP161	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.00
STMP170	1.00	0.00	0.00	0.00	0.04	0.95	0.00	0.00	0.19	0.00
STMP183	1.00	0.00	0.00	0.00	0.41	0.59	0.00	0.00	0.27	0.00
STMP184	1.00	0.00	0.00	0.00	0.50	0.50	0.00	0.00	0.72	0.00
STMP20	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.85	0.00
STMP248	1.00	0.00	0.00	0.00	0.59	0.41	0.00	0.00	0.38	0.00
STMP249	1.00	0.00	0.00	0.00	0.53	0.47	0.00	0.00	0.70	0.00
STMP274	1.00	0.00	0.00	0.00	0.97	0.02	0.00	0.00	0.74	0.00
STMP276	1.00	0.00	0.00	0.00	0.08	0.92	0.00	0.00	0.92	0.00
STMP29	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
STMP308	1.00	0.00	0.00	0.00	0.14	0.85	0.00	0.00	0.85	0.00
STMP309	1.00	0.00	0.00	0.00	0.43	0.57	0.00	0.00	0.84	0.00
STMP393	1.00	0.00	0.00	0.00	0.09	0.91	0.00	0.00	0.20	0.00
STMP394	1.00	0.00	0.00	0.00	0.40	0.60	0.00	0.00	0.78	0.00
STMP427	1.00	0.00	0.00	0.00	0.39	0.60	0.00	0.00	0.57	0.00
STMP428	1.00	0.00	0.00	0.00	0.38	0.61	0.00	0.00	0.78	0.00
STMP435	1.00	0.00	0.00	0.00	0.35	0.65	0.00	0.00	0.78	0.00
STMP521	1.00	0.00	0.00	0.00	0.33	0.67	0.00	0.00	0.78	0.00
STMP524	1.00	0.00	0.00	0.00	0.04	0.96	0.00	0.00	0.90	0.00

STMP525	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.90	0.00
STMP554	1.00	0.00	0.00	0.00	0.37	0.63	0.00	0.00	0.09	0.00
STMP555	1.00	0.00	0.00	0.00	0.33	0.66	0.00	0.00	0.15	0.00
STMP556	1.00	0.00	0.00	0.00	0.35	0.65	0.00	0.00	0.79	0.00
STMP591	1.00	0.00	0.00	0.00	0.38	0.62	0.00	0.00	0.76	0.00
STMP594	1.00	0.00	0.00	0.00	0.50	0.50	0.00	0.00	0.36	0.00
STMP595	1.00	0.00	0.00	0.00	0.60	0.40	0.00	0.00	0.56	0.00
STMP692	1.00	0.00	0.00	0.00	0.91	0.08	0.00	0.00	0.71	0.00
STMP749	1.00	0.00	0.00	0.00	0.47	0.53	0.00	0.00	0.68	0.00
STMP77	1.00	0.00	0.00	0.00	0.31	0.69	0.00	0.00	0.80	0.00
STMP79	1.00	0.00	0.00	0.00	0.93	0.07	0.00	0.00	0.91	0.00
STMP800	1.00	0.00	0.00	0.00	0.57	0.43	0.00	0.00	0.70	0.00
STMP801	1.00	0.00	0.00	0.00	0.87	0.13	0.00	0.00	0.71	0.00
STMP823	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.88	0.00
STMP824	1.00	0.00	0.00	0.00	0.07	0.92	0.00	0.00	0.88	0.00
STMP850	1.00	0.00	0.00	0.00	0.28	0.72	0.00	0.00	0.08	0.00
STMP88	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.24	0.00
STMP89	1.00	0.00	0.00	0.00	0.05	0.94	0.00	0.00	0.66	0.00
STMP9	1.00	0.00	0.00	0.00	0.36	0.64	0.00	0.00	0.77	0.00
STMP90	1.00	0.00	0.00	0.00	0.44	0.55	0.00	0.00	0.57	0.00
STMP914	1.00	0.00	0.00	0.00	0.29	0.03	0.00	0.68	0.01	0.00
STMP915	1.00	0.00	0.00	0.00	0.36	0.64	0.00	0.00	0.28	0.00
STMP964	1.00	0.00	0.00	0.00	0.60	0.00	0.00	0.40	0.03	0.00
STMP98	1.00	0.00	0.00	0.00	0.28	0.72	0.00	0.00	0.81	0.00
STMP99	1.00	0.00	0.00	0.00	0.45	0.54	0.00	0.00	0.80	0.00
SYMP182	1.00	0.00	0.00	0.00	0.38	0.62	0.00	0.00	0.26	0.00

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Conduit Surcharge Summary
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	Hours Full			Hours Above Full	Hours Capacity
Conduit	Both Ends	Upstream	Dnstream	Normal Flow	Limited
C100	0.30	0.30	0.30	0.69	0.18
C101	0.20	0.20	0.20	0.16	0.15
C102	0.33	0.33	0.33	0.37	0.33
C104	0.01	0.01	0.02	0.01	0.01
C105	0.01	0.01	0.01	0.21	0.01
C93	0.34	0.34	0.34	0.41	0.16
C98	0.15	0.15	0.16	0.01	0.01

STMP10	0.28	0.28	0.28	0.16	0.16
STMP101	0.01	0.01	0.01	0.21	0.01
STMP107	0.02	0.02	0.02	0.01	0.01
STMP1086	0.92	0.92	0.92	0.95	0.92
STMP11	0.30	0.30	0.30	0.16	0.16
STMP1170	0.01	0.01	0.01	0.60	0.01
STMP118	0.01	0.01	0.01	0.61	0.01
STMP12	0.32	0.32	0.32	0.16	0.16
STMP120	0.60	0.60	0.60	0.75	0.60
STMP13	0.33	0.33	0.33	0.01	0.01
STMP131	0.07	0.07	0.07	0.10	0.07
STMP14	0.36	0.36	0.36	0.01	0.01
STMP150	0.37	0.37	0.37	0.41	0.37
STMP1513	0.01	0.01	0.01	0.01	0.01
STMP1516	0.01	0.01	0.01	0.67	0.01
STMP155	0.01	0.01	0.01	0.28	0.01
STMP156A	0.07	0.07	0.07	0.08	0.06
STMP156B	0.07	0.07	0.07	0.16	0.07
STMP1604	0.03	0.03	0.03	0.06	0.03
STMP170	0.01	0.01	0.01	0.33	0.01
STMP183	0.50	0.50	0.50	0.01	0.01
STMP184	0.61	0.61	0.61	0.54	0.54
STMP20	0.33	0.33	0.33	0.01	0.01
STMP248	0.63	0.63	0.63	0.67	0.63
STMP249	0.60	0.60	0.60	0.66	0.60
STMP274	0.45	0.45	0.45	0.03	0.03
STMP308	0.19	0.19	0.19	0.23	0.19
STMP309	0.15	0.15	0.15	0.01	0.01
STMP393	0.03	0.03	0.03	0.46	0.03
STMP394	0.29	0.29	0.30	0.40	0.29
STMP427	0.40	0.40	0.40	0.01	0.01
STMP428	0.42	0.42	0.42	0.01	0.01
STMP435	0.45	0.45	0.45	0.46	0.44
STMP521	0.42	0.42	0.42	0.21	0.21
STMP554	0.46	0.46	0.46	0.48	0.46
STMP555	0.43	0.43	0.43	0.01	0.01
STMP556	0.44	0.44	0.44	0.01	0.01
STMP591	0.47	0.47	0.47	0.01	0.01
STMP594	0.54	0.54	0.54	0.54	0.53
STMP595	0.53	0.53	0.54	0.54	0.53
STMP692	0.68	0.68	0.68	0.01	0.01
STMP749	0.56	0.56	0.56	0.20	0.20
STMP77	0.32	0.32	0.32	0.11	0.11
STMP800	0.63	0.63	0.64	0.01	0.01

STMP801	0.58	0.58	0.58	0.01	0.01
STMP823	0.02	0.02	0.03	0.01	0.01
STMP850	0.37	0.37	0.37	0.41	0.37
STMP89	0.04	0.04	0.04	0.06	0.04
STMP9	0.37	0.37	0.37	0.20	0.19
STMP90	0.54	0.54	0.55	0.56	0.54
STMP914	0.37	0.37	0.37	0.26	0.26
STMP915	0.46	0.46	0.46	0.32	0.33
STMP964	0.61	0.61	0.62	0.66	0.61
STMP98	0.37	0.37	0.37	0.01	0.01
STMP99	0.38	0.38	0.38	0.42	0.38
SYMP182	0.47	0.47	0.47	0.34	0.34

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Pumping Summary
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Pump	Percent Utilized	Number of Start-Ups	Min Flow LPS	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr	Power Usage Kw-hr	% Time Off Pump Curve Low	% Time Off Pump Curve High
STMP187_PUMP	97.50	1	0.00	2195.11	7751.83	10.797	159.28	0.0	0.0

Analysis begun on: Thu Sep 01 15:50:34 2016
Analysis ended on: Thu Sep 01 15:50:34 2016
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.007)

WARNING 02: maximum depth increased for Node J77

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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.
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Analysis Options
****
Flow Units ..... LPS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... DYNWAVE
Starting Date NOV-05-2015 00:00:00
Ending Date NOV-05-2015 03:00:00
Antecedent Dry Days 0.0
Report Time Step 00:05:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00
Routing Time Step ..... 30.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Head Tolerance ..... 0.004921 m

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Element Count
****
Number of rain gages 1
Number of subcatchments ... 55
Number of nodes 100

Number of links 91
Number of pollutants 0
Number of land uses 0

****
Raingage Summary
****

Name	Data Source	Data Type	Recording Interval
_Current	CC2_AES_1hr_100yr	VOLUME	5 min.

****
Subcatchment Summary
****

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
S13-A	14.43	1550.00	70.00	2.5000	_Current	STMH286
S13-B	14.18	1060.00	70.00	1.9000	_Current	STMH188
S13-C	5.03	705.00	66.00	1.1000	_Current	STMH165
S13-D	2.85	632.00	77.00	3.2000	_Current	STMH161
S13-E	5.22	727.00	68.00	2.1000	_Current	STMH54
S13-F	7.67	569.00	50.00	0.5000	_Current	STMH178
S13-G	1.35	351.00	48.00	2.0000	_Current	STMH177
S13-H	1.52	473.00	57.00	3.1000	_Current	STMH398
S23-A	15.82	1095.00	69.00	1.6000	_Current	STMH116
S23-B	3.94	770.00	63.00	2.6000	_Current	DRCB64
S23-C	7.93	966.00	45.00	2.1000	_Current	DRCB40
S25-A	22.61	902.00	61.00	1.3000	_Current	STMH37
S25-B	6.70	737.00	55.00	1.7000	_Current	STMH225
S25-C	7.26	921.00	52.00	1.0000	_Current	STMH202
S25-D	10.70	1063.00	55.00	1.2000	_Current	STMH38
S25-E	10.16	1039.00	49.00	1.7000	_Current	J74
S25-F	41.71	2239.00	44.00	0.8000	_Current	J73
S25-G	3.30	633.00	49.00	1.9000	_Current	STMH205
S25-H	3.45	674.00	41.00	1.2000	_Current	STMH244
S25-I	20.24	1568.00	67.00	2.1000	_Current	J75
S25-J	24.53	1501.00	72.00	1.3000	_Current	J84
S32-A	54.37	400.00	50.00	0.5000	_Current	DRCB258
S32-B	5.37	400.00	50.00	0.5000	_Current	DRCB258
S38-A	16.25	1798.00	79.00	4.1000	_Current	J83
S38-B	18.36	1574.00	76.00	5.9000	_Current	J22

S38-C	8.37	802.00	79.00	4.5000	_Current	STMH78
S38-D	4.72	558.00	73.00	1.5000	_Current	STMH79
S38-Z1	136.40	7480.00	10.00	30.3000	_Current	J83
S38-Z2	5.70	1120.00	10.00	10.4000	_Current	J83
S3-A	8.53	955.00	63.00	2.9000	_Current	STMH12
S3-B	1.98	392.00	62.00	1.5000	_Current	STMH7
S3-C	3.55	735.00	61.00	1.3000	_Current	STMH6
S3-D	2.11	617.00	80.00	2.1000	_Current	STMH138
S3-E	5.92	588.00	76.00	17.2000	_Current	STMH246-DIV
S3-F	1.92	586.00	58.00	13.7000	_Current	J33
S3-G	3.26	655.00	60.00	13.0000	_Current	J87
S3-Z1	241.50	6550.00	10.00	34.0000	_Current	J33
S4-A	3.83	547.00	77.00	19.1000	_Current	J34
S4-B	4.08	379.00	80.00	1.5000	_Current	J37
S4-C	6.76	577.00	73.00	3.3000	_Current	STMH93
S5-A	8.95	974.00	64.00	2.6000	_Current	STMH133
S5-B	1.74	288.00	80.00	0.9000	_Current	STMH135
S5-C	2.50	464.00	80.00	0.6000	_Current	STMH131
S5-D	1.28	206.00	80.00	1.2000	_Current	STMH196
S5-E	4.01	610.00	79.00	2.3000	_Current	STMH4
S5-F	1.02	184.00	80.00	6.0000	_Current	STMH15
S5-G	4.10	727.00	77.00	0.3000	_Current	STMH2
S5-H	3.71	473.00	73.00	0.4000	_Current	STMH147
S5-I	10.27	885.00	71.00	6.2000	_Current	STMH212
S5-J	5.91	831.00	60.00	9.1000	_Current	J56
S5-K	28.67	1446.00	54.00	11.9000	_Current	J46
S5-Z1	87.70	4910.00	10.00	36.0000	_Current	J46
S7-A	7.47	684.00	56.00	0.9000	_Current	STMH23
S7-B	3.90	411.00	22.00	7.3000	_Current	STMH297
S13-I	2.12	370.00	60.00	1.0000	_Current	J1

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Node Summary
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Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J1	JUNCTION	444.92	2.90	0.0	
STMH286	JUNCTION	444.31	3.40	0.0	
STMH56	JUNCTION	443.98	3.20	0.0	
STMH54	JUNCTION	442.97	4.10	0.0	
STMH178	JUNCTION	441.29	3.20	0.0	
STMH177	JUNCTION	440.78	2.60	0.0	

STMH398	JUNCTION	440.42	3.10	0.0
STMH188	JUNCTION	446.02	3.40	0.0
STMH64	JUNCTION	445.56	3.40	0.0
STMH161	JUNCTION	444.09	3.00	0.0
STMH165	JUNCTION	443.56	3.60	0.0
STMH63	JUNCTION	445.08	3.30	0.0
STMH62	JUNCTION	444.98	2.80	0.0
STMH77	JUNCTION	454.15	2.20	0.0
STMH74	JUNCTION	452.88	3.20	0.0
STMH83	JUNCTION	441.98	3.00	0.0
STMH79	JUNCTION	441.38	2.60	0.0
STMH235	JUNCTION	442.44	1.90	0.0
J22	JUNCTION	442.75	1.90	0.0
STMH139	JUNCTION	455.33	1.80	0.0
STMH138	JUNCTION	454.88	1.60	0.0
STMH183	JUNCTION	454.27	1.60	0.0
STMH6	JUNCTION	453.29	2.16	0.0
STMH7	JUNCTION	452.73	3.27	0.0
STMH184	JUNCTION	451.89	4.40	0.0
STMH185	JUNCTION	451.75	4.44	0.0
STMH12	JUNCTION	451.69	4.40	0.0
J33	JUNCTION	459.08	2.50	0.0
J34	JUNCTION	455.36	2.50	0.0
STMH17	JUNCTION	453.99	1.60	0.0
STMH254	JUNCTION	453.24	2.60	0.0
STMH93	JUNCTION	451.88	3.90	0.0
J37	JUNCTION	453.49	2.00	0.0
J38	JUNCTION	454.36	2.50	0.0
STMH190	JUNCTION	449.72	4.70	0.0
STMH133	JUNCTION	450.28	4.40	0.0
STMH135	JUNCTION	451.01	3.80	0.0
STMH131	JUNCTION	451.21	3.70	0.0
STMH196	JUNCTION	451.69	3.00	0.0
STMH137	JUNCTION	453.28	2.60	0.0
STMH15	JUNCTION	454.27	1.80	0.0
J46	JUNCTION	455.31	5.00	0.0
STMH4	JUNCTION	452.57	3.10	0.0
STMH216	JUNCTION	452.15	3.10	0.0
STMH197	JUNCTION	451.95	2.70	0.0
STMH2	JUNCTION	453.06	1.80	0.0
STMH28	JUNCTION	453.20	1.90	0.0
STMH147	JUNCTION	453.75	2.90	0.0
STMH194	JUNCTION	454.00	1.80	0.0
STMH253	JUNCTION	454.49	2.00	0.0

J56	JUNCTION	455.38	2.60	0.0
STMH212	JUNCTION	454.85	1.20	0.0
STMH298	JUNCTION	440.27	1.60	0.0
STMH297	JUNCTION	440.64	3.90	0.0
STMH26	JUNCTION	452.49	5.00	0.0
STMH22	JUNCTION	454.19	3.70	0.0
STMH23	JUNCTION	454.38	3.30	0.0
STMH225	JUNCTION	450.19	2.44	0.0
STMH226	JUNCTION	448.06	3.04	0.0
STMH202	JUNCTION	446.71	3.02	0.0
STMH38	JUNCTION	444.70	2.75	0.0
STMH205	JUNCTION	441.90	3.20	0.0
STMH204	JUNCTION	441.59	3.16	0.0
STMH109	JUNCTION	440.60	1.70	0.0
STMH37	JUNCTION	450.62	2.50	0.0
STMH244	JUNCTION	440.10	1.50	0.0
STMH362	JUNCTION	439.80	1.70	0.0
J73	JUNCTION	439.28	1.50	0.0
J74	JUNCTION	438.27	1.50	0.0
J75	JUNCTION	437.62	1.50	0.0
J76	JUNCTION	437.10	1.80	0.0
J77	JUNCTION	442.00	2.00	0.0
J78	JUNCTION	438.00	1.50	0.0
J79	JUNCTION	454.78	4.70	0.0
STMH116	JUNCTION	454.00	2.30	0.0
DRCB64	JUNCTION	451.36	2.50	0.0
DRCB40	JUNCTION	445.61	2.50	0.0
J83	JUNCTION	458.49	2.80	0.0
J84	JUNCTION	437.36	1.50	0.0
J85	JUNCTION	457.37	2.50	0.0
STMH78	JUNCTION	446.63	2.90	0.0
J86	JUNCTION	458.46	2.50	0.0
J87	JUNCTION	458.57	2.50	0.0
J88	JUNCTION	458.25	2.50	0.0
J89	JUNCTION	456.77	2.50	0.0
J90	JUNCTION	459.23	2.50	0.0
J91	JUNCTION	457.00	2.50	0.0
DRCB258	JUNCTION	439.79	1.50	0.0
DRCB260	JUNCTION	438.95	1.50	0.0
J94	JUNCTION	436.84	1.50	0.0
STMH246-DIV	JUNCTION	455.92	2.50	0.0
DROF13	OUTFALL	440.21	0.90	0.0
DROF38	OUTFALL	440.85	1.05	0.0
DROF3	OUTFALL	451.34	0.75	0.0

DROF4	OUTFALL	451.61	0.75	0.0
DROF5	OUTFALL	449.45	1.20	0.0
DROF7	OUTFALL	440.02	0.60	0.0
DROF25	OUTFALL	440.00	2.00	0.0
DROF23	OUTFALL	443.90	0.35	0.0
DRFI2017	OUTFALL	436.42	1.00	0.0

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Link Summary
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Name	From Node	To Node	Type	Length	%Slope	Roughness
C100	STMH235	STMH83	CONDUIT	61.4	0.1515	0.0100
C101	STMH83	STMH79	CONDUIT	153.1	0.3430	0.0100
C102	STMH79	DROF38	CONDUIT	137.0	0.3831	0.0100
C103	STMH74	STMH78	CONDUIT	159.2	3.9237	0.0100
C104	STMH78	STMH83	CONDUIT	132.9	3.4096	0.0100
C105	J86	J85	CONDUIT	70.6	1.5447	0.0100
C106	J87	J88	CONDUIT	31.5	1.0172	0.0100
C107	J88	J85	CONDUIT	88.2	0.9974	0.0100
C108	J89	J34	CONDUIT	101.2	1.3931	0.0100
C109	J90	J91	CONDUIT	52.0	4.2949	0.0100
C110	J91	J34	CONDUIT	104.7	1.5661	0.0100
C93	J46	J79	CONDUIT	35.5	1.4931	0.0100
C96	J83	STMH77	CONDUIT	202.0	2.1231	0.0100
C98	J33	J86	CONDUIT	16.4	3.7740	0.0100
C99	J85	STMH246-DIV	CONDUIT	79.7	1.8201	0.0100
DRDI117	J94	DRFI2017	CONDUIT	41.6	1.0097	0.0100
DRDI27	J73	J74	CONDUIT	251.8	0.4012	0.0100
DRDI28	J74	J78	CONDUIT	67.3	0.4013	0.0100
DRDI4	J75	J76	CONDUIT	175.3	0.2966	0.0100
DRDI5	J84	J76	CONDUIT	65.5	0.3966	0.0100
DRDI6	J77	DROF25	CONDUIT	153.4	1.3036	0.0100
STMP10	STMH188	STMH64	CONDUIT	45.5	1.0110	0.0100
STMP100	STMH196	STMH131	CONDUIT	86.4	0.5557	0.0100
STMP101	STMH131	STMH135	CONDUIT	90.9	0.2201	0.0100
STMP103	STMH197	STMH196	CONDUIT	47.1	0.5524	0.0100
STMP106	STMH135	STMH133	CONDUIT	89.7	0.8139	0.0100
STMP107	STMH133	STMH190	CONDUIT	86.0	0.6511	0.0100
STMP1086	DRCB40	DROF23	CONDUIT	262.5	0.6514	0.0100
STMP11	STMH64	STMH63	CONDUIT	47.9	1.0026	0.0100
STMP1170	DRCB260	J94	CONDUIT	241.7	0.8730	0.0100
STMP118	STMH28	STMH2	CONDUIT	116.3	0.1204	0.0100

STMP12	STMH63	STMH62	CONDUIT	10.2	0.9824	0.0100
STMP120	STMH147	STMH28	CONDUIT	110.1	0.4994	0.0100
STMP123	STMH2	STMH197	CONDUIT	88.5	1.2548	0.0100
STMP1289	STMH26	STMH297	CONDUIT	27.8	47.1005	0.0100
STMP13	STMH62	STMH161	CONDUIT	89.3	0.9962	0.0100
STMP131	STMH190	DROF5	CONDUIT	54.9	0.4920	0.0100
STMP14	STMH161	STMH54	CONDUIT	92.7	1.2078	0.0100
STMP150	STMH37	STMH225	CONDUIT	86.2	0.4990	0.0100
STMP1513	DRCB258	DRCB260	CONDUIT	24.9	3.3754	0.0100
STMP1516	STMH362	J73	CONDUIT	33.6	0.4161	0.0100
STMP155	STMH23	STMH22	CONDUIT	82.8	0.2294	0.0100
STMP156A	STMH298	DROF7	CONDUIT	50.2	0.4979	0.0100
STMP156B	STMH297	STMH298	CONDUIT	136.3	0.2715	0.0100
STMP1604	STMH398	DROF13	CONDUIT	20.4	1.0300	0.0100
STMP161	STMH22	STMH26	CONDUIT	57.4	2.9625	0.0100
STMP170	J78	J75	CONDUIT	31.2	1.2184	0.0100
STMP183	STMH38	STMH205	CONDUIT	133.6	2.0956	0.0100
STMP184	STMH204	STMH109	CONDUIT	96.4	1.0273	0.0100
STMP20	J1	STMH286	CONDUIT	121.6	0.5014	0.0100
STMP248	STMH109	STMH244	CONDUIT	132.7	0.3768	0.0100
STMP249	STMH244	STMH362	CONDUIT	69.7	0.4307	0.0100
STMP274	J56	STMH253	CONDUIT	178.1	0.4998	0.0100
STMP276	STMH254	STMH93	CONDUIT	140.0	0.9714	0.0100
STMP29	STMH77	STMH74	CONDUIT	35.8	3.4248	0.0100
STMP308	STMH116	DRCB64	CONDUIT	71.1	3.7156	0.0100
STMP309	DRCB64	DRCB40	CONDUIT	215.4	2.6704	0.0100
STMP393	STMH177	STMH398	CONDUIT	105.6	0.3409	0.0100
STMP394	STMH178	STMH177	CONDUIT	124.0	0.4112	0.0100
STMP427	STMH56	STMH165	CONDUIT	112.2	0.3745	0.0100
STMP428	STMH165	STMH54	CONDUIT	92.0	0.6415	0.0100
STMP435	STMH54	STMH178	CONDUIT	132.3	1.2698	0.0100
STMP521	STMH139	STMH138	CONDUIT	19.0	2.3653	0.0100
STMP524	J38	STMH17	CONDUIT	16.1	2.3002	0.0100
STMP525	J34	J38	CONDUIT	41.6	2.4063	0.0100
STMP554	STMH6	STMH7	CONDUIT	75.5	0.7417	0.0100
STMP555	STMH138	STMH183	CONDUIT	46.0	1.3271	0.0100
STMP556	STMH183	STMH6	CONDUIT	54.9	1.7850	0.0100
STMP591	STMH7	STMH184	CONDUIT	43.1	1.9502	0.0100
STMP594	STMH184	STMH185	CONDUIT	34.9	0.4014	0.0100
STMP595	STMH185	STMH12	CONDUIT	14.4	0.4170	0.0100
STMP692	STMH194	STMH147	CONDUIT	49.5	0.5054	0.0100
STMP749	STMH205	STMH204	CONDUIT	13.4	2.3175	0.0100
STMP77	STMH246-DIV	STMH139	CONDUIT	27.8	2.1197	0.0100
STMP79	STMH17	J37	CONDUIT	94.2	0.5307	0.0100

STMP800	STMH253	STMH194	CONDUIT	97.4	0.5029	0.0100
STMP801	STMH212	STMH253	CONDUIT	72.7	0.4952	0.0100
STMP823	STMH216	STMH196	CONDUIT	67.8	0.6789	0.0100
STMP824	STMH4	STMH216	CONDUIT	62.6	0.6710	0.0100
STMP850	J79	STMH15	CONDUIT	33.9	1.5042	0.0100
STMP88	J37	STMH254	CONDUIT	45.8	0.5460	0.0100
STMP89	STMH93	DROP4	CONDUIT	27.1	0.9949	0.0100
STMP9	STMH286	STMH56	CONDUIT	62.1	0.5310	0.0100
STMP90	STMH12	DROP3	CONDUIT	69.3	0.5051	0.0100
STMP914	STMH225	STMH226	CONDUIT	43.8	1.6658	0.0100
STMP915	STMH226	STMH202	CONDUIT	128.5	1.0510	0.0100
STMP964	J22	STMH235	CONDUIT	89.5	0.2929	0.0100
STMP98	STMH15	STMH137	CONDUIT	29.4	3.3716	0.0100
STMP99	STMH137	STMH196	CONDUIT	97.5	1.6318	0.0100
SYMP182	STMH202	STMH38	CONDUIT	141.2	1.4237	0.0100
STMP187_PUMP	J76	J77	IDEAL PUMP			

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C100	CIRCULAR	0.45	0.16	0.11	0.45	1	144.26
C101	CIRCULAR	1.20	1.13	0.30	1.20	1	2968.54
C102	CIRCULAR	1.05	0.87	0.26	1.05	1	2197.46
C103	CIRCULAR	1.05	0.87	0.26	1.05	1	7032.30
C104	CIRCULAR	1.05	0.87	0.26	1.05	1	6555.37
C105	CIRCULAR	0.75	0.44	0.19	0.75	1	1798.88
C106	CIRCULAR	0.75	0.44	0.19	0.75	1	1459.75
C107	CIRCULAR	0.75	0.44	0.19	0.75	1	1445.50
C108	CIRCULAR	0.90	0.64	0.23	0.90	1	2777.92
C109	CIRCULAR	0.90	0.64	0.23	0.90	1	4877.52
C110	CIRCULAR	0.90	0.64	0.23	0.90	1	2945.34
C93	CIRCULAR	0.60	0.28	0.15	0.60	2	975.43
C96	CIRCULAR	1.05	0.87	0.26	1.05	1	5172.85
C98	CIRCULAR	0.90	0.64	0.23	0.90	1	4572.17
C99	TRAPEZOIDAL	2.00	5.00	0.83	4.00	1	59738.45
DRDI117	TRAPEZOIDAL	1.00	3.60	0.52	6.60	1	23389.71
DRDI27	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76654.24
DRDI28	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76659.66
DRDI4	TRAPEZOIDAL	1.50	14.25	0.98	14.00	1	76761.44
DRDI5	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76218.52

DRDI6	TRAPEZOIDAL	2.00	12.00	0.95	12.00	1	132287.57
STMP10	CIRCULAR	0.60	0.28	0.15	0.60	1	802.66
STMP100	CIRCULAR	1.20	1.13	0.30	1.20	1	3778.42
STMP101	CIRCULAR	1.20	1.13	0.30	1.20	1	2378.05
STMP103	CIRCULAR	0.90	0.64	0.23	0.90	1	1749.20
STMP106	CIRCULAR	1.20	1.13	0.30	1.20	1	4572.62
STMP107	CIRCULAR	1.20	1.13	0.30	1.20	1	4089.94
STMP1086	CIRCULAR	0.35	0.10	0.09	0.35	1	153.05
STMP11	CIRCULAR	0.60	0.28	0.15	0.60	1	799.28
STMP1170	CIRCULAR	0.60	0.28	0.15	0.60	1	745.86
STMP118	CIRCULAR	0.60	0.28	0.15	0.60	1	276.99
STMP12	CIRCULAR	0.60	0.28	0.15	0.60	1	791.19
STMP120	CIRCULAR	0.40	0.13	0.10	0.40	1	191.34
STMP123	CIRCULAR	0.75	0.44	0.19	0.75	1	1621.26
STMP1289	CIRCULAR	0.40	0.13	0.10	0.40	1	1858.16
STMP13	CIRCULAR	0.60	0.28	0.15	0.60	1	796.76
STMP131	CIRCULAR	1.20	1.13	0.30	1.20	1	3555.25
STMP14	CIRCULAR	0.60	0.28	0.15	0.60	1	877.28
STMP150	CIRCULAR	0.60	0.28	0.15	0.60	1	563.87
STMP1513	CIRCULAR	0.80	0.50	0.20	0.80	1	3158.49
STMP1516	CIRCULAR	0.60	0.28	0.15	0.60	1	514.90
STMP155	CIRCULAR	0.50	0.20	0.12	0.50	1	235.13
STMP156A	CIRCULAR	0.60	0.28	0.15	0.60	1	563.28
STMP156B	CIRCULAR	0.60	0.28	0.15	0.60	1	415.93
STMP1604	CIRCULAR	0.90	0.64	0.23	0.90	1	2388.56
STMP161	CIRCULAR	0.50	0.20	0.12	0.50	1	844.93
STMP170	CIRCULAR	0.80	0.50	0.20	0.80	3	1897.65
STMP183	CIRCULAR	0.60	0.28	0.15	0.60	1	1155.59
STMP184	CIRCULAR	0.60	0.28	0.15	0.60	1	809.10
STMP20	CIRCULAR	0.50	0.20	0.12	0.50	1	347.62
STMP248	CIRCULAR	0.60	0.28	0.15	0.60	1	489.98
STMP249	CIRCULAR	0.60	0.28	0.15	0.60	1	523.90
STMP274	CIRCULAR	0.60	0.28	0.15	0.60	1	564.32
STMP276	CIRCULAR	0.75	0.44	0.19	0.75	1	1426.50
STMP29	CIRCULAR	1.05	0.87	0.26	1.05	1	6569.95
STMP308	CIRCULAR	0.45	0.16	0.11	0.45	1	714.48
STMP309	CIRCULAR	0.60	0.28	0.15	0.60	1	1304.47
STMP393	CIRCULAR	0.90	0.64	0.23	0.90	1	1374.18
STMP394	CIRCULAR	0.90	0.64	0.23	0.90	1	1509.26
STMP427	CIRCULAR	0.68	0.36	0.17	0.68	1	668.74
STMP428	CIRCULAR	0.68	0.36	0.17	0.68	1	875.31
STMP435	CIRCULAR	0.68	0.36	0.17	0.68	1	1231.44
STMP521	CIRCULAR	0.75	0.44	0.19	0.75	1	2225.98
STMP524	CIRCULAR	0.75	0.44	0.19	0.75	1	2195.09

STMP525	CIRCULAR	0.75	0.44	0.19	0.75	1	2245.15
STMP554	CIRCULAR	0.75	0.44	0.19	0.75	1	1246.52
STMP555	CIRCULAR	0.75	0.44	0.19	0.75	1	1667.32
STMP556	CIRCULAR	0.75	0.44	0.19	0.75	1	1933.72
STMP591	CIRCULAR	0.75	0.44	0.19	0.75	1	2021.23
STMP594	CIRCULAR	0.75	0.44	0.19	0.75	1	916.96
STMP595	CIRCULAR	0.75	0.44	0.19	0.75	1	934.59
STMP692	CIRCULAR	0.50	0.20	0.12	0.50	1	348.98
STMP749	CIRCULAR	0.60	0.28	0.15	0.60	1	1215.23
STMP77	CIRCULAR	0.90	0.64	0.23	0.90	1	3426.60
STMP79	CIRCULAR	0.75	0.44	0.19	0.75	1	1054.36
STMP800	CIRCULAR	0.50	0.20	0.12	0.50	1	348.14
STMP801	CIRCULAR	0.50	0.20	0.12	0.50	1	345.45
STMP823	CIRCULAR	0.60	0.28	0.15	0.60	1	657.72
STMP824	CIRCULAR	0.60	0.28	0.15	0.60	1	653.92
STMP850	CIRCULAR	0.60	0.28	0.15	0.60	1	979.02
STMP88	CIRCULAR	0.75	0.44	0.19	0.75	1	1069.45
STMP89	CIRCULAR	0.75	0.44	0.19	0.75	1	1443.65
STMP9	CIRCULAR	0.68	0.36	0.17	0.68	1	796.33
STMP90	CIRCULAR	0.75	0.44	0.19	0.75	1	1028.59
STMP914	CIRCULAR	0.60	0.28	0.15	0.60	1	1030.27
STMP915	CIRCULAR	0.60	0.28	0.15	0.60	1	818.35
STMP964	CIRCULAR	0.45	0.16	0.11	0.45	1	200.59
STMP98	CIRCULAR	0.60	0.28	0.15	0.60	1	1465.75
STMP99	CIRCULAR	0.60	0.28	0.15	0.60	1	1019.72
SYMP182	CIRCULAR	0.60	0.28	0.15	0.60	1	952.46

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Control Actions Taken
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Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	28.155	30.050
Evaporation Loss	0.000	0.000
Infiltration Loss	18.161	19.384
Surface Runoff	9.697	10.349
Final Surface Storage	0.530	0.565
Continuity Error (%)	-0.827	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	9.693	96.935
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	5.864	58.644
Internal Outflow	3.827	38.268
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.005	0.051
Continuity Error (%)	-0.029	

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Time-Step Critical Elements
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Link STMP749 (27.80%)
Link C98 (16.29%)
Link STMP1513 (15.88%)
Link STMP1289 (12.13%)
Link STMP12 (11.20%)

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Highest Flow Instability Indexes
****
Link STMP595 (25)
Link STMP1516 (24)
Link C93 (22)
Link STMP12 (21)
Link STMP11 (17)

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Routing Time Step Summary
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Minimum Time Step : 0.50 sec
Average Time Step : 3.75 sec
Maximum Time Step : 30.00 sec

Percent in Steady State : 0.00
Average Iterations per Step : 5.13
Percent Not Converging : 36.60

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Subcatchment Runoff Summary
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Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
S13-A	30.05	0.00	0.00	9.01	20.59	2.97	3156.10	0.685
S13-B	30.05	0.00	0.00	9.02	20.53	2.91	2949.19	0.683
S13-C	30.05	0.00	0.00	10.22	19.40	0.98	1031.28	0.646
S13-D	30.05	0.00	0.00	6.91	22.65	0.65	701.58	0.754
S13-E	30.05	0.00	0.00	9.62	20.01	1.04	1120.58	0.666
S13-F	30.05	0.00	0.00	15.02	14.62	1.12	1069.39	0.486
S13-G	30.05	0.00	0.00	15.63	14.10	0.19	207.65	0.469
S13-H	30.05	0.00	0.00	12.92	16.73	0.25	277.76	0.557
S23-A	30.05	0.00	0.00	9.32	20.21	3.20	3165.28	0.672
S23-B	30.05	0.00	0.00	11.12	18.54	0.73	793.31	0.617
S23-C	30.05	0.00	0.00	16.53	13.24	1.05	1136.12	0.441
S25-A	30.05	0.00	0.00	11.72	17.76	4.02	3495.09	0.591
S25-B	30.05	0.00	0.00	13.52	16.18	1.08	1156.23	0.538
S25-C	30.05	0.00	0.00	14.42	15.29	1.11	1179.98	0.509
S25-D	30.05	0.00	0.00	13.52	16.22	1.74	1830.67	0.540
S25-E	30.05	0.00	0.00	15.33	14.42	1.46	1565.49	0.480
S25-F	30.05	0.00	0.00	16.83	12.87	5.37	5163.14	0.428
S25-G	30.05	0.00	0.00	15.33	14.41	0.48	517.19	0.480
S25-H	30.05	0.00	0.00	17.73	12.06	0.42	452.28	0.401
S25-I	30.05	0.00	0.00	9.92	19.66	3.98	4099.44	0.654
S25-J	30.05	0.00	0.00	8.41	21.03	5.16	4831.07	0.700
S32-A	30.05	0.00	0.00	15.02	13.64	7.42	2570.23	0.454
S32-B	30.05	0.00	0.00	15.02	14.62	0.78	749.41	0.486
S38-A	30.05	0.00	0.00	6.31	23.24	3.78	4044.75	0.773
S38-B	30.05	0.00	0.00	7.21	22.36	4.11	4389.30	0.744
S38-C	30.05	0.00	0.00	6.31	23.24	1.94	2073.19	0.773
S38-D	30.05	0.00	0.00	8.11	21.45	1.01	1060.24	0.714
S38-Z1	30.05	0.00	0.00	27.05	2.92	3.98	4373.67	0.097
S38-Z2	30.05	0.00	0.00	27.05	2.92	0.17	182.74	0.097
S3-A	30.05	0.00	0.00	11.12	18.54	1.58	1697.83	0.617

S3-B	30.05	0.00	0.00	11.42	18.25	0.36	390.81	0.607
S3-C	30.05	0.00	0.00	11.72	17.95	0.64	689.24	0.597
S3-D	30.05	0.00	0.00	6.01	23.54	0.50	539.80	0.783
S3-E	30.05	0.00	0.00	7.21	22.36	1.32	1439.09	0.744
S3-F	30.05	0.00	0.00	12.62	16.96	0.33	357.09	0.564
S3-G	30.05	0.00	0.00	12.02	17.59	0.57	627.17	0.585
S3-Z1	30.05	0.00	0.00	27.05	2.93	7.07	7743.87	0.097
S4-A	30.05	0.00	0.00	6.91	22.61	0.87	945.17	0.753
S4-B	30.05	0.00	0.00	6.01	23.45	0.96	964.76	0.780
S4-C	30.05	0.00	0.00	8.11	21.45	1.45	1527.40	0.714
S5-A	30.05	0.00	0.00	10.82	18.83	1.69	1801.88	0.627
S5-B	30.05	0.00	0.00	6.01	23.50	0.41	427.92	0.782
S5-C	30.05	0.00	0.00	6.01	23.49	0.59	609.44	0.782
S5-D	30.05	0.00	0.00	6.01	23.52	0.30	317.85	0.783
S5-E	30.05	0.00	0.00	6.31	23.25	0.93	999.41	0.774
S5-F	30.05	0.00	0.00	6.01	23.53	0.24	261.04	0.783
S5-G	30.05	0.00	0.00	6.91	22.55	0.92	914.45	0.750
S5-H	30.05	0.00	0.00	8.11	21.35	0.79	763.97	0.711
S5-I	30.05	0.00	0.00	8.71	20.89	2.15	2303.61	0.695
S5-J	30.05	0.00	0.00	12.02	17.63	1.04	1136.00	0.587
S5-K	30.05	0.00	0.00	13.82	15.89	4.56	4902.57	0.529
S5-Z1	30.05	0.00	0.00	27.05	2.92	2.56	2811.90	0.097
S7-A	30.05	0.00	0.00	13.22	16.43	1.23	1252.15	0.547
S7-B	30.05	0.00	0.00	23.44	6.45	0.25	275.11	0.214
S13-I	30.05	0.00	0.00	0.85	27.48	0.58	508.83	0.914

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Node Depth Summary
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J1	JUNCTION	1.02	2.90	447.82	0 00:13
STMH286	JUNCTION	1.27	3.40	447.71	0 00:13
STMH56	JUNCTION	1.24	3.20	447.18	0 00:13
STMH54	JUNCTION	1.44	4.10	447.07	0 00:13
STMH178	JUNCTION	0.91	3.20	444.49	0 00:13
STMH177	JUNCTION	0.71	2.60	443.38	0 00:13
STMH398	JUNCTION	0.42	1.08	441.50	0 00:15
STMH188	JUNCTION	1.11	3.40	449.42	0 00:13

STMH64	JUNCTION	1.07	3.16	448.72	0	00:13
STMH161	JUNCTION	1.13	3.00	447.09	0	00:13
STMH165	JUNCTION	1.34	3.60	447.16	0	00:13
STMH63	JUNCTION	1.03	3.16	448.24	0	00:13
STMH62	JUNCTION	1.02	2.80	447.78	0	00:13
STMH77	JUNCTION	0.26	0.83	454.98	0	00:17
STMH74	JUNCTION	0.26	0.92	453.80	0	00:17
STMH83	JUNCTION	0.95	3.00	444.98	0	00:13
STMH79	JUNCTION	0.93	2.60	443.98	0	00:13
STMH235	JUNCTION	0.82	1.90	444.34	0	00:11
J22	JUNCTION	0.96	1.90	444.65	0	00:11
STMH139	JUNCTION	0.73	1.80	457.13	0	00:12
STMH138	JUNCTION	0.72	1.60	456.48	0	00:12
STMH183	JUNCTION	0.72	1.60	455.87	0	00:12
STMH6	JUNCTION	0.96	2.16	455.45	0	00:12
STMH7	JUNCTION	0.88	3.27	456.00	0	00:12
STMH184	JUNCTION	1.09	4.40	456.29	0	00:12
STMH185	JUNCTION	0.98	4.44	456.19	0	00:12
STMH12	JUNCTION	0.95	4.40	456.09	0	00:12
J33	JUNCTION	0.61	2.50	461.58	0	00:15
J34	JUNCTION	0.11	0.46	455.82	0	00:20
STMH17	JUNCTION	0.22	1.60	455.59	0	00:19
STMH254	JUNCTION	0.26	2.44	455.68	0	00:18
STMH93	JUNCTION	0.34	1.77	453.65	0	00:16
J37	JUNCTION	0.31	2.00	455.49	0	00:18
J38	JUNCTION	0.15	2.02	456.38	0	00:19
STMH190	JUNCTION	0.57	1.83	451.55	0	00:18
STMH133	JUNCTION	0.58	2.77	453.05	0	00:16
STMH135	JUNCTION	0.49	2.79	453.80	0	00:18
STMH131	JUNCTION	0.63	3.33	454.54	0	00:18
STMH196	JUNCTION	0.52	3.00	454.69	0	00:18
STMH137	JUNCTION	0.83	2.55	455.83	0	00:18
STMH15	JUNCTION	0.72	1.80	456.07	0	00:11
J46	JUNCTION	1.52	5.00	460.31	0	00:13
STMH4	JUNCTION	0.32	3.10	455.67	0	00:18
STMH216	JUNCTION	0.32	3.10	455.25	0	00:18
STMH197	JUNCTION	0.39	2.70	454.65	0	00:18
STMH2	JUNCTION	0.27	1.80	454.86	0	00:18
STMH28	JUNCTION	0.39	1.90	455.10	0	00:18
STMH147	JUNCTION	1.08	2.90	456.65	0	00:12
STMH194	JUNCTION	0.94	1.80	455.80	0	00:12
STMH253	JUNCTION	0.85	2.00	456.49	0	00:12
J56	JUNCTION	0.60	2.60	457.98	0	00:13
STMH212	JUNCTION	0.62	1.20	456.05	0	00:12

STMH298	JUNCTION	0.31	1.60	441.87	0	00:15
STMH297	JUNCTION	0.57	3.90	444.54	0	00:17
STMH26	JUNCTION	0.07	0.19	452.68	0	00:19
STMH22	JUNCTION	0.19	1.85	456.04	0	00:17
STMH23	JUNCTION	0.57	3.30	457.68	0	00:17
STMH225	JUNCTION	0.83	2.44	452.63	0	00:17
STMH226	JUNCTION	1.32	3.04	451.10	0	00:14
STMH202	JUNCTION	1.33	3.02	449.73	0	00:13
STMH38	JUNCTION	1.26	2.75	447.45	0	00:13
STMH205	JUNCTION	1.46	3.20	445.10	0	00:13
STMH204	JUNCTION	1.49	3.16	444.75	0	00:13
STMH109	JUNCTION	0.96	1.70	442.30	0	00:13
STMH37	JUNCTION	1.02	2.50	453.12	0	00:13
STMH244	JUNCTION	0.71	1.50	441.60	0	00:13
STMH362	JUNCTION	0.49	1.70	441.50	0	00:13
J73	JUNCTION	0.16	0.41	439.69	0	00:20
J74	JUNCTION	0.18	0.54	438.81	0	00:21
J75	JUNCTION	0.21	0.55	438.17	0	00:21
J76	JUNCTION	0.00	0.00	437.10	0	00:00
J77	JUNCTION	0.42	0.90	442.90	0	00:20
J78	JUNCTION	0.27	0.84	438.84	0	00:21
J79	JUNCTION	1.50	4.66	459.44	0	00:23
STMH116	JUNCTION	0.73	2.30	456.30	0	00:13
DRCB64	JUNCTION	0.51	2.50	453.86	0	00:14
DRCB40	JUNCTION	1.55	2.50	448.11	0	00:12
J83	JUNCTION	0.43	2.80	461.29	0	00:17
J84	JUNCTION	0.12	0.35	437.71	0	00:20
J85	JUNCTION	0.19	0.66	458.03	0	00:21
STMH78	JUNCTION	0.50	2.90	449.54	0	00:16
J86	JUNCTION	0.72	2.50	460.96	0	00:12
J87	JUNCTION	0.10	0.35	458.92	0	00:20
J88	JUNCTION	0.10	0.34	458.59	0	00:20
J89	JUNCTION	0.00	0.00	456.77	0	00:00
J90	JUNCTION	0.00	0.00	459.23	0	00:00
J91	JUNCTION	0.00	0.00	457.00	0	00:00
DRCB258	JUNCTION	0.70	1.50	441.29	0	00:16
DRCB260	JUNCTION	1.05	1.50	440.45	0	00:16
J94	JUNCTION	0.19	0.23	437.07	0	00:17
STMH246-DIV	JUNCTION	0.70	2.34	458.26	0	00:21
DROF13	OUTFALL	0.41	0.90	441.11	0	00:14
DROF38	OUTFALL	0.56	1.05	441.90	0	00:13
DROF3	OUTFALL	0.44	0.75	452.09	0	00:12
DROF4	OUTFALL	0.28	0.75	452.36	0	00:15
DROF5	OUTFALL	0.54	1.20	450.65	0	00:15

DROF7	OUTFALL	0.24	0.60	440.62	0	00:15
DROF25	OUTFALL	0.42	0.89	440.89	0	00:20
DROF23	OUTFALL	0.27	0.35	444.25	0	00:11
DRFI2017	OUTFALL	0.19	0.23	436.65	0	00:17

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	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	508.34	539.66	0 00:13	0.583	0.6	-0.097
STMH286	JUNCTION	3152.29	3299.50	0 00:20	2.97	3.34	0.016
STMH56	JUNCTION	0.00	1009.18	0 00:31	0	2.3	0.042
STMH54	JUNCTION	1119.19	1823.44	0 00:13	1.04	4.57	0.001
STMH178	JUNCTION	1068.37	2599.06	0 00:20	1.12	5.68	-0.014
STMH177	JUNCTION	207.38	2800.99	0 00:20	0.19	5.87	-0.034
STMH398	JUNCTION	277.39	3077.47	0 00:20	0.254	6.12	-0.002
STMH188	JUNCTION	2945.99	2945.99	0 00:20	2.91	2.91	0.003
STMH64	JUNCTION	0.00	1004.99	0 00:27	0	2.12	-0.034
STMH161	JUNCTION	700.68	1402.21	0 00:20	0.646	2.37	-0.021
STMH165	JUNCTION	1030.05	1212.19	0 00:13	0.976	2.24	-0.054
STMH63	JUNCTION	0.00	1004.87	0 00:27	0	2.12	-0.010
STMH62	JUNCTION	0.00	1005.55	0 00:26	0	2.12	-0.006
STMH77	JUNCTION	0.00	6137.83	0 00:22	0	7.51	0.005
STMH74	JUNCTION	0.00	6147.81	0 00:18	0	7.51	-0.006
STMH83	JUNCTION	0.00	6576.58	0 00:23	0	9.74	0.249
STMH79	JUNCTION	1059.01	5155.96	0 00:20	1.01	9.21	-0.277
STMH235	JUNCTION	0.00	596.45	0 00:16	0	1.32	-0.325
J22	JUNCTION	4383.90	4383.90	0 00:20	4.11	4.1	0.133
STMH139	JUNCTION	0.00	4738.71	0 00:21	0	7.23	-0.004
STMH138	JUNCTION	539.11	3214.02	0 00:20	0.497	6.28	0.005
STMH183	JUNCTION	0.00	1795.26	0 00:12	0	4.28	-0.029
STMH6	JUNCTION	688.36	1954.18	0 00:20	0.637	4.23	-0.010
STMH7	JUNCTION	390.31	1922.04	0 00:12	0.361	4.08	-0.042
STMH184	JUNCTION	0.00	1627.85	0 00:45	0	4.07	-0.010
STMH185	JUNCTION	0.00	1627.98	0 00:45	0	4.07	-0.025
STMH12	JUNCTION	1695.72	2828.04	0 00:20	1.58	5.66	-0.004
J33	JUNCTION	8090.32	8090.32	0 00:20	7.4	7.39	-0.033

J34	JUNCTION	943.93	943.93	0	00:20	0.866	0.866	0.017
STMH17	JUNCTION	0.00	875.90	0	00:20	0	0.866	-0.061
STMH254	JUNCTION	0.00	1510.09	0	00:22	0	1.78	0.015
STMH93	JUNCTION	1525.59	3006.64	0	00:20	1.45	3.23	-0.007
J37	JUNCTION	963.73	1510.07	0	00:22	0.957	1.78	0.003
J38	JUNCTION	0.00	875.30	0	00:20	0	0.866	-0.041
STMH190	JUNCTION	0.00	6072.29	0	00:20	0	9.32	0.007
STMH133	JUNCTION	1799.67	6071.63	0	00:20	1.69	9.32	0.005
STMH135	JUNCTION	427.42	4282.50	0	00:20	0.409	7.64	0.019
STMH131	JUNCTION	608.74	3875.94	0	00:20	0.587	7.23	0.002
STMH196	JUNCTION	317.47	3314.67	0	00:21	0.301	6.65	-0.021
STMH137	JUNCTION	0.00	1388.35	0	00:13	0	3.32	0.024
STMH15	JUNCTION	260.71	2773.65	0	00:20	0.24	5.25	-0.012
J46	JUNCTION	7704.65	7704.65	0	00:20	7.12	7.12	0.000
STMH4	JUNCTION	998.17	998.17	0	00:20	0.932	0.932	0.010
STMH216	JUNCTION	0.00	891.41	0	00:21	0	0.921	-0.009
STMH197	JUNCTION	0.00	1156.92	0	00:20	0	2.11	0.007
STMH2	JUNCTION	913.51	1202.38	0	00:20	0.924	2.11	-0.046
STMH28	JUNCTION	0.00	380.42	0	00:18	0	1.19	0.037
STMH147	JUNCTION	763.22	763.22	0	00:20	0.792	1.33	0.019
STMH194	JUNCTION	0.00	867.56	0	00:20	0	1.09	-0.091
STMH253	JUNCTION	0.00	833.34	0	00:12	0	1.23	-0.054
J56	JUNCTION	1134.52	1134.52	0	00:20	1.04	1.04	-0.094
STMH212	JUNCTION	2300.75	2653.39	0	00:20	2.15	2.43	0.030
STMH298	JUNCTION	0.00	1140.85	0	00:20	0	1.41	0.018
STMH297	JUNCTION	274.75	1140.79	0	00:20	0.251	1.41	-0.009
STMH26	JUNCTION	0.00	866.11	0	00:21	0	1.16	0.005
STMH22	JUNCTION	0.00	889.03	0	00:17	0	1.16	0.011
STMH23	JUNCTION	1250.77	1250.77	0	00:20	1.23	1.23	-0.001
STMH225	JUNCTION	1154.82	1756.76	0	00:20	1.08	3.32	0.090
STMH226	JUNCTION	0.00	1491.44	0	00:21	0	3.28	-0.076
STMH202	JUNCTION	1178.55	2002.92	0	00:20	1.11	3.56	0.001
STMH38	JUNCTION	1828.52	2842.89	0	00:20	1.74	4.71	-0.011
STMH205	JUNCTION	516.52	1575.07	0	00:20	0.476	3.83	-0.039
STMH204	JUNCTION	0.00	1291.08	0	00:23	0	3.74	0.015
STMH109	JUNCTION	0.00	872.80	0	00:24	0	3.73	0.005
STMH37	JUNCTION	3492.35	3492.35	0	00:20	4.01	4.01	0.016
STMH244	JUNCTION	451.69	1031.45	0	00:20	0.416	2.84	-0.012
STMH362	JUNCTION	0.00	921.83	0	00:21	0	2.82	-0.001
J73	JUNCTION	5158.13	6079.86	0	00:20	5.37	8.18	0.006
J74	JUNCTION	1563.57	7545.45	0	00:20	1.46	9.65	0.076
J75	JUNCTION	4094.84	10637.36	0	00:21	3.98	13.6	0.035
J76	JUNCTION	0.00	14969.90	0	00:21	0	18.8	0.000
J77	JUNCTION	0.00	14969.90	0	00:21	0	18.8	0.001

J78	JUNCTION	0.00	7289.47	0	00:21	0	9.64	0.066
J79	JUNCTION	0.00	2513.45	0	00:27	0	5.01	-0.001
STMH116	JUNCTION	3162.02	3162.02	0	00:20	3.2	3.2	-0.002
DRCB64	JUNCTION	792.29	1478.94	0	00:20	0.731	2.71	-0.023
DRCB40	JUNCTION	1134.68	2438.92	0	00:20	1.05	3.74	0.006
J83	JUNCTION	8590.20	8590.20	0	00:20	7.93	7.93	0.032
J84	JUNCTION	4826.64	4826.64	0	00:20	5.16	5.16	0.008
J85	JUNCTION	0.00	3512.18	0	00:20	0	5.9	-0.033
STMH78	JUNCTION	2070.67	8209.09	0	00:20	1.95	9.46	0.064
J86	JUNCTION	0.00	4570.54	0	00:23	0	6.49	0.009
J87	JUNCTION	626.35	626.35	0	00:20	0.573	0.573	-0.004
J88	JUNCTION	0.00	628.33	0	00:20	0	0.573	0.039
J89	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
J90	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
J91	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
DRCB258	JUNCTION	2955.75	2955.75	0	00:25	8.17	8.18	0.001
DRCB260	JUNCTION	0.00	2956.37	0	00:25	0	8.18	0.042
J94	JUNCTION	0.00	810.86	0	00:17	0	4.33	0.088
STMH246-DIV	JUNCTION	1437.23	4738.25	0	00:21	1.32	7.23	0.037
DROF13	OUTFALL	0.00	3077.47	0	00:20	0	6.12	0.000
DROF38	OUTFALL	0.00	4368.67	0	00:24	0	8.89	0.000
DROF3	OUTFALL	0.00	2827.97	0	00:20	0	5.66	0.000
DROF4	OUTFALL	0.00	3006.74	0	00:20	0	3.23	0.000
DROF5	OUTFALL	0.00	6072.23	0	00:20	0	9.32	0.000
DROF7	OUTFALL	0.00	1140.80	0	00:20	0	1.41	0.000
DROF25	OUTFALL	0.00	15200.32	0	00:20	0	18.8	0.000
DROF23	OUTFALL	0.00	229.95	0	00:55	0	0.924	0.000
DRFI2017	OUTFALL	0.00	820.22	0	00:17	0	4.33	0.000

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Node Surcharge Summary
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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
J1	JUNCTION	0.53	2.400	0.000
STMH286	JUNCTION	0.57	2.725	0.000
STMH56	JUNCTION	0.59	2.525	0.000
STMH54	JUNCTION	0.62	3.425	0.000

STMH178	JUNCTION	0.53	2.300	0.000
STMH177	JUNCTION	0.51	1.700	0.000
STMH398	JUNCTION	0.21	0.183	2.017
STMH188	JUNCTION	0.50	2.800	0.000
STMH64	JUNCTION	0.52	2.557	0.243
STMH161	JUNCTION	0.56	2.400	0.000
STMH165	JUNCTION	0.60	2.925	0.000
STMH63	JUNCTION	0.53	2.562	0.138
STMH62	JUNCTION	0.54	2.200	0.000
STMH83	JUNCTION	0.43	1.800	0.000
STMH79	JUNCTION	0.48	1.325	0.000
STMH235	JUNCTION	0.71	1.400	0.000
J22	JUNCTION	0.73	1.450	0.000
STMH139	JUNCTION	0.57	0.900	0.000
STMH138	JUNCTION	0.59	0.850	0.000
STMH183	JUNCTION	0.60	0.850	0.000
STMH6	JUNCTION	0.61	1.410	0.000
STMH7	JUNCTION	0.61	2.520	0.000
STMH184	JUNCTION	0.64	3.650	0.000
STMH185	JUNCTION	0.64	3.690	0.000
STMH12	JUNCTION	0.64	3.650	0.000
J33	JUNCTION	0.34	1.600	0.000
STMH17	JUNCTION	0.09	0.850	0.000
STMH254	JUNCTION	0.11	1.686	0.164
STMH93	JUNCTION	0.20	1.025	2.125
J37	JUNCTION	0.12	1.250	0.000
J38	JUNCTION	0.08	1.266	0.484
STMH190	JUNCTION	0.24	0.634	2.866
STMH133	JUNCTION	0.20	1.570	1.630
STMH135	JUNCTION	0.11	1.593	1.007
STMH131	JUNCTION	0.15	2.132	0.368
STMH196	JUNCTION	0.11	1.800	0.000
STMH137	JUNCTION	0.58	1.953	0.047
STMH15	JUNCTION	0.55	1.200	0.000
J46	JUNCTION	0.54	4.400	0.000
STMH4	JUNCTION	0.15	2.500	0.000
STMH216	JUNCTION	0.19	2.500	0.000
STMH197	JUNCTION	0.12	1.800	0.000
STMH2	JUNCTION	0.07	1.050	0.000
STMH28	JUNCTION	0.10	1.300	0.000
STMH147	JUNCTION	0.85	2.400	0.000
STMH194	JUNCTION	0.80	1.300	0.000
STMH253	JUNCTION	0.72	1.400	0.000
J56	JUNCTION	0.58	2.000	0.000

STMH212	JUNCTION	0.71	0.700	0.000
STMH298	JUNCTION	0.23	1.000	0.000
STMH297	JUNCTION	0.30	3.300	0.000
STMH22	JUNCTION	0.11	1.353	1.847
STMH23	JUNCTION	0.39	2.800	0.000
STMH225	JUNCTION	0.56	1.840	0.000
STMH226	JUNCTION	0.58	1.040	0.000
STMH202	JUNCTION	0.64	2.420	0.000
STMH38	JUNCTION	0.66	2.150	0.000
STMH205	JUNCTION	0.70	2.600	0.000
STMH204	JUNCTION	0.74	2.560	0.000
STMH109	JUNCTION	0.77	1.100	0.000
STMH37	JUNCTION	0.57	1.900	0.000
STMH244	JUNCTION	0.76	0.900	0.000
STMH362	JUNCTION	0.72	1.100	0.000
J79	JUNCTION	0.56	4.061	0.039
STMH116	JUNCTION	0.45	1.850	0.000
DRCB64	JUNCTION	0.37	1.900	0.000
DRCB40	JUNCTION	0.94	1.900	0.000
J83	JUNCTION	0.11	1.750	0.000
STMH78	JUNCTION	0.15	1.850	0.000
J86	JUNCTION	0.39	1.600	0.000
DRCB258	JUNCTION	0.66	0.700	0.000
DRCB260	JUNCTION	0.95	0.700	0.000
STMH246-DIV	JUNCTION	0.13	0.340	0.160

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

Node	Hours Flooded	Maximum Rate LPS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
J1	0.38	524.70	0 00:13	0.232	0.000
STMH286	0.35	2288.72	0 00:20	1.019	0.000
STMH56	0.48	862.51	0 00:24	1.040	0.000
STMH54	0.03	481.27	0 00:13	0.005	0.000
STMH178	0.01	625.55	0 00:13	0.002	0.000
STMH177	0.01	907.71	0 00:13	0.004	0.000

STMH188	0.30	1939.43	0	00:20	0.794	0.000
STMH161	0.46	1245.65	0	00:20	0.841	0.000
STMH165	0.17	826.69	0	00:20	0.245	0.000
STMH62	0.42	322.35	0	00:14	0.392	0.000
STMH83	0.20	2102.26	0	00:18	1.189	0.000
STMH79	0.23	1264.15	0	00:13	0.345	0.000
STMH235	0.31	596.45	0	00:16	0.563	0.000
J22	0.63	4162.96	0	00:20	3.114	0.000
STMH139	0.35	2063.70	0	00:21	1.441	0.000
STMH138	0.52	1546.60	0	00:20	2.003	0.000
STMH183	0.56	473.77	0	00:12	0.693	0.000
STMH6	0.32	1213.41	0	00:20	0.513	0.000
STMH7	0.01	578.13	0	00:12	0.002	0.000
STMH184	0.01	140.51	0	00:12	0.000	0.000
STMH185	0.01	152.09	0	00:12	0.000	0.000
STMH12	0.01	511.10	0	00:12	0.001	0.000
J33	0.14	3517.68	0	00:20	0.903	0.000
STMH17	0.06	289.43	0	00:20	0.039	0.000
J37	0.01	30.58	0	00:18	0.000	0.000
STMH196	0.01	214.72	0	00:18	0.001	0.000
STMH15	0.50	1810.37	0	00:20	1.930	0.000
J46	0.28	5188.91	0	00:20	2.109	0.000
STMH4	0.04	156.26	0	00:20	0.011	0.000
STMH216	0.01	24.29	0	00:18	0.000	0.000
STMH197	0.01	309.94	0	00:18	0.001	0.000
STMH2	0.03	374.53	0	00:18	0.010	0.000
STMH28	0.01	94.00	0	00:18	0.000	0.000
STMH147	0.01	167.54	0	00:12	0.000	0.000
STMH194	0.54	866.94	0	00:20	0.554	0.000
STMH253	0.01	431.82	0	00:12	0.003	0.000
J56	0.12	388.31	0	00:20	0.081	0.000
STMH212	0.63	2652.39	0	00:20	2.158	0.000
STMH298	0.01	90.96	0	00:15	0.000	0.000
STMH297	0.01	3.87	0	00:17	0.000	0.000
STMH23	0.09	383.90	0	00:20	0.066	0.000
STMH225	0.08	264.76	0	00:20	0.034	0.000
STMH226	0.53	755.04	0	00:14	0.828	0.000
STMH202	0.49	987.96	0	00:20	0.584	0.000
STMH38	0.56	1783.28	0	00:20	1.361	0.000
STMH205	0.18	283.83	0	00:20	0.090	0.000
STMH204	0.21	274.30	0	00:13	0.014	0.000
STMH109	0.69	693.04	0	00:22	1.307	0.000
STMH37	0.46	2886.93	0	00:20	1.783	0.000
STMH244	0.09	459.31	0	00:13	0.019	0.000

STMH362	0.01	271.92	0	00:13	0.001	0.000
STMH116	0.37	2472.99	0	00:20	1.218	0.000
DRCB64	0.07	174.44	0	00:20	0.023	0.000
DRCB40	0.80	2208.54	0	00:20	2.813	0.000
J83	0.09	2449.35	0	00:20	0.412	0.000
STMH78	0.12	1631.39	0	00:20	0.473	0.000
J86	0.26	1760.45	0	00:16	1.163	0.000
DRCB258	0.01	182.10	0	00:16	0.000	0.000
DRCB260	0.88	2145.40	0	00:25	3.843	0.000

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
DROF13	99.62	1129.20	3077.47	6.124
DROF38	99.62	1649.67	4368.67	8.886
DROF3	99.62	1055.36	2827.97	5.656
DROF4	99.62	598.30	3006.74	3.235
DROF5	99.62	1723.62	6072.23	9.319
DROF7	99.48	261.04	1140.80	1.411
DROF25	99.65	3437.17	15200.32	18.764
DROF23	99.58	161.02	229.95	0.924
DRFI2017	99.51	629.95	820.22	4.325
System	99.59	10645.32	36347.99	58.644

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Link Flow Summary
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Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C100	CONDUIT	417.97	0 00:13	2.64	2.90	1.00
C101	CONDUIT	4096.96	0 00:26	3.62	1.38	1.00

C102	CONDUIT	4368.67	0	00:24	5.05	1.99	1.00
C103	CONDUIT	6207.72	0	00:18	7.40	0.88	0.94
C104	CONDUIT	6576.58	0	00:23	7.60	1.00	1.00
C105	CONDUIT	2912.27	0	00:21	7.62	1.62	0.94
C106	CONDUIT	628.33	0	00:20	3.19	0.43	0.46
C107	CONDUIT	620.45	0	00:20	2.39	0.43	0.66
C108	CONDUIT	0.00	0	00:00	0.00	0.00	0.26
C109	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C110	CONDUIT	0.00	0	00:00	0.00	0.00	0.26
C93	CONDUIT	2513.45	0	00:27	4.44	1.29	1.00
C96	CONDUIT	6137.83	0	00:22	7.19	1.19	1.00
C98	CONDUIT	4570.54	0	00:23	7.18	1.00	1.00
C99	CONDUIT	3699.80	0	00:23	3.22	0.06	0.66
DRDI117	CONDUIT	820.22	0	00:17	2.77	0.04	0.23
DRDI27	CONDUIT	6098.00	0	00:20	2.45	0.08	0.31
DRDI28	CONDUIT	7289.47	0	00:21	1.91	0.10	0.46
DRDI4	CONDUIT	10699.22	0	00:21	6.75	0.14	0.18
DRDI5	CONDUIT	4856.56	0	00:20	6.32	0.06	0.12
DRDI6	CONDUIT	15200.32	0	00:20	6.41	0.11	0.45
STMP10	CONDUIT	1004.99	0	00:27	3.55	1.25	1.00
STMP100	CONDUIT	3315.30	0	00:21	3.02	0.88	1.00
STMP101	CONDUIT	3877.33	0	00:20	3.50	1.63	1.00
STMP103	CONDUIT	1157.27	0	00:20	1.82	0.66	1.00
STMP106	CONDUIT	4283.14	0	00:20	3.79	0.94	1.00
STMP107	CONDUIT	6072.29	0	00:20	5.37	1.48	1.00
STMP1086	CONDUIT	229.95	0	00:55	2.39	1.50	1.00
STMP11	CONDUIT	1004.87	0	00:27	3.55	1.26	1.00
STMP1170	CONDUIT	810.86	0	00:17	3.97	1.09	0.69
STMP118	CONDUIT	388.47	0	00:15	1.96	1.40	1.00
STMP12	CONDUIT	1005.55	0	00:26	3.56	1.27	1.00
STMP120	CONDUIT	380.42	0	00:18	3.03	1.99	1.00
STMP123	CONDUIT	1156.92	0	00:20	2.80	0.71	1.00
STMP1289	CONDUIT	866.11	0	00:19	8.69	0.47	0.74
STMP13	CONDUIT	701.53	0	00:28	2.66	0.88	1.00
STMP131	CONDUIT	6072.23	0	00:20	5.37	1.71	1.00
STMP14	CONDUIT	738.57	0	00:41	2.66	0.84	1.00
STMP150	CONDUIT	919.01	0	00:41	3.25	1.63	1.00
STMP1513	CONDUIT	2956.37	0	00:25	5.88	0.94	1.00
STMP1516	CONDUIT	921.94	0	00:21	3.28	1.79	0.98
STMP155	CONDUIT	889.03	0	00:17	4.53	3.78	1.00
STMP156A	CONDUIT	1140.80	0	00:20	4.03	2.03	1.00
STMP156B	CONDUIT	1140.85	0	00:20	4.03	2.74	1.00
STMP1604	CONDUIT	3077.47	0	00:20	4.84	1.29	1.00
STMP161	CONDUIT	866.11	0	00:21	6.48	1.03	0.69

STMP170	CONDUIT	7184.50	0	00:22	5.38	1.26	0.84
STMP183	CONDUIT	1136.37	0	00:47	4.04	0.98	1.00
STMP184	CONDUIT	1272.80	0	00:24	4.50	1.57	1.00
STMP20	CONDUIT	401.54	0	00:13	2.05	1.16	1.00
STMP248	CONDUIT	795.73	0	00:13	2.82	1.62	1.00
STMP249	CONDUIT	921.83	0	00:21	3.26	1.76	1.00
STMP274	CONDUIT	745.92	0	00:22	2.64	1.32	1.00
STMP276	CONDUIT	1510.36	0	00:22	3.42	1.06	1.00
STMP29	CONDUIT	6147.81	0	00:18	8.68	0.94	0.80
STMP308	CONDUIT	918.69	0	00:14	5.78	1.29	1.00
STMP309	CONDUIT	1304.24	0	00:21	4.61	1.00	1.00
STMP393	CONDUIT	2800.83	0	00:20	4.40	2.04	1.00
STMP394	CONDUIT	2594.34	0	00:20	4.08	1.72	1.00
STMP427	CONDUIT	923.77	0	00:13	2.58	1.38	1.00
STMP428	CONDUIT	963.20	0	00:13	2.69	1.10	1.00
STMP435	CONDUIT	1824.06	0	00:13	5.10	1.48	1.00
STMP521	CONDUIT	2674.92	0	00:26	6.05	1.20	1.00
STMP524	CONDUIT	875.90	0	00:20	3.15	0.40	1.00
STMP525	CONDUIT	875.30	0	00:20	4.30	0.39	0.81
STMP554	CONDUIT	1828.72	0	00:12	4.15	1.47	1.00
STMP555	CONDUIT	1795.26	0	00:12	4.08	1.08	1.00
STMP556	CONDUIT	1660.94	0	00:12	3.76	0.86	1.00
STMP591	CONDUIT	1627.85	0	00:45	3.68	0.81	1.00
STMP594	CONDUIT	1627.98	0	00:45	3.68	1.78	1.00
STMP595	CONDUIT	1628.16	0	00:45	3.69	1.74	1.00
STMP692	CONDUIT	474.33	0	00:20	2.42	1.36	1.00
STMP749	CONDUIT	1291.08	0	00:23	4.57	1.06	1.00
STMP77	CONDUIT	4738.71	0	00:21	7.45	1.38	1.00
STMP79	CONDUIT	785.07	0	00:23	1.86	0.74	1.00
STMP800	CONDUIT	557.24	0	00:12	2.85	1.60	1.00
STMP801	CONDUIT	564.94	0	00:12	2.88	1.64	1.00
STMP823	CONDUIT	891.46	0	00:21	3.15	1.36	1.00
STMP824	CONDUIT	891.41	0	00:21	3.15	1.36	1.00
STMP850	CONDUIT	2513.17	0	00:16	8.89	2.57	1.00
STMP88	CONDUIT	1510.09	0	00:22	3.42	1.41	1.00
STMP89	CONDUIT	3006.74	0	00:20	6.81	2.08	1.00
STMP9	CONDUIT	1009.18	0	00:31	2.82	1.27	1.00
STMP90	CONDUIT	2827.97	0	00:20	6.40	2.75	1.00
STMP914	CONDUIT	1491.44	0	00:21	5.27	1.45	1.00
STMP915	CONDUIT	844.15	0	00:45	3.00	1.03	1.00
STMP964	CONDUIT	467.49	0	00:11	2.94	2.33	1.00
STMP98	CONDUIT	1388.35	0	00:13	4.91	0.95	1.00
STMP99	CONDUIT	1388.56	0	00:13	4.91	1.36	1.00
SYMP182	CONDUIT	1014.37	0	00:35	3.59	1.06	1.00

STMP187_PUMP	PUMP	14969.90	0	00:21

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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
		Fraction of Time in Flow Class								
C100	1.00	0.00	0.00	0.00	0.35	0.00	0.00	0.65	0.00	0.00
C101	1.00	0.00	0.00	0.00	0.38	0.05	0.00	0.56	0.02	0.00
C102	1.00	0.00	0.00	0.00	0.40	0.60	0.00	0.00	0.64	0.00
C103	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.88	0.00
C104	1.00	0.00	0.00	0.00	0.10	0.56	0.00	0.34	0.24	0.00
C105	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
C106	1.00	0.00	0.00	0.00	0.14	0.86	0.00	0.00	0.89	0.00
C107	1.00	0.00	0.00	0.00	0.39	0.61	0.00	0.00	0.51	0.00
C108	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C109	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C110	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C93	1.00	0.00	0.00	0.00	0.38	0.62	0.00	0.00	0.76	0.00
C96	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C98	1.00	0.00	0.00	0.00	0.23	0.76	0.00	0.00	0.80	0.00
C99	1.00	0.00	0.00	0.00	0.68	0.32	0.00	0.00	0.92	0.00
DRDI117	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.57	0.00
DRDI27	1.00	0.00	0.00	0.00	0.09	0.90	0.00	0.00	0.89	0.00
DRDI28	1.00	0.00	0.00	0.00	0.82	0.17	0.00	0.00	0.69	0.00
DRDI4	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
DRDI5	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
DRDI6	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.83	0.00
STMP10	1.00	0.00	0.00	0.00	0.35	0.65	0.00	0.00	0.59	0.00
STMP100	1.00	0.00	0.00	0.00	0.30	0.70	0.00	0.00	0.65	0.00
STMP101	1.00	0.00	0.00	0.00	0.15	0.85	0.00	0.00	0.17	0.00
STMP103	1.00	0.00	0.00	0.00	0.52	0.48	0.00	0.00	0.66	0.00
STMP106	1.00	0.00	0.00	0.00	0.16	0.84	0.00	0.00	0.78	0.00
STMP107	1.00	0.00	0.00	0.00	0.17	0.83	0.00	0.00	0.74	0.00
STMP1086	1.00	0.00	0.00	0.00	0.69	0.31	0.00	0.00	0.37	0.00
STMP11	1.00	0.00	0.00	0.00	0.36	0.64	0.00	0.00	0.74	0.00
STMP1170	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
STMP118	1.00	0.00	0.00	0.00	0.55	0.45	0.00	0.00	0.04	0.00
STMP12	1.00	0.00	0.00	0.00	0.37	0.63	0.00	0.00	0.46	0.00

STMP120	1.00	0.00	0.00	0.00	0.87	0.12	0.00	0.00	0.64	0.00
STMP123	1.00	0.00	0.00	0.00	0.08	0.92	0.00	0.00	0.87	0.00
STMP1289	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.97	0.00
STMP13	1.00	0.00	0.00	0.00	0.39	0.61	0.00	0.00	0.46	0.00
STMP131	1.00	0.00	0.00	0.00	0.18	0.81	0.00	0.00	0.71	0.00
STMP14	1.00	0.00	0.00	0.00	0.44	0.56	0.00	0.00	0.74	0.00
STMP150	1.00	0.00	0.00	0.00	0.39	0.60	0.00	0.00	0.09	0.00
STMP1513	1.00	0.00	0.00	0.00	0.64	0.36	0.00	0.00	0.63	0.00
STMP1516	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
STMP155	1.00	0.00	0.00	0.00	0.09	0.91	0.00	0.00	0.00	0.00
STMP156A	1.00	0.00	0.00	0.00	0.19	0.80	0.00	0.00	0.69	0.00
STMP156B	1.00	0.00	0.00	0.00	0.44	0.55	0.00	0.00	0.07	0.00
STMP1604	1.00	0.00	0.00	0.00	0.16	0.84	0.00	0.00	0.71	0.00
STMP161	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.00
STMP170	1.00	0.00	0.00	0.00	0.04	0.96	0.00	0.00	0.22	0.00
STMP183	1.00	0.00	0.00	0.00	0.46	0.54	0.00	0.00	0.24	0.00
STMP184	1.00	0.00	0.00	0.00	0.53	0.46	0.00	0.00	0.68	0.00
STMP20	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.78	0.00
STMP248	1.00	0.00	0.00	0.00	0.62	0.37	0.00	0.00	0.39	0.00
STMP249	1.00	0.00	0.00	0.00	0.56	0.44	0.00	0.00	0.66	0.00
STMP274	1.00	0.00	0.00	0.00	0.98	0.01	0.00	0.00	0.70	0.00
STMP276	1.00	0.00	0.00	0.00	0.17	0.83	0.00	0.00	0.89	0.00
STMP29	1.00	0.00	0.00	0.00	0.00	0.07	0.00	0.93	0.00	0.00
STMP308	1.00	0.00	0.00	0.00	0.28	0.72	0.00	0.00	0.79	0.00
STMP309	1.00	0.00	0.00	0.00	0.53	0.47	0.00	0.00	0.78	0.00
STMP393	1.00	0.00	0.00	0.00	0.20	0.80	0.00	0.00	0.17	0.00
STMP394	1.00	0.00	0.00	0.00	0.46	0.53	0.00	0.00	0.73	0.00
STMP427	1.00	0.00	0.00	0.00	0.48	0.51	0.00	0.00	0.50	0.00
STMP428	1.00	0.00	0.00	0.00	0.46	0.54	0.00	0.00	0.73	0.00
STMP435	1.00	0.00	0.00	0.00	0.43	0.57	0.00	0.00	0.73	0.00
STMP521	1.00	0.00	0.00	0.00	0.40	0.60	0.00	0.00	0.74	0.00
STMP524	1.00	0.00	0.00	0.00	0.10	0.89	0.00	0.00	0.87	0.00
STMP525	1.00	0.00	0.00	0.00	0.05	0.95	0.00	0.00	0.88	0.00
STMP554	1.00	0.00	0.00	0.00	0.41	0.58	0.00	0.00	0.08	0.00
STMP555	1.00	0.00	0.00	0.00	0.40	0.59	0.00	0.00	0.11	0.00
STMP556	1.00	0.00	0.00	0.00	0.41	0.59	0.00	0.00	0.75	0.00
STMP591	1.00	0.00	0.00	0.00	0.42	0.58	0.00	0.00	0.73	0.00
STMP594	1.00	0.00	0.00	0.00	0.51	0.48	0.00	0.00	0.37	0.00
STMP595	1.00	0.00	0.00	0.00	0.65	0.35	0.00	0.00	0.53	0.00
STMP692	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.67	0.00
STMP749	1.00	0.00	0.00	0.00	0.51	0.49	0.00	0.00	0.63	0.00
STMP77	1.00	0.00	0.00	0.00	0.39	0.61	0.00	0.00	0.74	0.00
STMP79	1.00	0.00	0.00	0.00	0.99	0.01	0.00	0.00	0.89	0.00
STMP800	1.00	0.00	0.00	0.00	0.59	0.40	0.00	0.00	0.66	0.00

STMP801	1.00	0.00	0.00	0.00	0.93	0.07	0.00	0.00	0.69	0.00
STMP823	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.81	0.00
STMP824	1.00	0.00	0.00	0.00	0.17	0.83	0.00	0.00	0.82	0.00
STMP850	1.00	0.00	0.00	0.00	0.37	0.62	0.00	0.00	0.06	0.00
STMP88	1.00	0.00	0.00	0.00	0.09	0.91	0.00	0.00	0.24	0.00
STMP89	1.00	0.00	0.00	0.00	0.15	0.85	0.00	0.00	0.61	0.00
STMP9	1.00	0.00	0.00	0.00	0.44	0.55	0.00	0.00	0.72	0.00
STMP90	1.00	0.00	0.00	0.00	0.45	0.54	0.00	0.00	0.57	0.00
STMP914	1.00	0.00	0.00	0.00	0.38	0.02	0.00	0.59	0.00	0.00
STMP915	1.00	0.00	0.00	0.00	0.44	0.56	0.00	0.00	0.25	0.00
STMP964	1.00	0.00	0.00	0.00	0.66	0.00	0.00	0.34	0.07	0.00
STMP98	1.00	0.00	0.00	0.00	0.37	0.62	0.00	0.00	0.76	0.00
STMP99	1.00	0.00	0.00	0.00	0.57	0.42	0.00	0.00	0.75	0.00
SYMP182	1.00	0.00	0.00	0.00	0.45	0.55	0.00	0.00	0.23	0.00

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Conduit Surcharge Summary
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Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C100	0.51	0.51	0.51	0.88	0.24
C101	0.43	0.43	0.43	0.38	0.37
C102	0.52	0.52	0.52	0.55	0.52
C104	0.15	0.15	0.15	0.11	0.12
C105	0.01	0.01	0.01	0.43	0.01
C93	0.54	0.54	0.54	0.57	0.38
C96	0.11	0.11	0.11	0.13	0.11
C98	0.34	0.34	0.34	0.01	0.01
STMP10	0.50	0.50	0.50	0.37	0.37
STMP100	0.11	0.11	0.11	0.01	0.01
STMP101	0.11	0.11	0.11	0.42	0.11
STMP103	0.12	0.12	0.12	0.01	0.01
STMP106	0.11	0.11	0.11	0.01	0.01
STMP107	0.20	0.20	0.20	0.19	0.19
STMP1086	1.03	1.03	1.03	1.05	1.03
STMP11	0.52	0.52	0.52	0.38	0.38
STMP1170	0.01	0.01	0.01	0.93	0.01
STMP118	0.09	0.09	0.09	0.72	0.08
STMP12	0.53	0.53	0.54	0.38	0.38

STMP120	0.71	0.71	0.72	0.88	0.71
STMP123	0.07	0.07	0.07	0.01	0.01
STMP13	0.54	0.54	0.54	0.01	0.01
STMP131	0.24	0.24	0.24	0.27	0.23
STMP14	0.56	0.56	0.56	0.01	0.01
STMP150	0.56	0.56	0.56	0.60	0.56
STMP1513	0.66	0.66	0.66	0.01	0.01
STMP1516	0.01	0.01	0.01	0.80	0.01
STMP155	0.11	0.11	0.11	0.50	0.11
STMP156A	0.23	0.23	0.23	0.26	0.23
STMP156B	0.23	0.23	0.23	0.37	0.23
STMP1604	0.21	0.21	0.21	0.24	0.21
STMP161	0.01	0.01	0.01	0.10	0.01
STMP170	0.01	0.01	0.01	0.53	0.01
STMP183	0.66	0.66	0.66	0.01	0.01
STMP184	0.74	0.74	0.74	0.69	0.69
STMP20	0.53	0.53	0.53	0.01	0.01
STMP248	0.76	0.76	0.76	0.80	0.76
STMP249	0.72	0.72	0.72	0.80	0.72
STMP274	0.58	0.58	0.58	0.16	0.17
STMP276	0.11	0.11	0.11	0.07	0.07
STMP308	0.41	0.41	0.41	0.37	0.32
STMP309	0.37	0.37	0.38	0.01	0.01
STMP393	0.21	0.21	0.21	0.62	0.21
STMP394	0.51	0.51	0.51	0.59	0.51
STMP427	0.59	0.59	0.59	0.02	0.01
STMP428	0.60	0.60	0.60	0.01	0.01
STMP435	0.62	0.62	0.62	0.63	0.62
STMP521	0.58	0.58	0.58	0.43	0.43
STMP524	0.08	0.08	0.08	0.01	0.01
STMP554	0.60	0.60	0.61	0.47	0.46
STMP555	0.59	0.59	0.59	0.01	0.01
STMP556	0.60	0.60	0.60	0.01	0.01
STMP591	0.61	0.61	0.61	0.01	0.01
STMP594	0.63	0.63	0.64	0.64	0.63
STMP595	0.64	0.64	0.64	0.64	0.63
STMP692	0.80	0.80	0.81	0.04	0.01
STMP749	0.70	0.70	0.70	0.44	0.43
STMP77	0.51	0.51	0.51	0.26	0.26
STMP79	0.09	0.09	0.09	0.01	0.01
STMP800	0.75	0.75	0.75	0.16	0.15
STMP801	0.71	0.71	0.71	0.13	0.01
STMP823	0.19	0.19	0.19	0.11	0.11
STMP824	0.15	0.15	0.15	0.11	0.11

STMP850	0.55	0.55	0.55	0.58	0.55
STMP88	0.11	0.11	0.11	0.15	0.11
STMP89	0.20	0.20	0.20	0.22	0.20
STMP9	0.57	0.57	0.57	0.44	0.43
STMP90	0.64	0.64	0.64	0.65	0.64
STMP914	0.56	0.56	0.56	0.49	0.48
STMP915	0.63	0.63	0.63	0.52	0.53
STMP964	0.72	0.72	0.72	0.76	0.72
STMP98	0.55	0.55	0.55	0.01	0.01
STMP99	0.56	0.56	0.56	0.55	0.51
SYMP182	0.64	0.64	0.64	0.54	0.54

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Pumping Summary
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Pump	Percent Utilized	Number of Start-Ups	Min Flow LPS	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr	Power Usage Kw-hr	% Time Off Pump Curve Low	% Time Off Pump Curve High
STMP187_PUMP	97.50	1	0.00	3436.81	14969.90	18.764	284.04	0.0	0.0

Analysis begun on: Thu Sep 01 15:52:03 2016
Analysis ended on: Thu Sep 01 15:52:04 2016
Total elapsed time: 00:00:01

APPENDIX D

Water Quality Analysis

CATCHMENT REFERENCE	SUB-CATCHMENT REFERENCE	LAND USE CLASSIFICATIONS																			TOTAL AREA (HECTARES)	COMPOSITE % IMPERVIOUSNESS	COMPOSITE TSS LOADING (mg/l/ha)	TSS LOADING (tonnes/year)	TSS LOADING (tonnes/year)
		HEAVY INDUSTRIAL	LIGHT INDUSTRIAL	PARKS AND TRAILS	PUBLIC AND INSTITUTIONAL	RESIDENTIAL	TOURIST COMMERCIAL	URBAN RESERVE	RIGHT OF WAY	MIXED USE COMMERCIAL	MIXED USE SERVICE	CENTRAL BUSINESS DISTRICT COMMERCIAL	FUTURE GROWTH	RESERVOIR DRAWDOWN	RESORT LANDS	RURAL RESIDENTIAL	NEIGHBOURHOOD COMMERCIAL	SAND AND GRAVEL	RESORT CORES	AGRICULTURAL	NEIGHBOURHOODS					
SUB-CATCHMENTS RECEIVED FROM CITY (NOT MODIFIED):																									
drca1	-	11.51	19.19	8.36	11.94	0.47	3.11	65.54	7.47	-	-	-	-	-	-	-	-	-	-	-	-	**127.61**	**37.6**	**68.0**	**20.58**	-
drca2	-	-	-	-	0.55	5.82	-	-	3.18	0.85	4.69	-	-	-	-	-	-	-	-	-	-	**15.09**	**62.7**	**102.1**	**6.08**	-
drca6	-	-	-	0.51	0.47	1.23	-	-	1.63	-	-	-	-	-	-	-	-	-	-	-	-	**3.84**	**56.6**	**96.1**	**1.32**	-
drca8	-	-	-	1.45	-	8.46	-	-	3.70	-	-	-	6.88	4.11	7.04	-	-	-	-	-	-	**31.64**	**46.6**	**89.1**	**8.28**	-
drca9	-	-	-	16.71	-	2.19	-	-	2.32	-	-	-	-	-	-	-	-	-	-	-	-	**21.21**	**20.7**	**72.4**	**2.01**	-
drca10	-	-	-	26.05	-	0.41	-	-	0.79	-	-	-	-	-	-	-	-	-	-	-	-	**27.24**	**12.5**	**64.7**	**1.38**	-
drca11	-	-	-	0.59	1.15	4.63	-	-	1.71	-	-	-	-	-	-	-	-	-	-	-	-	**8.08**	**50.6**	**108.9**	**2.80**	-
drca12	-	-	-	0.12	-	1.54	-	-	0.84	-	-	-	-	-	-	-	-	-	-	-	-	**2.49**	**52.0**	**112.3**	**0.92**	-
drca14	-	0.51	-	0.14	0.13	1.65	-	-	2.07	0.34	-	-	-	-	-	-	-	-	-	-	-	**4.84**	**64.1**	**99.5**	**1.94**	-
drca15	-	-	-	1.08	1.10	9.02	-	-	7.44	1.53	-	-	-	-	-	-	-	-	-	-	-	**20.17**	**57.8**	**103.5**	**7.60**	-
drca16	-	-	-	0.30	-	2.74	-	-	1.13	-	-	-	-	-	-	-	-	-	-	-	-	**4.17**	**48.7**	**113.7**	**1.46**	-
drca17	-	2.10	-	-	4.46	-	-	-	1.35	-	-	-	-	0.00	-	-	-	-	-	-	-	**7.92**	**74.4**	**82.1**	**3.05**	-
drca18	-	11.57	-	-	2.24	23.44	15.56	72.24	13.27	-	-	-	-	-	-	-	-	-	-	-	-	**138.33**	**36.5**	**76.3**	**24.27**	-
drca19	-	-	-	-	-	-	-	23.63	0.09	-	-	-	-	-	59.15	-	-	-	-	-	-	**82.87**	**10.1**	**55.0**	**2.89**	-
drca20	-	-	-	2.44	-	27.37	-	-	7.68	-	-	-	10.54	9.22	3.84	-	-	-	-	-	-	**61.08**	**50.4**	**102.2**	**19.81**	-
drca21	-	12.13	6.54	0.94	6.15	28.84	-	107.04	22.12	-	-	-	-	-	-	8.74	-	-	-	-	-	**192.50**	**31.8**	**74.5**	**28.68**	-
drca22	-	-	-	0.93	4.79	32.33	-	-	11.63	1.09	-	-	8.20	-	0.09	-	-	-	-	-	-	**59.06**	**56.1**	**109.2**	**22.78**	-
drca24	-	1.33	-	19.25	5.22	48.47	-	3.48	5.71	-	-	-	3.04	37.77	-	-	-	-	-	-	-	**124.27**	**42.1**	**97.2**	**32.02**	-
drca26	-	1.07	3.96	5.53	22.09	-	-	182.83	26.69	-	-	-	-	-	-	-	-	87.06	-	-	-	**329.23**	**41.1**	**71.0**	**60.52**	-
drca27	-	-	-	-	-	-	-	-	0.59	-	-	-	-	-	39.77	-	-	-	16.81	-	-	**57.17**	**31.3**	**61.8**	**6.97**	-
drca28	-	-	-	-	-	-	-	-	0.05	-	-	-	-	-	89.99	-	-	-	39.07	-	-	**129.11**	**31.2**	**61.7**	**15.65**	-
drca29	-	-	-	-	-	-	-	-	0.05	-	-	-	-	-	59.83	-	-	-	55.71	-	-	**115.60**	**43.8**	**65.6**	**20.92**	-
drca30	-	-	-	-	-	-	-	0.22	2.07	-	-	-	-	0.00	-	-	-	-	-	-	-	**2.29**	**73.3**	**82.1**	**0.87**	-
drca31	-	0.10	-	2.36	-	-	3.32	32.51	13.24	-	-	-	-	-	-	-	-	-	-	-	-	**51.52**	**32.6**	**64.6**	**6.84**	-
drca33	-	-	-	5.96	0.14	36.45	-	-	14.24	-	-	-	29.14	3.90	-	-	-	-	271.21	1.29	2.11	**364.45**	**74.0**	**83.2**	**141.32**	-
drca34	-	-	-	-	-	-	-	6.63	6.44	-	-	-	-	-	-	-	-	-	-	-	-	**13.07**	**44.5**	**69.8**	**2.56**	-
drca35	-	-	-	-	0.01	-	-	55.19	9.49	-	-	-	-	0.00	-	-	-	-	-	-	-	**64.69**	**20.3**	**59.4**	**4.91**	-
drca36	-	-	18.96	18.51	11.24	-	-	133.21	8.62	-	-	-	-	-	-	-	-	49.73	-	-	-	**240.27**	**36.4**	**69.2**	**38.13**	-
drca37	-	-	-	-	-	-	-	11.84	5.92	0.66	-	-	-	-	-	-	-	1.06	-	-	-	**19.48**	**37.8**	**67.2**	**3.12**	-
drca39	-	80.20	-	5.26	98.26	-	7.58	128.09	34.94	-	-	-	-	0.01	-	-	-	-	-	-	-	**354.34**	**50.9**	**72.4**	**82.29**	-
drca40	-	8.01	12.10	4.54	-	-	-	38.72	10.50	-	-	-	-	-	-	-	-	34.00	-	-	-	**107.86**	**53.6**	**77.8**	**28.32**	-
drca41	-	-	-	-	-	-	-	9.34	1.61	-	-	-	-	-	-	-	-	-	-	-	-	**10.95**	**20.3**	**59.4**	**0.83**	-
drca42	-	-	-	-	-	-	-	-	0.07	-	-	-	-	-	34.16	-	-	-	53.07	-	-	**87.30**	**52.6**	**68.4**	**19.79**	-
drca43	-	9.47	-	6.59	-	8.93	-	34.64	27.07	-	-	-	5.30	11.46	-	5.93	-	19.90	-	-	-	**129.29**	**50.8**	**80.2**	**33.18**	-
drca44	-	-	-	-	-	-	-	-	2.13	-	-	-	-	-	-	-	-	-	88.56	-	1.08	**91.77**	**79.4**	**77.1**	**35.38**	-
MODIFIED SUB-CATCHMENTS (INCLUDED IN EPA-SWMM MODELLING):																										
drca3	**S3-A**	-	-	0.16	0.61	3.20	-	-	3.70	0.77	-	-	0.11	-	-	-	-	-	-	-	-	**8.55**	**63.0**	**100.6**	**3.42**	**11.16**
	S3-B	-	-	-	0.17	0.86	-	-	0.78	-	-	-	0.17	-	-	-	-	-	-	-	-	**1.98**	**61.7**	**104.5**	**0.81**	
	S3-C	-	-	-	0.19	1.68	-	-	1.41	0.07	-	0.22	-	-	-	-	-	-	-	-	-	**3.57**	**60.7**	**106.1**	**1.45**	
	S3-D	0.18	-	-	-	-	-	-	0.97	0.86	-	0.13	-	-	-	-	-	-	-	-	-	**2.14**	**80.0**	**81.9**	**0.88**	
	S3-E	0.24	-	-	1.40	0.30	-	-	1.30	-	-	-	2.70	-	-	-	-	-	-	-	-	**5.94**	**75.6**	**86.0**	**2.44**	
	S3-F	0.08	-	-	-	1.10	-	-	0.12	-	-	-	0.66	-	-	-	-	-	-	-	-	**1.96**	**57.6**	**110.8**	**0.79**	
	S3-G	0.46	-	-	-	1.66	-	-	1.02	-	-	-	0.23	-	-	-	-	-	-	-	-	**3.37**	**60.3**	**107.9**	**1.38**	

drca4	S4-A	0.67	-	-	1.15	0.01	-	-	0.78	-	-	-	1.19	-	-	-	-	-	-	-	-	3.79	76.9	83.6	1.54	5.90
	S4-B	0.01	-	-	0.12	-	-	-	1.63	-	-	2.33	-	-	-	-	-	-	-	-	-	4.10	79.7	84.8	1.74	
	S4-C	-	-	0.55	0.29	0.08	-	-	2.87	-	-	2.27	0.73	-	-	-	-	-	-	-	-	6.79	73.4	83.5	2.62	
drca5	S5-A	-	-	0.01	1.04	3.34	-	-	3.84	-	-	0.85	-	-	-	-	-	-	-	-	-	9.07	64.0	101.2	3.70	22.73
	S5-B	-	-	-	-	-	-	-	0.87	-	-	0.84	-	-	-	-	-	-	-	-	-	1.72	80.0	85.0	0.73	
	S5-C	-	-	-	-	-	-	-	1.19	-	-	1.31	-	-	-	-	-	-	-	-	-	2.50	80.0	85.0	1.07	
	S5-D	-	-	-	-	-	-	-	0.67	-	-	0.55	-	-	-	-	-	-	-	-	-	1.21	80.0	85.0	0.52	
	S5-E	0.75	-	-	0.00	0.05	-	-	1.60	-	-	1.75	-	-	-	-	-	-	-	-	-	4.16	79.5	85.9	1.79	
	S5-F	0.33	-	-	-	-	-	-	0.47	-	-	0.18	-	-	-	-	-	-	-	-	-	0.98	80.0	85.7	0.42	
	S5-G	1.94	-	-	-	0.29	-	-	0.08	-	-	1.76	-	-	-	-	-	-	-	-	-	4.06	77.1	89.3	1.76	
	S5-H	-	-	-	-	0.67	-	-	1.72	-	-	1.34	-	-	-	-	-	-	-	-	-	3.73	72.8	93.2	1.60	
	S5-I	6.10	-	-	-	2.35	-	-	1.76	-	-	-	-	-	-	-	-	-	-	-	-	10.21	70.8	96.8	4.41	
	S5-J	0.36	-	-	0.00	2.99	-	0.01	2.52	-	-	-	-	-	-	-	-	-	-	-	-	5.89	59.5	108.4	2.39	
	S5-K	-	-	-	0.73	6.12	-	16.32	2.19	3.06	-	-	0.20	-	-	-	-	-	-	-	-	28.62	31.3	76.7	4.32	
drca7	S7-A	-	-	0.54	-	3.55	-	-	3.35	-	-	-	-	-	-	-	-	-	-	-	-	7.44	55.8	105.3	2.76	3.17
	S7-B	-	-	2.73	0.08	0.79	-	-	0.24	-	-	-	-	-	-	-	-	-	-	-	-	3.84	21.8	78.7	0.41	
drca13	S13-A	-	-	0.86	1.35	10.52	-	-	4.36	-	17.14	-	-	-	-	-	-	-	-	-	-	34.22	63.1	98.3	13.37	29.41
	S13-B	-	-	1.19	7.24	3.88	-	-	1.90	0.64	4.40	-	-	-	-	-	-	-	-	-	-	19.24	62.7	90.4	6.87	
	S13-C	-	-	-	0.19	1.68	-	-	2.73	0.29	-	0.22	-	-	-	-	-	-	-	-	-	5.10	66.5	99.5	2.13	
	S13-D	-	-	0.09	0.02	0.07	-	-	1.06	1.63	-	-	-	-	-	-	-	-	-	-	-	2.86	76.8	80.8	1.12	
	S13-E	-	-	0.14	-	1.34	-	-	1.58	2.03	-	-	-	-	-	-	-	-	-	-	-	5.09	67.5	93.3	2.02	
	S13-F	-	-	-	-	5.61	-	-	1.89	-	-	-	-	-	-	-	-	-	-	-	-	7.50	50.1	119.4	2.83	
	S13-G	-	-	-	-	1.24	-	-	0.30	-	-	-	-	-	-	-	-	-	-	-	-	1.54	47.9	121.9	0.57	
	S13-H	-	-	0.13	-	0.59	-	-	0.68	-	-	-	-	-	-	-	-	-	-	-	-	1.41	56.6	102.3	0.51	
drca23	S23-A	4.47	5.59	-	-	3.48	-	-	2.36	-	-	-	-	-	-	-	-	-	-	-	-	15.91	69.5	96.3	6.71	13.08
	S23-B	0.68	0.44	-	0.11	1.60	-	-	1.13	-	-	-	-	-	-	-	-	-	-	-	-	3.96	63.0	104.0	1.64	
	S23-C	-	-	0.10	0.00	6.69	-	-	1.10	-	-	-	-	-	-	-	-	-	-	-	-	7.88	45.2	123.7	2.78	
	S23-D	-	-	0.74	-	3.82	-	-	1.49	-	-	-	-	-	-	-	-	-	-	-	-	6.05	46.1	111.4	1.96	
drca25	S25-A	1.90	2.56	0.16	-	10.33	-	-	7.42	-	0.13	-	-	-	-	-	0.08	-	-	-	-	22.59	60.6	106.2	9.16	69.20
	S25-B	-	-	0.30	0.17	3.70	-	-	2.63	-	-	-	-	-	-	-	-	-	-	-	-	6.80	54.9	108.9	2.56	
	S25-C	0.89	-	-	-	5.09	-	-	1.34	-	-	-	-	-	-	-	-	-	-	-	-	7.32	52.2	117.2	2.82	
	S25-D	-	-	-	-	6.76	-	-	3.15	-	-	-	0.74	-	-	-	-	-	-	-	-	10.65	54.6	114.2	4.19	
	S25-E	2.71	-	1.20	-	5.77	-	-	0.42	-	-	-	-	-	-	-	-	-	-	-	-	10.10	48.8	109.2	3.39	
	S25-F	-	-	4.95	-	28.41	-	-	7.09	-	-	-	0.46	0.29	-	-	0.40	-	-	-	-	41.61	44.2	113.7	13.16	
	S25-G	-	-	-	-	2.64	-	-	0.80	-	-	-	-	-	-	-	-	-	-	-	-	3.44	49.3	120.3	1.28	
	S25-H	-	-	0.80	-	1.98	-	-	0.65	-	-	-	-	-	-	-	-	-	-	-	-	3.43	40.6	106.4	0.93	
	S25-I	8.73	-	1.15	5.93	2.82	-	-	1.31	-	-	-	-	-	-	-	-	-	-	-	-	19.93	67.3	89.3	7.55	
	S25-J	15.11	-	2.17	4.77	-	-	-	2.06	-	-	-	-	0.12	-	-	-	-	-	-	-	24.23	71.6	83.1	9.08	
	S25-K	3.96	-	11.38	3.06	-	-	-	3.29	-	-	-	-	42.91	-	-	-	-	-	-	-	64.60	47.3	78.3	15.07	
drca32	S32-A	6.83	-	0.32	-	14.26	-	-	11.17	-	21.79	-	-	-	-	-	-	-	-	-	-	54.37	67.1	97.2	22.33	64.30
	S32-B	-	-	-	-	0.05	-	-	1.47	-	3.74	-	-	-	-	-	0.11	-	-	-	-	5.37	76.1	85.3	2.20	
	S32-C	1.55	-	-	-	24.77	-	0.00	7.16	-	28.48	-	1.36	57.82	-	-	-	-	-	-	-	121.15	56.3	92.5	39.78	
drca38	S38-A	-	-	-	0.07	-	-	-	4.81	3.79	3.36	-	4.46	-	-	-	-	-	-	-	-	16.49	78.9	83.1	6.82	19.52
	S38-B	2.26	-	-	-	1.74	-	-	6.31	8.05	-	-	-	-	-	-	-	-	-	-	-	18.35	76.2	86.1	7.58	
	S38-C	0.58	-	-	0.73	-	-	-	4.43	2.66	-	-	-	-	-	-	-	-	-	-	-	8.40	79.1	82.1	3.44	
	S38-D	0.20	-	0.45	-	-	-	-	2.56	1.32	-	-	-	-	-	-	-	-	-	-	-	4.53	73.0	80.6	1.68	

REFERENCE VALUES FOR LANDUSES:

% Imp.		80	75	10	70	40	80	10	80	80	75	80	80	50	10	25	80	87	80	10	25
TSS Loading (mg/l/ha)		87	87	63	79	131	77	55	85	77	85	85	85	81	55	71	77	98	77	100	71

APPENDIX E

EPA-SWMM Input and Output Files (Proposed Upgrades)

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.007)
--------------------------------------------------------------

WARNING 02: maximum depth increased for Node J77

**********************************************************
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 ..... LPS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... DYNWAVE
Starting Date ..... NOV-05-2015 00:00:00
Ending Date ..... NOV-05-2015 03:00:00
Antecedent Dry Days ..... 0.0
Report Time Step ..... 00:05:00
Wet Time Step ..... 00:05:00
Dry Time Step ..... 00:05:00
Routing Time Step ..... 30.00 sec
Variable Time Step ..... YES
Maximum Trials ..... 8
Head Tolerance ..... 0.004921 m


*************
Element Count
*************
Number of rain gages ..... 1
Number of subcatchments ... 55
Number of nodes ..... 100
```



```
Number of links ..... 91
Number of pollutants ..... 0
Number of land uses ..... 0


****************
Raingage Summary
****************
                                                  Data       Recording
Name                 Data Source                  Type       Interval
------------------------------------------------------------------------
_Current             CityIDF_AES_1hr_5yr          VOLUME       5 min.


*******************
Subcatchment Summary
*******************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
------------------------------------------------------------------------------------------
S13-A                      14.43   1550.00     70.00    2.5000 _Current             STMH286
S13-B                      14.18   1060.00     70.00    1.9000 _Current             STMH188
S13-C                       5.03    705.00     66.00    1.1000 _Current             STMH165
S13-D                       2.85    632.00     77.00    3.2000 _Current             STMH161
S13-E                       5.22    727.00     68.00    2.1000 _Current             STMH54
S13-F                       7.67    569.00     50.00    0.5000 _Current             STMH178
S13-G                       1.35    351.00     48.00    2.0000 _Current             STMH177
S13-H                       1.52    473.00     57.00    3.1000 _Current             STMH398
S23-A                      15.82   1095.00     69.00    1.6000 _Current             STMH116
S23-B                       3.94    770.00     63.00    2.6000 _Current             DRCB64
S23-C                       7.93    966.00     45.00    2.1000 _Current             DRCB40
S25-A                      22.61    902.00     61.00    1.3000 _Current             STMH37
S25-B                       6.70    737.00     55.00    1.7000 _Current             STMH225
S25-C                       7.26    921.00     52.00    1.0000 _Current             STMH202
S25-D                      10.70   1063.00     55.00    1.2000 _Current             STMH38
S25-E                      10.16   1039.00     49.00    1.7000 _Current             J74
S25-F                      41.71   2239.00     44.00    0.8000 _Current             J73
S25-G                       3.30    633.00     49.00    1.9000 _Current             STMH205
S25-H                       3.45    674.00     41.00    1.2000 _Current             STMH244
S25-I                      20.24   1568.00     67.00    2.1000 _Current             J75
S25-J                      24.53   1501.00     72.00    1.3000 _Current             J84
S32-A                      54.37    400.00     50.00    0.5000 _Current             DRCB258
S32-B                       5.37    400.00     50.00    0.5000 _Current             DRCB258
S38-A                      16.25   1798.00     79.00    4.1000 _Current             J83
S38-B                      18.36   1574.00     76.00    5.9000 _Current             J22
```



```
S38-C                       8.37    802.00     79.00    4.5000 _Current             STMH78
S38-D                       4.72    558.00     73.00    1.5000 _Current             STMH79
S38-Z1                    136.40   7480.00     10.00   30.3000 _Current             J83
S38-Z2                      5.70   1120.00     10.00   10.4000 _Current             J83
S3-A                        8.53    955.00     63.00    2.9000 _Current             STMH12
S3-B                        1.98    392.00     62.00    1.5000 _Current             STMH7
S3-C                        3.55    735.00     61.00    1.3000 _Current             STMH6
S3-D                        2.11    617.00     80.00    2.1000 _Current             STMH138
S3-E                        5.92    588.00     76.00   17.2000 _Current             STMH246-DIV
S3-F                        1.92    586.00     58.00   13.7000 _Current             J33
S3-G                        3.26    655.00     60.00   13.0000 _Current             J87
S3-Z1                     241.50   6550.00     10.00   34.0000 _Current             J33
S4-A                        3.83    547.00     77.00   19.1000 _Current             J34
S4-B                        4.08    379.00     80.00    1.5000 _Current             J37
S4-C                        6.76    577.00     73.00    3.3000 _Current             STMH93
S5-A                        8.95    974.00     64.00    2.6000 _Current             STMH133
S5-B                        1.74    288.00     80.00    0.9000 _Current             STMH135
S5-C                        2.50    464.00     80.00    0.6000 _Current             STMH131
S5-D                        1.28    206.00     80.00    1.2000 _Current             STMH196
S5-E                        4.01    610.00     79.00    2.3000 _Current             STMH4
S5-F                        1.02    184.00     80.00    6.0000 _Current             STMH15
S5-G                        4.10    727.00     77.00    0.3000 _Current             STMH2
S5-H                        3.71    473.00     73.00    0.4000 _Current             STMH147
S5-I                       10.27    885.00     71.00    6.2000 _Current             STMH212
S5-J                        5.91    831.00     60.00    9.1000 _Current             J56
S5-K                       28.67   1446.00     54.00   11.9000 _Current             J46
S5-Z1                      87.70   4910.00     10.00   36.0000 _Current             J46
S7-A                        7.47    684.00     56.00    0.9000 _Current             STMH23
S7-B                        3.90    411.00     22.00    7.3000 _Current             STMH297
S13-I                       2.12    370.00     60.00    1.0000 _Current             J1


************
Node Summary
************
                                    Invert      Max.    Ponded    External
Name                 Type            Elev.     Depth      Area    Inflow
------------------------------------------------------------------------
J1                   JUNCTION       444.92      2.90       0.0
STMH286              JUNCTION       444.31      3.40       0.0
STMH56               JUNCTION       443.98      3.20       0.0
STMH54               JUNCTION       442.97      4.10       0.0
STMH178              JUNCTION       441.29      3.20       0.0
STMH177              JUNCTION       440.78      2.60       0.0
```



```
STMH398              JUNCTION       440.42      3.10       0.0
STMH188              JUNCTION       446.02      3.40       0.0
STMH64               JUNCTION       445.56      3.40       0.0
STMH161              JUNCTION       444.09      3.00       0.0
STMH165              JUNCTION       443.56      3.60       0.0
STMH63               JUNCTION       445.08      3.30       0.0
STMH62               JUNCTION       444.98      2.80       0.0
STMH77               JUNCTION       454.15      2.20       0.0
STMH74               JUNCTION       452.88      3.20       0.0
STMH83               JUNCTION       441.98      3.00       0.0
STMH79               JUNCTION       441.38      2.60       0.0
STMH235              JUNCTION       442.44      1.90       0.0
J22                  JUNCTION       442.75      1.90       0.0
STMH139              JUNCTION       453.09      4.04       0.0
STMH138              JUNCTION       452.99      3.41       0.0
STMH183              JUNCTION       452.76      3.11       0.0
STMH6                JUNCTION       452.48      2.97       0.0
STMH7                JUNCTION       452.10      3.90       0.0
STMH184              JUNCTION       451.89      4.40       0.0
STMH185              JUNCTION       451.75      4.44       0.0
STMH12               JUNCTION       451.69      4.40       0.0
J33                  JUNCTION       459.08      2.50       0.0
J34                  JUNCTION       455.36      2.50       0.0
STMH17               JUNCTION       453.99      1.60       0.0
STMH254              JUNCTION       453.24      2.60       0.0
STMH93               JUNCTION       451.88      3.90       0.0
J37                  JUNCTION       453.49      2.00       0.0
J38                  JUNCTION       454.36      2.50       0.0
STMH190              JUNCTION       449.72      4.70       0.0
STMH133              JUNCTION       450.28      4.40       0.0
STMH135              JUNCTION       451.01      3.80       0.0
STMH131              JUNCTION       451.21      3.70       0.0
STMH196              JUNCTION       451.69      3.00       0.0
STMH137              JUNCTION       453.28      2.60       0.0
STMH15               JUNCTION       454.27      1.80       0.0
J46                  JUNCTION       455.31      5.00       0.0
STMH4                JUNCTION       452.57      3.10       0.0
STMH216              JUNCTION       452.15      3.10       0.0
STMH197              JUNCTION       451.95      2.70       0.0
STMH2                JUNCTION       453.06      1.80       0.0
STMH28               JUNCTION       453.20      1.90       0.0
STMH147              JUNCTION       453.75      2.90       0.0
STMH194              JUNCTION       454.00      1.80       0.0
STMH253              JUNCTION       454.49      2.00       0.0
```

J56	JUNCTION	455.38	2.60	0.0
STMH212	JUNCTION	454.85	1.20	0.0
STMH298	JUNCTION	440.27	1.60	0.0
STMH297	JUNCTION	440.64	3.90	0.0
STMH26	JUNCTION	452.49	5.00	0.0
STMH22	JUNCTION	454.19	3.70	0.0
STMH23	JUNCTION	454.38	3.30	0.0
STMH225	JUNCTION	450.19	2.44	0.0
STMH226	JUNCTION	448.06	3.04	0.0
STMH202	JUNCTION	446.71	3.02	0.0
STMH38	JUNCTION	444.70	2.75	0.0
STMH205	JUNCTION	441.90	3.20	0.0
STMH204	JUNCTION	440.95	3.60	0.0
STMH109	JUNCTION	440.47	1.85	0.0
STMH37	JUNCTION	450.62	2.50	0.0
STMH244	JUNCTION	439.80	1.80	0.0
STMH362	JUNCTION	439.45	2.10	0.0
J73	JUNCTION	439.28	1.50	0.0
J74	JUNCTION	438.27	1.50	0.0
J75	JUNCTION	437.62	1.50	0.0
J76	JUNCTION	437.10	1.80	0.0
J77	JUNCTION	442.00	2.00	0.0
J78	JUNCTION	438.00	1.50	0.0
J79	JUNCTION	454.78	4.70	0.0
STMH116	JUNCTION	454.00	2.30	0.0
DRCB64	JUNCTION	451.36	2.50	0.0
DRCB40	JUNCTION	445.61	2.50	0.0
J83	JUNCTION	458.49	2.80	0.0
J84	JUNCTION	437.36	1.50	0.0
J85	JUNCTION	457.37	2.50	0.0
STMH78	JUNCTION	446.63	2.90	0.0
J86	JUNCTION	458.46	2.50	0.0
J87	JUNCTION	458.57	2.50	0.0
J88	JUNCTION	458.25	2.50	0.0
J89	JUNCTION	456.77	2.50	0.0
J90	JUNCTION	459.23	2.50	0.0
J91	JUNCTION	457.00	2.50	0.0
DRCB258	JUNCTION	439.79	1.50	0.0
DRCB260	JUNCTION	438.95	1.50	0.0
J94	JUNCTION	436.84	1.50	0.0
STMH246-DIV	JUNCTION	455.92	2.50	0.0
DROF13	OUTFALL	440.21	0.90	0.0
DROF38	OUTFALL	440.85	1.05	0.0
DROF3	OUTFALL	451.34	1.20	0.0

DROF4	OUTFALL	451.61	0.75	0.0
DROF5	OUTFALL	449.45	1.20	0.0
DROF7	OUTFALL	440.02	0.60	0.0
DROF25	OUTFALL	440.00	2.00	0.0
DROF23	OUTFALL	443.90	0.90	0.0
DRFI2017	OUTFALL	436.42	1.00	0.0

****
Link Summary
****

Name	From Node	To Node	Type	Length	%Slope	Roughness
C100	STMH235	STMH83	CONDUIT	61.4	0.1515	0.0100
C101	STMH83	STMH79	CONDUIT	153.1	0.3430	0.0100
C102	STMH79	DROF38	CONDUIT	137.0	0.3831	0.0100
C103	STMH74	STMH78	CONDUIT	159.2	3.9237	0.0100
C104	STMH78	STMH83	CONDUIT	132.9	3.4096	0.0100
C105	J86	J85	CONDUIT	70.6	1.5447	0.0100
C106	J87	J88	CONDUIT	31.5	1.0172	0.0100
C107	J88	J85	CONDUIT	88.2	0.9974	0.0100
C108	J89	J34	CONDUIT	101.2	1.3931	0.0100
C109	J90	J91	CONDUIT	52.0	4.2949	0.0100
C110	J91	J34	CONDUIT	104.7	1.5661	0.0100
C93	J46	J79	CONDUIT	35.5	1.4931	0.0100
C96	J83	STMH77	CONDUIT	202.0	2.1231	0.0100
C98	J33	J86	CONDUIT	16.4	3.7740	0.0100
C99	J85	STMH246-DIV	CONDUIT	79.7	1.8201	0.0100
DRDI117	J94	DRFI2017	CONDUIT	41.6	1.0097	0.0100
DRDI27	J73	J74	CONDUIT	251.8	0.4012	0.0100
DRDI28	J74	J78	CONDUIT	67.3	0.4013	0.0100
DRDI4	J75	J76	CONDUIT	175.3	0.2966	0.0100
DRDI5	J84	J76	CONDUIT	65.5	0.3966	0.0100
DRDI6	J77	DROF25	CONDUIT	153.4	1.3036	0.0100
STMP10	STMH188	STMH64	CONDUIT	45.5	1.0110	0.0100
STMP100	STMH196	STMH131	CONDUIT	86.4	0.5557	0.0100
STMP101	STMH131	STMH135	CONDUIT	90.9	0.2201	0.0100
STMP103	STMH197	STMH196	CONDUIT	47.1	0.5524	0.0100
STMP106	STMH135	STMH133	CONDUIT	89.7	0.8139	0.0100
STMP107	STMH133	STMH190	CONDUIT	86.0	0.6511	0.0100
STMP1086	DRCB40	DROF23	CONDUIT	262.5	0.6514	0.0100
STMP11	STMH64	STMH63	CONDUIT	47.9	1.0026	0.0100
STMP1170	DRCB260	J94	CONDUIT	241.7	0.8730	0.0100
STMP118	STMH28	STMH2	CONDUIT	116.3	0.1204	0.0100

STMP12	STMH63	STMH62	CONDUIT	10.2	0.9824	0.0100
STMP120	STMH147	STMH28	CONDUIT	110.1	0.4994	0.0100
STMP123	STMH2	STMH197	CONDUIT	88.5	1.2548	0.0100
STMP1289	STMH26	STMH297	CONDUIT	27.8	47.1005	0.0100
STMP13	STMH62	STMH161	CONDUIT	89.3	0.9962	0.0100
STMP131	STMH190	DROF5	CONDUIT	54.9	0.4920	0.0100
STMP14	STMH161	STMH54	CONDUIT	92.7	1.2078	0.0100
STMP150	STMH37	STMH225	CONDUIT	86.2	0.4990	0.0100
STMP1513	DRCB258	DRCB260	CONDUIT	24.9	3.3754	0.0100
STMP1516	STMH362	J73	CONDUIT	33.6	0.5052	0.0100
STMP155	STMH23	STMH22	CONDUIT	82.8	0.2294	0.0100
STMP156A	STMH298	DROF7	CONDUIT	50.2	0.4979	0.0100
STMP156B	STMH297	STMH298	CONDUIT	136.3	0.2715	0.0100
STMP1604	STMH398	DROF13	CONDUIT	20.4	1.0300	0.0100
STMP161	STMH22	STMH26	CONDUIT	57.4	2.9625	0.0100
STMP170	J78	J75	CONDUIT	31.2	1.2184	0.0100
STMP183	STMH38	STMH205	CONDUIT	133.6	2.0956	0.0100
STMP184	STMH204	STMH109	CONDUIT	96.4	0.4981	0.0100
STMP20	J1	STMH286	CONDUIT	121.6	0.5014	0.0100
STMP248	STMH109	STMH244	CONDUIT	132.7	0.5049	0.0100
STMP249	STMH244	STMH362	CONDUIT	69.7	0.5025	0.0100
STMP274	J56	STMH253	CONDUIT	178.1	0.4998	0.0100
STMP276	STMH254	STMH93	CONDUIT	140.0	0.9714	0.0100
STMP29	STMH77	STMH74	CONDUIT	35.8	3.4248	0.0100
STMP308	STMH116	DRCB64	CONDUIT	71.1	3.7156	0.0100
STMP309	DRCB64	DRCB40	CONDUIT	215.4	2.6704	0.0100
STMP393	STMH177	STMH398	CONDUIT	105.6	0.3409	0.0100
STMP394	STMH178	STMH177	CONDUIT	124.0	0.4112	0.0100
STMP427	STMH56	STMH165	CONDUIT	112.2	0.3745	0.0100
STMP428	STMH165	STMH54	CONDUIT	92.0	0.6415	0.0100
STMP435	STMH54	STMH178	CONDUIT	132.3	1.2698	0.0100
STMP521	STMH139	STMH138	CONDUIT	19.0	0.5255	0.0100
STMP524	J38	STMH17	CONDUIT	16.1	2.3002	0.0100
STMP525	J34	J38	CONDUIT	41.6	2.4063	0.0100
STMP554	STMH6	STMH7	CONDUIT	75.5	0.5033	0.0100
STMP555	STMH138	STMH183	CONDUIT	46.0	0.5003	0.0100
STMP556	STMH183	STMH6	CONDUIT	54.9	0.5099	0.0100
STMP591	STMH7	STMH184	CONDUIT	43.1	0.4875	0.0100
STMP594	STMH184	STMH185	CONDUIT	34.9	0.4014	0.0100
STMP595	STMH185	STMH12	CONDUIT	14.4	0.4170	0.0100
STMP692	STMH194	STMH147	CONDUIT	49.5	0.5054	0.0100
STMP749	STMH205	STMH204	CONDUIT	13.4	7.1181	0.0100
STMP77	STMH246-DIV	STMH139	CONDUIT	27.8	10.2182	0.0100
STMP79	STMH17	J37	CONDUIT	94.2	0.5307	0.0100

STMP800	STMH253	STMH194	CONDUIT	97.4	0.5029	0.0100
STMP801	STMH212	STMH253	CONDUIT	72.7	0.4952	0.0100
STMP823	STMH216	STMH196	CONDUIT	67.8	0.6789	0.0100
STMP824	STMH4	STMH216	CONDUIT	62.6	0.6710	0.0100
STMP850	J79	STMH15	CONDUIT	33.9	1.5042	0.0100
STMP88	J37	STMH254	CONDUIT	45.8	0.5460	0.0100
STMP89	STMH93	DROF4	CONDUIT	27.1	0.9949	0.0100
STMP9	STMH286	STMH56	CONDUIT	62.1	0.5310	0.0100
STMP90	STMH12	DROF3	CONDUIT	69.3	0.5051	0.0100
STMP914	STMH225	STMH226	CONDUIT	43.8	1.6658	0.0100
STMP915	STMH226	STMH202	CONDUIT	128.5	1.0510	0.0100
STMP964	J22	STMH235	CONDUIT	89.5	0.2929	0.0100
STMP98	STMH15	STMH137	CONDUIT	29.4	3.3716	0.0100
STMP99	STMH137	STMH196	CONDUIT	97.5	1.6318	0.0100
SYMP182	STMH202	STMH38	CONDUIT	141.2	1.4237	0.0100
STMP187_PUMP	J76	J77	IDEAL PUMP			

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C100	CIRCULAR	0.90	0.64	0.23	0.90	1	915.97
C101	CIRCULAR	1.20	1.13	0.30	1.20	1	2968.54
C102	CIRCULAR	1.05	0.87	0.26	1.05	1	2197.46
C103	CIRCULAR	1.05	0.87	0.26	1.05	1	7032.30
C104	CIRCULAR	1.05	0.87	0.26	1.05	1	6555.37
C105	CIRCULAR	0.75	0.44	0.19	0.75	1	1798.88
C106	CIRCULAR	0.75	0.44	0.19	0.75	1	1459.75
C107	CIRCULAR	0.75	0.44	0.19	0.75	1	1445.50
C108	CIRCULAR	0.90	0.64	0.23	0.90	1	2777.92
C109	CIRCULAR	0.90	0.64	0.23	0.90	1	4877.52
C110	CIRCULAR	0.90	0.64	0.23	0.90	1	2945.34
C93	CIRCULAR	0.90	0.64	0.23	0.90	2	2875.88
C96	CIRCULAR	1.05	0.87	0.26	1.05	1	5172.85
C98	CIRCULAR	0.90	0.64	0.23	0.90	1	4572.17
C99	TRAPEZOIDAL	2.00	5.00	0.83	4.00	1	59738.45
DRDI117	TRAPEZOIDAL	1.00	3.60	0.52	6.60	1	23389.71
DRDI27	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76654.24
DRDI28	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76659.66
DRDI4	TRAPEZOIDAL	1.50	14.25	0.98	14.00	1	76761.44
DRDI5	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76218.52

DRDI6	TRAPEZOIDAL	2.00	12.00	0.95	12.00	1	132287.57
STMP10	CIRCULAR	0.60	0.28	0.15	0.60	1	802.66
STMP100	CIRCULAR	1.20	1.13	0.30	1.20	1	3778.42
STMP101	CIRCULAR	1.20	1.13	0.30	1.20	1	2378.05
STMP103	CIRCULAR	0.90	0.64	0.23	0.90	1	1749.20
STMP106	CIRCULAR	1.20	1.13	0.30	1.20	1	4572.62
STMP107	CIRCULAR	1.20	1.13	0.30	1.20	1	4089.94
STMP1086	CIRCULAR	0.90	0.64	0.23	0.90	1	1899.52
STMP11	CIRCULAR	0.60	0.28	0.15	0.60	1	799.28
STMP1170	CIRCULAR	0.60	0.28	0.15	0.60	1	745.86
STMP118	CIRCULAR	0.60	0.28	0.15	0.60	1	276.99
STMP12	CIRCULAR	0.60	0.28	0.15	0.60	1	791.19
STMP120	CIRCULAR	0.60	0.28	0.15	0.60	1	564.13
STMP123	CIRCULAR	0.75	0.44	0.19	0.75	1	1621.26
STMP1289	CIRCULAR	0.40	0.13	0.10	0.40	1	1858.16
STMP13	CIRCULAR	0.90	0.64	0.23	0.90	1	2349.12
STMP131	CIRCULAR	1.20	1.13	0.30	1.20	1	3555.25
STMP14	CIRCULAR	0.90	0.64	0.23	0.90	1	2586.51
STMP150	CIRCULAR	0.60	0.28	0.15	0.60	1	563.87
STMP1513	CIRCULAR	0.80	0.50	0.20	0.80	1	3158.49
STMP1516	CIRCULAR	0.90	0.64	0.23	0.90	1	1672.85
STMP155	CIRCULAR	0.50	0.20	0.12	0.50	1	235.13
STMP156A	CIRCULAR	0.60	0.28	0.15	0.60	1	563.28
STMP156B	CIRCULAR	0.60	0.28	0.15	0.60	1	415.93
STMP1604	CIRCULAR	0.90	0.64	0.23	0.90	1	2388.56
STMP161	CIRCULAR	0.50	0.20	0.12	0.50	1	844.93
STMP170	CIRCULAR	0.80	0.50	0.20	0.80	3	1897.65
STMP183	CIRCULAR	0.75	0.44	0.19	0.75	1	2095.23
STMP184	CIRCULAR	0.90	0.64	0.23	0.90	1	1661.02
STMP20	CIRCULAR	0.50	0.20	0.12	0.50	1	347.62
STMP248	CIRCULAR	0.90	0.64	0.23	0.90	1	1672.29
STMP249	CIRCULAR	0.90	0.64	0.23	0.90	1	1668.40
STMP274	CIRCULAR	0.60	0.28	0.15	0.60	1	564.32
STMP276	CIRCULAR	0.75	0.44	0.19	0.75	1	1426.50
STMP29	CIRCULAR	1.05	0.87	0.26	1.05	1	6569.95
STMP308	CIRCULAR	0.45	0.16	0.11	0.45	1	714.48
STMP309	CIRCULAR	0.60	0.28	0.15	0.60	1	1304.47
STMP393	CIRCULAR	0.90	0.64	0.23	0.90	1	1374.18
STMP394	CIRCULAR	0.90	0.64	0.23	0.90	1	1509.26
STMP427	CIRCULAR	0.75	0.44	0.19	0.75	1	885.69
STMP428	CIRCULAR	0.75	0.44	0.19	0.75	1	1159.26
STMP435	CIRCULAR	0.90	0.64	0.23	0.90	1	2652.05
STMP521	CIRCULAR	1.20	1.13	0.30	1.20	1	3674.31
STMP524	CIRCULAR	0.75	0.44	0.19	0.75	1	2195.09

STMP525	CIRCULAR	0.75	0.44	0.19	0.75	1	2245.15
STMP554	CIRCULAR	1.20	1.13	0.30	1.20	1	3595.95
STMP555	CIRCULAR	1.20	1.13	0.30	1.20	1	3585.27
STMP556	CIRCULAR	1.20	1.13	0.30	1.20	1	3619.50
STMP591	CIRCULAR	1.20	1.13	0.30	1.20	1	3538.89
STMP594	CIRCULAR	1.20	1.13	0.30	1.20	1	3211.22
STMP595	CIRCULAR	1.20	1.13	0.30	1.20	1	3272.95
STMP692	CIRCULAR	0.50	0.20	0.12	0.50	1	348.98
STMP749	CIRCULAR	0.75	0.44	0.19	0.75	1	3861.49
STMP77	CIRCULAR	0.90	0.64	0.23	0.90	1	7523.31
STMP79	CIRCULAR	0.75	0.44	0.19	0.75	1	1054.36
STMP800	CIRCULAR	0.50	0.20	0.12	0.50	1	348.14
STMP801	CIRCULAR	0.50	0.20	0.12	0.50	1	345.45
STMP823	CIRCULAR	0.60	0.28	0.15	0.60	1	657.72
STMP824	CIRCULAR	0.60	0.28	0.15	0.60	1	653.92
STMP850	CIRCULAR	0.90	0.64	0.23	0.90	1	2886.48
STMP88	CIRCULAR	0.75	0.44	0.19	0.75	1	1069.45
STMP89	CIRCULAR	0.75	0.44	0.19	0.75	1	1443.65
STMP9	CIRCULAR	0.75	0.44	0.19	0.75	1	1054.66
STMP90	CIRCULAR	1.20	1.13	0.30	1.20	1	3602.16
STMP914	CIRCULAR	0.60	0.28	0.15	0.60	1	1030.27
STMP915	CIRCULAR	0.60	0.28	0.15	0.60	1	818.35
STMP964	CIRCULAR	0.90	0.64	0.23	0.90	1	1273.68
STMP98	CIRCULAR	0.90	0.64	0.23	0.90	1	4321.53
STMP99	CIRCULAR	0.90	0.64	0.23	0.90	1	3006.49
SYMP182	CIRCULAR	0.75	0.44	0.19	0.75	1	1726.93

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Control Actions Taken
****

********** Runoff Quantity Continuity **********	Volume hectare-m	Depth mm
Total Precipitation	11.159	11.910
Evaporation Loss	0.000	0.000
Infiltration Loss	7.199	7.684
Surface Runoff	3.543	3.782
Final Surface Storage	0.521	0.557
Continuity Error (%)	-0.940	

********** Flow Routing Continuity **********	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	3.541	35.406
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	3.465	34.647
Internal Outflow	0.075	0.750
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.005	0.046
Continuity Error (%)	-0.103	

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Time-Step Critical Elements
****
Link STMP749 (55.81%)
Link STMP1513 (13.34%)
Link C98 (8.24%)
Link STMP12 (8.20%)
Link STMP1604 (2.09%)

****
Highest Flow Instability Indexes
****
Link STMP101 (18)
Link STMP1516 (13)
Link STMP1513 (8)
Link STMP692 (7)
Link STMP393 (6)

****
Routing Time Step Summary
****
Minimum Time Step : 0.50 sec
Average Time Step : 4.34 sec
Maximum Time Step : 30.00 sec

Percent in Steady State : 0.00
Average Iterations per Step : 3.64
Percent Not Converging : 21.70

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Subcatchment Runoff Summary
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Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
S13-A	11.91	0.00	0.00	3.57	7.52	1.09	1101.81	0.632
S13-B	11.91	0.00	0.00	3.57	7.48	1.06	919.77	0.628
S13-C	11.91	0.00	0.00	4.05	7.09	0.36	354.01	0.595
S13-D	11.91	0.00	0.00	2.74	8.31	0.24	269.81	0.698
S13-E	11.91	0.00	0.00	3.81	7.32	0.38	405.12	0.614
S13-F	11.91	0.00	0.00	5.96	5.32	0.41	304.69	0.446
S13-G	11.91	0.00	0.00	6.19	5.20	0.07	81.42	0.437
S13-H	11.91	0.00	0.00	5.12	6.20	0.09	109.49	0.521
S23-A	11.91	0.00	0.00	3.69	7.36	1.16	949.59	0.618
S23-B	11.91	0.00	0.00	4.41	6.80	0.27	304.43	0.571
S23-C	11.91	0.00	0.00	6.55	4.85	0.38	426.29	0.407
S25-A	11.91	0.00	0.00	4.64	6.44	1.46	906.73	0.541
S25-B	11.91	0.00	0.00	5.36	5.91	0.40	409.04	0.497
S25-C	11.91	0.00	0.00	5.72	5.59	0.41	412.37	0.469
S25-D	11.91	0.00	0.00	5.36	5.90	0.63	606.06	0.495
S25-E	11.91	0.00	0.00	6.07	5.27	0.54	557.97	0.443
S25-F	11.91	0.00	0.00	6.67	4.68	1.95	1487.03	0.393
S25-G	11.91	0.00	0.00	6.07	5.29	0.17	199.53	0.444
S25-H	11.91	0.00	0.00	7.03	4.43	0.15	174.09	0.372
S25-I	11.91	0.00	0.00	3.93	7.17	1.45	1320.42	0.602
S25-J	11.91	0.00	0.00	3.33	7.64	1.87	1346.74	0.642
S32-A	11.91	0.00	0.00	5.96	4.64	2.52	662.13	0.389
S32-B	11.91	0.00	0.00	5.96	5.32	0.29	213.76	0.446
S38-A	11.91	0.00	0.00	2.50	8.50	1.38	1451.66	0.714
S38-B	11.91	0.00	0.00	2.86	8.18	1.50	1566.27	0.686
S38-C	11.91	0.00	0.00	2.50	8.49	0.71	731.68	0.713
S38-D	11.91	0.00	0.00	3.22	7.83	0.37	355.11	0.658
S38-Z1	11.91	0.00	0.00	10.72	1.13	1.54	1732.17	0.095
S38-Z2	11.91	0.00	0.00	10.72	1.15	0.07	72.39	0.096
S3-A	11.91	0.00	0.00	4.41	6.78	0.58	615.67	0.569

S3-B	11.91	0.00	0.00	4.53	6.68	0.13	146.59	0.561
S3-C	11.91	0.00	0.00	4.64	6.57	0.23	258.23	0.552
S3-D	11.91	0.00	0.00	2.38	8.64	0.18	207.99	0.725
S3-E	11.91	0.00	0.00	2.86	8.21	0.49	555.35	0.689
S3-F	11.91	0.00	0.00	5.00	6.44	0.12	141.39	0.541
S3-G	11.91	0.00	0.00	4.76	6.57	0.21	247.89	0.551
S3-Z1	11.91	0.00	0.00	10.72	1.10	2.66	3065.02	0.093
S4-A	11.91	0.00	0.00	2.74	8.36	0.32	371.22	0.702
S4-B	11.91	0.00	0.00	2.38	8.55	0.35	298.23	0.718
S4-C	11.91	0.00	0.00	3.22	7.84	0.53	519.18	0.658
S5-A	11.91	0.00	0.00	4.29	6.88	0.62	643.06	0.578
S5-B	11.91	0.00	0.00	2.38	8.58	0.15	142.99	0.721
S5-C	11.91	0.00	0.00	2.38	8.57	0.21	199.59	0.720
S5-D	11.91	0.00	0.00	2.38	8.59	0.11	108.87	0.721
S5-E	11.91	0.00	0.00	2.50	8.50	0.34	360.39	0.714
S5-F	11.91	0.00	0.00	2.38	8.64	0.09	100.86	0.726
S5-G	11.91	0.00	0.00	2.74	8.21	0.34	273.90	0.690
S5-H	11.91	0.00	0.00	3.22	7.77	0.29	220.76	0.652
S5-I	11.91	0.00	0.00	3.45	7.64	0.78	835.16	0.642
S5-J	11.91	0.00	0.00	4.76	6.50	0.38	444.25	0.546
S5-K	11.91	0.00	0.00	5.48	5.81	1.67	1794.36	0.488
S5-Z1	11.91	0.00	0.00	10.72	1.13	0.99	1113.72	0.095
S7-A	11.91	0.00	0.00	5.24	5.99	0.45	395.72	0.503
S7-B	11.91	0.00	0.00	9.29	2.41	0.09	108.79	0.203
S13-I	11.91	0.00	0.00	0.85	8.95	0.19	151.97	0.752

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Node Depth Summary
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J1	JUNCTION	0.31	2.90	447.82	0 00:20
STMH286	JUNCTION	0.49	3.40	447.71	0 00:19
STMH56	JUNCTION	0.53	3.20	447.18	0 00:19
STMH54	JUNCTION	0.59	4.10	447.07	0 00:19
STMH178	JUNCTION	0.82	3.20	444.49	0 00:18
STMH177	JUNCTION	0.65	2.60	443.38	0 00:19
STMH398	JUNCTION	0.40	1.48	441.90	0 00:20
STMH188	JUNCTION	0.26	3.40	449.42	0 00:21

STMH64	JUNCTION	0.26	3.40	448.96	0	00:21
STMH161	JUNCTION	0.33	3.00	447.09	0	00:20
STMH165	JUNCTION	0.54	3.60	447.16	0	00:19
STMH63	JUNCTION	0.26	3.11	448.19	0	00:21
STMH62	JUNCTION	0.23	2.80	447.78	0	00:21
STMH77	JUNCTION	0.21	0.52	454.67	0	00:20
STMH74	JUNCTION	0.20	0.50	453.37	0	00:20
STMH83	JUNCTION	0.67	3.00	444.98	0	00:18
STMH79	JUNCTION	0.72	2.60	443.98	0	00:18
STMH235	JUNCTION	0.49	1.90	444.34	0	00:18
J22	JUNCTION	0.43	1.90	444.65	0	00:18
STMH139	JUNCTION	0.40	2.64	455.73	0	00:19
STMH138	JUNCTION	0.41	2.81	455.80	0	00:19
STMH183	JUNCTION	0.41	2.79	455.55	0	00:19
STMH6	JUNCTION	0.43	2.48	454.96	0	00:19
STMH7	JUNCTION	0.44	2.49	454.59	0	00:19
STMH184	JUNCTION	0.46	2.49	454.38	0	00:19
STMH185	JUNCTION	0.45	2.53	454.28	0	00:19
STMH12	JUNCTION	0.46	2.70	454.39	0	00:19
J33	JUNCTION	0.32	2.20	461.28	0	00:19
J34	JUNCTION	0.08	0.20	455.56	0	00:20
STMH17	JUNCTION	0.12	0.31	454.30	0	00:20
STMH254	JUNCTION	0.15	0.35	453.59	0	00:21
STMH93	JUNCTION	0.21	0.49	452.37	0	00:21
J37	JUNCTION	0.18	0.42	453.91	0	00:21
J38	JUNCTION	0.08	0.21	454.57	0	00:20
STMH190	JUNCTION	0.53	3.76	453.48	0	00:20
STMH133	JUNCTION	0.50	3.39	453.67	0	00:20
STMH135	JUNCTION	0.43	3.80	454.81	0	00:20
STMH131	JUNCTION	0.58	3.63	454.84	0	00:20
STMH196	JUNCTION	0.49	3.00	454.69	0	00:20
STMH137	JUNCTION	0.30	2.60	455.88	0	00:20
STMH15	JUNCTION	0.23	1.37	455.64	0	00:20
J46	JUNCTION	0.18	0.51	455.82	0	00:20
STMH4	JUNCTION	0.18	3.10	455.67	0	00:20
STMH216	JUNCTION	0.23	3.10	455.25	0	00:19
STMH197	JUNCTION	0.37	2.49	454.44	0	00:20
STMH2	JUNCTION	0.24	1.80	454.86	0	00:21
STMH28	JUNCTION	0.50	1.90	455.10	0	00:18
STMH147	JUNCTION	0.46	2.48	456.23	0	00:18
STMH194	JUNCTION	0.50	1.80	455.80	0	00:17
STMH253	JUNCTION	0.59	2.00	456.49	0	00:17
J56	JUNCTION	0.27	2.60	457.98	0	00:18
STMH212	JUNCTION	0.49	1.20	456.05	0	00:16

STMH298	JUNCTION	0.18	0.43	440.70	0	00:21
STMH297	JUNCTION	0.22	0.56	441.20	0	00:20
STMH26	JUNCTION	0.06	0.13	452.62	0	00:20
STMH22	JUNCTION	0.12	0.26	454.45	0	00:20
STMH23	JUNCTION	0.22	2.10	456.48	0	00:19
STMH225	JUNCTION	0.31	2.22	452.41	0	00:19
STMH226	JUNCTION	0.53	3.04	451.10	0	00:20
STMH202	JUNCTION	0.27	0.60	447.31	0	00:22
STMH38	JUNCTION	0.31	2.75	447.45	0	00:21
STMH205	JUNCTION	0.27	2.42	444.32	0	00:20
STMH204	JUNCTION	0.51	3.06	444.01	0	00:21
STMH109	JUNCTION	0.48	1.85	442.32	0	00:20
STMH37	JUNCTION	0.45	2.50	453.12	0	00:19
STMH244	JUNCTION	0.44	1.80	441.60	0	00:20
STMH362	JUNCTION	0.41	0.89	440.34	0	00:22
J73	JUNCTION	0.15	0.31	439.59	0	00:21
J74	JUNCTION	0.16	0.37	438.64	0	00:22
J75	JUNCTION	0.18	0.38	438.00	0	00:23
J76	JUNCTION	0.00	0.00	437.10	0	00:00
J77	JUNCTION	0.38	0.64	442.64	0	00:23
J78	JUNCTION	0.24	0.50	438.50	0	00:23
J79	JUNCTION	0.26	0.79	455.57	0	00:20
STMH116	JUNCTION	0.30	2.30	456.30	0	00:19
DRCB64	JUNCTION	0.19	0.46	451.82	0	00:20
DRCB40	JUNCTION	0.27	0.65	446.26	0	00:20
J83	JUNCTION	0.23	0.60	459.09	0	00:20
J84	JUNCTION	0.09	0.18	437.54	0	00:20
J85	JUNCTION	0.16	0.42	457.79	0	00:19
STMH78	JUNCTION	0.23	0.62	447.25	0	00:20
J86	JUNCTION	0.44	2.50	460.96	0	00:18
J87	JUNCTION	0.08	0.21	458.78	0	00:20
J88	JUNCTION	0.08	0.21	458.46	0	00:20
J89	JUNCTION	0.00	0.00	456.77	0	00:00
J90	JUNCTION	0.00	0.00	459.23	0	00:00
J91	JUNCTION	0.00	0.00	457.00	0	00:00
DRCB258	JUNCTION	0.21	0.34	440.13	0	00:35
DRCB260	JUNCTION	0.48	1.22	440.17	0	00:33
J94	JUNCTION	0.17	0.22	437.06	0	00:34
STMH246-DIV	JUNCTION	0.18	0.51	456.43	0	00:20
DROF13	OUTFALL	0.39	0.90	441.11	0	00:20
DROF38	OUTFALL	0.55	1.05	441.90	0	00:17
DROF3	OUTFALL	0.44	1.20	452.54	0	00:19
DROF4	OUTFALL	0.21	0.49	452.10	0	00:21
DROF5	OUTFALL	0.51	1.20	450.65	0	00:19

DROF7	OUTFALL	0.18	0.43	440.45	0	00:21
DROF25	OUTFALL	0.38	0.64	440.64	0	00:23
DROF23	OUTFALL	0.27	0.64	444.54	0	00:21
DRFI2017	OUTFALL	0.17	0.22	436.64	0	00:35

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	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	151.87	383.42	0 00:20	0.19	0.195	-0.260
STMH286	JUNCTION	1101.01	1183.53	0 00:19	1.09	1.27	0.009
STMH56	JUNCTION	0.00	1145.11	0 00:21	0	1.27	0.025
STMH54	JUNCTION	404.81	2677.85	0 00:21	0.382	3.28	-0.046
STMH178	JUNCTION	304.59	2967.92	0 00:21	0.408	3.69	0.004
STMH177	JUNCTION	81.35	2758.87	0 00:22	0.0703	3.74	-0.007
STMH398	JUNCTION	109.38	2843.71	0 00:21	0.0944	3.83	0.009
STMH188	JUNCTION	919.29	919.29	0 00:20	1.06	1.06	0.030
STMH64	JUNCTION	0.00	920.94	0 00:20	0	1.06	0.001
STMH161	JUNCTION	269.57	1167.41	0 00:20	0.237	1.3	-0.087
STMH165	JUNCTION	353.77	1435.10	0 00:20	0.357	1.61	-0.077
STMH63	JUNCTION	0.00	914.27	0 00:20	0	1.06	-0.013
STMH62	JUNCTION	0.00	933.88	0 00:20	0	1.06	-0.053
STMH77	JUNCTION	0.00	3212.55	0 00:20	0	2.98	0.002
STMH74	JUNCTION	0.00	3227.50	0 00:20	0	2.98	-0.005
STMH83	JUNCTION	0.00	3953.33	0 00:21	0	4.84	0.043
STMH79	JUNCTION	354.88	3967.42	0 00:20	0.37	5.19	-0.254
STMH235	JUNCTION	0.00	1701.26	0 00:21	0	1.48	-0.595
J22	JUNCTION	1565.07	1565.07	0 00:20	1.5	1.5	0.550
STMH139	JUNCTION	0.00	3674.32	0 00:20	0	3.47	-0.008
STMH138	JUNCTION	207.81	3866.06	0 00:20	0.182	3.65	0.024
STMH183	JUNCTION	0.00	3867.49	0 00:20	0	3.65	0.004
STMH6	JUNCTION	258.01	4106.83	0 00:20	0.234	3.89	0.026
STMH7	JUNCTION	146.47	4242.87	0 00:20	0.132	4.02	-0.021
STMH184	JUNCTION	0.00	4243.39	0 00:20	0	4.02	-0.008
STMH185	JUNCTION	0.00	4243.54	0 00:20	0	4.02	0.000
STMH12	JUNCTION	615.18	4819.32	0 00:20	0.579	4.6	0.008
J33	JUNCTION	3203.31	3203.31	0 00:20	2.79	2.79	-0.478

J34	JUNCTION	370.87	370.87	0	00:20	0.32	0.32	0.034
STMH17	JUNCTION	0.00	364.34	0	00:20	0	0.32	-0.027
STMH254	JUNCTION	0.00	642.63	0	00:21	0	0.668	0.059
STMH93	JUNCTION	518.83	1102.19	0	00:21	0.53	1.2	0.005
J37	JUNCTION	298.08	648.54	0	00:20	0.349	0.669	0.030
J38	JUNCTION	0.00	362.49	0	00:20	0	0.32	-0.002
STMH190	JUNCTION	0.00	4761.91	0	00:21	0	5.68	-0.009
STMH133	JUNCTION	642.56	4758.60	0	00:21	0.616	5.68	0.010
STMH135	JUNCTION	142.90	4310.64	0	00:20	0.149	5.07	0.010
STMH131	JUNCTION	199.47	4174.68	0	00:20	0.214	4.92	0.021
STMH196	JUNCTION	108.79	3983.31	0	00:20	0.11	4.7	-0.001
STMH137	JUNCTION	0.00	2905.72	0	00:20	0	2.75	-0.023
STMH15	JUNCTION	100.77	2984.43	0	00:20	0.0882	2.75	-0.001
J46	JUNCTION	2905.54	2905.54	0	00:20	2.66	2.66	0.010
STMH4	JUNCTION	360.11	360.11	0	00:20	0.341	0.341	-0.037
STMH216	JUNCTION	0.00	358.03	0	00:20	0	0.341	-0.037
STMH197	JUNCTION	0.00	1003.46	0	00:23	0	1.51	0.023
STMH2	JUNCTION	273.78	916.01	0	00:20	0.337	1.51	-0.004
STMH28	JUNCTION	0.00	642.16	0	00:20	0	1.17	-0.038
STMH147	JUNCTION	220.68	642.03	0	00:19	0.288	1.17	0.018
STMH194	JUNCTION	0.00	533.34	0	00:17	0	0.882	-0.036
STMH253	JUNCTION	0.00	716.51	0	00:17	0	0.883	-0.120
J56	JUNCTION	443.84	443.84	0	00:20	0.384	0.384	-0.189
STMH212	JUNCTION	834.50	857.21	0	00:20	0.785	0.785	0.040
STMH298	JUNCTION	0.00	479.00	0	00:21	0	0.541	0.063
STMH297	JUNCTION	108.69	498.43	0	00:20	0.0942	0.541	-0.003
STMH26	JUNCTION	0.00	394.14	0	00:20	0	0.447	0.009
STMH22	JUNCTION	0.00	395.53	0	00:20	0	0.447	0.030
STMH23	JUNCTION	395.51	395.51	0	00:20	0.447	0.447	0.010
STMH225	JUNCTION	408.74	1315.38	0	00:20	0.396	1.85	0.021
STMH226	JUNCTION	0.00	1315.38	0	00:20	0	1.85	-0.064
STMH202	JUNCTION	412.07	1643.01	0	00:21	0.406	2.26	0.049
STMH38	JUNCTION	605.67	2164.72	0	00:21	0.631	2.89	0.011
STMH205	JUNCTION	199.34	2241.71	0	00:20	0.175	3.06	0.004
STMH204	JUNCTION	0.00	2199.96	0	00:21	0	3.06	0.031
STMH109	JUNCTION	0.00	2207.22	0	00:21	0	3.06	0.037
STMH37	JUNCTION	906.59	906.59	0	00:20	1.46	1.46	0.020
STMH244	JUNCTION	173.94	2324.88	0	00:21	0.153	3.21	0.000
STMH362	JUNCTION	0.00	2325.15	0	00:21	0	3.21	-0.012
J73	JUNCTION	1486.48	3895.66	0	00:21	1.95	5.16	0.035
J74	JUNCTION	557.55	4244.75	0	00:22	0.536	5.7	0.114
J75	JUNCTION	1319.65	5118.73	0	00:23	1.45	7.14	0.058
J76	JUNCTION	0.00	6329.99	0	00:23	0	9.01	0.000
J77	JUNCTION	0.00	6329.99	0	00:23	0	9.01	0.019

J78	JUNCTION	0.00	4143.15	0	00:23	0	5.69	0.084
J79	JUNCTION	0.00	2916.42	0	00:20	0	2.66	0.008
STMH116	JUNCTION	949.16	949.16	0	00:20	1.16	1.16	0.010
DRCB64	JUNCTION	304.16	1237.59	0	00:20	0.268	1.43	0.008
DRCB40	JUNCTION	425.93	1628.38	0	00:20	0.385	1.82	0.048
J83	JUNCTION	3253.34	3253.34	0	00:20	2.99	2.98	0.013
J84	JUNCTION	1346.33	1346.33	0	00:20	1.87	1.87	-0.161
J85	JUNCTION	0.00	3044.04	0	00:20	0	2.99	-0.030
STMH78	JUNCTION	731.13	3907.48	0	00:20	0.711	3.7	0.168
J86	JUNCTION	0.00	3203.58	0	00:20	0	2.8	0.165
J87	JUNCTION	247.65	247.65	0	00:20	0.214	0.214	-0.000
J88	JUNCTION	0.00	248.59	0	00:20	0	0.214	0.068
J89	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
J90	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
J91	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
DRCB258	JUNCTION	764.86	764.86	0	00:35	2.78	2.79	0.019
DRCB260	JUNCTION	0.00	766.95	0	00:33	0	2.79	0.122
J94	JUNCTION	0.00	764.92	0	00:35	0	2.78	0.108
STMH246-DIV	JUNCTION	554.85	3586.52	0	00:20	0.486	3.47	-0.003
DROF13	OUTFALL	0.00	2843.71	0	00:21	0	3.83	0.000
DROF38	OUTFALL	0.00	3967.43	0	00:20	0	5.19	0.000
DROF3	OUTFALL	0.00	4819.82	0	00:20	0	4.6	0.000
DROF4	OUTFALL	0.00	1103.97	0	00:21	0	1.2	0.000
DROF5	OUTFALL	0.00	4765.91	0	00:21	0	5.68	0.000
DROF7	OUTFALL	0.00	478.78	0	00:21	0	0.541	0.000
DROF25	OUTFALL	0.00	6357.70	0	00:23	0	9.01	0.000
DROF23	OUTFALL	0.00	1632.94	0	00:21	0	1.81	0.000
DRFI2017	OUTFALL	0.00	768.26	0	00:35	0	2.78	0.000

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Node Surcharge Summary
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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
J1	JUNCTION	0.10	2.400	0.000
STMH286	JUNCTION	0.13	2.650	0.000
STMH56	JUNCTION	0.15	2.450	0.000
STMH54	JUNCTION	0.14	3.200	0.000

STMH178	JUNCTION	0.22	2.300	0.000
STMH177	JUNCTION	0.21	1.700	0.000
STMH398	JUNCTION	0.11	0.575	1.625
STMH188	JUNCTION	0.06	2.800	0.000
STMH64	JUNCTION	0.07	2.800	0.000
STMH161	JUNCTION	0.08	2.100	0.000
STMH165	JUNCTION	0.16	2.850	0.000
STMH63	JUNCTION	0.06	2.511	0.189
STMH62	JUNCTION	0.04	1.900	0.000
STMH83	JUNCTION	0.14	1.730	0.000
STMH79	JUNCTION	0.20	1.325	0.000
STMH235	JUNCTION	0.13	0.950	0.000
J22	JUNCTION	0.11	1.000	0.000
STMH139	JUNCTION	0.03	1.442	1.398
STMH138	JUNCTION	0.04	1.606	0.604
STMH183	JUNCTION	0.05	1.593	0.317
STMH6	JUNCTION	0.06	1.281	0.489
STMH7	JUNCTION	0.07	1.286	1.414
STMH184	JUNCTION	0.08	1.294	1.906
STMH185	JUNCTION	0.08	1.334	1.906
STMH12	JUNCTION	0.09	1.502	1.698
J33	JUNCTION	0.08	1.305	0.295
STMH190	JUNCTION	0.11	2.559	0.941
STMH133	JUNCTION	0.08	2.190	1.010
STMH135	JUNCTION	0.05	2.600	0.000
STMH131	JUNCTION	0.08	2.434	0.066
STMH196	JUNCTION	0.06	1.800	0.000
STMH137	JUNCTION	0.04	1.700	0.000
STMH15	JUNCTION	0.01	0.473	0.427
STMH4	JUNCTION	0.05	2.500	0.000
STMH216	JUNCTION	0.09	2.500	0.000
STMH197	JUNCTION	0.08	1.593	0.207
STMH2	JUNCTION	0.02	1.050	0.000
STMH28	JUNCTION	0.39	1.300	0.000
STMH147	JUNCTION	0.30	1.878	0.422
STMH194	JUNCTION	0.34	1.300	0.000
STMH253	JUNCTION	0.34	1.400	0.000
J56	JUNCTION	0.10	2.000	0.000
STMH212	JUNCTION	0.33	0.700	0.000
STMH23	JUNCTION	0.06	1.596	1.204
STMH225	JUNCTION	0.10	1.615	0.225
STMH226	JUNCTION	0.03	1.040	0.000
STMH38	JUNCTION	0.03	2.000	0.000
STMH205	JUNCTION	0.07	1.669	0.781

STMH204	JUNCTION	0.13	2.157	0.543
STMH109	JUNCTION	0.12	0.950	0.000
STMH37	JUNCTION	0.20	1.900	0.000
STMH244	JUNCTION	0.11	0.900	0.000
STMH116	JUNCTION	0.10	1.850	0.000
J86	JUNCTION	0.10	1.600	0.000
DRCB260	JUNCTION	0.16	0.421	0.279

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

Node	Hours Flooded	Maximum Rate LPS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
J1	0.02	365.25	0 00:20	0.007	0.000
STMH286	0.01	311.50	0 00:19	0.001	0.000
STMH56	0.04	222.95	0 00:21	0.016	0.000
STMH54	0.01	661.82	0 00:19	0.001	0.000
STMH178	0.04	396.50	0 00:18	0.019	0.000
STMH177	0.01	505.30	0 00:19	0.001	0.000
STMH188	0.01	29.53	0 00:21	0.000	0.000
STMH64	0.01	36.15	0 00:21	0.000	0.000
STMH161	0.01	786.63	0 00:20	0.004	0.000
STMH165	0.01	458.66	0 00:19	0.001	0.000
STMH62	0.01	351.62	0 00:21	0.002	0.000
STMH83	0.01	992.66	0 00:18	0.003	0.000
STMH79	0.01	984.39	0 00:18	0.004	0.000
STMH235	0.09	1700.93	0 00:21	0.331	0.000
J22	0.04	661.66	0 00:18	0.039	0.000
STMH135	0.01	392.70	0 00:20	0.001	0.000
STMH196	0.01	43.45	0 00:20	0.000	0.000
STMH137	0.01	215.05	0 00:20	0.000	0.000
STMH4	0.01	95.75	0 00:20	0.000	0.000
STMH216	0.01	120.95	0 00:19	0.000	0.000
STMH2	0.01	138.39	0 00:21	0.000	0.000
STMH28	0.01	189.17	0 00:18	0.001	0.000
STMH194	0.01	127.54	0 00:17	0.000	0.000
STMH253	0.01	299.63	0 00:17	0.001	0.000

J56	0.01	206.66	0	00:18	0.001	0.000
STMH212	0.24	856.52	0	00:20	0.286	0.000
STMH226	0.01	95.02	0	00:20	0.000	0.000
STMH38	0.01	83.26	0	00:21	0.000	0.000
STMH109	0.01	133.52	0	00:21	0.001	0.000
STMH37	0.01	14.30	0	00:20	0.000	0.000
STMH244	0.01	140.79	0	00:20	0.000	0.000
STMH116	0.01	43.61	0	00:19	0.000	0.000
J86	0.04	401.08	0	00:20	0.026	0.000

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
DROF13	99.56	996.94	2843.71	3.834
DROF38	99.56	1377.59	3967.43	5.194
DROF3	99.56	1247.12	4819.82	4.597
DROF4	99.56	316.91	1103.97	1.198
DROF5	99.52	1495.46	4765.91	5.680
DROF7	99.32	141.97	478.78	0.541
DROF25	99.56	2265.79	6357.70	9.008
DROF23	99.52	474.60	1632.94	1.815
DRFI2017	99.36	486.90	768.26	2.780
System	99.50	8803.28	24948.43	34.647

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Link Flow Summary
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Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C100	CONDUIT	967.67	0 00:24	1.89	1.06	1.00
C101	CONDUIT	3631.87	0 00:20	3.21	1.22	1.00

C102	CONDUIT	3967.43	0	00:20	4.58	1.81	1.00
C103	CONDUIT	3219.02	0	00:20	6.89	0.46	0.53
C104	CONDUIT	3953.33	0	00:21	5.40	0.60	0.79
C105	CONDUIT	2802.30	0	00:20	7.62	1.56	0.78
C106	CONDUIT	248.59	0	00:20	2.49	0.17	0.28
C107	CONDUIT	241.98	0	00:20	1.40	0.17	0.41
C108	CONDUIT	0.00	0	00:00	0.00	0.00	0.11
C109	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C110	CONDUIT	0.00	0	00:00	0.00	0.00	0.11
C93	CONDUIT	2916.42	0	00:20	3.14	0.51	0.71
C96	CONDUIT	3212.55	0	00:20	6.33	0.62	0.57
C98	CONDUIT	3203.58	0	00:20	6.14	0.70	1.00
C99	CONDUIT	3042.80	0	00:20	5.43	0.05	0.23
DRDI117	CONDUIT	768.26	0	00:35	2.72	0.03	0.22
DRDI27	CONDUIT	3795.47	0	00:22	2.30	0.05	0.23
DRDI28	CONDUIT	4143.15	0	00:23	1.83	0.05	0.29
DRDI4	CONDUIT	5156.62	0	00:23	4.92	0.07	0.13
DRDI5	CONDUIT	1355.16	0	00:20	3.57	0.02	0.06
DRDI6	CONDUIT	6357.70	0	00:23	5.16	0.05	0.32
STMP10	CONDUIT	920.94	0	00:20	3.28	1.15	1.00
STMP100	CONDUIT	3982.87	0	00:20	3.52	1.05	1.00
STMP101	CONDUIT	4173.55	0	00:20	3.73	1.76	1.00
STMP103	CONDUIT	1033.42	0	00:25	1.81	0.59	1.00
STMP106	CONDUIT	4200.42	0	00:21	3.76	0.92	1.00
STMP107	CONDUIT	4761.91	0	00:21	4.21	1.16	1.00
STMP1086	CONDUIT	1632.94	0	00:21	3.36	0.86	0.72
STMP11	CONDUIT	914.27	0	00:20	3.27	1.14	1.00
STMP1170	CONDUIT	764.92	0	00:35	3.95	1.03	0.69
STMP118	CONDUIT	642.23	0	00:20	2.52	2.32	1.00
STMP12	CONDUIT	933.88	0	00:20	3.87	1.18	1.00
STMP120	CONDUIT	642.16	0	00:20	2.27	1.14	1.00
STMP123	CONDUIT	1003.46	0	00:23	2.97	0.62	1.00
STMP1289	CONDUIT	393.88	0	00:20	4.51	0.21	0.66
STMP13	CONDUIT	963.46	0	00:25	3.07	0.41	1.00
STMP131	CONDUIT	4765.91	0	00:21	4.21	1.34	1.00
STMP14	CONDUIT	1127.46	0	00:21	2.40	0.44	1.00
STMP150	CONDUIT	906.64	0	00:20	3.21	1.61	1.00
STMP1513	CONDUIT	766.95	0	00:33	3.05	0.24	0.71
STMP1516	CONDUIT	2538.30	0	00:22	5.80	1.52	0.66
STMP155	CONDUIT	395.53	0	00:20	2.46	1.68	0.76
STMP156A	CONDUIT	478.78	0	00:21	2.24	0.85	0.71
STMP156B	CONDUIT	479.00	0	00:21	1.96	1.15	0.82
STMP1604	CONDUIT	2843.71	0	00:21	4.47	1.19	1.00
STMP161	CONDUIT	394.14	0	00:20	5.59	0.47	0.39

STMP170	CONDUIT	4117.15	0	00:23	4.83	0.72	0.55
STMP183	CONDUIT	2061.51	0	00:20	6.01	0.98	1.00
STMP184	CONDUIT	2207.22	0	00:21	3.47	1.33	1.00
STMP20	CONDUIT	232.68	0	00:20	1.20	0.67	1.00
STMP248	CONDUIT	2185.29	0	00:21	3.44	1.31	1.00
STMP249	CONDUIT	2325.15	0	00:21	3.68	1.39	0.99
STMP274	CONDUIT	443.87	0	00:20	1.57	0.79	1.00
STMP276	CONDUIT	635.67	0	00:21	2.49	0.45	0.56
STMP29	CONDUIT	3227.50	0	00:20	7.58	0.49	0.50
STMP308	CONDUIT	933.43	0	00:20	5.87	1.31	1.00
STMP309	CONDUIT	1217.66	0	00:20	4.61	0.93	0.88
STMP393	CONDUIT	2758.97	0	00:22	4.34	2.01	1.00
STMP394	CONDUIT	2702.69	0	00:23	4.25	1.79	1.00
STMP427	CONDUIT	1096.20	0	00:20	2.48	1.24	1.00
STMP428	CONDUIT	1431.52	0	00:20	3.24	1.23	1.00
STMP435	CONDUIT	2680.71	0	00:21	4.21	1.01	1.00
STMP521	CONDUIT	3675.52	0	00:20	3.27	1.00	1.00
STMP524	CONDUIT	364.34	0	00:20	2.68	0.17	0.35
STMP525	CONDUIT	362.49	0	00:20	3.67	0.16	0.27
STMP554	CONDUIT	4107.27	0	00:20	3.63	1.14	1.00
STMP555	CONDUIT	3867.49	0	00:20	3.42	1.08	1.00
STMP556	CONDUIT	3868.06	0	00:20	3.42	1.07	1.00
STMP591	CONDUIT	4243.39	0	00:20	3.75	1.20	1.00
STMP594	CONDUIT	4243.54	0	00:20	3.75	1.32	1.00
STMP595	CONDUIT	4244.92	0	00:20	3.75	1.30	1.00
STMP692	CONDUIT	494.69	0	00:17	2.54	1.42	1.00
STMP749	CONDUIT	2199.96	0	00:21	5.18	0.57	1.00
STMP77	CONDUIT	3674.32	0	00:20	7.08	0.49	0.78
STMP79	CONDUIT	366.71	0	00:21	1.73	0.35	0.49
STMP800	CONDUIT	533.34	0	00:17	2.72	1.53	1.00
STMP801	CONDUIT	482.07	0	00:17	2.46	1.40	1.00
STMP823	CONDUIT	364.38	0	00:20	1.29	0.55	1.00
STMP824	CONDUIT	358.03	0	00:20	2.09	0.55	1.00
STMP850	CONDUIT	2886.77	0	00:20	5.82	1.00	0.93
STMP88	CONDUIT	642.63	0	00:21	2.83	0.60	0.51
STMP89	CONDUIT	1103.97	0	00:21	3.60	0.76	0.66
STMP9	CONDUIT	1145.11	0	00:21	2.59	1.09	1.00
STMP90	CONDUIT	4819.82	0	00:20	4.26	1.34	1.00
STMP914	CONDUIT	1315.38	0	00:20	4.65	1.28	1.00
STMP915	CONDUIT	1266.87	0	00:21	4.52	1.55	1.00
STMP964	CONDUIT	1378.63	0	00:21	2.17	1.08	1.00
STMP98	CONDUIT	2905.72	0	00:20	5.86	0.67	1.00
STMP99	CONDUIT	2767.74	0	00:20	4.35	0.92	1.00
SYMP182	CONDUIT	1629.49	0	00:21	4.19	0.94	0.90

STMP187_PUMP	PUMP	6329.99	0	00:23			

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Flow Classification Summary
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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
C100	1.00	0.00	0.00	0.00	0.26	0.00	0.00	0.74	0.00	0.00
C101	1.00	0.00	0.00	0.00	0.31	0.08	0.00	0.61	0.02	0.00
C102	1.00	0.00	0.00	0.00	0.34	0.66	0.00	0.00	0.71	0.00
C103	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.92	0.00
C104	1.00	0.00	0.00	0.00	0.00	0.66	0.00	0.34	0.23	0.00
C105	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.00
C106	1.00	0.00	0.00	0.00	0.08	0.92	0.00	0.00	0.89	0.00
C107	1.00	0.00	0.00	0.00	0.53	0.47	0.00	0.00	0.54	0.00
C108	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C109	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C110	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C93	1.00	0.00	0.00	0.00	0.01	0.98	0.00	0.00	0.88	0.00
C96	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C98	1.00	0.00	0.00	0.00	0.09	0.90	0.00	0.00	0.89	0.00
C99	1.00	0.00	0.00	0.00	0.16	0.83	0.00	0.00	0.92	0.00
DRDI117	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.74	0.00
DRDI27	1.00	0.00	0.00	0.00	0.06	0.93	0.00	0.00	0.88	0.00
DRDI28	1.00	0.00	0.00	0.00	0.82	0.17	0.00	0.00	0.74	0.00
DRDI4	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
DRDI5	1.00	0.01	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
DRDI6	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.80	0.00
STMP10	1.00	0.00	0.00	0.00	0.07	0.92	0.00	0.00	0.63	0.00
STMP100	1.00	0.00	0.00	0.00	0.20	0.80	0.00	0.00	0.76	0.00
STMP101	1.00	0.00	0.00	0.00	0.14	0.86	0.00	0.00	0.19	0.00
STMP103	1.00	0.00	0.00	0.00	0.54	0.46	0.00	0.00	0.73	0.00
STMP106	1.00	0.00	0.00	0.00	0.13	0.87	0.00	0.00	0.85	0.00
STMP107	1.00	0.00	0.00	0.00	0.14	0.85	0.00	0.00	0.81	0.00
STMP1086	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.71	0.00
STMP11	1.00	0.00	0.00	0.00	0.08	0.92	0.00	0.00	0.89	0.00
STMP1170	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
STMP118	1.00	0.00	0.00	0.00	0.36	0.63	0.00	0.00	0.05	0.00
STMP12	1.00	0.00	0.00	0.00	0.07	0.92	0.00	0.00	0.35	0.00

STMP120	1.00	0.00	0.00	0.00	0.93	0.07	0.00	0.00	0.79	0.00
STMP123	1.00	0.00	0.00	0.00	0.11	0.89	0.00	0.00	0.89	0.00
STMP1289	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.97	0.00
STMP13	1.00	0.00	0.00	0.00	0.12	0.87	0.00	0.00	0.46	0.00
STMP131	1.00	0.00	0.00	0.00	0.15	0.84	0.00	0.00	0.73	0.00
STMP14	1.00	0.00	0.00	0.00	0.23	0.77	0.00	0.00	0.89	0.00
STMP150	1.00	0.00	0.00	0.00	0.15	0.85	0.00	0.00	0.14	0.00
STMP1513	1.00	0.00	0.00	0.00	0.17	0.83	0.00	0.00	0.89	0.00
STMP1516	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.26	0.00
STMP155	1.00	0.00	0.00	0.00	0.03	0.97	0.00	0.00	0.00	0.00
STMP156A	1.00	0.00	0.00	0.00	0.01	0.98	0.00	0.00	0.71	0.00
STMP156B	1.00	0.00	0.00	0.00	0.22	0.78	0.00	0.00	0.10	0.00
STMP1604	1.00	0.00	0.00	0.00	0.15	0.85	0.00	0.00	0.72	0.00
STMP161	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.02	0.00
STMP170	1.00	0.00	0.00	0.00	0.04	0.95	0.00	0.00	0.18	0.00
STMP183	1.00	0.00	0.00	0.00	0.04	0.96	0.00	0.00	0.04	0.00
STMP184	1.00	0.00	0.00	0.00	0.19	0.81	0.00	0.00	0.85	0.00
STMP20	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.93	0.00
STMP248	1.00	0.00	0.00	0.00	0.22	0.78	0.00	0.00	0.88	0.00
STMP249	1.00	0.00	0.00	0.00	0.19	0.81	0.00	0.00	0.85	0.00
STMP274	1.00	0.00	0.00	0.00	0.97	0.03	0.00	0.00	0.84	0.00
STMP276	1.00	0.00	0.00	0.00	0.03	0.96	0.00	0.00	0.93	0.00
STMP29	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
STMP308	1.00	0.00	0.00	0.00	0.03	0.97	0.00	0.00	0.89	0.00
STMP309	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.94	0.00
STMP393	1.00	0.00	0.00	0.00	0.18	0.82	0.00	0.00	0.20	0.00
STMP394	1.00	0.00	0.00	0.00	0.35	0.64	0.00	0.00	0.80	0.00
STMP427	1.00	0.00	0.00	0.00	0.28	0.72	0.00	0.00	0.62	0.00
STMP428	1.00	0.00	0.00	0.00	0.25	0.74	0.00	0.00	0.86	0.00
STMP435	1.00	0.00	0.00	0.00	0.22	0.77	0.00	0.00	0.85	0.00
STMP521	1.00	0.00	0.00	0.00	0.14	0.86	0.00	0.00	0.67	0.00
STMP524	1.00	0.00	0.00	0.00	0.04	0.95	0.00	0.00	0.93	0.00
STMP525	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.91	0.00
STMP554	1.00	0.00	0.00	0.00	0.16	0.83	0.00	0.00	0.88	0.00
STMP555	1.00	0.00	0.00	0.00	0.13	0.87	0.00	0.00	0.87	0.00
STMP556	1.00	0.00	0.00	0.00	0.15	0.85	0.00	0.00	0.85	0.00
STMP591	1.00	0.00	0.00	0.00	0.18	0.82	0.00	0.00	0.77	0.00
STMP594	1.00	0.00	0.00	0.00	0.19	0.81	0.00	0.00	0.42	0.00
STMP595	1.00	0.00	0.00	0.00	0.24	0.75	0.00	0.00	0.65	0.00
STMP692	1.00	0.00	0.00	0.00	0.54	0.46	0.00	0.00	0.80	0.00
STMP749	1.00	0.00	0.00	0.00	0.08	0.92	0.00	0.00	0.91	0.00
STMP77	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.96	0.00
STMP79	1.00	0.00	0.00	0.00	0.84	0.16	0.00	0.00	0.91	0.00
STMP800	1.00	0.00	0.00	0.00	0.44	0.56	0.00	0.00	0.79	0.00

STMP801	1.00	0.00	0.00	0.00	0.78	0.22	0.00	0.00	0.78	0.00
STMP823	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.90	0.00
STMP824	1.00	0.00	0.00	0.00	0.16	0.83	0.00	0.00	0.88	0.00
STMP850	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.09	0.00
STMP88	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.21	0.00
STMP89	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.67	0.00
STMP9	1.00	0.00	0.00	0.00	0.24	0.75	0.00	0.00	0.80	0.00
STMP90	1.00	0.00	0.00	0.00	0.14	0.85	0.00	0.00	0.78	0.00
STMP914	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.96	0.00	0.00
STMP915	1.00	0.00	0.00	0.00	0.03	0.97	0.00	0.00	0.04	0.00
STMP964	1.00	0.00	0.00	0.00	0.26	0.15	0.00	0.58	0.05	0.00
STMP98	1.00	0.00	0.00	0.00	0.03	0.97	0.00	0.00	0.90	0.00
STMP99	1.00	0.00	0.00	0.00	0.24	0.75	0.00	0.00	0.89	0.00
SYMP182	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.90	0.00

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Conduit Surcharge Summary
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Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C100	0.14	0.14	0.14	0.01	0.04
C101	0.16	0.16	0.16	0.12	0.10
C102	0.24	0.24	0.24	0.27	0.24
C105	0.01	0.01	0.01	0.13	0.01
C93	0.01	0.01	0.01	0.01	0.01
C98	0.08	0.08	0.08	0.01	0.01
STMP10	0.06	0.06	0.06	0.05	0.03
STMP100	0.06	0.06	0.07	0.04	0.04
STMP101	0.05	0.05	0.05	0.17	0.04
STMP103	0.08	0.08	0.08	0.01	0.01
STMP106	0.05	0.05	0.05	0.01	0.01
STMP107	0.08	0.08	0.08	0.08	0.07
STMP11	0.06	0.06	0.06	0.04	0.01
STMP1170	0.01	0.01	0.01	0.08	0.01
STMP118	0.04	0.04	0.04	0.50	0.04
STMP12	0.06	0.06	0.06	0.05	0.02
STMP120	0.30	0.30	0.30	0.21	0.20
STMP123	0.02	0.02	0.02	0.01	0.01
STMP13	0.04	0.04	0.04	0.01	0.01

STMP131	0.11	0.11	0.11	0.13	0.11
STMP14	0.08	0.08	0.08	0.01	0.01
STMP150	0.10	0.10	0.10	0.27	0.10
STMP1516	0.01	0.01	0.01	0.17	0.01
STMP155	0.01	0.01	0.01	0.16	0.01
STMP156B	0.01	0.01	0.01	0.06	0.01
STMP1604	0.11	0.11	0.11	0.13	0.11
STMP170	0.01	0.01	0.01	0.32	0.01
STMP183	0.03	0.03	0.03	0.01	0.01
STMP184	0.12	0.12	0.12	0.16	0.12
STMP20	0.10	0.10	0.10	0.01	0.01
STMP248	0.11	0.11	0.11	0.16	0.11
STMP249	0.01	0.01	0.01	0.17	0.01
STMP274	0.10	0.10	0.10	0.01	0.01
STMP308	0.02	0.02	0.02	0.11	0.02
STMP393	0.11	0.11	0.11	0.28	0.11
STMP394	0.21	0.21	0.21	0.25	0.21
STMP427	0.15	0.15	0.15	0.07	0.05
STMP428	0.16	0.16	0.16	0.06	0.05
STMP435	0.14	0.14	0.15	0.01	0.01
STMP521	0.03	0.03	0.03	0.01	0.01
STMP554	0.06	0.06	0.06	0.04	0.03
STMP555	0.04	0.04	0.04	0.03	0.02
STMP556	0.05	0.05	0.05	0.02	0.02
STMP591	0.07	0.07	0.07	0.06	0.04
STMP594	0.08	0.08	0.08	0.09	0.08
STMP595	0.08	0.08	0.08	0.09	0.07
STMP692	0.33	0.33	0.33	0.40	0.32
STMP749	0.07	0.07	0.07	0.01	0.01
STMP800	0.34	0.34	0.34	0.40	0.34
STMP801	0.32	0.32	0.32	0.02	0.01
STMP823	0.09	0.09	0.09	0.01	0.01
STMP824	0.05	0.05	0.05	0.01	0.01
STMP850	0.01	0.01	0.01	0.01	0.01
STMP9	0.13	0.13	0.13	0.03	0.03
STMP90	0.08	0.08	0.08	0.10	0.08
STMP914	0.10	0.10	0.10	0.12	0.10
STMP915	0.01	0.01	0.01	0.24	0.01
STMP964	0.11	0.11	0.11	0.03	0.04
STMP98	0.01	0.01	0.01	0.01	0.01
STMP99	0.04	0.04	0.04	0.01	0.01

****

Pumping Summary
****

Pump	Percent Utilized	Number of Start-Ups	Min Flow LPS	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr	Power Usage Kw-hr	% Time Off Pump Curve Low	% Time Off Pump Curve High
STMP187_PUMP	97.50	1	0.00	2269.42	6329.99	9.008	132.19	0.0	0.0

Analysis begun on: Thu Sep 01 15:53:35 2016
Analysis ended on: Thu Sep 01 15:53:36 2016
Total elapsed time: 00:00:01

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.007)
--------------------------------------------------------------

WARNING 02: maximum depth increased for Node J77

***********************************************************
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 ..... LPS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... DYNWAVE
Starting Date ..... NOV-05-2015 00:00:00
Ending Date ..... NOV-05-2015 03:00:00
Antecedent Dry Days ..... 0.0
Report Time Step ..... 00:05:00
Wet Time Step ..... 00:05:00
Dry Time Step ..... 00:05:00
Routing Time Step ..... 30.00 sec
Variable Time Step ..... YES
Maximum Trials ..... 8
Head Tolerance ..... 0.004921 m


*************
Element Count
*************
Number of rain gages ..... 1
Number of subcatchments ... 55
Number of nodes ..... 100
```



```
Number of links ..... 91
Number of pollutants ..... 0
Number of land uses ..... 0


****************
Raingage Summary
****************
                                                  Data       Recording
Name                 Data Source                  Type       Interval
------------------------------------------------------------------------
_Current             CityIDF_AES_1hr_100yr        VOLUME      5 min.


*******************
Subcatchment Summary
*******************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
------------------------------------------------------------------------------------------
S13-A                      14.43   1550.00     70.00    2.5000 _Current             STMH286
S13-B                      14.18   1060.00     70.00    1.9000 _Current             STMH188
S13-C                       5.03    705.00     66.00    1.1000 _Current             STMH165
S13-D                       2.85    632.00     77.00    3.2000 _Current             STMH161
S13-E                       5.22    727.00     68.00    2.1000 _Current             STMH54
S13-F                       7.67    569.00     50.00    0.5000 _Current             STMH178
S13-G                       1.35    351.00     48.00    2.0000 _Current             STMH177
S13-H                       1.52    473.00     57.00    3.1000 _Current             STMH398
S23-A                      15.82   1095.00     69.00    1.6000 _Current             STMH116
S23-B                       3.94    770.00     63.00    2.6000 _Current             DRCB64
S23-C                       7.93    966.00     45.00    2.1000 _Current             DRCB40
S25-A                      22.61    902.00     61.00    1.3000 _Current             STMH37
S25-B                       6.70    737.00     55.00    1.7000 _Current             STMH225
S25-C                       7.26    921.00     52.00    1.0000 _Current             STMH202
S25-D                      10.70   1063.00     55.00    1.2000 _Current             STMH38
S25-E                      10.16   1039.00     49.00    1.7000 _Current             J74
S25-F                      41.71   2239.00     44.00    0.8000 _Current             J73
S25-G                       3.30    633.00     49.00    1.9000 _Current             STMH205
S25-H                       3.45    674.00     41.00    1.2000 _Current             STMH244
S25-I                      20.24   1568.00     67.00    2.1000 _Current             J75
S25-J                      24.53   1501.00     72.00    1.3000 _Current             J84
S32-A                      54.37    400.00     50.00    0.5000 _Current             DRCB258
S32-B                       5.37    400.00     50.00    0.5000 _Current             DRCB258
S38-A                      16.25   1798.00     79.00    4.1000 _Current             J83
S38-B                      18.36   1574.00     76.00    5.9000 _Current             J22
```



```
S38-C                       8.37    802.00     79.00    4.5000 _Current             STMH78
S38-D                       4.72    558.00     73.00    1.5000 _Current             STMH79
S38-Z1                    136.40   7480.00     10.00   30.3000 _Current             J83
S38-Z2                      5.70   1120.00     10.00   10.4000 _Current             J83
S3-A                        8.53    955.00     63.00    2.9000 _Current             STMH12
S3-B                        1.98    392.00     62.00    1.5000 _Current             STMH7
S3-C                        3.55    735.00     61.00    1.3000 _Current             STMH6
S3-D                        2.11    617.00     80.00    2.1000 _Current             STMH138
S3-E                        5.92    588.00     76.00   17.2000 _Current             STMH246-DIV
S3-F                        1.92    586.00     58.00   13.7000 _Current             J33
S3-G                        3.26    655.00     60.00   13.0000 _Current             J87
S3-Z1                     241.50   6550.00     10.00   34.0000 _Current             J33
S4-A                        3.83    547.00     77.00   19.1000 _Current             J34
S4-B                        4.08    379.00     80.00    1.5000 _Current             J37
S4-C                        6.76    577.00     73.00    3.3000 _Current             STMH93
S5-A                        8.95    974.00     64.00    2.6000 _Current             STMH133
S5-B                        1.74    288.00     80.00    0.9000 _Current             STMH135
S5-C                        2.50    464.00     80.00    0.6000 _Current             STMH131
S5-D                        1.28    206.00     80.00    1.2000 _Current             STMH196
S5-E                        4.01    610.00     79.00    2.3000 _Current             STMH4
S5-F                        1.02    184.00     80.00    6.0000 _Current             STMH15
S5-G                        4.10    727.00     77.00    0.3000 _Current             STMH2
S5-H                        3.71    473.00     73.00    0.4000 _Current             STMH147
S5-I                       10.27    885.00     71.00    6.2000 _Current             STMH212
S5-J                        5.91    831.00     60.00    9.1000 _Current             J56
S5-K                       28.67   1446.00     54.00   11.9000 _Current             J46
S5-Z1                      87.70   4910.00     10.00   36.0000 _Current             J46
S7-A                        7.47    684.00     56.00    0.9000 _Current             STMH23
S7-B                        3.90    411.00     22.00    7.3000 _Current             STMH297
S13-I                       2.12    370.00     60.00    1.0000 _Current             J1


************
Node Summary
************
                                    Invert      Max.    Ponded    External
Name                 Type            Elev.     Depth      Area    Inflow
------------------------------------------------------------------------
J1                   JUNCTION       444.92      2.90       0.0
STMH286              JUNCTION       444.31      3.40       0.0
STMH56               JUNCTION       443.98      3.20       0.0
STMH54               JUNCTION       442.97      4.10       0.0
STMH178              JUNCTION       441.29      3.20       0.0
STMH177              JUNCTION       440.78      2.60       0.0
```



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STMH398              JUNCTION       440.42      3.10       0.0
STMH188              JUNCTION       446.02      3.40       0.0
STMH64               JUNCTION       445.56      3.40       0.0
STMH161              JUNCTION       444.09      3.00       0.0
STMH165              JUNCTION       443.56      3.60       0.0
STMH63               JUNCTION       445.08      3.30       0.0
STMH62               JUNCTION       444.98      2.80       0.0
STMH77               JUNCTION       454.15      2.20       0.0
STMH74               JUNCTION       452.88      3.20       0.0
STMH83               JUNCTION       441.98      3.00       0.0
STMH79               JUNCTION       441.38      2.60       0.0
STMH235              JUNCTION       442.44      1.90       0.0
J22                  JUNCTION       442.75      1.90       0.0
STMH139              JUNCTION       453.09      4.04       0.0
STMH138              JUNCTION       452.99      3.41       0.0
STMH183              JUNCTION       452.76      3.11       0.0
STMH6                JUNCTION       452.48      2.97       0.0
STMH7                JUNCTION       452.10      3.90       0.0
STMH184              JUNCTION       451.89      4.40       0.0
STMH185              JUNCTION       451.75      4.44       0.0
STMH12               JUNCTION       451.69      4.40       0.0
J33                  JUNCTION       459.08      2.50       0.0
J34                  JUNCTION       455.36      2.50       0.0
STMH17               JUNCTION       453.99      1.60       0.0
STMH254              JUNCTION       453.24      2.60       0.0
STMH93               JUNCTION       451.88      3.90       0.0
J37                  JUNCTION       453.49      2.00       0.0
J38                  JUNCTION       454.36      2.50       0.0
STMH190              JUNCTION       449.72      4.70       0.0
STMH133              JUNCTION       450.28      4.40       0.0
STMH135              JUNCTION       451.01      3.80       0.0
STMH131              JUNCTION       451.21      3.70       0.0
STMH196              JUNCTION       451.69      3.00       0.0
STMH137              JUNCTION       453.28      2.60       0.0
STMH15               JUNCTION       454.27      1.80       0.0
J46                  JUNCTION       455.31      5.00       0.0
STMH4                JUNCTION       452.57      3.10       0.0
STMH216              JUNCTION       452.15      3.10       0.0
STMH197              JUNCTION       451.95      2.70       0.0
STMH2                JUNCTION       453.06      1.80       0.0
STMH28               JUNCTION       453.20      1.90       0.0
STMH147              JUNCTION       453.75      2.90       0.0
STMH194              JUNCTION       454.00      1.80       0.0
STMH253              JUNCTION       454.49      2.00       0.0
```

J56	JUNCTION	455.38	2.60	0.0
STMH212	JUNCTION	454.85	1.20	0.0
STMH298	JUNCTION	440.27	1.60	0.0
STMH297	JUNCTION	440.64	3.90	0.0
STMH26	JUNCTION	452.49	5.00	0.0
STMH22	JUNCTION	454.19	3.70	0.0
STMH23	JUNCTION	454.38	3.30	0.0
STMH225	JUNCTION	450.19	2.44	0.0
STMH226	JUNCTION	448.06	3.04	0.0
STMH202	JUNCTION	446.71	3.02	0.0
STMH38	JUNCTION	444.70	2.75	0.0
STMH205	JUNCTION	441.90	3.20	0.0
STMH204	JUNCTION	440.95	3.60	0.0
STMH109	JUNCTION	440.47	1.85	0.0
STMH37	JUNCTION	450.62	2.50	0.0
STMH244	JUNCTION	439.80	1.80	0.0
STMH362	JUNCTION	439.45	2.10	0.0
J73	JUNCTION	439.28	1.50	0.0
J74	JUNCTION	438.27	1.50	0.0
J75	JUNCTION	437.62	1.50	0.0
J76	JUNCTION	437.10	1.80	0.0
J77	JUNCTION	442.00	2.00	0.0
J78	JUNCTION	438.00	1.50	0.0
J79	JUNCTION	454.78	4.70	0.0
STMH116	JUNCTION	454.00	2.30	0.0
DRCB64	JUNCTION	451.36	2.50	0.0
DRCB40	JUNCTION	445.61	2.50	0.0
J83	JUNCTION	458.49	2.80	0.0
J84	JUNCTION	437.36	1.50	0.0
J85	JUNCTION	457.37	2.50	0.0
STMH78	JUNCTION	446.63	2.90	0.0
J86	JUNCTION	458.46	2.50	0.0
J87	JUNCTION	458.57	2.50	0.0
J88	JUNCTION	458.25	2.50	0.0
J89	JUNCTION	456.77	2.50	0.0
J90	JUNCTION	459.23	2.50	0.0
J91	JUNCTION	457.00	2.50	0.0
DRCB258	JUNCTION	439.79	1.50	0.0
DRCB260	JUNCTION	438.95	1.50	0.0
J94	JUNCTION	436.84	1.50	0.0
STMH246-DIV	JUNCTION	455.92	2.50	0.0
DROF13	OUTFALL	440.21	0.90	0.0
DROF38	OUTFALL	440.85	1.05	0.0
DROF3	OUTFALL	451.34	1.20	0.0

DROF4	OUTFALL	451.61	0.75	0.0
DROF5	OUTFALL	449.45	1.20	0.0
DROF7	OUTFALL	440.02	0.60	0.0
DROF25	OUTFALL	440.00	2.00	0.0
DROF23	OUTFALL	443.90	0.90	0.0
DRFI2017	OUTFALL	436.42	1.00	0.0

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Link Summary
****

Name	From Node	To Node	Type	Length	%Slope	Roughness
C100	STMH235	STMH83	CONDUIT	61.4	0.1515	0.0100
C101	STMH83	STMH79	CONDUIT	153.1	0.3430	0.0100
C102	STMH79	DROF38	CONDUIT	137.0	0.3831	0.0100
C103	STMH74	STMH78	CONDUIT	159.2	3.9237	0.0100
C104	STMH78	STMH83	CONDUIT	132.9	3.4096	0.0100
C105	J86	J85	CONDUIT	70.6	1.5447	0.0100
C106	J87	J88	CONDUIT	31.5	1.0172	0.0100
C107	J88	J85	CONDUIT	88.2	0.9974	0.0100
C108	J89	J34	CONDUIT	101.2	1.3931	0.0100
C109	J90	J91	CONDUIT	52.0	4.2949	0.0100
C110	J91	J34	CONDUIT	104.7	1.5661	0.0100
C93	J46	J79	CONDUIT	35.5	1.4931	0.0100
C96	J83	STMH77	CONDUIT	202.0	2.1231	0.0100
C98	J33	J86	CONDUIT	16.4	3.7740	0.0100
C99	J85	STMH246-DIV	CONDUIT	79.7	1.8201	0.0100
DRDI117	J94	DRFI2017	CONDUIT	41.6	1.0097	0.0100
DRDI27	J73	J74	CONDUIT	251.8	0.4012	0.0100
DRDI28	J74	J78	CONDUIT	67.3	0.4013	0.0100
DRDI4	J75	J76	CONDUIT	175.3	0.2966	0.0100
DRDI5	J84	J76	CONDUIT	65.5	0.3966	0.0100
DRDI6	J77	DROF25	CONDUIT	153.4	1.3036	0.0100
STMP10	STMH188	STMH64	CONDUIT	45.5	1.0110	0.0100
STMP100	STMH196	STMH131	CONDUIT	86.4	0.5557	0.0100
STMP101	STMH131	STMH135	CONDUIT	90.9	0.2201	0.0100
STMP103	STMH197	STMH196	CONDUIT	47.1	0.5524	0.0100
STMP106	STMH135	STMH133	CONDUIT	89.7	0.8139	0.0100
STMP107	STMH133	STMH190	CONDUIT	86.0	0.6511	0.0100
STMP1086	DRCB40	DROF23	CONDUIT	262.5	0.6514	0.0100
STMP11	STMH64	STMH63	CONDUIT	47.9	1.0026	0.0100
STMP1170	DRCB260	J94	CONDUIT	241.7	0.8730	0.0100
STMP118	STMH28	STMH2	CONDUIT	116.3	0.1204	0.0100

STMP12	STMH63	STMH62	CONDUIT	10.2	0.9824	0.0100
STMP120	STMH147	STMH28	CONDUIT	110.1	0.4994	0.0100
STMP123	STMH2	STMH197	CONDUIT	88.5	1.2548	0.0100
STMP1289	STMH26	STMH297	CONDUIT	27.8	47.1005	0.0100
STMP13	STMH62	STMH161	CONDUIT	89.3	0.9962	0.0100
STMP131	STMH190	DROF5	CONDUIT	54.9	0.4920	0.0100
STMP14	STMH161	STMH54	CONDUIT	92.7	1.2078	0.0100
STMP150	STMH37	STMH225	CONDUIT	86.2	0.4990	0.0100
STMP1513	DRCB258	DRCB260	CONDUIT	24.9	3.3754	0.0100
STMP1516	STMH362	J73	CONDUIT	33.6	0.5052	0.0100
STMP155	STMH23	STMH22	CONDUIT	82.8	0.2294	0.0100
STMP156A	STMH298	DROF7	CONDUIT	50.2	0.4979	0.0100
STMP156B	STMH297	STMH298	CONDUIT	136.3	0.2715	0.0100
STMP1604	STMH398	DROF13	CONDUIT	20.4	1.0300	0.0100
STMP161	STMH22	STMH26	CONDUIT	57.4	2.9625	0.0100
STMP170	J78	J75	CONDUIT	31.2	1.2184	0.0100
STMP183	STMH38	STMH205	CONDUIT	133.6	2.0956	0.0100
STMP184	STMH204	STMH109	CONDUIT	96.4	0.4981	0.0100
STMP20	J1	STMH286	CONDUIT	121.6	0.5014	0.0100
STMP248	STMH109	STMH244	CONDUIT	132.7	0.5049	0.0100
STMP249	STMH244	STMH362	CONDUIT	69.7	0.5025	0.0100
STMP274	J56	STMH253	CONDUIT	178.1	0.4998	0.0100
STMP276	STMH254	STMH93	CONDUIT	140.0	0.9714	0.0100
STMP29	STMH77	STMH74	CONDUIT	35.8	3.4248	0.0100
STMP308	STMH116	DRCB64	CONDUIT	71.1	3.7156	0.0100
STMP309	DRCB64	DRCB40	CONDUIT	215.4	2.6704	0.0100
STMP393	STMH177	STMH398	CONDUIT	105.6	0.3409	0.0100
STMP394	STMH178	STMH177	CONDUIT	124.0	0.4112	0.0100
STMP427	STMH56	STMH165	CONDUIT	112.2	0.3745	0.0100
STMP428	STMH165	STMH54	CONDUIT	92.0	0.6415	0.0100
STMP435	STMH54	STMH178	CONDUIT	132.3	1.2698	0.0100
STMP521	STMH139	STMH138	CONDUIT	19.0	0.5255	0.0100
STMP524	J38	STMH17	CONDUIT	16.1	2.3002	0.0100
STMP525	J34	J38	CONDUIT	41.6	2.4063	0.0100
STMP554	STMH6	STMH7	CONDUIT	75.5	0.5033	0.0100
STMP555	STMH138	STMH183	CONDUIT	46.0	0.5003	0.0100
STMP556	STMH183	STMH6	CONDUIT	54.9	0.5099	0.0100
STMP591	STMH7	STMH184	CONDUIT	43.1	0.4875	0.0100
STMP594	STMH184	STMH185	CONDUIT	34.9	0.4014	0.0100
STMP595	STMH185	STMH12	CONDUIT	14.4	0.4170	0.0100
STMP692	STMH194	STMH147	CONDUIT	49.5	0.5054	0.0100
STMP749	STMH205	STMH204	CONDUIT	13.4	7.1181	0.0100
STMP77	STMH246-DIV	STMH139	CONDUIT	27.8	10.2182	0.0100
STMP79	STMH17	J37	CONDUIT	94.2	0.5307	0.0100

STMP800	STMH253	STMH194	CONDUIT	97.4	0.5029	0.0100
STMP801	STMH212	STMH253	CONDUIT	72.7	0.4952	0.0100
STMP823	STMH216	STMH196	CONDUIT	67.8	0.6789	0.0100
STMP824	STMH4	STMH216	CONDUIT	62.6	0.6710	0.0100
STMP850	J79	STMH15	CONDUIT	33.9	1.5042	0.0100
STMP88	J37	STMH254	CONDUIT	45.8	0.5460	0.0100
STMP89	STMH93	DROF4	CONDUIT	27.1	0.9949	0.0100
STMP9	STMH286	STMH56	CONDUIT	62.1	0.5310	0.0100
STMP90	STMH12	DROF3	CONDUIT	69.3	0.5051	0.0100
STMP914	STMH225	STMH226	CONDUIT	43.8	1.6658	0.0100
STMP915	STMH226	STMH202	CONDUIT	128.5	1.0510	0.0100
STMP964	J22	STMH235	CONDUIT	89.5	0.2929	0.0100
STMP98	STMH15	STMH137	CONDUIT	29.4	3.3716	0.0100
STMP99	STMH137	STMH196	CONDUIT	97.5	1.6318	0.0100
SYMP182	STMH202	STMH38	CONDUIT	141.2	1.4237	0.0100
STMP187_PUMP	J76	J77	IDEAL PUMP			

****
Cross Section Summary
****

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C100	CIRCULAR	0.90	0.64	0.23	0.90	1	915.97
C101	CIRCULAR	1.20	1.13	0.30	1.20	1	2968.54
C102	CIRCULAR	1.05	0.87	0.26	1.05	1	2197.46
C103	CIRCULAR	1.05	0.87	0.26	1.05	1	7032.30
C104	CIRCULAR	1.05	0.87	0.26	1.05	1	6555.37
C105	CIRCULAR	0.75	0.44	0.19	0.75	1	1798.88
C106	CIRCULAR	0.75	0.44	0.19	0.75	1	1459.75
C107	CIRCULAR	0.75	0.44	0.19	0.75	1	1445.50
C108	CIRCULAR	0.90	0.64	0.23	0.90	1	2777.92
C109	CIRCULAR	0.90	0.64	0.23	0.90	1	4877.52
C110	CIRCULAR	0.90	0.64	0.23	0.90	1	2945.34
C93	CIRCULAR	0.90	0.64	0.23	0.90	2	2875.88
C96	CIRCULAR	1.05	0.87	0.26	1.05	1	5172.85
C98	CIRCULAR	0.90	0.64	0.23	0.90	1	4572.17
C99	TRAPEZOIDAL	2.00	5.00	0.83	4.00	1	59738.45
DRDI117	TRAPEZOIDAL	1.00	3.60	0.52	6.60	1	23389.71
DRDI27	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76654.24
DRDI28	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76659.66
DRDI4	TRAPEZOIDAL	1.50	14.25	0.98	14.00	1	76761.44
DRDI5	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76218.52

DRDI6	TRAPEZOIDAL	2.00	12.00	0.95	12.00	1	132287.57
STMP10	CIRCULAR	0.60	0.28	0.15	0.60	1	802.66
STMP100	CIRCULAR	1.20	1.13	0.30	1.20	1	3778.42
STMP101	CIRCULAR	1.20	1.13	0.30	1.20	1	2378.05
STMP103	CIRCULAR	0.90	0.64	0.23	0.90	1	1749.20
STMP106	CIRCULAR	1.20	1.13	0.30	1.20	1	4572.62
STMP107	CIRCULAR	1.20	1.13	0.30	1.20	1	4089.94
STMP1086	CIRCULAR	0.90	0.64	0.23	0.90	1	1899.52
STMP11	CIRCULAR	0.60	0.28	0.15	0.60	1	799.28
STMP1170	CIRCULAR	0.60	0.28	0.15	0.60	1	745.86
STMP118	CIRCULAR	0.60	0.28	0.15	0.60	1	276.99
STMP12	CIRCULAR	0.60	0.28	0.15	0.60	1	791.19
STMP120	CIRCULAR	0.60	0.28	0.15	0.60	1	564.13
STMP123	CIRCULAR	0.75	0.44	0.19	0.75	1	1621.26
STMP1289	CIRCULAR	0.40	0.13	0.10	0.40	1	1858.16
STMP13	CIRCULAR	0.90	0.64	0.23	0.90	1	2349.12
STMP131	CIRCULAR	1.20	1.13	0.30	1.20	1	3555.25
STMP14	CIRCULAR	0.90	0.64	0.23	0.90	1	2586.51
STMP150	CIRCULAR	0.60	0.28	0.15	0.60	1	563.87
STMP1513	CIRCULAR	0.80	0.50	0.20	0.80	1	3158.49
STMP1516	CIRCULAR	0.90	0.64	0.23	0.90	1	1672.85
STMP155	CIRCULAR	0.50	0.20	0.12	0.50	1	235.13
STMP156A	CIRCULAR	0.60	0.28	0.15	0.60	1	563.28
STMP156B	CIRCULAR	0.60	0.28	0.15	0.60	1	415.93
STMP1604	CIRCULAR	0.90	0.64	0.23	0.90	1	2388.56
STMP161	CIRCULAR	0.50	0.20	0.12	0.50	1	844.93
STMP170	CIRCULAR	0.80	0.50	0.20	0.80	3	1897.65
STMP183	CIRCULAR	0.75	0.44	0.19	0.75	1	2095.23
STMP184	CIRCULAR	0.90	0.64	0.23	0.90	1	1661.02
STMP20	CIRCULAR	0.50	0.20	0.12	0.50	1	347.62
STMP248	CIRCULAR	0.90	0.64	0.23	0.90	1	1672.29
STMP249	CIRCULAR	0.90	0.64	0.23	0.90	1	1668.40
STMP274	CIRCULAR	0.60	0.28	0.15	0.60	1	564.32
STMP276	CIRCULAR	0.75	0.44	0.19	0.75	1	1426.50
STMP29	CIRCULAR	1.05	0.87	0.26	1.05	1	6569.95
STMP308	CIRCULAR	0.45	0.16	0.11	0.45	1	714.48
STMP309	CIRCULAR	0.60	0.28	0.15	0.60	1	1304.47
STMP393	CIRCULAR	0.90	0.64	0.23	0.90	1	1374.18
STMP394	CIRCULAR	0.90	0.64	0.23	0.90	1	1509.26
STMP427	CIRCULAR	0.75	0.44	0.19	0.75	1	885.69
STMP428	CIRCULAR	0.75	0.44	0.19	0.75	1	1159.26
STMP435	CIRCULAR	0.90	0.64	0.23	0.90	1	2652.05
STMP521	CIRCULAR	1.20	1.13	0.30	1.20	1	3674.31
STMP524	CIRCULAR	0.75	0.44	0.19	0.75	1	2195.09

STMP525	CIRCULAR	0.75	0.44	0.19	0.75	1	2245.15
STMP554	CIRCULAR	1.20	1.13	0.30	1.20	1	3595.95
STMP555	CIRCULAR	1.20	1.13	0.30	1.20	1	3585.27
STMP556	CIRCULAR	1.20	1.13	0.30	1.20	1	3619.50
STMP591	CIRCULAR	1.20	1.13	0.30	1.20	1	3538.89
STMP594	CIRCULAR	1.20	1.13	0.30	1.20	1	3211.22
STMP595	CIRCULAR	1.20	1.13	0.30	1.20	1	3272.95
STMP692	CIRCULAR	0.50	0.20	0.12	0.50	1	348.98
STMP749	CIRCULAR	0.75	0.44	0.19	0.75	1	3861.49
STMP77	CIRCULAR	0.90	0.64	0.23	0.90	1	7523.31
STMP79	CIRCULAR	0.75	0.44	0.19	0.75	1	1054.36
STMP800	CIRCULAR	0.50	0.20	0.12	0.50	1	348.14
STMP801	CIRCULAR	0.50	0.20	0.12	0.50	1	345.45
STMP823	CIRCULAR	0.60	0.28	0.15	0.60	1	657.72
STMP824	CIRCULAR	0.60	0.28	0.15	0.60	1	653.92
STMP850	CIRCULAR	0.90	0.64	0.23	0.90	1	2886.48
STMP88	CIRCULAR	0.75	0.44	0.19	0.75	1	1069.45
STMP89	CIRCULAR	0.75	0.44	0.19	0.75	1	1443.65
STMP9	CIRCULAR	0.75	0.44	0.19	0.75	1	1054.66
STMP90	CIRCULAR	1.20	1.13	0.30	1.20	1	3602.16
STMP914	CIRCULAR	0.60	0.28	0.15	0.60	1	1030.27
STMP915	CIRCULAR	0.60	0.28	0.15	0.60	1	818.35
STMP964	CIRCULAR	0.90	0.64	0.23	0.90	1	1273.68
STMP98	CIRCULAR	0.90	0.64	0.23	0.90	1	4321.53
STMP99	CIRCULAR	0.90	0.64	0.23	0.90	1	3006.49
SYMP182	CIRCULAR	0.75	0.44	0.19	0.75	1	1726.93

****
Control Actions Taken
****

********** Runoff Quantity Continuity **********	Volume hectare-m	Depth mm
Total Precipitation	17.802	19.000
Evaporation Loss	0.000	0.000
Infiltration Loss	11.484	12.257
Surface Runoff	5.981	6.384
Final Surface Storage	0.526	0.561
Continuity Error (%)	-1.061	

********** Flow Routing Continuity **********	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	5.978	59.781
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	5.222	52.221
Internal Outflow	0.753	7.535
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.005	0.049
Continuity Error (%)	-0.038	

****
Time-Step Critical Elements
****
Link STMP749 (46.55%)
Link STMP1513 (19.05%)
Link STMP12 (7.71%)
Link STMP77 (6.20%)
Link C98 (5.92%)

****
Highest Flow Instability Indexes
****
Link STMP1516 (23)
Link STMP101 (14)
Link STMP249 (11)
Link STMP393 (9)
Link DRDI27 (6)

****
Routing Time Step Summary
****
Minimum Time Step : 0.50 sec
Average Time Step : 3.81 sec
Maximum Time Step : 30.00 sec

Percent in Steady State : 0.00
Average Iterations per Step : 4.34
Percent Not Converging : 29.96

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Subcatchment Runoff Summary
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Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
S13-A	19.00	0.00	0.00	5.70	12.69	1.83	1927.05	0.668
S13-B	19.00	0.00	0.00	5.70	12.61	1.79	1726.30	0.664
S13-C	19.00	0.00	0.00	6.46	11.95	0.60	626.04	0.629
S13-D	19.00	0.00	0.00	4.37	14.09	0.40	440.76	0.742
S13-E	19.00	0.00	0.00	6.08	12.35	0.64	692.03	0.650
S13-F	19.00	0.00	0.00	9.50	8.96	0.69	602.35	0.472
S13-G	19.00	0.00	0.00	9.88	8.82	0.12	131.01	0.464
S13-H	19.00	0.00	0.00	8.17	10.50	0.16	175.41	0.553
S23-A	19.00	0.00	0.00	5.89	12.40	1.96	1823.25	0.653
S23-B	19.00	0.00	0.00	7.03	11.52	0.45	498.14	0.606
S23-C	19.00	0.00	0.00	10.45	8.20	0.65	709.29	0.432
S25-A	19.00	0.00	0.00	7.41	10.87	2.46	1885.26	0.572
S25-B	19.00	0.00	0.00	8.55	9.98	0.67	709.11	0.525
S25-C	19.00	0.00	0.00	9.12	9.42	0.68	720.72	0.496
S25-D	19.00	0.00	0.00	8.55	9.94	1.06	1089.19	0.523
S25-E	19.00	0.00	0.00	9.69	8.89	0.90	962.44	0.468
S25-F	19.00	0.00	0.00	10.64	7.89	3.29	2922.11	0.415
S25-G	19.00	0.00	0.00	9.69	8.97	0.30	325.16	0.472
S25-H	19.00	0.00	0.00	11.21	7.50	0.26	284.20	0.395
S25-I	19.00	0.00	0.00	6.27	12.09	2.45	2430.55	0.636
S25-J	19.00	0.00	0.00	5.32	12.89	3.16	2694.64	0.678
S32-A	19.00	0.00	0.00	9.50	8.13	4.42	1333.29	0.428
S32-B	19.00	0.00	0.00	9.50	8.96	0.48	422.33	0.472
S38-A	19.00	0.00	0.00	3.99	14.34	2.33	2492.16	0.755
S38-B	19.00	0.00	0.00	4.56	13.79	2.53	2699.50	0.726
S38-C	19.00	0.00	0.00	3.99	14.33	1.20	1270.47	0.754
S38-D	19.00	0.00	0.00	5.13	13.20	0.62	637.97	0.695
S38-Z1	19.00	0.00	0.00	17.10	1.85	2.52	2764.35	0.097
S38-Z2	19.00	0.00	0.00	17.10	1.85	0.11	115.50	0.097
S3-A	19.00	0.00	0.00	7.03	11.45	0.98	1049.49	0.603

S3-B	19.00	0.00	0.00	7.22	11.30	0.22	243.97	0.595
S3-C	19.00	0.00	0.00	7.41	11.12	0.39	430.12	0.585
S3-D	19.00	0.00	0.00	3.80	14.64	0.31	339.28	0.771
S3-E	19.00	0.00	0.00	4.56	13.91	0.82	904.82	0.732
S3-F	19.00	0.00	0.00	7.98	10.72	0.21	225.68	0.564
S3-G	19.00	0.00	0.00	7.60	11.07	0.36	396.26	0.583
S3-Z1	19.00	0.00	0.00	17.10	1.85	4.46	4893.91	0.097
S4-A	19.00	0.00	0.00	4.37	14.16	0.54	596.52	0.745
S4-B	19.00	0.00	0.00	3.80	14.40	0.59	562.68	0.758
S4-C	19.00	0.00	0.00	5.13	13.21	0.89	923.99	0.695
S5-A	19.00	0.00	0.00	6.84	11.62	1.04	1108.23	0.611
S5-B	19.00	0.00	0.00	3.80	14.46	0.25	257.27	0.761
S5-C	19.00	0.00	0.00	3.80	14.45	0.36	363.66	0.760
S5-D	19.00	0.00	0.00	3.80	14.48	0.19	192.80	0.762
S5-E	19.00	0.00	0.00	3.99	14.35	0.58	616.70	0.755
S5-F	19.00	0.00	0.00	3.80	14.65	0.15	164.18	0.771
S5-G	19.00	0.00	0.00	4.37	13.84	0.57	526.38	0.728
S5-H	19.00	0.00	0.00	5.13	13.10	0.49	433.00	0.689
S5-I	19.00	0.00	0.00	5.51	12.90	1.33	1423.85	0.679
S5-J	19.00	0.00	0.00	7.60	11.02	0.65	716.35	0.580
S5-K	19.00	0.00	0.00	8.74	9.82	2.82	3038.99	0.517
S5-Z1	19.00	0.00	0.00	17.10	1.85	1.62	1777.38	0.097
S7-A	19.00	0.00	0.00	8.36	10.09	0.75	736.86	0.531
S7-B	19.00	0.00	0.00	14.82	4.06	0.16	173.84	0.214
S13-I	19.00	0.00	0.00	0.85	16.25	0.34	286.28	0.855

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Node Depth Summary
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J1	JUNCTION	0.61	2.90	447.82	0 00:17
STMH286	JUNCTION	0.84	3.40	447.71	0 00:17
STMH56	JUNCTION	0.86	3.20	447.18	0 00:16
STMH54	JUNCTION	0.94	4.10	447.07	0 00:16
STMH178	JUNCTION	1.13	3.20	444.49	0 00:16
STMH177	JUNCTION	0.84	2.60	443.38	0 00:16
STMH398	JUNCTION	0.47	1.54	441.96	0 00:17
STMH188	JUNCTION	0.57	3.40	449.42	0 00:17

STMH64	JUNCTION	0.52	3.40	448.96	0	00:17
STMH161	JUNCTION	0.60	3.00	447.09	0	00:17
STMH165	JUNCTION	0.89	3.60	447.16	0	00:16
STMH63	JUNCTION	0.46	3.00	448.08	0	00:17
STMH62	JUNCTION	0.43	2.80	447.78	0	00:17
STMH77	JUNCTION	0.24	0.73	454.88	0	00:20
STMH74	JUNCTION	0.23	0.76	453.64	0	00:20
STMH83	JUNCTION	0.89	3.00	444.98	0	00:15
STMH79	JUNCTION	0.92	2.60	443.98	0	00:15
STMH235	JUNCTION	0.66	1.90	444.34	0	00:15
J22	JUNCTION	0.60	1.90	444.65	0	00:16
STMH139	JUNCTION	0.55	3.07	456.16	0	00:16
STMH138	JUNCTION	0.56	2.85	455.84	0	00:20
STMH183	JUNCTION	0.56	2.74	455.50	0	00:20
STMH6	JUNCTION	0.57	2.61	455.09	0	00:19
STMH7	JUNCTION	0.57	2.61	454.71	0	00:16
STMH184	JUNCTION	0.57	2.44	454.33	0	00:16
STMH185	JUNCTION	0.56	2.65	454.40	0	00:16
STMH12	JUNCTION	0.56	3.65	455.34	0	00:16
J33	JUNCTION	0.47	2.50	461.58	0	00:18
J34	JUNCTION	0.10	0.26	455.62	0	00:20
STMH17	JUNCTION	0.14	0.40	454.39	0	00:20
STMH254	JUNCTION	0.18	0.54	453.78	0	00:21
STMH93	JUNCTION	0.26	1.50	453.38	0	00:19
J37	JUNCTION	0.21	0.64	454.13	0	00:20
J38	JUNCTION	0.10	0.28	454.64	0	00:20
STMH190	JUNCTION	0.63	4.70	454.42	0	00:17
STMH133	JUNCTION	0.65	3.56	453.84	0	00:17
STMH135	JUNCTION	0.58	3.80	454.81	0	00:17
STMH131	JUNCTION	0.76	3.70	454.91	0	00:16
STMH196	JUNCTION	0.68	3.00	454.69	0	00:17
STMH137	JUNCTION	0.47	2.60	455.88	0	00:16
STMH15	JUNCTION	0.36	1.80	456.07	0	00:17
J46	JUNCTION	0.32	4.48	459.79	0	00:17
STMH4	JUNCTION	0.36	3.10	455.67	0	00:17
STMH216	JUNCTION	0.42	3.10	455.25	0	00:16
STMH197	JUNCTION	0.55	2.70	454.65	0	00:16
STMH2	JUNCTION	0.36	1.80	454.86	0	00:17
STMH28	JUNCTION	0.65	1.90	455.10	0	00:15
STMH147	JUNCTION	0.64	2.90	456.65	0	00:15
STMH194	JUNCTION	0.66	1.80	455.80	0	00:14
STMH253	JUNCTION	0.74	2.00	456.49	0	00:14
J56	JUNCTION	0.42	2.60	457.98	0	00:15
STMH212	JUNCTION	0.59	1.20	456.05	0	00:13

STMH298	JUNCTION	0.24	1.60	441.87	0	00:18
STMH297	JUNCTION	0.34	3.90	444.54	0	00:17
STMH26	JUNCTION	0.07	0.17	452.66	0	00:20
STMH22	JUNCTION	0.14	0.40	454.59	0	00:20
STMH23	JUNCTION	0.35	2.25	456.63	0	00:19
STMH225	JUNCTION	0.59	2.44	452.63	0	00:16
STMH226	JUNCTION	0.94	3.04	451.10	0	00:17
STMH202	JUNCTION	0.47	3.02	449.73	0	00:18
STMH38	JUNCTION	0.54	2.75	447.45	0	00:18
STMH205	JUNCTION	0.47	3.20	445.10	0	00:17
STMH204	JUNCTION	0.76	3.60	444.55	0	00:18
STMH109	JUNCTION	0.65	1.85	442.32	0	00:17
STMH37	JUNCTION	0.84	2.50	453.12	0	00:16
STMH244	JUNCTION	0.55	1.80	441.60	0	00:17
STMH362	JUNCTION	0.48	1.56	441.01	0	00:19
J73	JUNCTION	0.17	0.39	439.67	0	00:20
J74	JUNCTION	0.20	0.49	438.76	0	00:21
J75	JUNCTION	0.22	0.48	438.10	0	00:21
J76	JUNCTION	0.00	0.00	437.10	0	00:00
J77	JUNCTION	0.42	0.78	442.78	0	00:20
J78	JUNCTION	0.29	0.74	438.74	0	00:22
J79	JUNCTION	0.43	4.35	459.13	0	00:17
STMH116	JUNCTION	0.57	2.30	456.30	0	00:16
DRCB64	JUNCTION	0.23	0.57	451.93	0	00:20
DRCB40	JUNCTION	0.32	0.83	446.44	0	00:20
J83	JUNCTION	0.28	0.89	459.38	0	00:20
J84	JUNCTION	0.11	0.26	437.62	0	00:20
J85	JUNCTION	0.18	0.43	457.80	0	00:20
STMH78	JUNCTION	0.32	2.90	449.54	0	00:19
J86	JUNCTION	0.59	2.50	460.96	0	00:14
J87	JUNCTION	0.10	0.27	458.84	0	00:20
J88	JUNCTION	0.10	0.27	458.52	0	00:20
J89	JUNCTION	0.00	0.00	456.77	0	00:00
J90	JUNCTION	0.00	0.00	459.23	0	00:00
J91	JUNCTION	0.00	0.00	457.00	0	00:00
DRCB258	JUNCTION	0.52	1.46	441.25	0	00:19
DRCB260	JUNCTION	0.99	1.50	440.45	0	00:18
J94	JUNCTION	0.19	0.23	437.07	0	00:19
STMH246-DIV	JUNCTION	0.21	0.77	456.69	0	00:20
DROF13	OUTFALL	0.45	0.90	441.11	0	00:17
DROF38	OUTFALL	0.60	1.05	441.90	0	00:14
DROF3	OUTFALL	0.51	1.20	452.54	0	00:16
DROF4	OUTFALL	0.26	0.75	452.36	0	00:18
DROF5	OUTFALL	0.58	1.20	450.65	0	00:17

DROF7	OUTFALL	0.22	0.60	440.62	0	00:18
DROF25	OUTFALL	0.42	0.78	440.78	0	00:21
DROF23	OUTFALL	0.32	0.90	444.80	0	00:19
DRFI2017	OUTFALL	0.19	0.23	436.65	0	00:20

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	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	286.20	469.97	0 00:17	0.344	0.356	-0.129
STMH286	JUNCTION	1926.33	2036.34	0 00:20	1.83	2.12	0.032
STMH56	JUNCTION	0.00	1336.57	0 00:23	0	1.98	0.042
STMH54	JUNCTION	691.76	3078.69	0 00:20	0.645	4.88	-0.036
STMH178	JUNCTION	602.20	3680.57	0 00:20	0.687	5.56	0.014
STMH177	JUNCTION	130.95	2785.72	0 00:20	0.119	5.29	0.012
STMH398	JUNCTION	175.34	2961.06	0 00:20	0.16	5.44	0.005
STMH188	JUNCTION	1725.76	1725.76	0 00:20	1.79	1.79	0.016
STMH64	JUNCTION	0.00	1199.40	0 00:23	0	1.68	0.003
STMH161	JUNCTION	440.58	1582.56	0 00:20	0.402	2.07	-0.090
STMH165	JUNCTION	625.81	1565.46	0 00:17	0.601	2.2	-0.050
STMH63	JUNCTION	0.00	1199.10	0 00:23	0	1.68	-0.021
STMH62	JUNCTION	0.00	1199.35	0 00:23	0	1.68	-0.100
STMH77	JUNCTION	0.00	5319.69	0 00:20	0	4.95	0.002
STMH74	JUNCTION	0.00	5349.29	0 00:20	0	4.95	0.001
STMH83	JUNCTION	0.00	6526.06	0 00:20	0	7.44	0.177
STMH79	JUNCTION	637.74	4644.85	0 00:21	0.623	7.34	-0.208
STMH235	JUNCTION	0.00	3779.08	0 00:21	0	2.86	-0.256
J22	JUNCTION	2698.45	2698.45	0 00:20	2.53	2.53	0.286
STMH139	JUNCTION	0.00	4097.68	0 00:21	0	5.25	0.004
STMH138	JUNCTION	339.14	4390.82	0 00:21	0.309	5.56	0.001
STMH183	JUNCTION	0.00	4391.78	0 00:21	0	5.56	0.001
STMH6	JUNCTION	429.95	4771.60	0 00:21	0.395	5.95	0.016
STMH7	JUNCTION	243.87	4991.56	0 00:20	0.224	6.17	-0.012
STMH184	JUNCTION	0.00	4992.26	0 00:20	0	6.17	-0.007
STMH185	JUNCTION	0.00	4992.06	0 00:20	0	6.17	-0.005
STMH12	JUNCTION	1049.07	5976.57	0 00:20	0.977	7.15	0.009
J33	JUNCTION	5117.35	5117.35	0 00:20	4.67	4.67	0.005

J34	JUNCTION	596.26	596.26	0	00:20	0.543	0.542	0.023
STMH17	JUNCTION	0.00	587.25	0	00:20	0	0.542	-0.014
STMH254	JUNCTION	0.00	1105.95	0	00:20	0	1.13	0.049
STMH93	JUNCTION	923.65	1938.92	0	00:20	0.893	2.02	-0.008
J37	JUNCTION	562.51	1123.00	0	00:20	0.588	1.13	0.015
J38	JUNCTION	0.00	584.25	0	00:20	0	0.542	0.002
STMH190	JUNCTION	0.00	5842.38	0	00:20	0	8.41	-0.019
STMH133	JUNCTION	1107.80	5842.22	0	00:20	1.04	8.41	-0.006
STMH135	JUNCTION	257.18	4734.52	0	00:20	0.252	7.37	0.010
STMH131	JUNCTION	363.53	4488.80	0	00:21	0.361	7.12	0.011
STMH196	JUNCTION	192.73	4217.13	0	00:24	0.185	6.77	-0.001
STMH137	JUNCTION	0.00	3028.86	0	00:16	0	4.05	-0.021
STMH15	JUNCTION	164.11	4978.47	0	00:20	0.149	4.59	-0.021
J46	JUNCTION	4814.38	4814.38	0	00:20	4.44	4.44	-0.006
STMH4	JUNCTION	616.46	616.46	0	00:20	0.576	0.575	-0.037
STMH216	JUNCTION	0.00	616.54	0	00:20	0	0.575	-0.036
STMH197	JUNCTION	0.00	1066.41	0	00:27	0	1.96	0.031
STMH2	JUNCTION	526.23	1014.12	0	00:17	0.567	1.97	-0.049
STMH28	JUNCTION	0.00	674.95	0	00:17	0	1.47	-0.044
STMH147	JUNCTION	432.89	674.90	0	00:17	0.486	1.47	0.007
STMH194	JUNCTION	0.00	527.47	0	00:14	0	1.03	-0.026
STMH253	JUNCTION	0.00	716.01	0	00:20	0	1.14	-0.082
J56	JUNCTION	716.04	716.04	0	00:20	0.652	0.651	-0.100
STMH212	JUNCTION	1423.29	1757.14	0	00:20	1.33	1.43	0.012
STMH298	JUNCTION	0.00	897.87	0	00:20	0	0.912	0.036
STMH297	JUNCTION	173.76	897.91	0	00:20	0.158	0.912	0.000
STMH26	JUNCTION	0.00	730.68	0	00:20	0	0.754	0.005
STMH22	JUNCTION	0.00	736.57	0	00:20	0	0.754	0.020
STMH23	JUNCTION	736.62	736.62	0	00:20	0.754	0.754	0.009
STMH225	JUNCTION	708.84	1513.51	0	00:17	0.669	2.65	0.010
STMH226	JUNCTION	0.00	1513.60	0	00:17	0	2.65	-0.082
STMH202	JUNCTION	720.45	1880.09	0	00:18	0.684	3.21	0.029
STMH38	JUNCTION	1088.80	2749.99	0	00:20	1.06	4.27	0.021
STMH205	JUNCTION	325.02	2652.05	0	00:20	0.296	4.5	-0.051
STMH204	JUNCTION	0.00	2651.93	0	00:20	0	4.5	0.008
STMH109	JUNCTION	0.00	2652.29	0	00:20	0	4.5	0.016
STMH37	JUNCTION	1884.91	1884.91	0	00:20	2.46	2.46	0.006
STMH244	JUNCTION	284.08	2531.13	0	00:20	0.259	4.63	0.007
STMH362	JUNCTION	0.00	2531.26	0	00:20	0	4.63	-0.010
J73	JUNCTION	2921.34	5525.47	0	00:20	3.29	7.92	0.009
J74	JUNCTION	962.07	6493.86	0	00:20	0.904	8.82	0.085
J75	JUNCTION	2429.74	8145.71	0	00:21	2.45	11.3	0.038
J76	JUNCTION	0.00	10628.65	0	00:21	0	14.4	0.000
J77	JUNCTION	0.00	10628.65	0	00:21	0	14.4	0.006

J78	JUNCTION	0.00	6327.36	0	00:21	0	8.82	0.066
J79	JUNCTION	0.00	4814.87	0	00:20	0	4.44	-0.003
STMH116	JUNCTION	1822.72	1822.72	0	00:20	1.96	1.96	-0.001
DRCB64	JUNCTION	497.93	1419.55	0	00:20	0.454	2.14	-0.001
DRCB40	JUNCTION	709.00	2090.69	0	00:20	0.651	2.79	0.039
J83	JUNCTION	5369.77	5369.77	0	00:20	4.96	4.96	0.052
J84	JUNCTION	2694.00	2694.00	0	00:20	3.16	3.16	0.020
J85	JUNCTION	0.00	3201.20	0	00:20	0	4.42	0.004
STMH78	JUNCTION	1269.99	6525.97	0	00:20	1.2	6.15	0.110
J86	JUNCTION	0.00	4570.54	0	00:20	0	4.63	-0.018
J87	JUNCTION	396.09	396.09	0	00:20	0.361	0.361	-0.003
J88	JUNCTION	0.00	396.97	0	00:20	0	0.361	0.045
J89	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
J90	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
J91	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
DRCB258	JUNCTION	1524.73	1524.73	0	00:30	4.88	4.88	0.013
DRCB260	JUNCTION	0.00	1524.82	0	00:30	0	4.88	0.066
J94	JUNCTION	0.00	810.93	0	00:20	0	3.76	0.092
STMH246-DIV	JUNCTION	904.44	4090.65	0	00:20	0.824	5.25	-0.003
DROF13	OUTFALL	0.00	2961.07	0	00:20	0	5.44	0.000
DROF38	OUTFALL	0.00	4368.52	0	00:21	0	7.33	0.000
DROF3	OUTFALL	0.00	5977.28	0	00:20	0	7.15	0.000
DROF4	OUTFALL	0.00	1938.93	0	00:20	0	2.02	0.000
DROF5	OUTFALL	0.00	5842.13	0	00:20	0	8.41	0.000
DROF7	OUTFALL	0.00	897.78	0	00:20	0	0.911	0.000
DROF25	OUTFALL	0.00	10626.91	0	00:21	0	14.4	0.000
DROF23	OUTFALL	0.00	2018.09	0	00:20	0	2.79	0.000
DRFI2017	OUTFALL	0.00	820.71	0	00:20	0	3.75	0.000

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Node Surcharge Summary
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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
J1	JUNCTION	0.27	2.400	0.000
STMH286	JUNCTION	0.30	2.650	0.000
STMH56	JUNCTION	0.32	2.450	0.000
STMH54	JUNCTION	0.32	3.200	0.000

STMH178	JUNCTION	0.41	2.300	0.000
STMH177	JUNCTION	0.40	1.700	0.000
STMH398	JUNCTION	0.27	0.636	1.564
STMH188	JUNCTION	0.22	2.800	0.000
STMH64	JUNCTION	0.22	2.800	0.000
STMH161	JUNCTION	0.24	2.100	0.000
STMH165	JUNCTION	0.33	2.850	0.000
STMH63	JUNCTION	0.22	2.396	0.304
STMH62	JUNCTION	0.19	1.900	0.000
STMH83	JUNCTION	0.32	1.730	0.000
STMH79	JUNCTION	0.39	1.325	0.000
STMH235	JUNCTION	0.30	0.950	0.000
J22	JUNCTION	0.27	1.000	0.000
STMH139	JUNCTION	0.14	1.870	0.970
STMH138	JUNCTION	0.14	1.649	0.561
STMH183	JUNCTION	0.15	1.538	0.372
STMH6	JUNCTION	0.16	1.412	0.358
STMH7	JUNCTION	0.18	1.414	1.286
STMH184	JUNCTION	0.19	1.239	1.961
STMH185	JUNCTION	0.19	1.448	1.792
STMH12	JUNCTION	0.19	2.455	0.745
J33	JUNCTION	0.18	1.600	0.000
STMH93	JUNCTION	0.08	0.753	2.397
STMH190	JUNCTION	0.25	3.500	0.000
STMH133	JUNCTION	0.22	2.357	0.843
STMH135	JUNCTION	0.16	2.600	0.000
STMH131	JUNCTION	0.21	2.500	0.000
STMH196	JUNCTION	0.18	1.800	0.000
STMH137	JUNCTION	0.15	1.700	0.000
STMH15	JUNCTION	0.14	0.900	0.000
J46	JUNCTION	0.11	3.577	0.523
STMH4	JUNCTION	0.17	2.500	0.000
STMH216	JUNCTION	0.22	2.500	0.000
STMH197	JUNCTION	0.20	1.800	0.000
STMH2	JUNCTION	0.14	1.050	0.000
STMH28	JUNCTION	0.56	1.300	0.000
STMH147	JUNCTION	0.48	2.300	0.000
STMH194	JUNCTION	0.52	1.300	0.000
STMH253	JUNCTION	0.52	1.400	0.000
J56	JUNCTION	0.30	2.000	0.000
STMH212	JUNCTION	0.50	0.700	0.000
STMH298	JUNCTION	0.10	1.000	0.000
STMH297	JUNCTION	0.14	3.300	0.000
STMH23	JUNCTION	0.21	1.746	1.054

STMH225	JUNCTION	0.32	1.840	0.000
STMH226	JUNCTION	0.26	1.040	0.000
STMH202	JUNCTION	0.17	2.270	0.000
STMH38	JUNCTION	0.21	2.000	0.000
STMH205	JUNCTION	0.24	2.450	0.000
STMH204	JUNCTION	0.32	2.700	0.000
STMH109	JUNCTION	0.30	0.950	0.000
STMH37	JUNCTION	0.41	1.900	0.000
STMH244	JUNCTION	0.29	0.900	0.000
STMH362	JUNCTION	0.02	0.658	0.542
J79	JUNCTION	0.13	3.448	0.352
STMH116	JUNCTION	0.28	1.850	0.000
STMH78	JUNCTION	0.04	1.850	0.000
J86	JUNCTION	0.22	1.600	0.000
DRCB258	JUNCTION	0.39	0.661	0.039
DRCB260	JUNCTION	0.73	0.700	0.000

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

Node	Hours Flooded	Maximum Rate LPS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
J1	0.12	455.96	0 00:17	0.067	0.000
STMH286	0.11	697.38	0 00:20	0.131	0.000
STMH56	0.18	996.64	0 00:20	0.381	0.000
STMH54	0.01	1008.12	0 00:16	0.003	0.000
STMH178	0.19	1024.24	0 00:20	0.397	0.000
STMH177	0.01	330.61	0 00:16	0.001	0.000
STMH188	0.10	581.45	0 00:20	0.112	0.000
STMH64	0.01	33.53	0 00:17	0.000	0.000
STMH161	0.06	1346.18	0 00:17	0.034	0.000
STMH165	0.01	311.66	0 00:16	0.001	0.000
STMH62	0.01	953.15	0 00:17	0.009	0.000
STMH83	0.02	1023.77	0 00:15	0.012	0.000
STMH79	0.03	880.46	0 00:15	0.026	0.000
STMH235	0.22	3778.63	0 00:21	1.569	0.000
J22	0.15	1304.51	0 00:20	0.366	0.000

J33	0.04	540.35	0	00:20	0.034	0.000
STMH190	0.01	624.71	0	00:17	0.001	0.000
STMH135	0.01	733.18	0	00:17	0.002	0.000
STMH131	0.01	249.76	0	00:16	0.001	0.000
STMH196	0.01	163.55	0	00:17	0.001	0.000
STMH137	0.01	220.08	0	00:16	0.000	0.000
STMH15	0.11	2431.40	0	00:20	0.538	0.000
STMH4	0.01	155.50	0	00:17	0.000	0.000
STMH216	0.01	154.69	0	00:16	0.000	0.000
STMH197	0.01	137.51	0	00:16	0.000	0.000
STMH2	0.06	552.33	0	00:17	0.019	0.000
STMH28	0.11	244.25	0	00:20	0.069	0.000
STMH147	0.01	84.34	0	00:15	0.000	0.000
STMH194	0.11	203.83	0	00:20	0.042	0.000
STMH253	0.01	294.73	0	00:14	0.002	0.000
J56	0.01	198.83	0	00:15	0.001	0.000
STMH212	0.43	1753.91	0	00:20	0.944	0.000
STMH298	0.01	87.53	0	00:18	0.000	0.000
STMH297	0.01	94.18	0	00:17	0.000	0.000
STMH225	0.01	127.36	0	00:16	0.000	0.000
STMH226	0.13	467.79	0	00:20	0.129	0.000
STMH202	0.01	436.73	0	00:18	0.002	0.000
STMH38	0.08	420.48	0	00:20	0.064	0.000
STMH205	0.01	315.10	0	00:17	0.000	0.000
STMH204	0.01	267.79	0	00:18	0.001	0.000
STMH109	0.12	428.78	0	00:19	0.129	0.000
STMH37	0.23	1182.16	0	00:20	0.473	0.000
STMH244	0.01	266.04	0	00:17	0.000	0.000
STMH116	0.19	898.83	0	00:20	0.276	0.000
STMH78	0.01	532.93	0	00:19	0.003	0.000
J86	0.15	1760.68	0	00:19	0.570	0.000
DRCB260	0.65	714.55	0	00:30	1.120	0.000

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
DROF13	99.61	1243.78	2961.07	5.444

STMP101	CONDUIT	4489.35	0	00:21	3.97	1.89	1.00
STMP103	CONDUIT	1066.50	0	00:27	1.93	0.61	1.00
STMP106	CONDUIT	4736.11	0	00:20	4.19	1.04	1.00
STMP107	CONDUIT	5842.38	0	00:20	5.17	1.43	1.00
STMP1086	CONDUIT	2018.09	0	00:20	3.40	1.06	0.96
STMP11	CONDUIT	1199.10	0	00:23	4.24	1.50	1.00
STMP1170	CONDUIT	810.93	0	00:20	3.96	1.09	0.69
STMP118	CONDUIT	674.81	0	00:17	2.55	2.44	1.00
STMP12	CONDUIT	1199.35	0	00:23	4.26	1.52	1.00
STMP120	CONDUIT	674.95	0	00:17	2.39	1.20	1.00
STMP123	CONDUIT	1066.41	0	00:27	2.97	0.66	1.00
STMP1289	CONDUIT	730.32	0	00:20	7.56	0.39	0.72
STMP13	CONDUIT	1200.00	0	00:23	3.07	0.51	1.00
STMP131	CONDUIT	5842.13	0	00:20	5.17	1.64	1.00
STMP14	CONDUIT	1515.03	0	00:21	2.38	0.59	1.00
STMP150	CONDUIT	1042.62	0	00:17	3.69	1.85	1.00
STMP1513	CONDUIT	1524.82	0	00:30	3.27	0.48	1.00
STMP1516	CONDUIT	2688.98	0	00:21	5.83	1.61	0.71
STMP155	CONDUIT	736.57	0	00:20	3.96	3.13	0.90
STMP156A	CONDUIT	897.78	0	00:20	3.18	1.59	1.00
STMP156B	CONDUIT	897.87	0	00:20	3.18	2.16	1.00
STMP1604	CONDUIT	2961.07	0	00:20	4.65	1.24	1.00
STMP161	CONDUIT	730.68	0	00:20	6.32	0.86	0.58
STMP170	CONDUIT	6114.46	0	00:22	5.13	1.07	0.76
STMP183	CONDUIT	2356.64	0	00:22	6.03	1.12	1.00
STMP184	CONDUIT	2652.29	0	00:20	4.17	1.60	1.00
STMP20	CONDUIT	295.00	0	00:17	1.51	0.85	1.00
STMP248	CONDUIT	2306.74	0	00:25	3.63	1.38	1.00
STMP249	CONDUIT	2531.26	0	00:20	4.00	1.52	1.00
STMP274	CONDUIT	716.01	0	00:20	2.53	1.27	1.00
STMP276	CONDUIT	1114.35	0	00:21	2.78	0.78	0.86
STMP29	CONDUIT	5349.29	0	00:20	8.51	0.81	0.69
STMP308	CONDUIT	936.05	0	00:25	5.89	1.31	1.00
STMP309	CONDUIT	1383.92	0	00:20	4.99	1.06	0.97
STMP393	CONDUIT	2785.73	0	00:20	4.38	2.03	1.00
STMP394	CONDUIT	2708.35	0	00:28	4.26	1.79	1.00
STMP427	CONDUIT	1180.99	0	00:16	2.68	1.33	1.00
STMP428	CONDUIT	1564.41	0	00:17	3.54	1.35	1.00
STMP435	CONDUIT	3078.37	0	00:20	4.84	1.16	1.00
STMP521	CONDUIT	4099.15	0	00:21	3.62	1.12	1.00
STMP524	CONDUIT	587.25	0	00:20	3.05	0.27	0.45
STMP525	CONDUIT	584.25	0	00:20	4.12	0.26	0.36
STMP554	CONDUIT	4772.25	0	00:21	4.22	1.33	1.00
STMP555	CONDUIT	4391.78	0	00:21	3.88	1.22	1.00

STMP556	CONDUIT	4392.25	0	00:21	3.88	1.21	1.00
STMP591	CONDUIT	4992.26	0	00:20	4.41	1.41	1.00
STMP594	CONDUIT	4992.06	0	00:20	4.41	1.55	1.00
STMP595	CONDUIT	4993.44	0	00:20	4.42	1.53	1.00
STMP692	CONDUIT	497.87	0	00:14	2.57	1.43	1.00
STMP749	CONDUIT	2651.93	0	00:20	6.00	0.69	1.00
STMP77	CONDUIT	4097.68	0	00:21	7.14	0.54	0.93
STMP79	CONDUIT	585.93	0	00:20	1.80	0.56	0.69
STMP800	CONDUIT	527.47	0	00:14	2.69	1.52	1.00
STMP801	CONDUIT	439.21	0	00:14	2.24	1.27	1.00
STMP823	CONDUIT	616.54	0	00:20	2.18	0.94	1.00
STMP824	CONDUIT	616.54	0	00:20	2.18	0.94	1.00
STMP850	CONDUIT	4814.37	0	00:20	7.57	1.67	1.00
STMP88	CONDUIT	1105.95	0	00:20	3.07	1.03	0.79
STMP89	CONDUIT	1938.93	0	00:20	4.39	1.34	1.00
STMP9	CONDUIT	1336.57	0	00:23	3.03	1.27	1.00
STMP90	CONDUIT	5977.28	0	00:20	5.29	1.66	1.00
STMP914	CONDUIT	1513.60	0	00:17	5.35	1.47	1.00
STMP915	CONDUIT	1343.49	0	00:17	4.75	1.64	1.00
STMP964	CONDUIT	1389.91	0	00:24	2.18	1.09	1.00
STMP98	CONDUIT	3028.86	0	00:16	5.87	0.70	1.00
STMP99	CONDUIT	2924.41	0	00:17	4.60	0.97	1.00
SYMP182	CONDUIT	1706.49	0	00:17	4.27	0.99	1.00
STMP187_PUMP	PUMP	10628.65	0	00:21			

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Flow Classification Summary
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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
C100	1.00	0.00	0.00	0.00	0.37	0.00	0.00	0.62	0.00	0.00
C101	1.00	0.00	0.00	0.00	0.42	0.06	0.00	0.52	0.02	0.00
C102	1.00	0.00	0.00	0.00	0.45	0.55	0.00	0.00	0.68	0.00
C103	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.91	0.00
C104	1.00	0.00	0.00	0.00	0.03	0.69	0.00	0.28	0.26	0.00
C105	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.00
C106	1.00	0.00	0.00	0.00	0.11	0.89	0.00	0.00	0.89	0.00
C107	1.00	0.00	0.00	0.00	0.49	0.51	0.00	0.00	0.54	0.00
C108	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DROF38	99.61	1694.75	4368.52	7.327
DROF3	99.61	1637.84	5977.28	7.151
DROF4	99.61	452.69	1938.93	2.022
DROF5	99.58	1910.08	5842.13	8.412
DROF7	99.44	203.55	897.78	0.911
DROF25	99.65	3199.69	10626.91	14.412
DROF23	99.61	630.15	2018.09	2.789
DRFI2017	99.47	607.38	820.71	3.752
System	99.58	11579.91	35142.35	52.220

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days	hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C100	CONDUIT	2389.24	0	00:21	3.76	2.61	1.00
C101	CONDUIT	4073.90	0	00:21	3.60	1.37	1.00
C102	CONDUIT	4368.52	0	00:21	5.05	1.99	1.00
C103	CONDUIT	5373.87	0	00:20	7.06	0.76	0.86
C104	CONDUIT	6526.06	0	00:20	7.54	1.00	1.00
C105	CONDUIT	2811.23	0	00:20	7.62	1.56	0.78
C106	CONDUIT	396.97	0	00:20	2.82	0.27	0.36
C107	CONDUIT	390.29	0	00:20	1.96	0.27	0.46
C108	CONDUIT	0.00	0	00:00	0.00	0.00	0.15
C109	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C110	CONDUIT	0.00	0	00:00	0.00	0.00	0.15
C93	CONDUIT	4814.87	0	00:20	3.78	0.84	1.00
C96	CONDUIT	5319.69	0	00:20	7.02	1.03	0.93
C98	CONDUIT	4570.54	0	00:20	7.18	1.00	1.00
C99	CONDUIT	3199.17	0	00:20	5.46	0.05	0.30
DRDI117	CONDUIT	820.71	0	00:20	2.77	0.04	0.23
DRDI27	CONDUIT	5584.28	0	00:20	2.48	0.07	0.29
DRDI28	CONDUIT	6327.36	0	00:21	1.92	0.08	0.40
DRDI4	CONDUIT	8195.86	0	00:21	6.00	0.11	0.16
DRDI5	CONDUIT	2710.60	0	00:20	4.86	0.04	0.09
DRDI6	CONDUIT	10626.91	0	00:21	5.87	0.08	0.39
STMP10	CONDUIT	1199.40	0	00:23	4.24	1.49	1.00
STMP100	CONDUIT	4217.49	0	00:24	3.73	1.12	1.00

C109	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C110	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C93	1.00	0.00	0.00	0.00	0.10	0.89	0.00	0.00	0.83	0.00
C96	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C98	1.00	0.00	0.00	0.00	0.15	0.85	0.00	0.00	0.83	0.00
C99	1.00	0.00	0.00	0.00	0.19	0.80	0.00	0.00	0.94	0.00
DRDI117	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.65	0.00
DRDI27	1.00	0.00	0.00	0.00	0.08	0.92	0.00	0.00	0.89	0.00
DRDI28	1.00	0.00	0.00	0.00	0.83	0.17	0.00	0.00	0.71	0.00
DRDI4	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
DRDI5	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
DRDI6	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.83	0.00
STMP10	1.00	0.00	0.00	0.00	0.18	0.81	0.00	0.00	0.63	0.00
STMP100	1.00	0.00	0.00	0.00	0.30	0.70	0.00	0.00	0.73	0.00
STMP101	1.00	0.00	0.00	0.00	0.21	0.79	0.00	0.00	0.18	0.00
STMP103	1.00	0.00	0.00	0.00	0.56	0.44	0.00	0.00	0.66	0.00
STMP106	1.00	0.00	0.00	0.00	0.21	0.79	0.00	0.00	0.81	0.00
STMP107	1.00	0.00	0.00	0.00	0.22	0.78	0.00	0.00	0.77	0.00
STMP1086	1.00	0.00	0.00	0.00	0.04	0.96	0.00	0.00	0.74	0.00
STMP11	1.00	0.00	0.00	0.00	0.19	0.81	0.00	0.00	0.84	0.00
STMP1170	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.00
STMP118	1.00	0.00	0.00	0.00	0.42	0.58	0.00	0.00	0.04	0.00
STMP12	1.00	0.00	0.00	0.00	0.18	0.82	0.00	0.00	0.32	0.00
STMP120	1.00	0.00	0.00	0.00	0.95	0.05	0.00	0.00	0.74	0.00
STMP123	1.00	0.00	0.00	0.00	0.18	0.81	0.00	0.00	0.86	0.00
STMP1289	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.97	0.00
STMP13	1.00	0.00	0.00	0.00	0.23	0.77	0.00	0.00	0.50	0.00
STMP131	1.00	0.00	0.00	0.00	0.22	0.77	0.00	0.00	0.73	0.00
STMP14	1.00	0.00	0.00	0.00	0.34	0.66	0.00	0.00	0.83	0.00
STMP150	1.00	0.00	0.00	0.00	0.30	0.70	0.00	0.00	0.09	0.00
STMP1513	1.00	0.00	0.00	0.00	0.59	0.40	0.00	0.00	0.69	0.00
STMP1516	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.23	0.00
STMP155	1.00	0.00	0.00	0.00	0.02	0.98	0.00	0.00	0.00	0.00
STMP156A	1.00	0.00	0.00	0.00	0.10	0.90	0.00	0.00	0.73	0.00
STMP156B	1.00	0.00	0.00	0.00	0.34	0.66	0.00	0.00	0.06	0.00
STMP1604	1.00	0.00	0.00	0.00	0.26	0.74	0.00	0.00	0.71	0.00
STMP161	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.00
STMP170	1.00	0.00	0.00	0.00	0.03	0.96	0.00	0.00	0.23	0.00
STMP183	1.00	0.00	0.00	0.00	0.17	0.82	0.00	0.00	0.03	0.00
STMP184	1.00	0.00	0.00	0.00	0.31	0.69	0.00	0.00	0.80	0.00
STMP20	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.87	0.00
STMP248	1.00	0.00	0.00	0.00	0.34	0.66	0.00	0.00	0.82	0.00
STMP249	1.00	0.00	0.00	0.00	0.31	0.68	0.00	0.00	0.79	0.00
STMP274	1.00	0.00	0.00	0.00	0.98	0.02	0.00	0.00	0.77	0.00

STMP276	1.00	0.00	0.00	0.00	0.07	0.93	0.00	0.00	0.92	0.00
STMP29	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
STMP308	1.00	0.00	0.00	0.00	0.10	0.89	0.00	0.00	0.83	0.00
STMP309	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.93	0.00
STMP393	1.00	0.00	0.00	0.00	0.29	0.71	0.00	0.00	0.20	0.00
STMP394	1.00	0.00	0.00	0.00	0.46	0.53	0.00	0.00	0.78	0.00
STMP427	1.00	0.00	0.00	0.00	0.38	0.62	0.00	0.00	0.60	0.00
STMP428	1.00	0.00	0.00	0.00	0.35	0.64	0.00	0.00	0.80	0.00
STMP435	1.00	0.00	0.00	0.00	0.34	0.66	0.00	0.00	0.80	0.00
STMP521	1.00	0.00	0.00	0.00	0.20	0.80	0.00	0.00	0.66	0.00
STMP524	1.00	0.00	0.00	0.00	0.04	0.96	0.00	0.00	0.90	0.00
STMP525	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.91	0.00
STMP554	1.00	0.00	0.00	0.00	0.22	0.78	0.00	0.00	0.82	0.00
STMP555	1.00	0.00	0.00	0.00	0.18	0.82	0.00	0.00	0.84	0.00
STMP556	1.00	0.00	0.00	0.00	0.21	0.78	0.00	0.00	0.80	0.00
STMP591	1.00	0.00	0.00	0.00	0.22	0.77	0.00	0.00	0.71	0.00
STMP594	1.00	0.00	0.00	0.00	0.25	0.75	0.00	0.00	0.47	0.00
STMP595	1.00	0.00	0.00	0.00	0.35	0.65	0.00	0.00	0.61	0.00
STMP692	1.00	0.00	0.00	0.00	0.67	0.33	0.00	0.00	0.76	0.00
STMP749	1.00	0.00	0.00	0.00	0.20	0.79	0.00	0.00	0.85	0.00
STMP77	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.93	0.00
STMP79	1.00	0.00	0.00	0.00	0.94	0.06	0.00	0.00	0.92	0.00
STMP800	1.00	0.00	0.00	0.00	0.52	0.47	0.00	0.00	0.75	0.00
STMP801	1.00	0.00	0.00	0.00	0.85	0.14	0.00	0.00	0.74	0.00
STMP823	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.83	0.00
STMP824	1.00	0.00	0.00	0.00	0.24	0.76	0.00	0.00	0.84	0.00
STMP850	1.00	0.00	0.00	0.00	0.10	0.90	0.00	0.00	0.12	0.00
STMP88	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.25	0.00
STMP89	1.00	0.00	0.00	0.00	0.07	0.93	0.00	0.00	0.67	0.00
STMP9	1.00	0.00	0.00	0.00	0.34	0.66	0.00	0.00	0.76	0.00
STMP90	1.00	0.00	0.00	0.00	0.20	0.80	0.00	0.00	0.76	0.00
STMP914	1.00	0.00	0.00	0.00	0.22	0.00	0.00	0.78	0.00	0.00
STMP915	1.00	0.00	0.00	0.00	0.17	0.83	0.00	0.00	0.04	0.00
STMP964	1.00	0.00	0.00	0.00	0.38	0.13	0.00	0.48	0.05	0.00
STMP98	1.00	0.00	0.00	0.00	0.10	0.89	0.00	0.00	0.87	0.00
STMP99	1.00	0.00	0.00	0.00	0.34	0.65	0.00	0.00	0.85	0.00
SYMP182	1.00	0.00	0.00	0.00	0.15	0.85	0.00	0.00	0.86	0.00

****
Conduit Surcharge Summary
****

Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C100	0.31	0.31	0.31	0.13	0.06
C101	0.34	0.34	0.34	0.27	0.26
C102	0.44	0.44	0.44	0.46	0.44
C104	0.04	0.04	0.04	0.01	0.01
C105	0.01	0.01	0.01	0.26	0.01
C93	0.11	0.11	0.11	0.12	0.01
C96	0.01	0.01	0.01	0.01	0.01
C98	0.18	0.18	0.18	0.01	0.01
STMP10	0.21	0.21	0.21	0.20	0.19
STMP100	0.18	0.18	0.19	0.15	0.15
STMP101	0.16	0.16	0.16	0.35	0.16
STMP103	0.20	0.20	0.20	0.01	0.01
STMP106	0.16	0.16	0.16	0.10	0.11
STMP107	0.22	0.22	0.22	0.20	0.19
STMP1086	0.01	0.01	0.01	0.06	0.01
STMP11	0.21	0.21	0.21	0.20	0.18
STMP1170	0.01	0.01	0.01	0.70	0.01
STMP118	0.16	0.16	0.16	0.62	0.16
STMP12	0.21	0.21	0.22	0.21	0.18
STMP120	0.48	0.48	0.48	0.40	0.39
STMP123	0.14	0.14	0.14	0.01	0.01
STMP13	0.19	0.19	0.19	0.01	0.01
STMP131	0.25	0.25	0.25	0.26	0.25
STMP14	0.24	0.24	0.24	0.01	0.01
STMP150	0.32	0.32	0.32	0.46	0.32
STMP1513	0.39	0.39	0.39	0.01	0.01
STMP1516	0.01	0.01	0.01	0.36	0.01
STMP155	0.01	0.01	0.01	0.33	0.01
STMP156A	0.10	0.10	0.10	0.12	0.10
STMP156B	0.10	0.10	0.10	0.20	0.10
STMP1604	0.27	0.27	0.27	0.30	0.27
STMP170	0.01	0.01	0.01	0.50	0.01
STMP183	0.21	0.21	0.21	0.15	0.14
STMP184	0.30	0.30	0.30	0.34	0.30
STMP20	0.27	0.27	0.27	0.01	0.01
STMP248	0.29	0.29	0.29	0.35	0.29
STMP249	0.02	0.02	0.02	0.36	0.02
STMP274	0.30	0.30	0.30	0.06	0.07
STMP308	0.13	0.13	0.13	0.28	0.13
STMP309	0.01	0.01	0.01	0.07	0.01

STMP393	0.27	0.27	0.27	0.47	0.27
STMP394	0.40	0.40	0.40	0.44	0.39
STMP427	0.32	0.32	0.32	0.07	0.06
STMP428	0.33	0.33	0.33	0.08	0.07
STMP435	0.32	0.32	0.32	0.13	0.13
STMP521	0.14	0.14	0.14	0.11	0.10
STMP554	0.16	0.16	0.16	0.15	0.14
STMP555	0.14	0.14	0.14	0.14	0.13
STMP556	0.15	0.15	0.15	0.13	0.13
STMP591	0.18	0.18	0.18	0.16	0.14
STMP594	0.19	0.19	0.19	0.20	0.18
STMP595	0.19	0.19	0.19	0.19	0.17
STMP692	0.51	0.51	0.51	0.43	0.37
STMP749	0.24	0.24	0.24	0.01	0.01
STMP800	0.52	0.52	0.52	0.48	0.42
STMP801	0.50	0.50	0.50	0.01	0.01
STMP823	0.22	0.22	0.22	0.01	0.01
STMP824	0.17	0.17	0.17	0.01	0.01
STMP850	0.13	0.13	0.13	0.11	0.10
STMP88	0.01	0.01	0.01	0.02	0.01
STMP89	0.08	0.08	0.08	0.10	0.08
STMP9	0.30	0.30	0.30	0.16	0.15
STMP90	0.19	0.19	0.19	0.22	0.19
STMP914	0.32	0.32	0.32	0.33	0.32
STMP915	0.21	0.21	0.21	0.43	0.21
STMP964	0.27	0.27	0.27	0.15	0.15
STMP98	0.14	0.14	0.14	0.01	0.01
STMP99	0.15	0.15	0.16	0.01	0.01
SYMP182	0.17	0.17	0.17	0.01	0.01

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Pumping Summary
****

Pump	Percent Utilized	Number of Start-Ups	Min Flow LPS	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr	Power Usage Kw-hr	% Time Off Pump Curve Low	% Time Off Pump Curve High
STMP187_PUMP	97.50	1	0.00	3200.89	10628.65	14.412	215.59	0.0	0.0

Analysis begun on: Thu Sep 01 15:55:16 2016

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Analysis ended on:  Thu Sep 01 15:55:17 2016
Total elapsed time: 00:00:01
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EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.007)
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WARNING 02: maximum depth increased for Node J77

**********************************************************
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 ..... LPS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... DYNWAVE
Starting Date ..... NOV-05-2015 00:00:00
Ending Date ..... NOV-05-2015 03:00:00
Antecedent Dry Days ..... 0.0
Report Time Step ..... 00:05:00
Wet Time Step ..... 00:05:00
Dry Time Step ..... 00:05:00
Routing Time Step ..... 30.00 sec
Variable Time Step ..... YES
Maximum Trials ..... 8
Head Tolerance ..... 0.004921 m


*************
Element Count
*************
Number of rain gages ..... 1
Number of subcatchments ... 55
Number of nodes ..... 100
```



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Number of links ..... 91
Number of pollutants ..... 0
Number of land uses ..... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------
_Current             CC1_AES_1hr_5yr             VOLUME       5 min.


*********************
Subcatchment Summary
*********************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
-----------------------------------------------------------------------------------------
S13-A                      14.43   1550.00     70.00    2.5000 _Current             STMH286
S13-B                      14.18   1060.00     70.00    1.9000 _Current             STMH188
S13-C                       5.03    705.00     66.00    1.1000 _Current             STMH165
S13-D                       2.85    632.00     77.00    3.2000 _Current             STMH161
S13-E                       5.22    727.00     68.00    2.1000 _Current             STMH54
S13-F                       7.67    569.00     50.00    0.5000 _Current             STMH178
S13-G                       1.35    351.00     48.00    2.0000 _Current             STMH177
S13-H                       1.52    473.00     57.00    3.1000 _Current             STMH398
S23-A                      15.82   1095.00     69.00    1.6000 _Current             STMH116
S23-B                       3.94    770.00     63.00    2.6000 _Current             DRCB64
S23-C                       7.93    966.00     45.00    2.1000 _Current             DRCB40
S25-A                      22.61    902.00     61.00    1.3000 _Current             STMH37
S25-B                       6.70    737.00     55.00    1.7000 _Current             STMH225
S25-C                       7.26    921.00     52.00    1.0000 _Current             STMH202
S25-D                      10.70   1063.00     55.00    1.2000 _Current             STMH38
S25-E                      10.16   1039.00     49.00    1.7000 _Current             J74
S25-F                      41.71   2239.00     44.00    0.8000 _Current             J73
S25-G                       3.30    633.00     49.00    1.9000 _Current             STMH205
S25-H                       3.45    674.00     41.00    1.2000 _Current             STMH244
S25-I                      20.24   1568.00     67.00    2.1000 _Current             J75
S25-J                      24.53   1501.00     72.00    1.3000 _Current             J84
S32-A                      54.37    400.00     50.00    0.5000 _Current             DRCB258
S32-B                       5.37    400.00     50.00    0.5000 _Current             DRCB258
S38-A                      16.25   1798.00     79.00    4.1000 _Current             J83
S38-B                      18.36   1574.00     76.00    5.9000 _Current             J22
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S38-C                       8.37    802.00     79.00    4.5000 _Current             STMH78
S38-D                       4.72    558.00     73.00    1.5000 _Current             STMH79
S38-Z1                    136.40   7480.00     10.00   30.3000 _Current             J83
S38-Z2                      5.70   1120.00     10.00   10.4000 _Current             J83
S3-A                        8.53    955.00     63.00    2.9000 _Current             STMH12
S3-B                        1.98    392.00     62.00    1.5000 _Current             STMH7
S3-C                        3.55    735.00     61.00    1.3000 _Current             STMH6
S3-D                        2.11    617.00     80.00    2.1000 _Current             STMH138
S3-E                        5.92    588.00     76.00   17.2000 _Current             STMH246-DIV
S3-F                        1.92    586.00     58.00   13.7000 _Current             J33
S3-G                        3.26    655.00     60.00   13.0000 _Current             J87
S3-Z1                     241.50   6550.00     10.00   34.0000 _Current             J33
S4-A                        3.83    547.00     77.00   19.1000 _Current             J34
S4-B                        4.08    379.00     80.00    1.5000 _Current             J37
S4-C                        6.76    577.00     73.00    3.3000 _Current             STMH93
S5-A                        8.95    974.00     64.00    2.6000 _Current             STMH133
S5-B                        1.74    288.00     80.00    0.9000 _Current             STMH135
S5-C                        2.50    464.00     80.00    0.6000 _Current             STMH131
S5-D                        1.28    206.00     80.00    1.2000 _Current             STMH196
S5-E                        4.01    610.00     79.00    2.3000 _Current             STMH4
S5-F                        1.02    184.00     80.00    6.0000 _Current             STMH15
S5-G                        4.10    727.00     77.00    0.3000 _Current             STMH2
S5-H                        3.71    473.00     73.00    0.4000 _Current             STMH147
S5-I                       10.27    885.00     71.00    6.2000 _Current             STMH212
S5-J                        5.91    831.00     60.00    9.1000 _Current             J56
S5-K                       28.67   1446.00     54.00   11.9000 _Current             J46
S5-Z1                      87.70   4910.00     10.00   36.0000 _Current             J46
S7-A                        7.47    684.00     56.00    0.9000 _Current             STMH23
S7-B                        3.90    411.00     22.00    7.3000 _Current             STMH297
S13-I                       2.12    370.00     60.00    1.0000 _Current             J1


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Node Summary
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                                          Invert      Max.    Ponded    External
Name                 Type                  Elev.     Depth      Area    Inflow
-------------------------------------------------------------------------------
J1                   JUNCTION             444.92      2.90       0.0
STMH286              JUNCTION             444.31      3.40       0.0
STMH56               JUNCTION             443.98      3.20       0.0
STMH54               JUNCTION             442.97      4.10       0.0
STMH178              JUNCTION             441.29      3.20       0.0
STMH177              JUNCTION             440.78      2.60       0.0
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STMH398	JUNCTION	440.42	3.10	0.0
STMH188	JUNCTION	446.02	3.40	0.0
STMH64	JUNCTION	445.56	3.40	0.0
STMH161	JUNCTION	444.09	3.00	0.0
STMH165	JUNCTION	443.56	3.60	0.0
STMH63	JUNCTION	445.08	3.30	0.0
STMH62	JUNCTION	444.98	2.80	0.0
STMH77	JUNCTION	454.15	2.20	0.0
STMH74	JUNCTION	452.88	3.20	0.0
STMH83	JUNCTION	441.98	3.00	0.0
STMH79	JUNCTION	441.38	2.60	0.0
STMH235	JUNCTION	442.44	1.90	0.0
J22	JUNCTION	442.75	1.90	0.0
STMH139	JUNCTION	453.09	4.04	0.0
STMH138	JUNCTION	452.99	3.41	0.0
STMH183	JUNCTION	452.76	3.11	0.0
STMH6	JUNCTION	452.48	2.97	0.0
STMH7	JUNCTION	452.10	3.90	0.0
STMH184	JUNCTION	451.89	4.40	0.0
STMH185	JUNCTION	451.75	4.44	0.0
STMH12	JUNCTION	451.69	4.40	0.0
J33	JUNCTION	459.08	2.50	0.0
J34	JUNCTION	455.36	2.50	0.0
STMH17	JUNCTION	453.99	1.60	0.0
STMH254	JUNCTION	453.24	2.60	0.0
STMH93	JUNCTION	451.88	3.90	0.0
J37	JUNCTION	453.49	2.00	0.0
J38	JUNCTION	454.36	2.50	0.0
STMH190	JUNCTION	449.72	4.70	0.0
STMH133	JUNCTION	450.28	4.40	0.0
STMH135	JUNCTION	451.01	3.80	0.0
STMH131	JUNCTION	451.21	3.70	0.0
STMH196	JUNCTION	451.69	3.00	0.0
STMH137	JUNCTION	453.28	2.60	0.0
STMH15	JUNCTION	454.27	1.80	0.0
J46	JUNCTION	455.31	5.00	0.0
STMH4	JUNCTION	452.57	3.10	0.0
STMH216	JUNCTION	452.15	3.10	0.0
STMH197	JUNCTION	451.95	2.70	0.0
STMH2	JUNCTION	453.06	1.80	0.0
STMH28	JUNCTION	453.20	1.90	0.0
STMH147	JUNCTION	453.75	2.90	0.0
STMH194	JUNCTION	454.00	1.80	0.0
STMH253	JUNCTION	454.49	2.00	0.0

J56	JUNCTION	455.38	2.60	0.0
STMH212	JUNCTION	454.85	1.20	0.0
STMH298	JUNCTION	440.27	1.60	0.0
STMH297	JUNCTION	440.64	3.90	0.0
STMH26	JUNCTION	452.49	5.00	0.0
STMH22	JUNCTION	454.19	3.70	0.0
STMH23	JUNCTION	454.38	3.30	0.0
STMH225	JUNCTION	450.19	2.44	0.0
STMH226	JUNCTION	448.06	3.04	0.0
STMH202	JUNCTION	446.71	3.02	0.0
STMH38	JUNCTION	444.70	2.75	0.0
STMH205	JUNCTION	441.90	3.20	0.0
STMH204	JUNCTION	440.95	3.60	0.0
STMH109	JUNCTION	440.47	1.85	0.0
STMH37	JUNCTION	450.62	2.50	0.0
STMH244	JUNCTION	439.80	1.80	0.0
STMH362	JUNCTION	439.45	2.10	0.0
J73	JUNCTION	439.28	1.50	0.0
J74	JUNCTION	438.27	1.50	0.0
J75	JUNCTION	437.62	1.50	0.0
J76	JUNCTION	437.10	1.80	0.0
J77	JUNCTION	442.00	2.00	0.0
J78	JUNCTION	438.00	1.50	0.0
J79	JUNCTION	454.78	4.70	0.0
STMH116	JUNCTION	454.00	2.30	0.0
DRCB64	JUNCTION	451.36	2.50	0.0
DRCB40	JUNCTION	445.61	2.50	0.0
J83	JUNCTION	458.49	2.80	0.0
J84	JUNCTION	437.36	1.50	0.0
J85	JUNCTION	457.37	2.50	0.0
STMH78	JUNCTION	446.63	2.90	0.0
J86	JUNCTION	458.46	2.50	0.0
J87	JUNCTION	458.57	2.50	0.0
J88	JUNCTION	458.25	2.50	0.0
J89	JUNCTION	456.77	2.50	0.0
J90	JUNCTION	459.23	2.50	0.0
J91	JUNCTION	457.00	2.50	0.0
DRCB258	JUNCTION	439.79	1.50	0.0
DRCB260	JUNCTION	438.95	1.50	0.0
J94	JUNCTION	436.84	1.50	0.0
STMH246-DIV	JUNCTION	455.92	2.50	0.0
DROF13	OUTFALL	440.21	0.90	0.0
DROF38	OUTFALL	440.85	1.05	0.0
DROF3	OUTFALL	451.34	1.20	0.0

DROF4	OUTFALL	451.61	0.75	0.0
DROF5	OUTFALL	449.45	1.20	0.0
DROF7	OUTFALL	440.02	0.60	0.0
DROF25	OUTFALL	440.00	2.00	0.0
DROF23	OUTFALL	443.90	0.90	0.0
DRFI2017	OUTFALL	436.42	1.00	0.0

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Link Summary
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Name	From Node	To Node	Type	Length	%Slope	Roughness
C100	STMH235	STMH83	CONDUIT	61.4	0.1515	0.0100
C101	STMH83	STMH79	CONDUIT	153.1	0.3430	0.0100
C102	STMH79	DROF38	CONDUIT	137.0	0.3831	0.0100
C103	STMH74	STMH78	CONDUIT	159.2	3.9237	0.0100
C104	STMH78	STMH83	CONDUIT	132.9	3.4096	0.0100
C105	J86	J85	CONDUIT	70.6	1.5447	0.0100
C106	J87	J88	CONDUIT	31.5	1.0172	0.0100
C107	J88	J85	CONDUIT	88.2	0.9974	0.0100
C108	J89	J34	CONDUIT	101.2	1.3931	0.0100
C109	J90	J91	CONDUIT	52.0	4.2949	0.0100
C110	J91	J34	CONDUIT	104.7	1.5661	0.0100
C93	J46	J79	CONDUIT	35.5	1.4931	0.0100
C96	J83	STMH77	CONDUIT	202.0	2.1231	0.0100
C98	J33	J86	CONDUIT	16.4	3.7740	0.0100
C99	J85	STMH246-DIV	CONDUIT	79.7	1.8201	0.0100
DRDI117	J94	DRFI2017	CONDUIT	41.6	1.0097	0.0100
DRDI27	J73	J74	CONDUIT	251.8	0.4012	0.0100
DRDI28	J74	J78	CONDUIT	67.3	0.4013	0.0100
DRDI4	J75	J76	CONDUIT	175.3	0.2966	0.0100
DRDI5	J84	J76	CONDUIT	65.5	0.3966	0.0100
DRDI6	J77	DROF25	CONDUIT	153.4	1.3036	0.0100
STMP10	STMH188	STMH64	CONDUIT	45.5	1.0110	0.0100
STMP100	STMH196	STMH131	CONDUIT	86.4	0.5557	0.0100
STMP101	STMH131	STMH135	CONDUIT	90.9	0.2201	0.0100
STMP103	STMH197	STMH196	CONDUIT	47.1	0.5524	0.0100
STMP106	STMH135	STMH133	CONDUIT	89.7	0.8139	0.0100
STMP107	STMH133	STMH190	CONDUIT	86.0	0.6511	0.0100
STMP1086	DRCB40	DROF23	CONDUIT	262.5	0.6514	0.0100
STMP11	STMH64	STMH63	CONDUIT	47.9	1.0026	0.0100
STMP1170	DRCB260	J94	CONDUIT	241.7	0.8730	0.0100
STMP118	STMH28	STMH2	CONDUIT	116.3	0.1204	0.0100

STMP12	STMH63	STMH62	CONDUIT	10.2	0.9824	0.0100
STMP120	STMH147	STMH28	CONDUIT	110.1	0.4994	0.0100
STMP123	STMH2	STMH197	CONDUIT	88.5	1.2548	0.0100
STMP1289	STMH26	STMH297	CONDUIT	27.8	47.1005	0.0100
STMP13	STMH62	STMH161	CONDUIT	89.3	0.9962	0.0100
STMP131	STMH190	DROF5	CONDUIT	54.9	0.4920	0.0100
STMP14	STMH161	STMH54	CONDUIT	92.7	1.2078	0.0100
STMP150	STMH37	STMH225	CONDUIT	86.2	0.4990	0.0100
STMP1513	DRCB258	DRCB260	CONDUIT	24.9	3.3754	0.0100
STMP1516	STMH362	J73	CONDUIT	33.6	0.5052	0.0100
STMP155	STMH23	STMH22	CONDUIT	82.8	0.2294	0.0100
STMP156A	STMH298	DROF7	CONDUIT	50.2	0.4979	0.0100
STMP156B	STMH297	STMH298	CONDUIT	136.3	0.2715	0.0100
STMP1604	STMH398	DROF13	CONDUIT	20.4	1.0300	0.0100
STMP161	STMH22	STMH26	CONDUIT	57.4	2.9625	0.0100
STMP170	J78	J75	CONDUIT	31.2	1.2184	0.0100
STMP183	STMH38	STMH205	CONDUIT	133.6	2.0956	0.0100
STMP184	STMH204	STMH109	CONDUIT	96.4	0.4981	0.0100
STMP20	J1	STMH286	CONDUIT	121.6	0.5014	0.0100
STMP248	STMH109	STMH244	CONDUIT	132.7	0.5049	0.0100
STMP249	STMH244	STMH362	CONDUIT	69.7	0.5025	0.0100
STMP274	J56	STMH253	CONDUIT	178.1	0.4998	0.0100
STMP276	STMH254	STMH93	CONDUIT	140.0	0.9714	0.0100
STMP29	STMH77	STMH74	CONDUIT	35.8	3.4248	0.0100
STMP308	STMH116	DRCB64	CONDUIT	71.1	3.7156	0.0100
STMP309	DRCB64	DRCB40	CONDUIT	215.4	2.6704	0.0100
STMP393	STMH177	STMH398	CONDUIT	105.6	0.3409	0.0100
STMP394	STMH178	STMH177	CONDUIT	124.0	0.4112	0.0100
STMP427	STMH56	STMH165	CONDUIT	112.2	0.3745	0.0100
STMP428	STMH165	STMH54	CONDUIT	92.0	0.6415	0.0100
STMP435	STMH54	STMH178	CONDUIT	132.3	1.2698	0.0100
STMP521	STMH139	STMH138	CONDUIT	19.0	0.5255	0.0100
STMP524	J38	STMH17	CONDUIT	16.1	2.3002	0.0100
STMP525	J34	J38	CONDUIT	41.6	2.4063	0.0100
STMP554	STMH6	STMH7	CONDUIT	75.5	0.5033	0.0100
STMP555	STMH138	STMH183	CONDUIT	46.0	0.5003	0.0100
STMP556	STMH183	STMH6	CONDUIT	54.9	0.5099	0.0100
STMP591	STMH7	STMH184	CONDUIT	43.1	0.4875	0.0100
STMP594	STMH184	STMH185	CONDUIT	34.9	0.4014	0.0100
STMP595	STMH185	STMH12	CONDUIT	14.4	0.4170	0.0100
STMP692	STMH194	STMH147	CONDUIT	49.5	0.5054	0.0100
STMP749	STMH205	STMH204	CONDUIT	13.4	7.1181	0.0100
STMP77	STMH246-DIV	STMH139	CONDUIT	27.8	10.2182	0.0100
STMP79	STMH17	J37	CONDUIT	94.2	0.5307	0.0100

STMP800	STMH253	STMH194	CONDUIT	97.4	0.5029	0.0100
STMP801	STMH212	STMH253	CONDUIT	72.7	0.4952	0.0100
STMP823	STMH216	STMH196	CONDUIT	67.8	0.6789	0.0100
STMP824	STMH4	STMH216	CONDUIT	62.6	0.6710	0.0100
STMP850	J79	STMH15	CONDUIT	33.9	1.5042	0.0100
STMP88	J37	STMH254	CONDUIT	45.8	0.5460	0.0100
STMP89	STMH93	DROP4	CONDUIT	27.1	0.9949	0.0100
STMP9	STMH286	STMH56	CONDUIT	62.1	0.5310	0.0100
STMP90	STMH12	DROP3	CONDUIT	69.3	0.5051	0.0100
STMP914	STMH225	STMH226	CONDUIT	43.8	1.6658	0.0100
STMP915	STMH226	STMH202	CONDUIT	128.5	1.0510	0.0100
STMP964	J22	STMH235	CONDUIT	89.5	0.2929	0.0100
STMP98	STMH15	STMH137	CONDUIT	29.4	3.3716	0.0100
STMP99	STMH137	STMH196	CONDUIT	97.5	1.6318	0.0100
SYMP182	STMH202	STMH38	CONDUIT	141.2	1.4237	0.0100
STMP187_PUMP	J76	J77	IDEAL PUMP			

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C100	CIRCULAR	0.90	0.64	0.23	0.90	1	915.97
C101	CIRCULAR	1.20	1.13	0.30	1.20	1	2968.54
C102	CIRCULAR	1.05	0.87	0.26	1.05	1	2197.46
C103	CIRCULAR	1.05	0.87	0.26	1.05	1	7032.30
C104	CIRCULAR	1.05	0.87	0.26	1.05	1	6555.37
C105	CIRCULAR	0.75	0.44	0.19	0.75	1	1798.88
C106	CIRCULAR	0.75	0.44	0.19	0.75	1	1459.75
C107	CIRCULAR	0.75	0.44	0.19	0.75	1	1445.50
C108	CIRCULAR	0.90	0.64	0.23	0.90	1	2777.92
C109	CIRCULAR	0.90	0.64	0.23	0.90	1	4877.52
C110	CIRCULAR	0.90	0.64	0.23	0.90	1	2945.34
C93	CIRCULAR	0.90	0.64	0.23	0.90	2	2875.88
C96	CIRCULAR	1.05	0.87	0.26	1.05	1	5172.85
C98	CIRCULAR	0.90	0.64	0.23	0.90	1	4572.17
C99	TRAPEZOIDAL	2.00	5.00	0.83	4.00	1	59738.45
DRDI117	TRAPEZOIDAL	1.00	3.60	0.52	6.60	1	23389.71
DRDI27	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76654.24
DRDI28	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76659.66
DRDI4	TRAPEZOIDAL	1.50	14.25	0.98	14.00	1	76761.44
DRDI5	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76218.52

DRDI6	TRAPEZOIDAL	2.00	12.00	0.95	12.00	1	132287.57
STMP10	CIRCULAR	0.60	0.28	0.15	0.60	1	802.66
STMP100	CIRCULAR	1.20	1.13	0.30	1.20	1	3778.42
STMP101	CIRCULAR	1.20	1.13	0.30	1.20	1	2378.05
STMP103	CIRCULAR	0.90	0.64	0.23	0.90	1	1749.20
STMP106	CIRCULAR	1.20	1.13	0.30	1.20	1	4572.62
STMP107	CIRCULAR	1.20	1.13	0.30	1.20	1	4089.94
STMP1086	CIRCULAR	0.90	0.64	0.23	0.90	1	1899.52
STMP11	CIRCULAR	0.60	0.28	0.15	0.60	1	799.28
STMP1170	CIRCULAR	0.60	0.28	0.15	0.60	1	745.86
STMP118	CIRCULAR	0.60	0.28	0.15	0.60	1	276.99
STMP12	CIRCULAR	0.60	0.28	0.15	0.60	1	791.19
STMP120	CIRCULAR	0.60	0.28	0.15	0.60	1	564.13
STMP123	CIRCULAR	0.75	0.44	0.19	0.75	1	1621.26
STMP1289	CIRCULAR	0.40	0.13	0.10	0.40	1	1858.16
STMP13	CIRCULAR	0.90	0.64	0.23	0.90	1	2349.12
STMP131	CIRCULAR	1.20	1.13	0.30	1.20	1	3555.25
STMP14	CIRCULAR	0.90	0.64	0.23	0.90	1	2586.51
STMP150	CIRCULAR	0.60	0.28	0.15	0.60	1	563.87
STMP1513	CIRCULAR	0.80	0.50	0.20	0.80	1	3158.49
STMP1516	CIRCULAR	0.90	0.64	0.23	0.90	1	1672.85
STMP155	CIRCULAR	0.50	0.20	0.12	0.50	1	235.13
STMP156A	CIRCULAR	0.60	0.28	0.15	0.60	1	563.28
STMP156B	CIRCULAR	0.60	0.28	0.15	0.60	1	415.93
STMP1604	CIRCULAR	0.90	0.64	0.23	0.90	1	2388.56
STMP161	CIRCULAR	0.50	0.20	0.12	0.50	1	844.93
STMP170	CIRCULAR	0.80	0.50	0.20	0.80	3	1897.65
STMP183	CIRCULAR	0.75	0.44	0.19	0.75	1	2095.23
STMP184	CIRCULAR	0.90	0.64	0.23	0.90	1	1661.02
STMP20	CIRCULAR	0.50	0.20	0.12	0.50	1	347.62
STMP248	CIRCULAR	0.90	0.64	0.23	0.90	1	1672.29
STMP249	CIRCULAR	0.90	0.64	0.23	0.90	1	1668.40
STMP274	CIRCULAR	0.60	0.28	0.15	0.60	1	564.32
STMP276	CIRCULAR	0.75	0.44	0.19	0.75	1	1426.50
STMP29	CIRCULAR	1.05	0.87	0.26	1.05	1	6569.95
STMP308	CIRCULAR	0.45	0.16	0.11	0.45	1	714.48
STMP309	CIRCULAR	0.60	0.28	0.15	0.60	1	1304.47
STMP393	CIRCULAR	0.90	0.64	0.23	0.90	1	1374.18
STMP394	CIRCULAR	0.90	0.64	0.23	0.90	1	1509.26
STMP427	CIRCULAR	0.75	0.44	0.19	0.75	1	885.69
STMP428	CIRCULAR	0.75	0.44	0.19	0.75	1	1159.26
STMP435	CIRCULAR	0.90	0.64	0.23	0.90	1	2652.05
STMP521	CIRCULAR	1.20	1.13	0.30	1.20	1	3674.31
STMP524	CIRCULAR	0.75	0.44	0.19	0.75	1	2195.09

STMP525	CIRCULAR	0.75	0.44	0.19	0.75	1	2245.15
STMP554	CIRCULAR	1.20	1.13	0.30	1.20	1	3595.95
STMP555	CIRCULAR	1.20	1.13	0.30	1.20	1	3585.27
STMP556	CIRCULAR	1.20	1.13	0.30	1.20	1	3619.50
STMP591	CIRCULAR	1.20	1.13	0.30	1.20	1	3538.89
STMP594	CIRCULAR	1.20	1.13	0.30	1.20	1	3211.22
STMP595	CIRCULAR	1.20	1.13	0.30	1.20	1	3272.95
STMP692	CIRCULAR	0.50	0.20	0.12	0.50	1	348.98
STMP749	CIRCULAR	0.75	0.44	0.19	0.75	1	3861.49
STMP77	CIRCULAR	0.90	0.64	0.23	0.90	1	7523.31
STMP79	CIRCULAR	0.75	0.44	0.19	0.75	1	1054.36
STMP800	CIRCULAR	0.50	0.20	0.12	0.50	1	348.14
STMP801	CIRCULAR	0.50	0.20	0.12	0.50	1	345.45
STMP823	CIRCULAR	0.60	0.28	0.15	0.60	1	657.72
STMP824	CIRCULAR	0.60	0.28	0.15	0.60	1	653.92
STMP850	CIRCULAR	0.90	0.64	0.23	0.90	1	2886.48
STMP88	CIRCULAR	0.75	0.44	0.19	0.75	1	1069.45
STMP89	CIRCULAR	0.75	0.44	0.19	0.75	1	1443.65
STMP9	CIRCULAR	0.75	0.44	0.19	0.75	1	1054.66
STMP90	CIRCULAR	1.20	1.13	0.30	1.20	1	3602.16
STMP914	CIRCULAR	0.60	0.28	0.15	0.60	1	1030.27
STMP915	CIRCULAR	0.60	0.28	0.15	0.60	1	818.35
STMP964	CIRCULAR	0.90	0.64	0.23	0.90	1	1273.68
STMP98	CIRCULAR	0.90	0.64	0.23	0.90	1	4321.53
STMP99	CIRCULAR	0.90	0.64	0.23	0.90	1	3006.49
SYMP182	CIRCULAR	0.75	0.44	0.19	0.75	1	1726.93

****
Control Actions Taken
****

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	14.260	15.220
Evaporation Loss	0.000	0.000
Infiltration Loss	9.199	9.819
Surface Runoff	4.691	5.007
Final Surface Storage	0.524	0.559
Continuity Error (%)	-1.082	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	4.688	46.884
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	4.361	43.612
Internal Outflow	0.326	3.256
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.005	0.047
Continuity Error (%)	-0.067	

****
Time-Step Critical Elements
****
Link STMP749 (49.34%)
Link STMP1513 (16.62%)
Link STMP12 (9.06%)
Link C98 (7.60%)
Link STMP77 (4.55%)

****
Highest Flow Instability Indexes
****
Link STMP1516 (18)
Link STMP101 (16)
Link STMP249 (9)
Link STMP1513 (8)
Link STMP393 (6)

****
Routing Time Step Summary
****
Minimum Time Step : 0.50 sec
Average Time Step : 4.07 sec
Maximum Time Step : 30.00 sec

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Percent in Steady State     :     0.00
Average Iterations per Step :     4.01
Percent Not Converging      :    25.72


**************************
Subcatchment Runoff Summary
**************************
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Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
S13-A	15.22	0.00	0.00	4.57	9.94	1.43	1497.99	0.653
S13-B	15.22	0.00	0.00	4.57	9.88	1.40	1302.92	0.649
S13-C	15.22	0.00	0.00	5.17	9.36	0.47	484.50	0.615
S13-D	15.22	0.00	0.00	3.50	11.05	0.31	351.34	0.726
S13-E	15.22	0.00	0.00	4.87	9.68	0.51	542.90	0.636
S13-F	15.22	0.00	0.00	7.61	7.02	0.54	444.20	0.461
S13-G	15.22	0.00	0.00	7.91	6.94	0.09	104.92	0.456
S13-H	15.22	0.00	0.00	6.54	8.28	0.13	140.65	0.544
S23-A	15.22	0.00	0.00	4.72	9.72	1.54	1362.36	0.638
S23-B	15.22	0.00	0.00	5.63	9.03	0.36	396.85	0.593
S23-C	15.22	0.00	0.00	8.37	6.43	0.51	561.86	0.422
S25-A	15.22	0.00	0.00	5.94	8.51	1.92	1358.02	0.559
S25-B	15.22	0.00	0.00	6.85	7.82	0.52	553.15	0.514
S25-C	15.22	0.00	0.00	7.31	7.38	0.54	560.41	0.485
S25-D	15.22	0.00	0.00	6.85	7.79	0.83	837.38	0.512
S25-E	15.22	0.00	0.00	7.76	6.97	0.71	752.23	0.458
S25-F	15.22	0.00	0.00	8.52	6.18	2.58	2160.78	0.406
S25-G	15.22	0.00	0.00	7.76	7.03	0.23	259.39	0.462
S25-H	15.22	0.00	0.00	8.98	5.88	0.20	226.59	0.387
S25-I	15.22	0.00	0.00	5.02	9.47	1.92	1849.87	0.622
S25-J	15.22	0.00	0.00	4.26	10.09	2.48	1976.18	0.663
S32-A	15.22	0.00	0.00	7.61	6.26	3.40	968.00	0.411
S32-B	15.22	0.00	0.00	7.61	7.02	0.38	311.53	0.461
S38-A	15.22	0.00	0.00	3.20	11.24	1.83	1951.39	0.738
S38-B	15.22	0.00	0.00	3.65	10.81	1.98	2110.54	0.710
S38-C	15.22	0.00	0.00	3.20	11.23	0.94	990.42	0.738
S38-D	15.22	0.00	0.00	4.11	10.34	0.49	490.54	0.679
S38-Z1	15.22	0.00	0.00	13.70	1.48	2.01	2218.69	0.097
S38-Z2	15.22	0.00	0.00	13.70	1.48	0.08	92.59	0.097
S3-A	15.22	0.00	0.00	5.63	8.97	0.77	823.98	0.589

S3-B	15.22	0.00	0.00	5.78	8.86	0.18	193.24	0.582
S3-C	15.22	0.00	0.00	5.94	8.71	0.31	340.58	0.572
S3-D	15.22	0.00	0.00	3.04	11.48	0.24	270.57	0.754
S3-E	15.22	0.00	0.00	3.65	10.91	0.65	721.87	0.717
S3-F	15.22	0.00	0.00	6.39	8.53	0.16	181.13	0.560
S3-G	15.22	0.00	0.00	6.09	8.75	0.29	317.92	0.575
S3-Z1	15.22	0.00	0.00	13.70	1.47	3.54	3927.50	0.096
S4-A	15.22	0.00	0.00	3.50	11.14	0.43	477.91	0.732
S4-B	15.22	0.00	0.00	3.04	11.28	0.46	423.71	0.741
S4-C	15.22	0.00	0.00	4.11	10.35	0.70	713.23	0.680
S5-A	15.22	0.00	0.00	5.48	9.10	0.81	866.47	0.598
S5-B	15.22	0.00	0.00	3.04	11.33	0.20	197.70	0.744
S5-C	15.22	0.00	0.00	3.04	11.32	0.28	277.98	0.744
S5-D	15.22	0.00	0.00	3.04	11.35	0.15	149.13	0.745
S5-E	15.22	0.00	0.00	3.20	11.24	0.45	483.48	0.739
S5-F	15.22	0.00	0.00	3.04	11.49	0.12	131.02	0.755
S5-G	15.22	0.00	0.00	3.50	10.84	0.44	393.16	0.712
S5-H	15.22	0.00	0.00	4.11	10.26	0.38	320.46	0.674
S5-I	15.22	0.00	0.00	4.41	10.11	1.04	1117.83	0.664
S5-J	15.22	0.00	0.00	6.09	8.66	0.51	573.34	0.569
S5-K	15.22	0.00	0.00	7.00	7.69	2.21	2391.80	0.505
S5-Z1	15.22	0.00	0.00	13.70	1.48	1.30	1426.55	0.097
S7-A	15.22	0.00	0.00	6.70	7.91	0.59	558.06	0.520
S7-B	15.22	0.00	0.00	11.87	3.21	0.13	139.48	0.211
S13-I	15.22	0.00	0.00	0.85	12.37	0.26	214.26	0.813

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Node Depth Summary
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J1	JUNCTION	0.45	2.90	447.82	0 00:18
STMH286	JUNCTION	0.66	3.40	447.71	0 00:18
STMH56	JUNCTION	0.69	3.20	447.18	0 00:18
STMH54	JUNCTION	0.75	4.10	447.07	0 00:18
STMH178	JUNCTION	0.96	3.20	444.49	0 00:17
STMH177	JUNCTION	0.74	2.60	443.38	0 00:17
STMH398	JUNCTION	0.43	1.42	441.84	0 00:18
STMH188	JUNCTION	0.41	3.40	449.42	0 00:19

STMH64	JUNCTION	0.39	3.40	448.96	0	00:19
STMH161	JUNCTION	0.46	3.00	447.09	0	00:18
STMH165	JUNCTION	0.71	3.60	447.16	0	00:18
STMH63	JUNCTION	0.36	3.30	448.38	0	00:19
STMH62	JUNCTION	0.32	2.80	447.78	0	00:19
STMH77	JUNCTION	0.22	0.62	454.77	0	00:20
STMH74	JUNCTION	0.21	0.59	453.46	0	00:20
STMH83	JUNCTION	0.77	3.00	444.98	0	00:17
STMH79	JUNCTION	0.81	2.60	443.98	0	00:16
STMH235	JUNCTION	0.57	1.90	444.34	0	00:17
J22	JUNCTION	0.51	1.90	444.65	0	00:17
STMH139	JUNCTION	0.47	2.52	455.61	0	00:18
STMH138	JUNCTION	0.48	2.72	455.71	0	00:18
STMH183	JUNCTION	0.48	2.63	455.39	0	00:18
STMH6	JUNCTION	0.50	2.48	454.96	0	00:18
STMH7	JUNCTION	0.50	2.43	454.53	0	00:17
STMH184	JUNCTION	0.51	2.45	454.34	0	00:17
STMH185	JUNCTION	0.50	2.19	453.94	0	00:17
STMH12	JUNCTION	0.50	2.40	454.09	0	00:17
J33	JUNCTION	0.40	2.41	461.49	0	00:20
J34	JUNCTION	0.09	0.23	455.59	0	00:20
STMH17	JUNCTION	0.13	0.36	454.35	0	00:20
STMH254	JUNCTION	0.16	0.42	453.66	0	00:21
STMH93	JUNCTION	0.23	0.71	452.59	0	00:21
J37	JUNCTION	0.19	0.51	454.00	0	00:20
J38	JUNCTION	0.09	0.24	454.60	0	00:20
STMH190	JUNCTION	0.57	4.39	454.11	0	00:18
STMH133	JUNCTION	0.57	4.40	454.68	0	00:18
STMH135	JUNCTION	0.50	3.80	454.81	0	00:18
STMH131	JUNCTION	0.67	3.70	454.91	0	00:18
STMH196	JUNCTION	0.59	3.00	454.69	0	00:18
STMH137	JUNCTION	0.40	2.60	455.88	0	00:18
STMH15	JUNCTION	0.30	1.80	456.07	0	00:18
J46	JUNCTION	0.25	4.54	459.85	0	00:18
STMH4	JUNCTION	0.27	3.10	455.67	0	00:18
STMH216	JUNCTION	0.32	3.10	455.25	0	00:17
STMH197	JUNCTION	0.46	2.63	454.58	0	00:18
STMH2	JUNCTION	0.30	1.80	454.86	0	00:19
STMH28	JUNCTION	0.58	1.90	455.10	0	00:16
STMH147	JUNCTION	0.56	2.90	456.65	0	00:16
STMH194	JUNCTION	0.59	1.80	455.80	0	00:15
STMH253	JUNCTION	0.67	2.00	456.49	0	00:15
J56	JUNCTION	0.34	2.60	457.98	0	00:17
STMH212	JUNCTION	0.54	1.20	456.05	0	00:15

STMH298	JUNCTION	0.21	1.60	441.87	0	00:20
STMH297	JUNCTION	0.26	3.90	444.54	0	00:18
STMH26	JUNCTION	0.06	0.15	452.64	0	00:20
STMH22	JUNCTION	0.13	0.33	454.52	0	00:20
STMH23	JUNCTION	0.28	1.93	456.31	0	00:17
STMH225	JUNCTION	0.48	2.44	452.63	0	00:18
STMH226	JUNCTION	0.78	3.04	451.10	0	00:18
STMH202	JUNCTION	0.38	3.02	449.73	0	00:19
STMH38	JUNCTION	0.44	2.75	447.45	0	00:19
STMH205	JUNCTION	0.38	3.20	445.10	0	00:19
STMH204	JUNCTION	0.65	3.60	444.55	0	00:19
STMH109	JUNCTION	0.57	1.85	442.32	0	00:18
STMH37	JUNCTION	0.69	2.50	453.12	0	00:17
STMH244	JUNCTION	0.50	1.80	441.60	0	00:19
STMH362	JUNCTION	0.45	1.82	441.27	0	00:19
J73	JUNCTION	0.16	0.36	439.64	0	00:20
J74	JUNCTION	0.18	0.44	438.71	0	00:21
J75	JUNCTION	0.20	0.44	438.06	0	00:22
J76	JUNCTION	0.00	0.00	437.10	0	00:00
J77	JUNCTION	0.40	0.72	442.72	0	00:22
J78	JUNCTION	0.27	0.61	438.61	0	00:22
J79	JUNCTION	0.35	4.32	459.10	0	00:18
STMH116	JUNCTION	0.45	2.30	456.30	0	00:17
DRCB64	JUNCTION	0.21	0.50	451.86	0	00:20
DRCB40	JUNCTION	0.30	0.73	446.34	0	00:20
J83	JUNCTION	0.25	0.73	459.22	0	00:20
J84	JUNCTION	0.10	0.23	437.59	0	00:20
J85	JUNCTION	0.17	0.42	457.79	0	00:20
STMH78	JUNCTION	0.26	0.81	447.45	0	00:20
J86	JUNCTION	0.51	2.50	460.96	0	00:16
J87	JUNCTION	0.09	0.24	458.81	0	00:20
J88	JUNCTION	0.09	0.24	458.49	0	00:20
J89	JUNCTION	0.00	0.00	456.77	0	00:00
J90	JUNCTION	0.00	0.00	459.23	0	00:00
J91	JUNCTION	0.00	0.00	457.00	0	00:00
DRCB258	JUNCTION	0.42	0.89	440.68	0	00:21
DRCB260	JUNCTION	0.89	1.50	440.45	0	00:20
J94	JUNCTION	0.18	0.23	437.07	0	00:21
STMH246-DIV	JUNCTION	0.19	0.57	456.49	0	00:20
DROF13	OUTFALL	0.42	0.90	441.11	0	00:18
DROF38	OUTFALL	0.58	1.05	441.90	0	00:16
DROF3	OUTFALL	0.47	1.20	452.54	0	00:17
DROF4	OUTFALL	0.23	0.75	452.36	0	00:20
DROF5	OUTFALL	0.54	1.20	450.65	0	00:18

DROF7	OUTFALL	0.20	0.60	440.62	0	00:19
DROF25	OUTFALL	0.40	0.72	440.72	0	00:22
DROF23	OUTFALL	0.29	0.72	444.62	0	00:20
DRFI2017	OUTFALL	0.18	0.23	436.65	0	00:21

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	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	214.04	438.37	0 00:18	0.262	0.271	-0.157
STMH286	JUNCTION	1496.41	1524.41	0 00:20	1.43	1.67	0.043
STMH56	JUNCTION	0.00	1336.56	0 00:22	0	1.64	0.026
STMH54	JUNCTION	542.35	3009.00	0 00:20	0.505	4.11	-0.046
STMH178	JUNCTION	443.68	3445.21	0 00:20	0.538	4.65	0.006
STMH177	JUNCTION	104.83	2773.38	0 00:20	0.0937	4.56	-0.005
STMH398	JUNCTION	140.54	2912.27	0 00:20	0.126	4.68	0.006
STMH188	JUNCTION	1301.46	1301.46	0 00:20	1.4	1.4	0.021
STMH64	JUNCTION	0.00	1179.81	0 00:21	0	1.39	0.002
STMH161	JUNCTION	351.01	1489.20	0 00:20	0.315	1.7	-0.119
STMH165	JUNCTION	483.98	1540.13	0 00:18	0.471	1.92	-0.055
STMH63	JUNCTION	0.00	1179.92	0 00:21	0	1.39	0.018
STMH62	JUNCTION	0.00	1180.35	0 00:21	0	1.39	-0.162
STMH77	JUNCTION	0.00	4207.84	0 00:20	0	3.92	0.002
STMH74	JUNCTION	0.00	4225.83	0 00:20	0	3.92	-0.004
STMH83	JUNCTION	0.00	5163.64	0 00:21	0	6.09	0.040
STMH79	JUNCTION	490.01	4151.20	0 00:20	0.488	6.29	-0.101
STMH235	JUNCTION	0.00	2851.10	0 00:21	0	2.11	-0.425
J22	JUNCTION	2108.36	2108.36	0 00:20	1.98	1.98	0.234
STMH139	JUNCTION	0.00	3844.15	0 00:20	0	4.4	-0.001
STMH138	JUNCTION	270.33	4091.20	0 00:20	0.242	4.65	0.006
STMH183	JUNCTION	0.00	4093.45	0 00:20	0	4.65	-0.003
STMH6	JUNCTION	340.25	4409.55	0 00:20	0.309	4.96	0.013
STMH7	JUNCTION	193.05	4591.01	0 00:20	0.175	5.13	-0.019
STMH184	JUNCTION	0.00	4590.61	0 00:20	0	5.13	-0.002
STMH185	JUNCTION	0.00	4591.68	0 00:20	0	5.13	-0.005
STMH12	JUNCTION	823.14	5377.42	0 00:20	0.765	5.9	0.009
J33	JUNCTION	4105.62	4105.62	0 00:20	3.71	3.7	0.002

J34	JUNCTION	477.51	477.51	0	00:20	0.427	0.427	0.027
STMH17	JUNCTION	0.00	470.10	0	00:20	0	0.427	-0.024
STMH254	JUNCTION	0.00	864.62	0	00:20	0	0.887	0.054
STMH93	JUNCTION	712.47	1509.24	0	00:20	0.7	1.59	-0.003
J37	JUNCTION	423.24	870.82	0	00:20	0.46	0.887	0.023
J38	JUNCTION	0.00	467.94	0	00:20	0	0.427	-0.001
STMH190	JUNCTION	0.00	5500.89	0	00:20	0	7.1	-0.011
STMH133	JUNCTION	865.58	5499.87	0	00:20	0.815	7.1	0.012
STMH135	JUNCTION	197.48	4641.89	0	00:20	0.197	6.29	-0.002
STMH131	JUNCTION	277.68	4453.93	0	00:20	0.283	6.09	0.016
STMH196	JUNCTION	148.97	4216.57	0	00:22	0.145	5.82	-0.007
STMH137	JUNCTION	0.00	2949.24	0	00:18	0	3.46	-0.039
STMH15	JUNCTION	130.90	3946.82	0	00:20	0.117	3.62	-0.025
J46	JUNCTION	3814.98	3814.98	0	00:20	3.5	3.5	0.007
STMH4	JUNCTION	482.99	482.99	0	00:20	0.451	0.451	-0.065
STMH216	JUNCTION	0.00	482.94	0	00:20	0	0.451	-0.068
STMH197	JUNCTION	0.00	1101.47	0	00:25	0	1.76	0.015
STMH2	JUNCTION	392.71	998.93	0	00:19	0.444	1.76	-0.030
STMH28	JUNCTION	0.00	669.75	0	00:18	0	1.33	-0.015
STMH147	JUNCTION	320.09	669.74	0	00:18	0.38	1.33	-0.004
STMH194	JUNCTION	0.00	527.42	0	00:15	0	0.962	-0.032
STMH253	JUNCTION	0.00	690.39	0	00:15	0	1.01	-0.078
J56	JUNCTION	572.85	572.85	0	00:20	0.512	0.512	-0.168
STMH212	JUNCTION	1116.70	1353.02	0	00:20	1.04	1.09	-0.016
STMH298	JUNCTION	0.00	688.31	0	00:20	0	0.716	0.032
STMH297	JUNCTION	139.38	688.40	0	00:20	0.125	0.716	-0.011
STMH26	JUNCTION	0.00	554.37	0	00:20	0	0.59	0.008
STMH22	JUNCTION	0.00	557.38	0	00:20	0	0.591	0.023
STMH23	JUNCTION	557.44	557.44	0	00:20	0.591	0.591	0.008
STMH225	JUNCTION	552.57	1492.55	0	00:18	0.524	2.29	0.018
STMH226	JUNCTION	0.00	1492.52	0	00:18	0	2.29	-0.086
STMH202	JUNCTION	559.82	1846.16	0	00:19	0.536	2.78	0.004
STMH38	JUNCTION	836.47	2446.68	0	00:19	0.834	3.61	0.009
STMH205	JUNCTION	259.15	2597.70	0	00:20	0.232	3.83	-0.044
STMH204	JUNCTION	0.00	2598.00	0	00:20	0	3.83	0.016
STMH109	JUNCTION	0.00	2598.51	0	00:20	0	3.83	0.027
STMH37	JUNCTION	1356.69	1356.69	0	00:20	1.92	1.92	0.006
STMH244	JUNCTION	226.38	2482.73	0	00:21	0.203	3.98	0.006
STMH362	JUNCTION	0.00	2483.64	0	00:21	0	3.98	-0.049
J73	JUNCTION	2158.31	4814.96	0	00:20	2.58	6.56	0.028
J74	JUNCTION	751.45	5533.13	0	00:21	0.708	7.26	0.099
J75	JUNCTION	1847.84	6746.56	0	00:22	1.92	9.17	0.046
J76	JUNCTION	0.00	8533.21	0	00:22	0	11.6	0.000
J77	JUNCTION	0.00	8533.21	0	00:22	0	11.6	0.010

J78	JUNCTION	0.00	5326.16	0	00:22	0	7.26	0.072
J79	JUNCTION	0.00	3813.42	0	00:20	0	3.5	-0.000
STMH116	JUNCTION	1360.82	1360.82	0	00:20	1.54	1.54	-0.001
DRCB64	JUNCTION	396.49	1323.66	0	00:20	0.356	1.8	0.004
DRCB40	JUNCTION	561.31	1868.30	0	00:20	0.51	2.31	0.046
J83	JUNCTION	4259.09	4259.09	0	00:20	3.93	3.92	0.011
J84	JUNCTION	1973.89	1973.89	0	00:20	2.48	2.48	0.015
J85	JUNCTION	0.00	3118.70	0	00:20	0	3.76	0.005
STMH78	JUNCTION	989.39	5147.22	0	00:20	0.94	4.86	0.158
J86	JUNCTION	0.00	4104.01	0	00:20	0	3.7	-0.014
J87	JUNCTION	317.67	317.67	0	00:20	0.286	0.285	-0.004
J88	JUNCTION	0.00	318.51	0	00:20	0	0.285	0.052
J89	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
J90	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
J91	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
DRCB258	JUNCTION	1100.72	1100.72	0	00:30	3.76	3.76	0.013
DRCB260	JUNCTION	0.00	1101.26	0	00:30	0	3.76	0.104
J94	JUNCTION	0.00	810.90	0	00:21	0	3.39	0.095
STMH246-DIV	JUNCTION	721.21	3825.79	0	00:20	0.646	4.4	-0.006
DROF13	OUTFALL	0.00	2912.46	0	00:20	0	4.68	0.000
DROF38	OUTFALL	0.00	4151.23	0	00:20	0	6.29	0.000
DROF3	OUTFALL	0.00	5378.02	0	00:20	0	5.9	0.000
DROF4	OUTFALL	0.00	1485.14	0	00:21	0	1.59	0.000
DROF5	OUTFALL	0.00	5501.49	0	00:20	0	7.1	0.000
DROF7	OUTFALL	0.00	688.59	0	00:20	0	0.715	0.000
DROF25	OUTFALL	0.00	8593.35	0	00:22	0	11.6	0.000
DROF23	OUTFALL	0.00	1859.62	0	00:20	0	2.31	0.000
DRFI2017	OUTFALL	0.00	820.48	0	00:21	0	3.39	0.000

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Node Surcharge Summary
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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
J1	JUNCTION	0.19	2.400	0.000
STMH286	JUNCTION	0.22	2.650	0.000
STMH56	JUNCTION	0.23	2.450	0.000
STMH54	JUNCTION	0.23	3.200	0.000

STMH178	JUNCTION	0.31	2.300	0.000
STMH177	JUNCTION	0.30	1.700	0.000
STMH398	JUNCTION	0.19	0.521	1.679
STMH188	JUNCTION	0.15	2.800	0.000
STMH64	JUNCTION	0.15	2.800	0.000
STMH161	JUNCTION	0.17	2.100	0.000
STMH165	JUNCTION	0.24	2.850	0.000
STMH63	JUNCTION	0.14	2.700	0.000
STMH62	JUNCTION	0.11	1.900	0.000
STMH83	JUNCTION	0.22	1.730	0.000
STMH79	JUNCTION	0.29	1.325	0.000
STMH235	JUNCTION	0.21	0.950	0.000
J22	JUNCTION	0.19	1.000	0.000
STMH139	JUNCTION	0.09	1.325	1.515
STMH138	JUNCTION	0.10	1.519	0.691
STMH183	JUNCTION	0.10	1.431	0.479
STMH6	JUNCTION	0.12	1.276	0.494
STMH7	JUNCTION	0.13	1.227	1.473
STMH184	JUNCTION	0.14	1.252	1.948
STMH185	JUNCTION	0.14	0.986	2.254
STMH12	JUNCTION	0.14	1.203	1.997
J33	JUNCTION	0.14	1.505	0.095
STMH190	JUNCTION	0.18	3.189	0.311
STMH133	JUNCTION	0.16	3.199	0.001
STMH135	JUNCTION	0.11	2.600	0.000
STMH131	JUNCTION	0.14	2.500	0.000
STMH196	JUNCTION	0.12	1.800	0.000
STMH137	JUNCTION	0.11	1.700	0.000
STMH15	JUNCTION	0.09	0.900	0.000
J46	JUNCTION	0.06	3.639	0.461
STMH4	JUNCTION	0.12	2.500	0.000
STMH216	JUNCTION	0.15	2.500	0.000
STMH197	JUNCTION	0.13	1.732	0.068
STMH2	JUNCTION	0.09	1.050	0.000
STMH28	JUNCTION	0.49	1.300	0.000
STMH147	JUNCTION	0.40	2.300	0.000
STMH194	JUNCTION	0.44	1.300	0.000
STMH253	JUNCTION	0.44	1.400	0.000
J56	JUNCTION	0.20	2.000	0.000
STMH212	JUNCTION	0.42	0.700	0.000
STMH298	JUNCTION	0.04	1.000	0.000
STMH297	JUNCTION	0.08	3.300	0.000
STMH23	JUNCTION	0.14	1.435	1.365
STMH225	JUNCTION	0.22	1.840	0.000

STMH226	JUNCTION	0.16	1.040	0.000
STMH202	JUNCTION	0.10	2.270	0.000
STMH38	JUNCTION	0.14	2.000	0.000
STMH205	JUNCTION	0.16	2.450	0.000
STMH204	JUNCTION	0.22	2.700	0.000
STMH109	JUNCTION	0.22	0.950	0.000
STMH37	JUNCTION	0.33	1.900	0.000
STMH244	JUNCTION	0.20	0.900	0.000
STMH362	JUNCTION	0.01	0.916	0.284
J79	JUNCTION	0.08	3.415	0.385
STMH116	JUNCTION	0.19	1.850	0.000
J86	JUNCTION	0.15	1.600	0.000
DRCB258	JUNCTION	0.01	0.089	0.611
DRCB260	JUNCTION	0.57	0.700	0.000

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

Node	Hours Flooded	Maximum Rate LPS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
J1	0.07	424.12	0 00:18	0.037	0.000
STMH286	0.05	193.19	0 00:20	0.019	0.000
STMH56	0.10	802.63	0 00:20	0.188	0.000
STMH54	0.01	995.79	0 00:18	0.003	0.000
STMH178	0.11	772.98	0 00:20	0.180	0.000
STMH177	0.01	501.91	0 00:17	0.002	0.000
STMH188	0.03	172.95	0 00:19	0.013	0.000
STMH64	0.01	15.31	0 00:19	0.000	0.000
STMH161	0.02	1202.59	0 00:18	0.018	0.000
STMH165	0.01	271.54	0 00:18	0.001	0.000
STMH63	0.01	330.54	0 00:19	0.001	0.000
STMH62	0.01	652.10	0 00:19	0.006	0.000
STMH83	0.01	1191.26	0 00:17	0.005	0.000
STMH79	0.01	798.67	0 00:16	0.003	0.000
STMH235	0.15	2850.78	0 00:21	0.881	0.000
J22	0.10	723.70	0 00:20	0.155	0.000
STMH135	0.01	602.26	0 00:18	0.001	0.000

STMH131	0.01	165.00	0 00:18	0.000	0.000
STMH196	0.01	101.18	0 00:18	0.000	0.000
STMH137	0.01	250.91	0 00:18	0.000	0.000
STMH15	0.06	1243.87	0 00:20	0.156	0.000
STMH4	0.01	134.48	0 00:18	0.000	0.000
STMH216	0.01	180.33	0 00:17	0.000	0.000
STMH2	0.01	517.71	0 00:19	0.008	0.000
STMH28	0.06	177.30	0 00:16	0.019	0.000
STMH147	0.01	87.47	0 00:16	0.000	0.000
STMH194	0.05	106.62	0 00:15	0.008	0.000
STMH253	0.01	268.70	0 00:15	0.001	0.000
J56	0.01	212.86	0 00:17	0.001	0.000
STMH212	0.35	1352.09	0 00:20	0.587	0.000
STMH298	0.01	65.90	0 00:20	0.000	0.000
STMH297	0.01	72.45	0 00:18	0.000	0.000
STMH225	0.01	6.53	0 00:18	0.000	0.000
STMH226	0.08	358.62	0 00:18	0.051	0.000
STMH202	0.01	391.03	0 00:19	0.002	0.000
STMH38	0.02	446.44	0 00:19	0.006	0.000
STMH205	0.01	394.47	0 00:19	0.001	0.000
STMH204	0.01	168.43	0 00:19	0.000	0.000
STMH109	0.07	411.81	0 00:20	0.057	0.000
STMH37	0.14	578.91	0 00:20	0.157	0.000
STMH244	0.01	255.65	0 00:19	0.001	0.000
STMH116	0.12	433.21	0 00:20	0.089	0.000
J86	0.10	1294.92	0 00:20	0.232	0.000
DRCB260	0.49	290.98	0 00:30	0.366	0.000

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
DROF13	99.59	1119.76	2912.46	4.684
DROF38	99.59	1528.12	4151.23	6.292
DROF3	99.59	1430.45	5378.02	5.896
DROF4	99.59	377.75	1485.14	1.586
DROF5	99.55	1697.84	5501.49	7.104
DROF7	99.40	169.95	688.59	0.715

DROF25	99.59	2716.64	8593.35	11.636
DROF23	99.59	550.44	1859.62	2.312
DRFI2017	99.44	572.98	820.48	3.386
System	99.54	10163.93	30159.08	43.612

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Link Flow Summary
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Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C100	CONDUIT	1462.11	0 00:21	2.30	1.60	1.00
C101	CONDUIT	3702.19	0 00:21	3.27	1.25	1.00
C102	CONDUIT	4151.23	0 00:20	4.79	1.89	1.00
C103	CONDUIT	4218.40	0 00:20	7.06	0.60	0.67
C104	CONDUIT	5163.64	0 00:21	6.42	0.79	0.89
C105	CONDUIT	2806.71	0 00:20	7.62	1.56	0.78
C106	CONDUIT	318.51	0 00:20	2.66	0.22	0.32
C107	CONDUIT	312.29	0 00:20	1.68	0.22	0.44
C108	CONDUIT	0.00	0 00:00	0.00	0.00	0.13
C109	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
C110	CONDUIT	0.00	0 00:00	0.00	0.00	0.13
C93	CONDUIT	3813.42	0 00:20	3.13	0.66	1.00
C96	CONDUIT	4207.84	0 00:20	6.72	0.81	0.69
C98	CONDUIT	4104.01	0 00:20	6.45	0.90	1.00
C99	CONDUIT	3117.13	0 00:20	5.45	0.05	0.25
DRDI117	CONDUIT	820.48	0 00:21	2.77	0.04	0.23
DRDI27	CONDUIT	4860.06	0 00:21	2.45	0.06	0.26
DRDI28	CONDUIT	5326.16	0 00:22	1.91	0.07	0.34
DRDI4	CONDUIT	6813.36	0 00:22	5.56	0.09	0.15
DRDI5	CONDUIT	1988.36	0 00:20	4.23	0.03	0.08
DRDI6	CONDUIT	8593.35	0 00:22	5.57	0.06	0.36
STMP10	CONDUIT	1179.81	0 00:21	4.17	1.47	1.00
STMP100	CONDUIT	4216.78	0 00:22	3.73	1.12	1.00
STMP101	CONDUIT	4454.11	0 00:20	3.94	1.87	1.00
STMP103	CONDUIT	1103.52	0 00:25	1.87	0.63	1.00
STMP106	CONDUIT	4642.46	0 00:20	4.10	1.02	1.00
STMP107	CONDUIT	5500.89	0 00:20	4.86	1.34	1.00
STMP1086	CONDUIT	1859.62	0 00:20	3.40	0.98	0.80

STMP11	CONDUIT	1179.92	0	00:21	4.17	1.48	1.00
STMP1170	CONDUIT	810.90	0	00:21	3.95	1.09	0.69
STMP118	CONDUIT	669.68	0	00:18	2.54	2.42	1.00
STMP12	CONDUIT	1180.35	0	00:21	4.21	1.49	1.00
STMP120	CONDUIT	669.75	0	00:18	2.37	1.19	1.00
STMP123	CONDUIT	1101.47	0	00:25	2.97	0.68	1.00
STMP1289	CONDUIT	554.01	0	00:20	6.02	0.30	0.69
STMP13	CONDUIT	1180.76	0	00:21	3.08	0.50	1.00
STMP131	CONDUIT	5501.49	0	00:20	4.86	1.55	1.00
STMP14	CONDUIT	1489.50	0	00:20	2.46	0.58	1.00
STMP150	CONDUIT	1043.97	0	00:18	3.69	1.85	1.00
STMP1513	CONDUIT	1101.26	0	00:30	3.17	0.35	1.00
STMP1516	CONDUIT	2669.95	0	00:19	5.90	1.60	0.70
STMP155	CONDUIT	557.38	0	00:20	3.22	2.37	0.83
STMP156A	CONDUIT	688.59	0	00:20	2.44	1.22	1.00
STMP156B	CONDUIT	688.31	0	00:20	2.43	1.65	1.00
STMP1604	CONDUIT	2912.46	0	00:20	4.58	1.22	1.00
STMP161	CONDUIT	554.37	0	00:20	6.05	0.66	0.48
STMP170	CONDUIT	5259.63	0	00:22	5.06	0.92	0.65
STMP183	CONDUIT	2349.51	0	00:20	6.03	1.12	1.00
STMP184	CONDUIT	2598.51	0	00:20	4.08	1.56	1.00
STMP20	CONDUIT	272.09	0	00:18	1.39	0.78	1.00
STMP248	CONDUIT	2308.82	0	00:23	3.63	1.38	1.00
STMP249	CONDUIT	2483.64	0	00:21	3.92	1.49	1.00
STMP274	CONDUIT	572.78	0	00:20	2.03	1.01	1.00
STMP276	CONDUIT	858.66	0	00:21	2.51	0.60	0.75
STMP29	CONDUIT	4225.83	0	00:20	8.09	0.64	0.58
STMP308	CONDUIT	936.34	0	00:23	5.89	1.31	1.00
STMP309	CONDUIT	1312.75	0	00:20	4.85	1.01	0.91
STMP393	CONDUIT	2773.46	0	00:20	4.36	2.02	1.00
STMP394	CONDUIT	2708.43	0	00:25	4.26	1.79	1.00
STMP427	CONDUIT	1137.00	0	00:18	2.57	1.28	1.00
STMP428	CONDUIT	1535.69	0	00:18	3.48	1.32	1.00
STMP435	CONDUIT	3009.07	0	00:20	4.73	1.13	1.00
STMP521	CONDUIT	3845.74	0	00:20	3.40	1.05	1.00
STMP524	CONDUIT	470.10	0	00:20	2.87	0.21	0.40
STMP525	CONDUIT	467.94	0	00:20	3.91	0.21	0.32
STMP554	CONDUIT	4410.14	0	00:20	3.90	1.23	1.00
STMP555	CONDUIT	4093.45	0	00:20	3.62	1.14	1.00
STMP556	CONDUIT	4094.59	0	00:20	3.62	1.13	1.00
STMP591	CONDUIT	4590.61	0	00:20	4.06	1.30	1.00
STMP594	CONDUIT	4591.68	0	00:20	4.06	1.43	1.00
STMP595	CONDUIT	4592.39	0	00:20	4.06	1.40	1.00
STMP692	CONDUIT	497.20	0	00:16	2.57	1.42	1.00

STMP749	CONDUIT	2598.00	0	00:20	5.88	0.67	1.00	
STMP77	CONDUIT	3844.15	0	00:20	7.07	0.51	0.82	
STMP79	CONDUIT	470.16	0	00:20	1.78	0.45	0.58	
STMP800	CONDUIT	527.42	0	00:15	2.69	1.51	1.00	
STMP801	CONDUIT	445.39	0	00:15	2.27	1.29	1.00	
STMP823	CONDUIT	483.52	0	00:20	1.71	0.74	1.00	
STMP824	CONDUIT	482.94	0	00:20	2.07	0.74	1.00	
STMP850	CONDUIT	3816.20	0	00:20	6.00	1.32	1.00	
STMP88	CONDUIT	864.62	0	00:20	3.02	0.81	0.62	
STMP89	CONDUIT	1485.14	0	00:21	3.72	1.03	0.97	
STMP9	CONDUIT	1336.56	0	00:22	3.03	1.27	1.00	
STMP90	CONDUIT	5378.02	0	00:20	4.76	1.49	1.00	
STMP914	CONDUIT	1492.52	0	00:18	5.28	1.45	1.00	
STMP915	CONDUIT	1337.06	0	00:19	4.73	1.63	1.00	
STMP964	CONDUIT	1389.90	0	00:23	2.18	1.09	1.00	
STMP98	CONDUIT	2949.24	0	00:18	5.87	0.68	1.00	
STMP99	CONDUIT	2874.43	0	00:22	4.52	0.96	1.00	
SYMP182	CONDUIT	1702.54	0	00:19	4.25	0.99	1.00	
STMP187_PUMP	PUMP	8533.21	0	00:22				

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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
		Fraction of Time in Flow Class								
C100	1.00	0.00	0.00	0.00	0.32	0.00	0.00	0.68	0.00	0.00
C101	1.00	0.00	0.00	0.00	0.37	0.07	0.00	0.56	0.02	0.00
C102	1.00	0.00	0.00	0.00	0.40	0.60	0.00	0.00	0.70	0.00
C103	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.92	0.00
C104	1.00	0.00	0.00	0.00	0.00	0.67	0.00	0.33	0.24	0.00
C105	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.00
C106	1.00	0.00	0.00	0.00	0.09	0.90	0.00	0.00	0.89	0.00
C107	1.00	0.00	0.00	0.00	0.52	0.48	0.00	0.00	0.54	0.00
C108	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C109	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C110	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C93	1.00	0.00	0.00	0.00	0.08	0.92	0.00	0.00	0.86	0.00
C96	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C98	1.00	0.00	0.00	0.00	0.12	0.88	0.00	0.00	0.86	0.00

C99	1.00	0.00	0.00	0.00	0.18	0.81	0.00	0.00	0.93	0.00
DRDI117	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.69	0.00
DRDI27	1.00	0.00	0.00	0.00	0.07	0.92	0.00	0.00	0.89	0.00
DRDI28	1.00	0.00	0.00	0.00	0.82	0.18	0.00	0.00	0.72	0.00
DRDI4	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
DRDI5	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
DRDI6	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.85	0.00
STMP10	1.00	0.00	0.00	0.00	0.14	0.86	0.00	0.00	0.63	0.00
STMP100	1.00	0.00	0.00	0.00	0.24	0.75	0.00	0.00	0.75	0.00
STMP101	1.00	0.00	0.00	0.00	0.17	0.83	0.00	0.00	0.18	0.00
STMP103	1.00	0.00	0.00	0.00	0.55	0.45	0.00	0.00	0.69	0.00
STMP106	1.00	0.00	0.00	0.00	0.16	0.83	0.00	0.00	0.83	0.00
STMP107	1.00	0.00	0.00	0.00	0.17	0.82	0.00	0.00	0.79	0.00
STMP1086	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.74	0.00
STMP11	1.00	0.00	0.00	0.00	0.14	0.86	0.00	0.00	0.86	0.00
STMP1170	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.00
STMP118	1.00	0.00	0.00	0.00	0.38	0.61	0.00	0.00	0.04	0.00
STMP12	1.00	0.00	0.00	0.00	0.13	0.87	0.00	0.00	0.33	0.00
STMP120	1.00	0.00	0.00	0.00	0.94	0.06	0.00	0.00	0.76	0.00
STMP123	1.00	0.00	0.00	0.00	0.14	0.86	0.00	0.00	0.88	0.00
STMP1289	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.97	0.00
STMP13	1.00	0.00	0.00	0.00	0.17	0.82	0.00	0.00	0.48	0.00
STMP131	1.00	0.00	0.00	0.00	0.18	0.82	0.00	0.00	0.74	0.00
STMP14	1.00	0.00	0.00	0.00	0.28	0.72	0.00	0.00	0.87	0.00
STMP150	1.00	0.00	0.00	0.00	0.24	0.76	0.00	0.00	0.11	0.00
STMP1513	1.00	0.00	0.00	0.00	0.51	0.49	0.00	0.00	0.75	0.00
STMP1516	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.25	0.00
STMP155	1.00	0.00	0.00	0.00	0.02	0.97	0.00	0.00	0.00	0.00
STMP156A	1.00	0.00	0.00	0.00	0.06	0.93	0.00	0.00	0.73	0.00
STMP156B	1.00	0.00	0.00	0.00	0.28	0.71	0.00	0.00	0.08	0.00
STMP1604	1.00	0.00	0.00	0.00	0.20	0.80	0.00	0.00	0.73	0.00
STMP161	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.02	0.00
STMP170	1.00	0.00	0.00	0.00	0.04	0.96	0.00	0.00	0.21	0.00
STMP183	1.00	0.00	0.00	0.00	0.12	0.87	0.00	0.00	0.03	0.00
STMP184	1.00	0.00	0.00	0.00	0.25	0.75	0.00	0.00	0.83	0.00
STMP20	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.90	0.00
STMP248	1.00	0.00	0.00	0.00	0.28	0.72	0.00	0.00	0.85	0.00
STMP249	1.00	0.00	0.00	0.00	0.25	0.74	0.00	0.00	0.82	0.00
STMP274	1.00	0.00	0.00	0.00	0.97	0.02	0.00	0.00	0.80	0.00
STMP276	1.00	0.00	0.00	0.00	0.03	0.96	0.00	0.00	0.93	0.00
STMP29	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
STMP308	1.00	0.00	0.00	0.00	0.08	0.92	0.00	0.00	0.86	0.00
STMP309	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.94	0.00
STMP393	1.00	0.00	0.00	0.00	0.23	0.76	0.00	0.00	0.21	0.00

STMP394	1.00	0.00	0.00	0.00	0.41	0.58	0.00	0.00	0.78	0.00
STMP427	1.00	0.00	0.00	0.00	0.32	0.67	0.00	0.00	0.61	0.00
STMP428	1.00	0.00	0.00	0.00	0.30	0.70	0.00	0.00	0.83	0.00
STMP435	1.00	0.00	0.00	0.00	0.28	0.72	0.00	0.00	0.82	0.00
STMP521	1.00	0.00	0.00	0.00	0.16	0.83	0.00	0.00	0.67	0.00
STMP524	1.00	0.00	0.00	0.00	0.04	0.96	0.00	0.00	0.92	0.00
STMP525	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.91	0.00
STMP554	1.00	0.00	0.00	0.00	0.19	0.81	0.00	0.00	0.85	0.00
STMP555	1.00	0.00	0.00	0.00	0.15	0.84	0.00	0.00	0.86	0.00
STMP556	1.00	0.00	0.00	0.00	0.17	0.82	0.00	0.00	0.82	0.00
STMP591	1.00	0.00	0.00	0.00	0.19	0.81	0.00	0.00	0.74	0.00
STMP594	1.00	0.00	0.00	0.00	0.19	0.80	0.00	0.00	0.46	0.00
STMP595	1.00	0.00	0.00	0.00	0.29	0.71	0.00	0.00	0.62	0.00
STMP692	1.00	0.00	0.00	0.00	0.61	0.38	0.00	0.00	0.78	0.00
STMP749	1.00	0.00	0.00	0.00	0.15	0.85	0.00	0.00	0.88	0.00
STMP77	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.94	0.00
STMP79	1.00	0.00	0.00	0.00	0.92	0.08	0.00	0.00	0.91	0.00
STMP800	1.00	0.00	0.00	0.00	0.49	0.51	0.00	0.00	0.76	0.00
STMP801	1.00	0.00	0.00	0.00	0.80	0.19	0.00	0.00	0.76	0.00
STMP823	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.86	0.00
STMP824	1.00	0.00	0.00	0.00	0.20	0.80	0.00	0.00	0.87	0.00
STMP850	1.00	0.00	0.00	0.00	0.07	0.93	0.00	0.00	0.10	0.00
STMP88	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.23	0.00
STMP89	1.00	0.00	0.00	0.00	0.02	0.98	0.00	0.00	0.68	0.00
STMP9	1.00	0.00	0.00	0.00	0.29	0.71	0.00	0.00	0.78	0.00
STMP90	1.00	0.00	0.00	0.00	0.16	0.84	0.00	0.00	0.78	0.00
STMP914	1.00	0.00	0.00	0.00	0.14	0.00	0.00	0.85	0.00	0.00
STMP915	1.00	0.00	0.00	0.00	0.12	0.87	0.00	0.00	0.03	0.00
STMP964	1.00	0.00	0.00	0.00	0.32	0.16	0.00	0.52	0.06	0.00
STMP98	1.00	0.00	0.00	0.00	0.08	0.92	0.00	0.00	0.88	0.00
STMP99	1.00	0.00	0.00	0.00	0.30	0.70	0.00	0.00	0.87	0.00
SYMP182	1.00	0.00	0.00	0.00	0.10	0.90	0.00	0.00	0.88	0.00

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Conduit Surcharge Summary
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Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C100	0.22	0.22	0.22	0.08	0.06

C101	0.24	0.24	0.24	0.19	0.18
C102	0.34	0.34	0.34	0.37	0.34
C105	0.01	0.01	0.01	0.18	0.01
C93	0.06	0.06	0.07	0.07	0.01
C98	0.14	0.14	0.14	0.01	0.01
STMP10	0.14	0.14	0.14	0.13	0.12
STMP100	0.12	0.12	0.12	0.11	0.10
STMP101	0.11	0.11	0.11	0.25	0.11
STMP103	0.13	0.13	0.13	0.01	0.01
STMP106	0.11	0.11	0.11	0.05	0.06
STMP107	0.16	0.16	0.16	0.14	0.13
STMP11	0.14	0.14	0.14	0.13	0.11
STMP1170	0.01	0.01	0.01	0.54	0.01
STMP118	0.11	0.11	0.11	0.57	0.11
STMP12	0.14	0.14	0.14	0.14	0.11
STMP120	0.40	0.40	0.40	0.28	0.27
STMP123	0.09	0.09	0.09	0.01	0.01
STMP13	0.11	0.11	0.11	0.01	0.01
STMP131	0.18	0.18	0.18	0.19	0.18
STMP14	0.16	0.16	0.16	0.01	0.01
STMP150	0.22	0.22	0.22	0.38	0.22
STMP1513	0.01	0.01	0.01	0.01	0.01
STMP1516	0.01	0.01	0.01	0.27	0.01
STMP155	0.01	0.01	0.01	0.24	0.01
STMP156A	0.04	0.04	0.04	0.06	0.04
STMP156B	0.04	0.04	0.04	0.13	0.04
STMP1604	0.19	0.19	0.19	0.21	0.19
STMP170	0.01	0.01	0.01	0.43	0.01
STMP183	0.14	0.14	0.14	0.09	0.08
STMP184	0.22	0.22	0.22	0.25	0.21
STMP20	0.19	0.19	0.19	0.01	0.01
STMP248	0.20	0.20	0.20	0.25	0.20
STMP249	0.01	0.01	0.01	0.27	0.01
STMP274	0.20	0.20	0.20	0.01	0.01
STMP308	0.09	0.09	0.09	0.20	0.09
STMP309	0.01	0.01	0.01	0.01	0.01
STMP393	0.19	0.19	0.19	0.38	0.19
STMP394	0.30	0.30	0.30	0.35	0.30
STMP427	0.23	0.23	0.23	0.06	0.05
STMP428	0.24	0.24	0.24	0.06	0.05
STMP435	0.23	0.23	0.23	0.07	0.08
STMP521	0.09	0.09	0.09	0.05	0.05
STMP554	0.12	0.12	0.12	0.11	0.09
STMP555	0.10	0.10	0.10	0.09	0.09

STMP556	0.10	0.10	0.10	0.08	0.08
STMP591	0.13	0.13	0.13	0.12	0.10
STMP594	0.14	0.14	0.14	0.15	0.13
STMP595	0.14	0.14	0.14	0.14	0.12
STMP692	0.43	0.43	0.43	0.42	0.35
STMP749	0.16	0.16	0.16	0.01	0.01
STMP800	0.44	0.44	0.44	0.42	0.36
STMP801	0.42	0.42	0.42	0.01	0.01
STMP823	0.15	0.15	0.15	0.01	0.01
STMP824	0.11	0.11	0.12	0.01	0.01
STMP850	0.08	0.08	0.08	0.06	0.05
STMP89	0.01	0.01	0.01	0.03	0.01
STMP9	0.22	0.22	0.22	0.10	0.09
STMP90	0.14	0.14	0.14	0.16	0.14
STMP914	0.22	0.22	0.22	0.24	0.22
STMP915	0.14	0.14	0.14	0.35	0.14
STMP964	0.19	0.19	0.19	0.09	0.10
STMP98	0.09	0.09	0.09	0.01	0.01
STMP99	0.11	0.11	0.11	0.01	0.01
SYMP182	0.10	0.10	0.10	0.01	0.01

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Pumping Summary
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Pump	Percent Utilized	Number of Start-Ups	Min Flow LPS	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr	Power Usage Kw-hr	% Time Off Pump Curve Low	% Time Off Pump Curve High
STMP187_PUMP	97.50	1	0.00	2717.90	8533.21	11.636	172.53	0.0	0.0

Analysis begun on: Thu Sep 01 15:55:48 2016
Analysis ended on: Thu Sep 01 15:55:49 2016
Total elapsed time: 00:00:01

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.007)

WARNING 02: maximum depth increased for Node J77

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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.
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Analysis Options
****
Flow Units ..... LPS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... DYNWAVE
Starting Date NOV-05-2015 00:00:00
Ending Date NOV-05-2015 03:00:00
Antecedent Dry Days 0.0
Report Time Step 00:05:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00
Routing Time Step ..... 30.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Head Tolerance ..... 0.004921 m

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Element Count
****
Number of rain gages 1
Number of subcatchments ... 55
Number of nodes 100

Number of links 91
Number of pollutants 0
Number of land uses 0

****
Raingage Summary
****

Name	Data Source	Data Type	Recording Interval
_Current	CC1_AES_1hr_100yr	VOLUME	5 min.

****
Subcatchment Summary
****

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
S13-A	14.43	1550.00	70.00	2.5000	_Current	STMH286
S13-B	14.18	1060.00	70.00	1.9000	_Current	STMH188
S13-C	5.03	705.00	66.00	1.1000	_Current	STMH165
S13-D	2.85	632.00	77.00	3.2000	_Current	STMH161
S13-E	5.22	727.00	68.00	2.1000	_Current	STMH54
S13-F	7.67	569.00	50.00	0.5000	_Current	STMH178
S13-G	1.35	351.00	48.00	2.0000	_Current	STMH177
S13-H	1.52	473.00	57.00	3.1000	_Current	STMH398
S23-A	15.82	1095.00	69.00	1.6000	_Current	STMH116
S23-B	3.94	770.00	63.00	2.6000	_Current	DRCB64
S23-C	7.93	966.00	45.00	2.1000	_Current	DRCB40
S25-A	22.61	902.00	61.00	1.3000	_Current	STMH37
S25-B	6.70	737.00	55.00	1.7000	_Current	STMH225
S25-C	7.26	921.00	52.00	1.0000	_Current	STMH202
S25-D	10.70	1063.00	55.00	1.2000	_Current	STMH38
S25-E	10.16	1039.00	49.00	1.7000	_Current	J74
S25-F	41.71	2239.00	44.00	0.8000	_Current	J73
S25-G	3.30	633.00	49.00	1.9000	_Current	STMH205
S25-H	3.45	674.00	41.00	1.2000	_Current	STMH244
S25-I	20.24	1568.00	67.00	2.1000	_Current	J75
S25-J	24.53	1501.00	72.00	1.3000	_Current	J84
S32-A	54.37	400.00	50.00	0.5000	_Current	DRCB258
S32-B	5.37	400.00	50.00	0.5000	_Current	DRCB258
S38-A	16.25	1798.00	79.00	4.1000	_Current	J83
S38-B	18.36	1574.00	76.00	5.9000	_Current	J22

S38-C	8.37	802.00	79.00	4.5000	_Current	STMH78
S38-D	4.72	558.00	73.00	1.5000	_Current	STMH79
S38-Z1	136.40	7480.00	10.00	30.3000	_Current	J83
S38-Z2	5.70	1120.00	10.00	10.4000	_Current	J83
S3-A	8.53	955.00	63.00	2.9000	_Current	STMH12
S3-B	1.98	392.00	62.00	1.5000	_Current	STMH7
S3-C	3.55	735.00	61.00	1.3000	_Current	STMH6
S3-D	2.11	617.00	80.00	2.1000	_Current	STMH138
S3-E	5.92	588.00	76.00	17.2000	_Current	STMH246-DIV
S3-F	1.92	586.00	58.00	13.7000	_Current	J33
S3-G	3.26	655.00	60.00	13.0000	_Current	J87
S3-Z1	241.50	6550.00	10.00	34.0000	_Current	J33
S4-A	3.83	547.00	77.00	19.1000	_Current	J34
S4-B	4.08	379.00	80.00	1.5000	_Current	J37
S4-C	6.76	577.00	73.00	3.3000	_Current	STMH93
S5-A	8.95	974.00	64.00	2.6000	_Current	STMH133
S5-B	1.74	288.00	80.00	0.9000	_Current	STMH135
S5-C	2.50	464.00	80.00	0.6000	_Current	STMH131
S5-D	1.28	206.00	80.00	1.2000	_Current	STMH196
S5-E	4.01	610.00	79.00	2.3000	_Current	STMH4
S5-F	1.02	184.00	80.00	6.0000	_Current	STMH15
S5-G	4.10	727.00	77.00	0.3000	_Current	STMH2
S5-H	3.71	473.00	73.00	0.4000	_Current	STMH147
S5-I	10.27	885.00	71.00	6.2000	_Current	STMH212
S5-J	5.91	831.00	60.00	9.1000	_Current	J56
S5-K	28.67	1446.00	54.00	11.9000	_Current	J46
S5-Z1	87.70	4910.00	10.00	36.0000	_Current	J46
S7-A	7.47	684.00	56.00	0.9000	_Current	STMH23
S7-B	3.90	411.00	22.00	7.3000	_Current	STMH297
S13-I	2.12	370.00	60.00	1.0000	_Current	J1

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Node Summary
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Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J1	JUNCTION	444.92	2.90	0.0	
STMH286	JUNCTION	444.31	3.40	0.0	
STMH56	JUNCTION	443.98	3.20	0.0	
STMH54	JUNCTION	442.97	4.10	0.0	
STMH178	JUNCTION	441.29	3.20	0.0	
STMH177	JUNCTION	440.78	2.60	0.0	

STMH398	JUNCTION	440.42	3.10	0.0
STMH188	JUNCTION	446.02	3.40	0.0
STMH64	JUNCTION	445.56	3.40	0.0
STMH161	JUNCTION	444.09	3.00	0.0
STMH165	JUNCTION	443.56	3.60	0.0
STMH63	JUNCTION	445.08	3.30	0.0
STMH62	JUNCTION	444.98	2.80	0.0
STMH77	JUNCTION	454.15	2.20	0.0
STMH74	JUNCTION	452.88	3.20	0.0
STMH83	JUNCTION	441.98	3.00	0.0
STMH79	JUNCTION	441.38	2.60	0.0
STMH235	JUNCTION	442.44	1.90	0.0
J22	JUNCTION	442.75	1.90	0.0
STMH139	JUNCTION	453.09	4.04	0.0
STMH138	JUNCTION	452.99	3.41	0.0
STMH183	JUNCTION	452.76	3.11	0.0
STMH6	JUNCTION	452.48	2.97	0.0
STMH7	JUNCTION	452.10	3.90	0.0
STMH184	JUNCTION	451.89	4.40	0.0
STMH185	JUNCTION	451.75	4.44	0.0
STMH12	JUNCTION	451.69	4.40	0.0
J33	JUNCTION	459.08	2.50	0.0
J34	JUNCTION	455.36	2.50	0.0
STMH17	JUNCTION	453.99	1.60	0.0
STMH254	JUNCTION	453.24	2.60	0.0
STMH93	JUNCTION	451.88	3.90	0.0
J37	JUNCTION	453.49	2.00	0.0
J38	JUNCTION	454.36	2.50	0.0
STMH190	JUNCTION	449.72	4.70	0.0
STMH133	JUNCTION	450.28	4.40	0.0
STMH135	JUNCTION	451.01	3.80	0.0
STMH131	JUNCTION	451.21	3.70	0.0
STMH196	JUNCTION	451.69	3.00	0.0
STMH137	JUNCTION	453.28	2.60	0.0
STMH15	JUNCTION	454.27	1.80	0.0
J46	JUNCTION	455.31	5.00	0.0
STMH4	JUNCTION	452.57	3.10	0.0
STMH216	JUNCTION	452.15	3.10	0.0
STMH197	JUNCTION	451.95	2.70	0.0
STMH2	JUNCTION	453.06	1.80	0.0
STMH28	JUNCTION	453.20	1.90	0.0
STMH147	JUNCTION	453.75	2.90	0.0
STMH194	JUNCTION	454.00	1.80	0.0
STMH253	JUNCTION	454.49	2.00	0.0

J56	JUNCTION	455.38	2.60	0.0
STMH212	JUNCTION	454.85	1.20	0.0
STMH298	JUNCTION	440.27	1.60	0.0
STMH297	JUNCTION	440.64	3.90	0.0
STMH26	JUNCTION	452.49	5.00	0.0
STMH22	JUNCTION	454.19	3.70	0.0
STMH23	JUNCTION	454.38	3.30	0.0
STMH225	JUNCTION	450.19	2.44	0.0
STMH226	JUNCTION	448.06	3.04	0.0
STMH202	JUNCTION	446.71	3.02	0.0
STMH38	JUNCTION	444.70	2.75	0.0
STMH205	JUNCTION	441.90	3.20	0.0
STMH204	JUNCTION	440.95	3.60	0.0
STMH109	JUNCTION	440.47	1.85	0.0
STMH37	JUNCTION	450.62	2.50	0.0
STMH244	JUNCTION	439.80	1.80	0.0
STMH362	JUNCTION	439.45	2.10	0.0
J73	JUNCTION	439.28	1.50	0.0
J74	JUNCTION	438.27	1.50	0.0
J75	JUNCTION	437.62	1.50	0.0
J76	JUNCTION	437.10	1.80	0.0
J77	JUNCTION	442.00	2.00	0.0
J78	JUNCTION	438.00	1.50	0.0
J79	JUNCTION	454.78	4.70	0.0
STMH116	JUNCTION	454.00	2.30	0.0
DRCB64	JUNCTION	451.36	2.50	0.0
DRCB40	JUNCTION	445.61	2.50	0.0
J83	JUNCTION	458.49	2.80	0.0
J84	JUNCTION	437.36	1.50	0.0
J85	JUNCTION	457.37	2.50	0.0
STMH78	JUNCTION	446.63	2.90	0.0
J86	JUNCTION	458.46	2.50	0.0
J87	JUNCTION	458.57	2.50	0.0
J88	JUNCTION	458.25	2.50	0.0
J89	JUNCTION	456.77	2.50	0.0
J90	JUNCTION	459.23	2.50	0.0
J91	JUNCTION	457.00	2.50	0.0
DRCB258	JUNCTION	439.79	1.50	0.0
DRCB260	JUNCTION	438.95	1.50	0.0
J94	JUNCTION	436.84	1.50	0.0
STMH246-DIV	JUNCTION	455.92	2.50	0.0
DROF13	OUTFALL	440.21	0.90	0.0
DROF38	OUTFALL	440.85	1.05	0.0
DROF3	OUTFALL	451.34	1.20	0.0

DROF4	OUTFALL	451.61	0.75	0.0
DROF5	OUTFALL	449.45	1.20	0.0
DROF7	OUTFALL	440.02	0.60	0.0
DROF25	OUTFALL	440.00	2.00	0.0
DROF23	OUTFALL	443.90	0.90	0.0
DRFI2017	OUTFALL	436.42	1.00	0.0

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Link Summary
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Name	From Node	To Node	Type	Length	%Slope	Roughness
C100	STMH235	STMH83	CONDUIT	61.4	0.1515	0.0100
C101	STMH83	STMH79	CONDUIT	153.1	0.3430	0.0100
C102	STMH79	DROF38	CONDUIT	137.0	0.3831	0.0100
C103	STMH74	STMH78	CONDUIT	159.2	3.9237	0.0100
C104	STMH78	STMH83	CONDUIT	132.9	3.4096	0.0100
C105	J86	J85	CONDUIT	70.6	1.5447	0.0100
C106	J87	J88	CONDUIT	31.5	1.0172	0.0100
C107	J88	J85	CONDUIT	88.2	0.9974	0.0100
C108	J89	J34	CONDUIT	101.2	1.3931	0.0100
C109	J90	J91	CONDUIT	52.0	4.2949	0.0100
C110	J91	J34	CONDUIT	104.7	1.5661	0.0100
C93	J46	J79	CONDUIT	35.5	1.4931	0.0100
C96	J83	STMH77	CONDUIT	202.0	2.1231	0.0100
C98	J33	J86	CONDUIT	16.4	3.7740	0.0100
C99	J85	STMH246-DIV	CONDUIT	79.7	1.8201	0.0100
DRDI117	J94	DRFI2017	CONDUIT	41.6	1.0097	0.0100
DRDI27	J73	J74	CONDUIT	251.8	0.4012	0.0100
DRDI28	J74	J78	CONDUIT	67.3	0.4013	0.0100
DRDI4	J75	J76	CONDUIT	175.3	0.2966	0.0100
DRDI5	J84	J76	CONDUIT	65.5	0.3966	0.0100
DRDI6	J77	DROF25	CONDUIT	153.4	1.3036	0.0100
STMP10	STMH188	STMH64	CONDUIT	45.5	1.0110	0.0100
STMP100	STMH196	STMH131	CONDUIT	86.4	0.5557	0.0100
STMP101	STMH131	STMH135	CONDUIT	90.9	0.2201	0.0100
STMP103	STMH197	STMH196	CONDUIT	47.1	0.5524	0.0100
STMP106	STMH135	STMH133	CONDUIT	89.7	0.8139	0.0100
STMP107	STMH133	STMH190	CONDUIT	86.0	0.6511	0.0100
STMP1086	DRCB40	DROF23	CONDUIT	262.5	0.6514	0.0100
STMP11	STMH64	STMH63	CONDUIT	47.9	1.0026	0.0100
STMP1170	DRCB260	J94	CONDUIT	241.7	0.8730	0.0100
STMP118	STMH28	STMH2	CONDUIT	116.3	0.1204	0.0100

STMP12	STMH63	STMH62	CONDUIT	10.2	0.9824	0.0100
STMP120	STMH147	STMH28	CONDUIT	110.1	0.4994	0.0100
STMP123	STMH2	STMH197	CONDUIT	88.5	1.2548	0.0100
STMP1289	STMH26	STMH297	CONDUIT	27.8	47.1005	0.0100
STMP13	STMH62	STMH161	CONDUIT	89.3	0.9962	0.0100
STMP131	STMH190	DROF5	CONDUIT	54.9	0.4920	0.0100
STMP14	STMH161	STMH54	CONDUIT	92.7	1.2078	0.0100
STMP150	STMH37	STMH225	CONDUIT	86.2	0.4990	0.0100
STMP1513	DRCB258	DRCB260	CONDUIT	24.9	3.3754	0.0100
STMP1516	STMH362	J73	CONDUIT	33.6	0.5052	0.0100
STMP155	STMH23	STMH22	CONDUIT	82.8	0.2294	0.0100
STMP156A	STMH298	DROF7	CONDUIT	50.2	0.4979	0.0100
STMP156B	STMH297	STMH298	CONDUIT	136.3	0.2715	0.0100
STMP1604	STMH398	DROF13	CONDUIT	20.4	1.0300	0.0100
STMP161	STMH22	STMH26	CONDUIT	57.4	2.9625	0.0100
STMP170	J78	J75	CONDUIT	31.2	1.2184	0.0100
STMP183	STMH38	STMH205	CONDUIT	133.6	2.0956	0.0100
STMP184	STMH204	STMH109	CONDUIT	96.4	0.4981	0.0100
STMP20	J1	STMH286	CONDUIT	121.6	0.5014	0.0100
STMP248	STMH109	STMH244	CONDUIT	132.7	0.5049	0.0100
STMP249	STMH244	STMH362	CONDUIT	69.7	0.5025	0.0100
STMP274	J56	STMH253	CONDUIT	178.1	0.4998	0.0100
STMP276	STMH254	STMH93	CONDUIT	140.0	0.9714	0.0100
STMP29	STMH77	STMH74	CONDUIT	35.8	3.4248	0.0100
STMP308	STMH116	DRCB64	CONDUIT	71.1	3.7156	0.0100
STMP309	DRCB64	DRCB40	CONDUIT	215.4	2.6704	0.0100
STMP393	STMH177	STMH398	CONDUIT	105.6	0.3409	0.0100
STMP394	STMH178	STMH177	CONDUIT	124.0	0.4112	0.0100
STMP427	STMH56	STMH165	CONDUIT	112.2	0.3745	0.0100
STMP428	STMH165	STMH54	CONDUIT	92.0	0.6415	0.0100
STMP435	STMH54	STMH178	CONDUIT	132.3	1.2698	0.0100
STMP521	STMH139	STMH138	CONDUIT	19.0	0.5255	0.0100
STMP524	J38	STMH17	CONDUIT	16.1	2.3002	0.0100
STMP525	J34	J38	CONDUIT	41.6	2.4063	0.0100
STMP554	STMH6	STMH7	CONDUIT	75.5	0.5033	0.0100
STMP555	STMH138	STMH183	CONDUIT	46.0	0.5003	0.0100
STMP556	STMH183	STMH6	CONDUIT	54.9	0.5099	0.0100
STMP591	STMH7	STMH184	CONDUIT	43.1	0.4875	0.0100
STMP594	STMH184	STMH185	CONDUIT	34.9	0.4014	0.0100
STMP595	STMH185	STMH12	CONDUIT	14.4	0.4170	0.0100
STMP692	STMH194	STMH147	CONDUIT	49.5	0.5054	0.0100
STMP749	STMH205	STMH204	CONDUIT	13.4	7.1181	0.0100
STMP77	STMH246-DIV	STMH139	CONDUIT	27.8	10.2182	0.0100
STMP79	STMH17	J37	CONDUIT	94.2	0.5307	0.0100

STMP800	STMH253	STMH194	CONDUIT	97.4	0.5029	0.0100
STMP801	STMH212	STMH253	CONDUIT	72.7	0.4952	0.0100
STMP823	STMH216	STMH196	CONDUIT	67.8	0.6789	0.0100
STMP824	STMH4	STMH216	CONDUIT	62.6	0.6710	0.0100
STMP850	J79	STMH15	CONDUIT	33.9	1.5042	0.0100
STMP88	J37	STMH254	CONDUIT	45.8	0.5460	0.0100
STMP89	STMH93	DROP4	CONDUIT	27.1	0.9949	0.0100
STMP9	STMH286	STMH56	CONDUIT	62.1	0.5310	0.0100
STMP90	STMH12	DROP3	CONDUIT	69.3	0.5051	0.0100
STMP914	STMH225	STMH226	CONDUIT	43.8	1.6658	0.0100
STMP915	STMH226	STMH202	CONDUIT	128.5	1.0510	0.0100
STMP964	J22	STMH235	CONDUIT	89.5	0.2929	0.0100
STMP98	STMH15	STMH137	CONDUIT	29.4	3.3716	0.0100
STMP99	STMH137	STMH196	CONDUIT	97.5	1.6318	0.0100
SYMP182	STMH202	STMH38	CONDUIT	141.2	1.4237	0.0100
STMP187_PUMP	J76	J77	IDEAL PUMP			

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C100	CIRCULAR	0.90	0.64	0.23	0.90	1	915.97
C101	CIRCULAR	1.20	1.13	0.30	1.20	1	2968.54
C102	CIRCULAR	1.05	0.87	0.26	1.05	1	2197.46
C103	CIRCULAR	1.05	0.87	0.26	1.05	1	7032.30
C104	CIRCULAR	1.05	0.87	0.26	1.05	1	6555.37
C105	CIRCULAR	0.75	0.44	0.19	0.75	1	1798.88
C106	CIRCULAR	0.75	0.44	0.19	0.75	1	1459.75
C107	CIRCULAR	0.75	0.44	0.19	0.75	1	1445.50
C108	CIRCULAR	0.90	0.64	0.23	0.90	1	2777.92
C109	CIRCULAR	0.90	0.64	0.23	0.90	1	4877.52
C110	CIRCULAR	0.90	0.64	0.23	0.90	1	2945.34
C93	CIRCULAR	0.90	0.64	0.23	0.90	2	2875.88
C96	CIRCULAR	1.05	0.87	0.26	1.05	1	5172.85
C98	CIRCULAR	0.90	0.64	0.23	0.90	1	4572.17
C99	TRAPEZOIDAL	2.00	5.00	0.83	4.00	1	59738.45
DRDI117	TRAPEZOIDAL	1.00	3.60	0.52	6.60	1	23389.71
DRDI27	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76654.24
DRDI28	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76659.66
DRDI4	TRAPEZOIDAL	1.50	14.25	0.98	14.00	1	76761.44
DRDI5	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76218.52

DRDI6	TRAPEZOIDAL	2.00	12.00	0.95	12.00	1	132287.57
STMP10	CIRCULAR	0.60	0.28	0.15	0.60	1	802.66
STMP100	CIRCULAR	1.20	1.13	0.30	1.20	1	3778.42
STMP101	CIRCULAR	1.20	1.13	0.30	1.20	1	2378.05
STMP103	CIRCULAR	0.90	0.64	0.23	0.90	1	1749.20
STMP106	CIRCULAR	1.20	1.13	0.30	1.20	1	4572.62
STMP107	CIRCULAR	1.20	1.13	0.30	1.20	1	4089.94
STMP1086	CIRCULAR	0.90	0.64	0.23	0.90	1	1899.52
STMP11	CIRCULAR	0.60	0.28	0.15	0.60	1	799.28
STMP1170	CIRCULAR	0.60	0.28	0.15	0.60	1	745.86
STMP118	CIRCULAR	0.60	0.28	0.15	0.60	1	276.99
STMP12	CIRCULAR	0.60	0.28	0.15	0.60	1	791.19
STMP120	CIRCULAR	0.60	0.28	0.15	0.60	1	564.13
STMP123	CIRCULAR	0.75	0.44	0.19	0.75	1	1621.26
STMP1289	CIRCULAR	0.40	0.13	0.10	0.40	1	1858.16
STMP13	CIRCULAR	0.90	0.64	0.23	0.90	1	2349.12
STMP131	CIRCULAR	1.20	1.13	0.30	1.20	1	3555.25
STMP14	CIRCULAR	0.90	0.64	0.23	0.90	1	2586.51
STMP150	CIRCULAR	0.60	0.28	0.15	0.60	1	563.87
STMP1513	CIRCULAR	0.80	0.50	0.20	0.80	1	3158.49
STMP1516	CIRCULAR	0.90	0.64	0.23	0.90	1	1672.85
STMP155	CIRCULAR	0.50	0.20	0.12	0.50	1	235.13
STMP156A	CIRCULAR	0.60	0.28	0.15	0.60	1	563.28
STMP156B	CIRCULAR	0.60	0.28	0.15	0.60	1	415.93
STMP1604	CIRCULAR	0.90	0.64	0.23	0.90	1	2388.56
STMP161	CIRCULAR	0.50	0.20	0.12	0.50	1	844.93
STMP170	CIRCULAR	0.80	0.50	0.20	0.80	3	1897.65
STMP183	CIRCULAR	0.75	0.44	0.19	0.75	1	2095.23
STMP184	CIRCULAR	0.90	0.64	0.23	0.90	1	1661.02
STMP20	CIRCULAR	0.50	0.20	0.12	0.50	1	347.62
STMP248	CIRCULAR	0.90	0.64	0.23	0.90	1	1672.29
STMP249	CIRCULAR	0.90	0.64	0.23	0.90	1	1668.40
STMP274	CIRCULAR	0.60	0.28	0.15	0.60	1	564.32
STMP276	CIRCULAR	0.75	0.44	0.19	0.75	1	1426.50
STMP29	CIRCULAR	1.05	0.87	0.26	1.05	1	6569.95
STMP308	CIRCULAR	0.45	0.16	0.11	0.45	1	714.48
STMP309	CIRCULAR	0.60	0.28	0.15	0.60	1	1304.47
STMP393	CIRCULAR	0.90	0.64	0.23	0.90	1	1374.18
STMP394	CIRCULAR	0.90	0.64	0.23	0.90	1	1509.26
STMP427	CIRCULAR	0.75	0.44	0.19	0.75	1	885.69
STMP428	CIRCULAR	0.75	0.44	0.19	0.75	1	1159.26
STMP435	CIRCULAR	0.90	0.64	0.23	0.90	1	2652.05
STMP521	CIRCULAR	1.20	1.13	0.30	1.20	1	3674.31
STMP524	CIRCULAR	0.75	0.44	0.19	0.75	1	2195.09

STMP525	CIRCULAR	0.75	0.44	0.19	0.75	1	2245.15
STMP554	CIRCULAR	1.20	1.13	0.30	1.20	1	3595.95
STMP555	CIRCULAR	1.20	1.13	0.30	1.20	1	3585.27
STMP556	CIRCULAR	1.20	1.13	0.30	1.20	1	3619.50
STMP591	CIRCULAR	1.20	1.13	0.30	1.20	1	3538.89
STMP594	CIRCULAR	1.20	1.13	0.30	1.20	1	3211.22
STMP595	CIRCULAR	1.20	1.13	0.30	1.20	1	3272.95
STMP692	CIRCULAR	0.50	0.20	0.12	0.50	1	348.98
STMP749	CIRCULAR	0.75	0.44	0.19	0.75	1	3861.49
STMP77	CIRCULAR	0.90	0.64	0.23	0.90	1	7523.31
STMP79	CIRCULAR	0.75	0.44	0.19	0.75	1	1054.36
STMP800	CIRCULAR	0.50	0.20	0.12	0.50	1	348.14
STMP801	CIRCULAR	0.50	0.20	0.12	0.50	1	345.45
STMP823	CIRCULAR	0.60	0.28	0.15	0.60	1	657.72
STMP824	CIRCULAR	0.60	0.28	0.15	0.60	1	653.92
STMP850	CIRCULAR	0.90	0.64	0.23	0.90	1	2886.48
STMP88	CIRCULAR	0.75	0.44	0.19	0.75	1	1069.45
STMP89	CIRCULAR	0.75	0.44	0.19	0.75	1	1443.65
STMP9	CIRCULAR	0.75	0.44	0.19	0.75	1	1054.66
STMP90	CIRCULAR	1.20	1.13	0.30	1.20	1	3602.16
STMP914	CIRCULAR	0.60	0.28	0.15	0.60	1	1030.27
STMP915	CIRCULAR	0.60	0.28	0.15	0.60	1	818.35
STMP964	CIRCULAR	0.90	0.64	0.23	0.90	1	1273.68
STMP98	CIRCULAR	0.90	0.64	0.23	0.90	1	4321.53
STMP99	CIRCULAR	0.90	0.64	0.23	0.90	1	3006.49
SYMP182	CIRCULAR	0.75	0.44	0.19	0.75	1	1726.93

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Control Actions Taken
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Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	25.794	27.530
Evaporation Loss	0.000	0.000
Infiltration Loss	16.638	17.758
Surface Runoff	8.854	9.450
Final Surface Storage	0.529	0.565
Continuity Error (%)	-0.881	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	8.850	88.503
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	6.809	68.091
Internal Outflow	2.040	20.400
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.005	0.051
Continuity Error (%)	-0.042	

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Time-Step Critical Elements
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Link STMP749 (37.52%)
Link STMP1513 (20.47%)
Link STMP12 (7.72%)
Link STMP1289 (7.09%)
Link STMP595 (6.72%)

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Highest Flow Instability Indexes
****
Link STMP1516 (28)
Link STMP1513 (20)
Link STMP12 (14)
Link STMP393 (14)
Link STMP249 (13)

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Routing Time Step Summary
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Minimum Time Step : 0.50 sec
Average Time Step : 3.60 sec
Maximum Time Step : 30.00 sec

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Percent in Steady State     :     0.00
Average Iterations per Step :     4.70
Percent Not Converging      :    35.65


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Subcatchment Runoff Summary
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Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
S13-A	27.53	0.00	0.00	8.26	18.80	2.71	2877.39	0.683
S13-B	27.53	0.00	0.00	8.26	18.73	2.66	2671.65	0.680
S13-C	27.53	0.00	0.00	9.36	17.72	0.89	939.43	0.643
S13-D	27.53	0.00	0.00	6.33	20.73	0.59	642.06	0.753
S13-E	27.53	0.00	0.00	8.81	18.28	0.95	1023.24	0.664
S13-F	27.53	0.00	0.00	13.76	13.33	1.02	962.62	0.484
S13-G	27.53	0.00	0.00	14.32	12.91	0.17	190.13	0.469
S13-H	27.53	0.00	0.00	11.84	15.32	0.23	254.35	0.556
S23-A	27.53	0.00	0.00	8.53	18.43	2.92	2859.97	0.670
S23-B	27.53	0.00	0.00	10.19	16.96	0.67	725.96	0.616
S23-C	27.53	0.00	0.00	15.14	12.11	0.96	1038.92	0.440
S25-A	27.53	0.00	0.00	10.74	16.19	3.66	3122.45	0.588
S25-B	27.53	0.00	0.00	12.39	14.78	0.99	1054.78	0.537
S25-C	27.53	0.00	0.00	13.21	13.97	1.01	1075.83	0.507
S25-D	27.53	0.00	0.00	12.39	14.75	1.58	1647.03	0.536
S25-E	27.53	0.00	0.00	14.04	13.17	1.34	1428.62	0.478
S25-F	27.53	0.00	0.00	15.42	11.74	4.90	4651.38	0.426
S25-G	27.53	0.00	0.00	14.04	13.19	0.44	473.35	0.479
S25-H	27.53	0.00	0.00	16.24	11.04	0.38	413.92	0.401
S25-I	27.53	0.00	0.00	9.08	17.95	3.63	3721.14	0.652
S25-J	27.53	0.00	0.00	7.71	19.18	4.70	4341.56	0.697
S32-A	27.53	0.00	0.00	13.77	12.38	6.73	2271.35	0.450
S32-B	27.53	0.00	0.00	13.77	13.33	0.72	674.65	0.484
S38-A	27.53	0.00	0.00	5.78	21.23	3.45	3692.25	0.771
S38-B	27.53	0.00	0.00	6.61	20.42	3.75	4005.75	0.742
S38-C	27.53	0.00	0.00	5.78	21.22	1.78	1891.09	0.771
S38-D	27.53	0.00	0.00	7.43	19.58	0.92	964.56	0.711
S38-Z1	27.53	0.00	0.00	24.78	2.68	3.65	4005.54	0.097
S38-Z2	27.53	0.00	0.00	24.78	2.67	0.15	167.38	0.097
S3-A	27.53	0.00	0.00	10.19	16.94	1.44	1550.54	0.615

S3-B	27.53	0.00	0.00	10.46	16.68	0.33	357.37	0.606
S3-C	27.53	0.00	0.00	10.74	16.41	0.58	630.24	0.596
S3-D	27.53	0.00	0.00	5.51	21.53	0.45	494.03	0.782
S3-E	27.53	0.00	0.00	6.61	20.46	1.21	1317.13	0.743
S3-F	27.53	0.00	0.00	11.56	15.54	0.30	327.02	0.565
S3-G	27.53	0.00	0.00	11.01	16.11	0.53	574.35	0.585
S3-Z1	27.53	0.00	0.00	24.78	2.68	6.48	7091.75	0.097
S4-A	27.53	0.00	0.00	6.33	20.71	0.79	865.45	0.752
S4-B	27.53	0.00	0.00	5.51	21.40	0.87	873.47	0.777
S4-C	27.53	0.00	0.00	7.43	19.59	1.32	1390.66	0.712
S5-A	27.53	0.00	0.00	9.91	17.20	1.54	1644.44	0.625
S5-B	27.53	0.00	0.00	5.51	21.45	0.37	389.25	0.779
S5-C	27.53	0.00	0.00	5.51	21.44	0.54	553.74	0.779
S5-D	27.53	0.00	0.00	5.51	21.47	0.27	289.51	0.780
S5-E	27.53	0.00	0.00	5.78	21.24	0.85	912.49	0.771
S5-F	27.53	0.00	0.00	5.51	21.53	0.22	238.93	0.782
S5-G	27.53	0.00	0.00	6.33	20.57	0.84	826.15	0.747
S5-H	27.53	0.00	0.00	7.43	19.47	0.72	688.41	0.707
S5-I	27.53	0.00	0.00	7.98	19.09	1.96	2103.75	0.693
S5-J	27.53	0.00	0.00	11.01	16.14	0.95	1040.09	0.586
S5-K	27.53	0.00	0.00	12.66	14.52	4.16	4478.97	0.528
S5-Z1	27.53	0.00	0.00	24.78	2.68	2.35	2575.05	0.097
S7-A	27.53	0.00	0.00	12.11	14.99	1.12	1135.27	0.544
S7-B	27.53	0.00	0.00	21.47	5.91	0.23	251.95	0.215
S13-I	27.53	0.00	0.00	0.85	24.93	0.53	456.85	0.905

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Node Depth Summary
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J1	JUNCTION	0.88	2.90	447.82	0 00:14
STMH286	JUNCTION	1.12	3.40	447.71	0 00:14
STMH56	JUNCTION	1.12	3.20	447.18	0 00:14
STMH54	JUNCTION	1.22	4.10	447.07	0 00:14
STMH178	JUNCTION	1.34	3.20	444.49	0 00:14
STMH177	JUNCTION	0.96	2.60	443.38	0 00:14
STMH398	JUNCTION	0.52	1.38	441.80	0 00:15
STMH188	JUNCTION	0.81	3.40	449.42	0 00:15

STMH64	JUNCTION	0.72	3.34	448.90	0	00:15
STMH161	JUNCTION	0.83	3.00	447.09	0	00:15
STMH165	JUNCTION	1.17	3.60	447.16	0	00:14
STMH63	JUNCTION	0.64	2.89	447.97	0	00:15
STMH62	JUNCTION	0.59	2.80	447.78	0	00:15
STMH77	JUNCTION	0.27	0.84	454.99	0	00:18
STMH74	JUNCTION	0.27	0.92	453.79	0	00:18
STMH83	JUNCTION	1.06	3.00	444.98	0	00:13
STMH79	JUNCTION	1.04	2.60	443.98	0	00:13
STMH235	JUNCTION	0.78	1.90	444.34	0	00:13
J22	JUNCTION	0.73	1.90	444.65	0	00:14
STMH139	JUNCTION	0.73	3.39	456.48	0	00:20
STMH138	JUNCTION	0.74	3.34	456.33	0	00:20
STMH183	JUNCTION	0.73	3.11	455.87	0	00:18
STMH6	JUNCTION	0.73	2.97	455.45	0	00:14
STMH7	JUNCTION	0.71	3.40	455.50	0	00:14
STMH184	JUNCTION	0.69	3.24	455.13	0	00:14
STMH185	JUNCTION	0.66	3.56	455.31	0	00:14
STMH12	JUNCTION	0.66	4.25	455.94	0	00:14
J33	JUNCTION	0.60	2.50	461.58	0	00:15
J34	JUNCTION	0.11	0.40	455.76	0	00:21
STMH17	JUNCTION	0.20	1.60	455.59	0	00:19
STMH254	JUNCTION	0.25	2.34	455.58	0	00:18
STMH93	JUNCTION	0.33	1.54	453.42	0	00:20
J37	JUNCTION	0.29	2.00	455.49	0	00:18
J38	JUNCTION	0.14	1.82	456.18	0	00:19
STMH190	JUNCTION	0.71	4.70	454.42	0	00:15
STMH133	JUNCTION	0.77	4.40	454.68	0	00:15
STMH135	JUNCTION	0.71	3.80	454.81	0	00:15
STMH131	JUNCTION	0.91	3.70	454.91	0	00:15
STMH196	JUNCTION	0.85	3.00	454.69	0	00:14
STMH137	JUNCTION	0.61	2.48	455.76	0	00:15
STMH15	JUNCTION	0.45	1.80	456.07	0	00:15
J46	JUNCTION	0.52	4.85	460.16	0	00:15
STMH4	JUNCTION	0.54	3.10	455.67	0	00:15
STMH216	JUNCTION	0.61	3.10	455.25	0	00:14
STMH197	JUNCTION	0.71	2.70	454.65	0	00:14
STMH2	JUNCTION	0.46	1.80	454.86	0	00:15
STMH28	JUNCTION	0.73	1.90	455.10	0	00:14
STMH147	JUNCTION	0.73	2.30	456.05	0	00:13
STMH194	JUNCTION	0.74	1.80	455.80	0	00:13
STMH253	JUNCTION	0.81	2.00	456.49	0	00:12
J56	JUNCTION	0.56	2.60	457.98	0	00:13
STMH212	JUNCTION	0.62	1.20	456.05	0	00:12

STMH298	JUNCTION	0.30	1.60	441.87	0	00:16
STMH297	JUNCTION	0.53	3.90	444.54	0	00:15
STMH26	JUNCTION	0.08	0.19	452.68	0	00:21
STMH22	JUNCTION	0.19	1.77	455.96	0	00:18
STMH23	JUNCTION	0.54	3.30	457.68	0	00:18
STMH225	JUNCTION	0.75	2.44	452.63	0	00:15
STMH226	JUNCTION	1.15	3.04	451.10	0	00:15
STMH202	JUNCTION	0.65	3.02	449.73	0	00:15
STMH38	JUNCTION	0.72	2.75	447.45	0	00:15
STMH205	JUNCTION	0.63	3.20	445.10	0	00:15
STMH204	JUNCTION	0.94	3.60	444.55	0	00:15
STMH109	JUNCTION	0.77	1.85	442.32	0	00:15
STMH37	JUNCTION	1.00	2.50	453.12	0	00:14
STMH244	JUNCTION	0.62	1.80	441.60	0	00:15
STMH362	JUNCTION	0.51	1.87	441.32	0	00:24
J73	JUNCTION	0.19	0.45	439.73	0	00:20
J74	JUNCTION	0.23	0.61	438.88	0	00:22
J75	JUNCTION	0.24	0.56	438.18	0	00:20
J76	JUNCTION	0.00	0.00	437.10	0	00:00
J77	JUNCTION	0.46	0.91	442.91	0	00:20
J78	JUNCTION	0.34	0.95	438.95	0	00:21
J79	JUNCTION	0.62	4.54	459.32	0	00:15
STMH116	JUNCTION	0.75	2.30	456.30	0	00:14
DRCB64	JUNCTION	0.35	2.50	453.86	0	00:17
DRCB40	JUNCTION	0.40	2.50	448.11	0	00:18
J83	JUNCTION	0.41	2.80	461.29	0	00:17
J84	JUNCTION	0.12	0.34	437.70	0	00:20
J85	JUNCTION	0.19	0.44	457.81	0	00:20
STMH78	JUNCTION	0.47	2.90	449.54	0	00:16
J86	JUNCTION	0.73	2.50	460.96	0	00:12
J87	JUNCTION	0.11	0.33	458.90	0	00:20
J88	JUNCTION	0.11	0.33	458.58	0	00:20
J89	JUNCTION	0.00	0.00	456.77	0	00:00
J90	JUNCTION	0.00	0.00	459.23	0	00:00
J91	JUNCTION	0.00	0.00	457.00	0	00:00
DRCB258	JUNCTION	0.68	1.50	441.29	0	00:16
DRCB260	JUNCTION	1.07	1.50	440.45	0	00:16
J94	JUNCTION	0.20	0.23	437.07	0	00:17
STMH246-DIV	JUNCTION	0.29	1.58	457.50	0	00:21
DROF13	OUTFALL	0.49	0.90	441.11	0	00:14
DROF38	OUTFALL	0.62	1.05	441.90	0	00:13
DROF3	OUTFALL	0.56	1.20	452.54	0	00:13
DROF4	OUTFALL	0.29	0.75	452.36	0	00:16
DROF5	OUTFALL	0.62	1.20	450.65	0	00:15

DROF7	OUTFALL	0.25	0.60	440.62	0	00:16
DROF25	OUTFALL	0.45	0.90	440.90	0	00:20
DROF23	OUTFALL	0.36	0.90	444.80	0	00:16
DRFI2017	OUTFALL	0.19	0.23	436.65	0	00:17

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	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	456.66	456.66	0 00:20	0.528	0.539	-0.093
STMH286	JUNCTION	2875.87	3021.97	0 00:20	2.71	3.09	0.023
STMH56	JUNCTION	0.00	1336.57	0 00:27	0	2.54	0.023
STMH54	JUNCTION	1022.68	3135.16	0 00:20	0.954	6.11	-0.024
STMH178	JUNCTION	962.22	4097.33	0 00:20	1.02	7.13	0.008
STMH177	JUNCTION	190.02	2806.96	0 00:20	0.174	6.38	-0.019
STMH398	JUNCTION	254.20	3061.20	0 00:20	0.233	6.61	0.002
STMH188	JUNCTION	2670.39	2670.39	0 00:20	2.66	2.66	0.012
STMH64	JUNCTION	0.00	1205.61	0 00:27	0	2.15	0.009
STMH161	JUNCTION	641.70	1783.67	0 00:20	0.591	2.73	-0.051
STMH165	JUNCTION	938.94	1573.15	0 00:15	0.891	2.62	-0.017
STMH63	JUNCTION	0.00	1206.15	0 00:27	0	2.15	-0.022
STMH62	JUNCTION	0.00	1206.48	0 00:27	0	2.15	-0.083
STMH77	JUNCTION	0.00	6137.83	0 00:21	0	7.03	0.001
STMH74	JUNCTION	0.00	6147.05	0 00:18	0	7.03	-0.004
STMH83	JUNCTION	0.00	6576.58	0 00:23	0	9.69	0.233
STMH79	JUNCTION	964.07	5060.25	0 00:20	0.924	9.11	-0.306
STMH235	JUNCTION	0.00	3787.13	0 00:23	0	4.17	-0.272
J22	JUNCTION	4003.58	4003.58	0 00:20	3.75	3.75	0.307
STMH139	JUNCTION	0.00	4531.01	0 00:21	0	6.82	0.001
STMH138	JUNCTION	493.75	4956.98	0 00:21	0.454	7.28	0.009
STMH183	JUNCTION	0.00	4955.58	0 00:21	0	7.28	0.002
STMH6	JUNCTION	629.88	5078.24	0 00:23	0.583	7.78	0.006
STMH7	JUNCTION	357.17	5313.22	0 00:23	0.33	8.09	-0.016
STMH184	JUNCTION	0.00	5313.68	0 00:23	0	8.1	0.010
STMH185	JUNCTION	0.00	5314.18	0 00:23	0	8.1	-0.006
STMH12	JUNCTION	1549.69	6770.32	0 00:20	1.45	9.54	0.012
J33	JUNCTION	7414.45	7414.45	0 00:20	6.78	6.78	-0.125

J34	JUNCTION	864.95	864.95	0	00:20	0.793	0.793	0.019
STMH17	JUNCTION	0.00	784.08	0	00:22	0	0.793	-0.065
STMH254	JUNCTION	0.00	1506.49	0	00:21	0	1.66	0.027
STMH93	JUNCTION	1389.94	2816.59	0	00:20	1.32	2.98	-0.010
J37	JUNCTION	873.06	1506.42	0	00:21	0.873	1.66	0.008
J38	JUNCTION	0.00	817.78	0	00:19	0	0.793	-0.049
STMH190	JUNCTION	0.00	6292.49	0	00:20	0	10.7	-0.016
STMH133	JUNCTION	1643.55	6292.17	0	00:20	1.54	10.7	0.001
STMH135	JUNCTION	389.05	4736.94	0	00:23	0.373	9.15	0.003
STMH131	JUNCTION	553.47	4497.67	0	00:24	0.536	8.78	0.011
STMH196	JUNCTION	289.36	4218.27	0	00:27	0.275	8.25	-0.029
STMH137	JUNCTION	0.00	3140.80	0	00:14	0	5.03	-0.007
STMH15	JUNCTION	238.79	7289.40	0	00:20	0.22	6.73	-0.021
J46	JUNCTION	7050.05	7050.05	0	00:20	6.51	6.51	0.002
STMH4	JUNCTION	911.99	911.99	0	00:20	0.852	0.852	-0.039
STMH216	JUNCTION	0.00	718.14	0	00:22	0	0.826	-0.025
STMH197	JUNCTION	0.00	1032.80	0	00:32	0	2.21	0.048
STMH2	JUNCTION	825.78	1188.49	0	00:20	0.843	2.35	-0.045
STMH28	JUNCTION	0.00	672.69	0	00:15	0	1.67	-0.054
STMH147	JUNCTION	688.12	688.12	0	00:20	0.722	1.67	0.054
STMH194	JUNCTION	0.00	550.48	0	00:13	0	1.12	-0.042
STMH253	JUNCTION	0.00	817.88	0	00:12	0	1.34	-0.054
J56	JUNCTION	1039.49	1039.49	0	00:20	0.954	0.954	-0.093
STMH212	JUNCTION	2102.60	2455.28	0	00:20	1.96	2.18	0.020
STMH298	JUNCTION	0.00	1117.84	0	00:20	0	1.31	0.008
STMH297	JUNCTION	251.80	1117.83	0	00:20	0.23	1.31	-0.008
STMH26	JUNCTION	0.00	866.12	0	00:21	0	1.08	0.005
STMH22	JUNCTION	0.00	886.02	0	00:18	0	1.08	0.011
STMH23	JUNCTION	1134.73	1134.73	0	00:20	1.12	1.12	0.009
STMH225	JUNCTION	1054.22	1656.29	0	00:20	0.99	3.23	0.019
STMH226	JUNCTION	0.00	1526.84	0	00:15	0	3.21	-0.096
STMH202	JUNCTION	1075.26	1914.86	0	00:15	1.01	3.9	-0.011
STMH38	JUNCTION	1646.19	3484.68	0	00:20	1.58	5.47	-0.003
STMH205	JUNCTION	473.08	2754.95	0	00:20	0.435	5.56	-0.010
STMH204	JUNCTION	0.00	2754.80	0	00:20	0	5.56	0.008
STMH209	JUNCTION	0.00	2755.38	0	00:20	0	5.56	0.024
STMH37	JUNCTION	3121.41	3121.41	0	00:20	3.66	3.66	0.009
STMH244	JUNCTION	413.68	2615.99	0	00:20	0.381	5.64	0.008
STMH362	JUNCTION	0.00	2616.19	0	00:20	0	5.64	-0.054
J73	JUNCTION	4649.44	7314.25	0	00:19	4.89	10.5	-0.010
J74	JUNCTION	1427.85	8574.25	0	00:20	1.34	11.9	0.080
J75	JUNCTION	3719.32	10941.75	0	00:21	3.63	15.5	0.029
J76	JUNCTION	0.00	15336.17	0	00:20	0	20.2	0.000
J77	JUNCTION	0.00	15336.17	0	00:20	0	20.2	0.001

J78	JUNCTION	0.00	7878.12	0	00:21	0	11.9	0.056
J79	JUNCTION	0.00	7049.34	0	00:20	0	6.51	0.006
STMH116	JUNCTION	2858.69	2858.69	0	00:20	2.92	2.92	0.001
DRCB64	JUNCTION	725.55	1454.22	0	00:17	0.668	2.67	-0.004
DRCB40	JUNCTION	1038.34	2402.64	0	00:20	0.96	3.63	0.031
J83	JUNCTION	7860.73	7860.73	0	00:20	7.25	7.25	0.031
J84	JUNCTION	4339.85	4339.85	0	00:20	4.7	4.7	0.014
J85	JUNCTION	0.00	3387.75	0	00:20	0	5.61	-0.002
STMH78	JUNCTION	1890.07	8019.18	0	00:20	1.78	8.8	0.097
J86	JUNCTION	0.00	4570.54	0	00:22	0	6.14	0.017
J87	JUNCTION	574.01	574.01	0	00:20	0.525	0.525	-0.004
J88	JUNCTION	0.00	575.39	0	00:20	0	0.525	0.041
J89	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
J90	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
J91	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
DRCB258	JUNCTION	2602.18	2602.18	0	00:25	7.42	7.42	0.005
DRCB260	JUNCTION	0.00	2602.52	0	00:25	0	7.42	0.057
J94	JUNCTION	0.00	810.83	0	00:17	0	4.23	0.090
STMH246-DIV	JUNCTION	1316.38	4683.48	0	00:20	1.21	6.82	-0.011
DROF13	OUTFALL	0.00	3061.24	0	00:20	0	6.61	0.000
DROF38	OUTFALL	0.00	4368.67	0	00:24	0	8.91	0.000
DROF3	OUTFALL	0.00	6770.28	0	00:20	0	9.54	0.000
DROF4	OUTFALL	0.00	2816.58	0	00:20	0	2.98	0.000
DROF5	OUTFALL	0.00	6292.52	0	00:20	0	10.7	0.000
DROF7	OUTFALL	0.00	1117.83	0	00:20	0	1.31	0.000
DROF25	OUTFALL	0.00	15652.07	0	00:20	0	20.2	0.000
DROF23	OUTFALL	0.00	2402.63	0	00:20	0	3.63	0.000
DRFI2017	OUTFALL	0.00	819.75	0	00:17	0	4.23	0.000

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Node Surcharge Summary
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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
J1	JUNCTION	0.43	2.400	0.000
STMH286	JUNCTION	0.46	2.650	0.000
STMH56	JUNCTION	0.47	2.450	0.000
STMH54	JUNCTION	0.46	3.200	0.000

STMH178	JUNCTION	0.53	2.300	0.000
STMH177	JUNCTION	0.53	1.700	0.000
STMH398	JUNCTION	0.43	0.480	1.720
STMH188	JUNCTION	0.36	2.800	0.000
STMH64	JUNCTION	0.37	2.737	0.063
STMH161	JUNCTION	0.40	2.100	0.000
STMH165	JUNCTION	0.48	2.850	0.000
STMH63	JUNCTION	0.37	2.290	0.410
STMH62	JUNCTION	0.33	1.900	0.000
STMH83	JUNCTION	0.46	1.730	0.000
STMH79	JUNCTION	0.51	1.325	0.000
STMH235	JUNCTION	0.44	0.950	0.000
J22	JUNCTION	0.42	1.000	0.000
STMH139	JUNCTION	0.25	2.191	0.649
STMH138	JUNCTION	0.26	2.137	0.073
STMH183	JUNCTION	0.27	1.910	0.000
STMH6	JUNCTION	0.28	1.770	0.000
STMH7	JUNCTION	0.31	2.203	0.497
STMH184	JUNCTION	0.32	2.045	1.155
STMH185	JUNCTION	0.32	2.361	0.879
STMH12	JUNCTION	0.33	3.047	0.153
J33	JUNCTION	0.30	1.600	0.000
STMH17	JUNCTION	0.07	0.850	0.000
STMH254	JUNCTION	0.09	1.593	0.257
STMH93	JUNCTION	0.17	0.794	2.356
J37	JUNCTION	0.10	1.250	0.000
J38	JUNCTION	0.05	1.070	0.680
STMH190	JUNCTION	0.39	3.500	0.000
STMH133	JUNCTION	0.37	3.200	0.000
STMH135	JUNCTION	0.29	2.600	0.000
STMH131	JUNCTION	0.35	2.500	0.000
STMH196	JUNCTION	0.32	1.800	0.000
STMH137	JUNCTION	0.27	1.584	0.116
STMH15	JUNCTION	0.25	0.900	0.000
J46	JUNCTION	0.21	3.947	0.153
STMH4	JUNCTION	0.30	2.500	0.000
STMH216	JUNCTION	0.35	2.500	0.000
STMH197	JUNCTION	0.34	1.800	0.000
STMH2	JUNCTION	0.26	1.050	0.000
STMH28	JUNCTION	0.64	1.300	0.000
STMH147	JUNCTION	0.58	1.700	0.600
STMH194	JUNCTION	0.61	1.300	0.000
STMH253	JUNCTION	0.60	1.400	0.000
J56	JUNCTION	0.44	2.000	0.000

STMH212	JUNCTION	0.60	0.700	0.000
STMH298	JUNCTION	0.21	1.000	0.000
STMH297	JUNCTION	0.26	3.300	0.000
STMH22	JUNCTION	0.08	1.273	1.927
STMH23	JUNCTION	0.35	2.800	0.000
STMH225	JUNCTION	0.45	1.840	0.000
STMH226	JUNCTION	0.40	1.040	0.000
STMH202	JUNCTION	0.31	2.270	0.000
STMH38	JUNCTION	0.36	2.000	0.000
STMH205	JUNCTION	0.39	2.450	0.000
STMH204	JUNCTION	0.47	2.700	0.000
STMH109	JUNCTION	0.46	0.950	0.000
STMH37	JUNCTION	0.53	1.900	0.000
STMH244	JUNCTION	0.44	0.900	0.000
STMH362	JUNCTION	0.03	0.971	0.229
J79	JUNCTION	0.24	3.643	0.157
STMH116	JUNCTION	0.42	1.850	0.000
DRCB64	JUNCTION	0.12	1.900	0.000
DRCB40	JUNCTION	0.10	1.600	0.000
J83	JUNCTION	0.09	1.750	0.000
STMH78	JUNCTION	0.13	1.850	0.000
J86	JUNCTION	0.35	1.600	0.000
DRCB258	JUNCTION	0.62	0.700	0.000
DRCB260	JUNCTION	0.91	0.700	0.000

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

Node	Hours Flooded	Maximum Rate LPS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
J1	0.25	422.71	0 00:14	0.166	0.000
STMH286	0.21	1681.77	0 00:20	0.538	0.000
STMH56	0.32	1131.20	0 00:22	0.809	0.000
STMH54	0.01	989.23	0 00:14	0.003	0.000
STMH178	0.34	1478.58	0 00:20	0.919	0.000
STMH177	0.01	842.53	0 00:14	0.003	0.000
STMH188	0.20	1524.57	0 00:20	0.505	0.000

STMH161	0.14	1199.85	0	00:15	0.155	0.000
STMH165	0.10	302.76	0	00:20	0.046	0.000
STMH62	0.01	971.82	0	00:15	0.010	0.000
STMH83	0.12	716.66	0	00:13	0.043	0.000
STMH79	0.13	1600.43	0	00:13	0.227	0.000
STMH235	0.36	3787.13	0	00:23	2.929	0.000
J22	0.26	2608.85	0	00:20	1.012	0.000
STMH183	0.07	523.00	0	00:21	0.079	0.000
STMH6	0.04	191.33	0	00:20	0.015	0.000
J33	0.13	2836.99	0	00:20	0.641	0.000
STMH17	0.03	219.20	0	00:19	0.007	0.000
J37	0.01	27.87	0	00:18	0.000	0.000
STMH190	0.01	745.36	0	00:15	0.001	0.000
STMH135	0.01	725.29	0	00:15	0.002	0.000
STMH131	0.01	127.27	0	00:15	0.000	0.000
STMH196	0.01	680.44	0	00:14	0.002	0.000
STMH15	0.21	4808.54	0	00:20	1.700	0.000
STMH4	0.07	210.02	0	00:20	0.026	0.000
STMH216	0.01	243.29	0	00:14	0.000	0.000
STMH197	0.10	467.75	0	00:20	0.089	0.000
STMH2	0.15	627.98	0	00:15	0.152	0.000
STMH28	0.22	352.76	0	00:14	0.163	0.000
STMH194	0.22	428.17	0	00:20	0.164	0.000
STMH253	0.01	409.97	0	00:12	0.003	0.000
J56	0.10	292.60	0	00:20	0.050	0.000
STMH212	0.54	2452.80	0	00:20	1.749	0.000
STMH298	0.01	95.33	0	00:16	0.000	0.000
STMH297	0.01	87.67	0	00:15	0.000	0.000
STMH23	0.07	267.08	0	00:20	0.036	0.000
STMH225	0.05	163.56	0	00:20	0.015	0.000
STMH226	0.25	667.00	0	00:20	0.332	0.000
STMH202	0.03	536.29	0	00:15	0.006	0.000
STMH38	0.16	1200.37	0	00:20	0.351	0.000
STMH205	0.01	262.30	0	00:15	0.001	0.000
STMH204	0.01	45.95	0	00:15	0.000	0.000
STMH109	0.25	552.87	0	00:20	0.293	0.000
STMH37	0.38	2516.24	0	00:20	1.421	0.000
STMH244	0.01	210.79	0	00:15	0.001	0.000
STMH116	0.32	2168.18	0	00:20	0.914	0.000
DRCB64	0.02	91.30	0	00:17	0.002	0.000
DRCB40	0.01	238.60	0	00:18	0.001	0.000
J83	0.07	1714.63	0	00:20	0.224	0.000
STMH78	0.10	1440.12	0	00:20	0.353	0.000
J86	0.23	1760.43	0	00:16	1.056	0.000

DRCB258	0.01	166.96	0	00:16	0.000	0.000
DRCB260	0.85	1791.92	0	00:25	3.183	0.000

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
DROF13	99.63	1375.39	3061.24	6.613
DROF38	99.63	1872.17	4368.67	8.909
DROF3	99.63	1968.57	6770.28	9.539
DROF4	99.63	598.36	2816.58	2.983
DROF5	99.63	2197.74	6292.52	10.686
DROF7	99.47	264.47	1117.83	1.314
DROF25	99.67	4050.31	15652.07	20.191
DROF23	99.63	744.06	2402.63	3.627
DRFI2017	99.57	637.84	819.75	4.229
System	99.61	13708.91	42953.19	68.090

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Link Flow Summary
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Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C100	CONDUIT	2397.22	0 00:23	3.77	2.62	1.00
C101	CONDUIT	4096.96	0 00:23	3.62	1.38	1.00
C102	CONDUIT	4368.67	0 00:24	5.05	1.99	1.00
C103	CONDUIT	6203.97	0 00:18	7.40	0.88	0.94
C104	CONDUIT	6576.58	0 00:23	7.60	1.00	1.00
C105	CONDUIT	2821.11	0 00:20	7.62	1.57	0.79
C106	CONDUIT	575.39	0 00:20	3.11	0.39	0.44
C107	CONDUIT	567.12	0 00:20	2.49	0.39	0.51
C108	CONDUIT	0.00	0 00:00	0.00	0.00	0.22

C109	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C110	CONDUIT	0.00	0	00:00	0.00	0.00	0.22
C93	CONDUIT	7049.34	0	00:20	5.54	1.23	1.00
C96	CONDUIT	6137.83	0	00:21	7.17	1.19	1.00
C98	CONDUIT	4570.54	0	00:22	7.18	1.00	1.00
C99	CONDUIT	3384.25	0	00:20	5.51	0.06	0.50
DRDI117	CONDUIT	819.75	0	00:17	2.76	0.04	0.23
DRDI27	CONDUIT	7267.18	0	00:20	2.57	0.09	0.35
DRDI28	CONDUIT	7878.12	0	00:21	1.93	0.10	0.52
DRDI4	CONDUIT	11083.28	0	00:20	6.84	0.14	0.19
DRDI5	CONDUIT	4365.03	0	00:20	6.03	0.06	0.11
DRDI6	CONDUIT	15652.07	0	00:20	6.46	0.12	0.45
STMP10	CONDUIT	1205.61	0	00:27	4.26	1.50	1.00
STMP100	CONDUIT	4218.66	0	00:27	3.73	1.12	1.00
STMP101	CONDUIT	4498.44	0	00:24	3.98	1.89	1.00
STMP103	CONDUIT	1032.73	0	00:32	1.95	0.59	1.00
STMP106	CONDUIT	4737.13	0	00:23	4.19	1.04	1.00
STMP107	CONDUIT	6292.49	0	00:20	5.56	1.54	1.00
STMP1086	CONDUIT	2402.63	0	00:20	3.78	1.26	1.00
STMP11	CONDUIT	1206.15	0	00:27	4.27	1.51	1.00
STMP1170	CONDUIT	810.83	0	00:17	3.97	1.09	0.69
STMP118	CONDUIT	672.67	0	00:15	2.71	2.43	1.00
STMP12	CONDUIT	1206.48	0	00:27	4.41	1.52	1.00
STMP120	CONDUIT	672.69	0	00:15	2.41	1.19	1.00
STMP123	CONDUIT	1032.80	0	00:32	2.97	0.64	1.00
STMP1289	CONDUIT	866.11	0	00:21	8.69	0.47	0.74
STMP13	CONDUIT	1206.85	0	00:27	3.00	0.51	1.00
STMP131	CONDUIT	6292.52	0	00:20	5.56	1.77	1.00
STMP14	CONDUIT	1509.11	0	00:23	2.47	0.58	1.00
STMP150	CONDUIT	1031.43	0	00:38	3.65	1.83	1.00
STMP1513	CONDUIT	2602.52	0	00:25	5.18	0.82	1.00
STMP1516	CONDUIT	2725.87	0	00:22	5.86	1.63	0.74
STMP155	CONDUIT	886.02	0	00:18	4.52	3.77	1.00
STMP156A	CONDUIT	1117.83	0	00:20	3.95	1.98	1.00
STMP156B	CONDUIT	1117.84	0	00:20	3.95	2.69	1.00
STMP1604	CONDUIT	3061.24	0	00:20	4.81	1.28	1.00
STMP161	CONDUIT	866.12	0	00:21	6.47	1.03	0.69
STMP170	CONDUIT	7746.79	0	00:21	5.72	1.36	0.85
STMP183	CONDUIT	2362.17	0	00:25	6.02	1.13	1.00
STMP184	CONDUIT	2755.38	0	00:20	4.33	1.66	1.00
STMP20	CONDUIT	276.51	0	00:14	1.42	0.80	1.00
STMP248	CONDUIT	2309.22	0	00:29	3.63	1.38	1.00
STMP249	CONDUIT	2616.19	0	00:20	4.12	1.57	1.00
STMP274	CONDUIT	745.92	0	00:22	2.64	1.32	1.00

STMP276	CONDUIT	1506.90	0	00:21	3.41	1.06	1.00
STMP29	CONDUIT	6147.05	0	00:18	8.67	0.94	0.80
STMP308	CONDUIT	936.81	0	00:29	5.90	1.31	1.00
STMP309	CONDUIT	1383.64	0	00:17	4.97	1.06	1.00
STMP393	CONDUIT	2807.00	0	00:20	4.41	2.04	1.00
STMP394	CONDUIT	2707.43	0	00:35	4.26	1.79	1.00
STMP427	CONDUIT	1158.84	0	00:15	2.62	1.31	1.00
STMP428	CONDUIT	1571.54	0	00:15	3.56	1.36	1.00
STMP435	CONDUIT	3135.11	0	00:20	4.93	1.18	1.00
STMP521	CONDUIT	4532.13	0	00:21	4.01	1.23	1.00
STMP524	CONDUIT	784.08	0	00:22	3.15	0.36	1.00
STMP525	CONDUIT	817.78	0	00:19	4.30	0.36	0.77
STMP554	CONDUIT	5078.81	0	00:23	4.49	1.41	1.00
STMP555	CONDUIT	4955.58	0	00:21	4.38	1.38	1.00
STMP556	CONDUIT	4667.59	0	00:23	4.13	1.29	1.00
STMP591	CONDUIT	5313.68	0	00:23	4.70	1.50	1.00
STMP594	CONDUIT	5314.18	0	00:23	4.70	1.65	1.00
STMP595	CONDUIT	5314.93	0	00:23	4.70	1.62	1.00
STMP692	CONDUIT	503.49	0	00:13	2.65	1.44	1.00
STMP749	CONDUIT	2754.80	0	00:20	6.24	0.71	1.00
STMP77	CONDUIT	4531.01	0	00:21	7.47	0.60	1.00
STMP79	CONDUIT	785.00	0	00:22	1.86	0.74	1.00
STMP800	CONDUIT	550.48	0	00:13	2.81	1.58	1.00
STMP801	CONDUIT	551.78	0	00:12	2.81	1.60	1.00
STMP823	CONDUIT	718.14	0	00:22	2.54	1.09	1.00
STMP824	CONDUIT	718.14	0	00:22	2.54	1.10	1.00
STMP850	CONDUIT	7050.61	0	00:20	11.08	2.44	1.00
STMP88	CONDUIT	1506.49	0	00:21	3.41	1.41	1.00
STMP89	CONDUIT	2816.58	0	00:20	6.38	1.95	1.00
STMP9	CONDUIT	1336.57	0	00:27	3.03	1.27	1.00
STMP90	CONDUIT	6770.28	0	00:20	5.99	1.88	1.00
STMP914	CONDUIT	1526.84	0	00:15	5.40	1.48	1.00
STMP915	CONDUIT	1347.27	0	00:15	4.76	1.65	1.00
STMP964	CONDUIT	1389.91	0	00:29	2.22	1.09	1.00
STMP98	CONDUIT	3140.80	0	00:14	5.85	0.73	1.00
STMP99	CONDUIT	3023.75	0	00:15	4.75	1.01	1.00
SYMP182	CONDUIT	1839.11	0	00:20	4.27	1.06	1.00
STMP187_PUMP	PUMP	15336.17	0	00:20			

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Flow Classification Summary
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	Adjusted /Actual		Fraction of Time in Flow Class							
Conduit	Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
C100	1.00	0.00	0.00	0.00	0.42	0.00	0.00	0.57	0.00	0.00
C101	1.00	0.00	0.00	0.00	0.46	0.04	0.00	0.50	0.02	0.00
C102	1.00	0.00	0.00	0.00	0.48	0.52	0.00	0.00	0.66	0.00
C103	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.89	0.00
C104	1.00	0.00	0.00	0.00	0.08	0.62	0.00	0.29	0.24	0.00
C105	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
C106	1.00	0.00	0.00	0.00	0.13	0.87	0.00	0.00	0.89	0.00
C107	1.00	0.00	0.00	0.00	0.43	0.56	0.00	0.00	0.52	0.00
C108	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C109	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C110	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C93	1.00	0.00	0.00	0.00	0.17	0.83	0.00	0.00	0.80	0.00
C96	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C98	1.00	0.00	0.00	0.00	0.22	0.78	0.00	0.00	0.80	0.00
C99	1.00	0.00	0.00	0.00	0.27	0.73	0.00	0.00	0.94	0.00
DRDI117	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.60	0.00
DRDI27	1.00	0.00	0.00	0.00	0.09	0.91	0.00	0.00	0.88	0.00
DRDI28	1.00	0.00	0.00	0.00	0.87	0.13	0.00	0.00	0.69	0.00
DRDI4	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
DRDI5	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
DRDI6	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.84	0.00
STMP10	1.00	0.00	0.00	0.00	0.27	0.72	0.00	0.00	0.63	0.00
STMP100	1.00	0.00	0.00	0.00	0.42	0.57	0.00	0.00	0.71	0.00
STMP101	1.00	0.00	0.00	0.00	0.30	0.70	0.00	0.00	0.16	0.00
STMP103	1.00	0.00	0.00	0.00	0.55	0.45	0.00	0.00	0.65	0.00
STMP106	1.00	0.00	0.00	0.00	0.28	0.71	0.00	0.00	0.78	0.00
STMP107	1.00	0.00	0.00	0.00	0.30	0.70	0.00	0.00	0.75	0.00
STMP1086	1.00	0.00	0.00	0.00	0.10	0.90	0.00	0.00	0.73	0.00
STMP11	1.00	0.00	0.00	0.00	0.28	0.72	0.00	0.00	0.79	0.00
STMP1170	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
STMP118	1.00	0.00	0.00	0.00	0.50	0.49	0.00	0.00	0.04	0.00
STMP12	1.00	0.00	0.00	0.00	0.28	0.72	0.00	0.00	0.28	0.00
STMP120	1.00	0.00	0.00	0.00	0.95	0.04	0.00	0.00	0.71	0.00
STMP123	1.00	0.00	0.00	0.00	0.27	0.72	0.00	0.00	0.81	0.00
STMP1289	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.97	0.00
STMP13	1.00	0.00	0.00	0.00	0.33	0.67	0.00	0.00	0.50	0.00
STMP131	1.00	0.00	0.00	0.00	0.31	0.69	0.00	0.00	0.71	0.00
STMP14	1.00	0.00	0.00	0.00	0.41	0.58	0.00	0.00	0.79	0.00
STMP150	1.00	0.00	0.00	0.00	0.38	0.62	0.00	0.00	0.08	0.00

STMP1513	1.00	0.00	0.00	0.00	0.66	0.34	0.00	0.00	0.64	0.00
STMP1516	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.21	0.00
STMP155	1.00	0.00	0.00	0.00	0.07	0.92	0.00	0.00	0.00	0.00
STMP156A	1.00	0.00	0.00	0.00	0.16	0.83	0.00	0.00	0.73	0.00
STMP156B	1.00	0.00	0.00	0.00	0.43	0.56	0.00	0.00	0.07	0.00
STMP1604	1.00	0.00	0.00	0.00	0.35	0.65	0.00	0.00	0.67	0.00
STMP161	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.00
STMP170	1.00	0.00	0.00	0.00	0.03	0.96	0.00	0.00	0.22	0.00
STMP183	1.00	0.00	0.00	0.00	0.27	0.73	0.00	0.00	0.03	0.00
STMP184	1.00	0.00	0.00	0.00	0.39	0.60	0.00	0.00	0.76	0.00
STMP20	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.82	0.00
STMP248	1.00	0.00	0.00	0.00	0.42	0.58	0.00	0.00	0.78	0.00
STMP249	1.00	0.00	0.00	0.00	0.40	0.60	0.00	0.00	0.75	0.00
STMP274	1.00	0.00	0.00	0.00	0.99	0.01	0.00	0.00	0.74	0.00
STMP276	1.00	0.00	0.00	0.00	0.14	0.86	0.00	0.00	0.90	0.00
STMP29	1.00	0.00	0.00	0.00	0.00	0.05	0.00	0.94	0.00	0.00
STMP308	1.00	0.00	0.00	0.00	0.17	0.83	0.00	0.00	0.80	0.00
STMP309	1.00	0.00	0.00	0.00	0.08	0.91	0.00	0.00	0.88	0.00
STMP393	1.00	0.00	0.00	0.00	0.38	0.62	0.00	0.00	0.18	0.00
STMP394	1.00	0.00	0.00	0.00	0.50	0.50	0.00	0.00	0.75	0.00
STMP427	1.00	0.00	0.00	0.00	0.47	0.53	0.00	0.00	0.56	0.00
STMP428	1.00	0.00	0.00	0.00	0.43	0.57	0.00	0.00	0.77	0.00
STMP435	1.00	0.00	0.00	0.00	0.41	0.59	0.00	0.00	0.75	0.00
STMP521	1.00	0.00	0.00	0.00	0.28	0.71	0.00	0.00	0.64	0.00
STMP524	1.00	0.00	0.00	0.00	0.09	0.91	0.00	0.00	0.88	0.00
STMP525	1.00	0.00	0.00	0.00	0.03	0.97	0.00	0.00	0.89	0.00
STMP554	1.00	0.00	0.00	0.00	0.31	0.68	0.00	0.00	0.78	0.00
STMP555	1.00	0.00	0.00	0.00	0.26	0.74	0.00	0.00	0.80	0.00
STMP556	1.00	0.00	0.00	0.00	0.32	0.68	0.00	0.00	0.76	0.00
STMP591	1.00	0.00	0.00	0.00	0.31	0.68	0.00	0.00	0.68	0.00
STMP594	1.00	0.00	0.00	0.00	0.33	0.66	0.00	0.00	0.48	0.00
STMP595	1.00	0.00	0.00	0.00	0.45	0.55	0.00	0.00	0.58	0.00
STMP692	1.00	0.00	0.00	0.00	0.70	0.29	0.00	0.00	0.73	0.00
STMP749	1.00	0.00	0.00	0.00	0.30	0.70	0.00	0.00	0.80	0.00
STMP77	1.00	0.00	0.00	0.00	0.08	0.92	0.00	0.00	0.89	0.00
STMP79	1.00	0.00	0.00	0.00	0.96	0.03	0.00	0.00	0.89	0.00
STMP800	1.00	0.00	0.00	0.00	0.53	0.47	0.00	0.00	0.72	0.00
STMP801	1.00	0.00	0.00	0.00	0.87	0.13	0.00	0.00	0.72	0.00
STMP823	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.80	0.00
STMP824	1.00	0.00	0.00	0.00	0.36	0.64	0.00	0.00	0.80	0.00
STMP850	1.00	0.00	0.00	0.00	0.16	0.83	0.00	0.00	0.12	0.00
STMP88	1.00	0.00	0.00	0.00	0.07	0.93	0.00	0.00	0.24	0.00
STMP89	1.00	0.00	0.00	0.00	0.12	0.87	0.00	0.00	0.66	0.00
STMP9	1.00	0.00	0.00	0.00	0.42	0.57	0.00	0.00	0.74	0.00

STMP90	1.00	0.00	0.00	0.00	0.29	0.71	0.00	0.00	0.72	0.00
STMP914	1.00	0.00	0.00	0.00	0.30	0.00	0.00	0.70	0.00	0.00
STMP915	1.00	0.00	0.00	0.00	0.26	0.74	0.00	0.00	0.06	0.00
STMP964	1.00	0.00	0.00	0.00	0.43	0.07	0.00	0.49	0.03	0.00
STMP98	1.00	0.00	0.00	0.00	0.17	0.83	0.00	0.00	0.84	0.00
STMP99	1.00	0.00	0.00	0.00	0.44	0.56	0.00	0.00	0.81	0.00
SYMP182	1.00	0.00	0.00	0.00	0.24	0.76	0.00	0.00	0.82	0.00

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Conduit Surcharge Summary
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Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C100	0.46	0.46	0.46	0.23	0.05
C101	0.47	0.47	0.47	0.42	0.41
C102	0.55	0.55	0.55	0.56	0.55
C104	0.13	0.13	0.13	0.09	0.10
C105	0.01	0.01	0.01	0.40	0.01
C93	0.21	0.21	0.21	0.21	0.06
C96	0.09	0.09	0.09	0.12	0.09
C98	0.30	0.30	0.30	0.01	0.01
STMP10	0.36	0.36	0.36	0.34	0.32
STMP100	0.32	0.32	0.32	0.25	0.24
STMP101	0.29	0.29	0.29	0.48	0.28
STMP103	0.34	0.34	0.34	0.01	0.01
STMP106	0.29	0.29	0.29	0.20	0.20
STMP107	0.36	0.36	0.36	0.34	0.33
STMP1086	0.10	0.10	0.10	0.15	0.10
STMP11	0.37	0.37	0.37	0.34	0.32
STMP1170	0.01	0.01	0.01	0.89	0.01
STMP118	0.28	0.28	0.28	0.69	0.28
STMP12	0.37	0.37	0.37	0.34	0.32
STMP120	0.57	0.57	0.57	0.52	0.50
STMP123	0.26	0.26	0.26	0.01	0.01
STMP13	0.33	0.33	0.33	0.01	0.01
STMP131	0.39	0.39	0.39	0.41	0.39
STMP14	0.40	0.40	0.40	0.01	0.01
STMP150	0.45	0.45	0.45	0.57	0.45
STMP1513	0.62	0.62	0.62	0.01	0.01

STMP1516	0.01	0.01	0.01	0.51	0.01
STMP155	0.08	0.08	0.09	0.48	0.08
STMP156A	0.21	0.21	0.21	0.23	0.21
STMP156B	0.21	0.21	0.21	0.34	0.21
STMP1604	0.43	0.43	0.43	0.45	0.43
STMP161	0.01	0.01	0.01	0.07	0.01
STMP170	0.01	0.01	0.01	0.60	0.01
STMP183	0.36	0.36	0.36	0.27	0.27
STMP184	0.46	0.46	0.46	0.49	0.45
STMP20	0.43	0.43	0.43	0.01	0.01
STMP248	0.44	0.44	0.44	0.49	0.44
STMP249	0.03	0.03	0.04	0.51	0.03
STMP274	0.44	0.44	0.44	0.15	0.15
STMP276	0.09	0.09	0.09	0.05	0.05
STMP308	0.23	0.23	0.23	0.40	0.20
STMP309	0.12	0.12	0.12	0.15	0.10
STMP393	0.43	0.43	0.43	0.57	0.43
STMP394	0.53	0.53	0.53	0.56	0.53
STMP427	0.47	0.47	0.47	0.10	0.09
STMP428	0.48	0.48	0.48	0.11	0.10
STMP435	0.46	0.46	0.46	0.26	0.26
STMP521	0.25	0.25	0.25	0.19	0.19
STMP524	0.05	0.05	0.05	0.01	0.01
STMP554	0.28	0.28	0.28	0.25	0.23
STMP555	0.26	0.26	0.26	0.24	0.22
STMP556	0.27	0.27	0.27	0.23	0.22
STMP591	0.31	0.31	0.31	0.27	0.25
STMP594	0.32	0.32	0.32	0.33	0.32
STMP595	0.32	0.32	0.32	0.32	0.30
STMP692	0.60	0.60	0.60	0.39	0.34
STMP749	0.39	0.39	0.40	0.01	0.01
STMP77	0.12	0.12	0.12	0.01	0.01
STMP79	0.07	0.07	0.07	0.01	0.01
STMP800	0.61	0.61	0.61	0.52	0.49
STMP801	0.59	0.59	0.59	0.11	0.01
STMP823	0.35	0.35	0.35	0.09	0.09
STMP824	0.30	0.30	0.30	0.09	0.09
STMP850	0.24	0.24	0.24	0.20	0.19
STMP88	0.09	0.09	0.09	0.13	0.09
STMP89	0.17	0.17	0.17	0.19	0.17
STMP9	0.46	0.46	0.46	0.30	0.29
STMP90	0.33	0.33	0.33	0.35	0.33
STMP914	0.45	0.45	0.45	0.48	0.45
STMP915	0.35	0.35	0.35	0.56	0.35

STMP964	0.42	0.42	0.42	0.27	0.28
STMP98	0.25	0.25	0.25	0.01	0.01
STMP99	0.27	0.27	0.27	0.01	0.01
SYMP182	0.31	0.31	0.31	0.07	0.07

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Pumping Summary
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Pump	Percent Utilized	Number of Start-Ups	Min Flow LPS	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr	Power Usage Kw-hr	% Time Off Pump Low	% Time Off Curve High
STMP187_PUMP	97.50	1	0.00	4050.24	15336.17	20.190	306.70	0.0	0.0

Analysis begun on: Thu Sep 01 15:56:32 2016
Analysis ended on: Thu Sep 01 15:56:32 2016
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.007)

WARNING 02: maximum depth increased for Node J77

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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.
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Analysis Options
****
Flow Units ..... LPS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... DYNWAVE
Starting Date NOV-05-2015 00:00:00
Ending Date NOV-05-2015 03:00:00
Antecedent Dry Days 0.0
Report Time Step 00:05:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00
Routing Time Step ..... 30.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Head Tolerance ..... 0.004921 m

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Element Count
****
Number of rain gages 1
Number of subcatchments ... 55
Number of nodes 100

Number of links 91
Number of pollutants 0
Number of land uses 0

****
Raingage Summary
****

Name	Data Source	Data Type	Recording Interval
_Current	CC2_AES_1hr_5yr	VOLUME	5 min.

****
Subcatchment Summary
****

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
S13-A	14.43	1550.00	70.00	2.5000	_Current	STMH286
S13-B	14.18	1060.00	70.00	1.9000	_Current	STMH188
S13-C	5.03	705.00	66.00	1.1000	_Current	STMH165
S13-D	2.85	632.00	77.00	3.2000	_Current	STMH161
S13-E	5.22	727.00	68.00	2.1000	_Current	STMH54
S13-F	7.67	569.00	50.00	0.5000	_Current	STMH178
S13-G	1.35	351.00	48.00	2.0000	_Current	STMH177
S13-H	1.52	473.00	57.00	3.1000	_Current	STMH398
S23-A	15.82	1095.00	69.00	1.6000	_Current	STMH116
S23-B	3.94	770.00	63.00	2.6000	_Current	DRCB64
S23-C	7.93	966.00	45.00	2.1000	_Current	DRCB40
S25-A	22.61	902.00	61.00	1.3000	_Current	STMH37
S25-B	6.70	737.00	55.00	1.7000	_Current	STMH225
S25-C	7.26	921.00	52.00	1.0000	_Current	STMH202
S25-D	10.70	1063.00	55.00	1.2000	_Current	STMH38
S25-E	10.16	1039.00	49.00	1.7000	_Current	J74
S25-F	41.71	2239.00	44.00	0.8000	_Current	J73
S25-G	3.30	633.00	49.00	1.9000	_Current	STMH205
S25-H	3.45	674.00	41.00	1.2000	_Current	STMH244
S25-I	20.24	1568.00	67.00	2.1000	_Current	J75
S25-J	24.53	1501.00	72.00	1.3000	_Current	J84
S32-A	54.37	400.00	50.00	0.5000	_Current	DRCB258
S32-B	5.37	400.00	50.00	0.5000	_Current	DRCB258
S38-A	16.25	1798.00	79.00	4.1000	_Current	J83
S38-B	18.36	1574.00	76.00	5.9000	_Current	J22

S38-C	8.37	802.00	79.00	4.5000	_Current	STMH78
S38-D	4.72	558.00	73.00	1.5000	_Current	STMH79
S38-Z1	136.40	7480.00	10.00	30.3000	_Current	J83
S38-Z2	5.70	1120.00	10.00	10.4000	_Current	J83
S3-A	8.53	955.00	63.00	2.9000	_Current	STMH12
S3-B	1.98	392.00	62.00	1.5000	_Current	STMH7
S3-C	3.55	735.00	61.00	1.3000	_Current	STMH6
S3-D	2.11	617.00	80.00	2.1000	_Current	STMH138
S3-E	5.92	588.00	76.00	17.2000	_Current	STMH246-DIV
S3-F	1.92	586.00	58.00	13.7000	_Current	J33
S3-G	3.26	655.00	60.00	13.0000	_Current	J87
S3-Z1	241.50	6550.00	10.00	34.0000	_Current	J33
S4-A	3.83	547.00	77.00	19.1000	_Current	J34
S4-B	4.08	379.00	80.00	1.5000	_Current	J37
S4-C	6.76	577.00	73.00	3.3000	_Current	STMH93
S5-A	8.95	974.00	64.00	2.6000	_Current	STMH133
S5-B	1.74	288.00	80.00	0.9000	_Current	STMH135
S5-C	2.50	464.00	80.00	0.6000	_Current	STMH131
S5-D	1.28	206.00	80.00	1.2000	_Current	STMH196
S5-E	4.01	610.00	79.00	2.3000	_Current	STMH4
S5-F	1.02	184.00	80.00	6.0000	_Current	STMH15
S5-G	4.10	727.00	77.00	0.3000	_Current	STMH2
S5-H	3.71	473.00	73.00	0.4000	_Current	STMH147
S5-I	10.27	885.00	71.00	6.2000	_Current	STMH212
S5-J	5.91	831.00	60.00	9.1000	_Current	J56
S5-K	28.67	1446.00	54.00	11.9000	_Current	J46
S5-Z1	87.70	4910.00	10.00	36.0000	_Current	J46
S7-A	7.47	684.00	56.00	0.9000	_Current	STMH23
S7-B	3.90	411.00	22.00	7.3000	_Current	STMH297
S13-I	2.12	370.00	60.00	1.0000	_Current	J1

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Node Summary
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Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J1	JUNCTION	444.92	2.90	0.0	
STMH286	JUNCTION	444.31	3.40	0.0	
STMH56	JUNCTION	443.98	3.20	0.0	
STMH54	JUNCTION	442.97	4.10	0.0	
STMH178	JUNCTION	441.29	3.20	0.0	
STMH177	JUNCTION	440.78	2.60	0.0	

STMH398	JUNCTION	440.42	3.10	0.0
STMH188	JUNCTION	446.02	3.40	0.0
STMH64	JUNCTION	445.56	3.40	0.0
STMH161	JUNCTION	444.09	3.00	0.0
STMH165	JUNCTION	443.56	3.60	0.0
STMH63	JUNCTION	445.08	3.30	0.0
STMH62	JUNCTION	444.98	2.80	0.0
STMH77	JUNCTION	454.15	2.20	0.0
STMH74	JUNCTION	452.88	3.20	0.0
STMH83	JUNCTION	441.98	3.00	0.0
STMH79	JUNCTION	441.38	2.60	0.0
STMH235	JUNCTION	442.44	1.90	0.0
J22	JUNCTION	442.75	1.90	0.0
STMH139	JUNCTION	453.09	4.04	0.0
STMH138	JUNCTION	452.99	3.41	0.0
STMH183	JUNCTION	452.76	3.11	0.0
STMH6	JUNCTION	452.48	2.97	0.0
STMH7	JUNCTION	452.10	3.90	0.0
STMH184	JUNCTION	451.89	4.40	0.0
STMH185	JUNCTION	451.75	4.44	0.0
STMH12	JUNCTION	451.69	4.40	0.0
J33	JUNCTION	459.08	2.50	0.0
J34	JUNCTION	455.36	2.50	0.0
STMH17	JUNCTION	453.99	1.60	0.0
STMH254	JUNCTION	453.24	2.60	0.0
STMH93	JUNCTION	451.88	3.90	0.0
J37	JUNCTION	453.49	2.00	0.0
J38	JUNCTION	454.36	2.50	0.0
STMH190	JUNCTION	449.72	4.70	0.0
STMH133	JUNCTION	450.28	4.40	0.0
STMH135	JUNCTION	451.01	3.80	0.0
STMH131	JUNCTION	451.21	3.70	0.0
STMH196	JUNCTION	451.69	3.00	0.0
STMH137	JUNCTION	453.28	2.60	0.0
STMH15	JUNCTION	454.27	1.80	0.0
J46	JUNCTION	455.31	5.00	0.0
STMH4	JUNCTION	452.57	3.10	0.0
STMH216	JUNCTION	452.15	3.10	0.0
STMH197	JUNCTION	451.95	2.70	0.0
STMH2	JUNCTION	453.06	1.80	0.0
STMH28	JUNCTION	453.20	1.90	0.0
STMH147	JUNCTION	453.75	2.90	0.0
STMH194	JUNCTION	454.00	1.80	0.0
STMH253	JUNCTION	454.49	2.00	0.0

J56	JUNCTION	455.38	2.60	0.0
STMH212	JUNCTION	454.85	1.20	0.0
STMH298	JUNCTION	440.27	1.60	0.0
STMH297	JUNCTION	440.64	3.90	0.0
STMH26	JUNCTION	452.49	5.00	0.0
STMH22	JUNCTION	454.19	3.70	0.0
STMH23	JUNCTION	454.38	3.30	0.0
STMH225	JUNCTION	450.19	2.44	0.0
STMH226	JUNCTION	448.06	3.04	0.0
STMH202	JUNCTION	446.71	3.02	0.0
STMH38	JUNCTION	444.70	2.75	0.0
STMH205	JUNCTION	441.90	3.20	0.0
STMH204	JUNCTION	440.95	3.60	0.0
STMH109	JUNCTION	440.47	1.85	0.0
STMH37	JUNCTION	450.62	2.50	0.0
STMH244	JUNCTION	439.80	1.80	0.0
STMH362	JUNCTION	439.45	2.10	0.0
J73	JUNCTION	439.28	1.50	0.0
J74	JUNCTION	438.27	1.50	0.0
J75	JUNCTION	437.62	1.50	0.0
J76	JUNCTION	437.10	1.80	0.0
J77	JUNCTION	442.00	2.00	0.0
J78	JUNCTION	438.00	1.50	0.0
J79	JUNCTION	454.78	4.70	0.0
STMH116	JUNCTION	454.00	2.30	0.0
DRCB64	JUNCTION	451.36	2.50	0.0
DRCB40	JUNCTION	445.61	2.50	0.0
J83	JUNCTION	458.49	2.80	0.0
J84	JUNCTION	437.36	1.50	0.0
J85	JUNCTION	457.37	2.50	0.0
STMH78	JUNCTION	446.63	2.90	0.0
J86	JUNCTION	458.46	2.50	0.0
J87	JUNCTION	458.57	2.50	0.0
J88	JUNCTION	458.25	2.50	0.0
J89	JUNCTION	456.77	2.50	0.0
J90	JUNCTION	459.23	2.50	0.0
J91	JUNCTION	457.00	2.50	0.0
DRCB258	JUNCTION	439.79	1.50	0.0
DRCB260	JUNCTION	438.95	1.50	0.0
J94	JUNCTION	436.84	1.50	0.0
STMH246-DIV	JUNCTION	455.92	2.50	0.0
DROF13	OUTFALL	440.21	0.90	0.0
DROF38	OUTFALL	440.85	1.05	0.0
DROF3	OUTFALL	451.34	1.20	0.0

DROF4	OUTFALL	451.61	0.75	0.0
DROF5	OUTFALL	449.45	1.20	0.0
DROF7	OUTFALL	440.02	0.60	0.0
DROF25	OUTFALL	440.00	2.00	0.0
DROF23	OUTFALL	443.90	0.90	0.0
DRFI2017	OUTFALL	436.42	1.00	0.0

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Link Summary
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Name	From Node	To Node	Type	Length	%Slope	Roughness
C100	STMH235	STMH83	CONDUIT	61.4	0.1515	0.0100
C101	STMH83	STMH79	CONDUIT	153.1	0.3430	0.0100
C102	STMH79	DROF38	CONDUIT	137.0	0.3831	0.0100
C103	STMH74	STMH78	CONDUIT	159.2	3.9237	0.0100
C104	STMH78	STMH83	CONDUIT	132.9	3.4096	0.0100
C105	J86	J85	CONDUIT	70.6	1.5447	0.0100
C106	J87	J88	CONDUIT	31.5	1.0172	0.0100
C107	J88	J85	CONDUIT	88.2	0.9974	0.0100
C108	J89	J34	CONDUIT	101.2	1.3931	0.0100
C109	J90	J91	CONDUIT	52.0	4.2949	0.0100
C110	J91	J34	CONDUIT	104.7	1.5661	0.0100
C93	J46	J79	CONDUIT	35.5	1.4931	0.0100
C96	J83	STMH77	CONDUIT	202.0	2.1231	0.0100
C98	J33	J86	CONDUIT	16.4	3.7740	0.0100
C99	J85	STMH246-DIV	CONDUIT	79.7	1.8201	0.0100
DRDI117	J94	DRFI2017	CONDUIT	41.6	1.0097	0.0100
DRDI27	J73	J74	CONDUIT	251.8	0.4012	0.0100
DRDI28	J74	J78	CONDUIT	67.3	0.4013	0.0100
DRDI4	J75	J76	CONDUIT	175.3	0.2966	0.0100
DRDI5	J84	J76	CONDUIT	65.5	0.3966	0.0100
DRDI6	J77	DROF25	CONDUIT	153.4	1.3036	0.0100
STMP10	STMH188	STMH64	CONDUIT	45.5	1.0110	0.0100
STMP100	STMH196	STMH131	CONDUIT	86.4	0.5557	0.0100
STMP101	STMH131	STMH135	CONDUIT	90.9	0.2201	0.0100
STMP103	STMH197	STMH196	CONDUIT	47.1	0.5524	0.0100
STMP106	STMH135	STMH133	CONDUIT	89.7	0.8139	0.0100
STMP107	STMH133	STMH190	CONDUIT	86.0	0.6511	0.0100
STMP1086	DRCB40	DROF23	CONDUIT	262.5	0.6514	0.0100
STMP11	STMH64	STMH63	CONDUIT	47.9	1.0026	0.0100
STMP1170	DRCB260	J94	CONDUIT	241.7	0.8730	0.0100
STMP118	STMH28	STMH2	CONDUIT	116.3	0.1204	0.0100

STMP12	STMH63	STMH62	CONDUIT	10.2	0.9824	0.0100
STMP120	STMH147	STMH28	CONDUIT	110.1	0.4994	0.0100
STMP123	STMH2	STMH197	CONDUIT	88.5	1.2548	0.0100
STMP1289	STMH26	STMH297	CONDUIT	27.8	47.1005	0.0100
STMP13	STMH62	STMH161	CONDUIT	89.3	0.9962	0.0100
STMP131	STMH190	DROF5	CONDUIT	54.9	0.4920	0.0100
STMP14	STMH161	STMH54	CONDUIT	92.7	1.2078	0.0100
STMP150	STMH37	STMH225	CONDUIT	86.2	0.4990	0.0100
STMP1513	DRCB258	DRCB260	CONDUIT	24.9	3.3754	0.0100
STMP1516	STMH362	J73	CONDUIT	33.6	0.5052	0.0100
STMP155	STMH23	STMH22	CONDUIT	82.8	0.2294	0.0100
STMP156A	STMH298	DROF7	CONDUIT	50.2	0.4979	0.0100
STMP156B	STMH297	STMH298	CONDUIT	136.3	0.2715	0.0100
STMP1604	STMH398	DROF13	CONDUIT	20.4	1.0300	0.0100
STMP161	STMH22	STMH26	CONDUIT	57.4	2.9625	0.0100
STMP170	J78	J75	CONDUIT	31.2	1.2184	0.0100
STMP183	STMH38	STMH205	CONDUIT	133.6	2.0956	0.0100
STMP184	STMH204	STMH109	CONDUIT	96.4	0.4981	0.0100
STMP20	J1	STMH286	CONDUIT	121.6	0.5014	0.0100
STMP248	STMH109	STMH244	CONDUIT	132.7	0.5049	0.0100
STMP249	STMH244	STMH362	CONDUIT	69.7	0.5025	0.0100
STMP274	J56	STMH253	CONDUIT	178.1	0.4998	0.0100
STMP276	STMH254	STMH93	CONDUIT	140.0	0.9714	0.0100
STMP29	STMH77	STMH74	CONDUIT	35.8	3.4248	0.0100
STMP308	STMH116	DRCB64	CONDUIT	71.1	3.7156	0.0100
STMP309	DRCB64	DRCB40	CONDUIT	215.4	2.6704	0.0100
STMP393	STMH177	STMH398	CONDUIT	105.6	0.3409	0.0100
STMP394	STMH178	STMH177	CONDUIT	124.0	0.4112	0.0100
STMP427	STMH56	STMH165	CONDUIT	112.2	0.3745	0.0100
STMP428	STMH165	STMH54	CONDUIT	92.0	0.6415	0.0100
STMP435	STMH54	STMH178	CONDUIT	132.3	1.2698	0.0100
STMP521	STMH139	STMH138	CONDUIT	19.0	0.5255	0.0100
STMP524	J38	STMH17	CONDUIT	16.1	2.3002	0.0100
STMP525	J34	J38	CONDUIT	41.6	2.4063	0.0100
STMP554	STMH6	STMH7	CONDUIT	75.5	0.5033	0.0100
STMP555	STMH138	STMH183	CONDUIT	46.0	0.5003	0.0100
STMP556	STMH183	STMH6	CONDUIT	54.9	0.5099	0.0100
STMP591	STMH7	STMH184	CONDUIT	43.1	0.4875	0.0100
STMP594	STMH184	STMH185	CONDUIT	34.9	0.4014	0.0100
STMP595	STMH185	STMH12	CONDUIT	14.4	0.4170	0.0100
STMP692	STMH194	STMH147	CONDUIT	49.5	0.5054	0.0100
STMP749	STMH205	STMH204	CONDUIT	13.4	7.1181	0.0100
STMP77	STMH246-DIV	STMH139	CONDUIT	27.8	10.2182	0.0100
STMP79	STMH17	J37	CONDUIT	94.2	0.5307	0.0100

STMP800	STMH253	STMH194	CONDUIT	97.4	0.5029	0.0100
STMP801	STMH212	STMH253	CONDUIT	72.7	0.4952	0.0100
STMP823	STMH216	STMH196	CONDUIT	67.8	0.6789	0.0100
STMP824	STMH4	STMH216	CONDUIT	62.6	0.6710	0.0100
STMP850	J79	STMH15	CONDUIT	33.9	1.5042	0.0100
STMP88	J37	STMH254	CONDUIT	45.8	0.5460	0.0100
STMP89	STMH93	DROF4	CONDUIT	27.1	0.9949	0.0100
STMP9	STMH286	STMH56	CONDUIT	62.1	0.5310	0.0100
STMP90	STMH12	DROF3	CONDUIT	69.3	0.5051	0.0100
STMP914	STMH225	STMH226	CONDUIT	43.8	1.6658	0.0100
STMP915	STMH226	STMH202	CONDUIT	128.5	1.0510	0.0100
STMP964	J22	STMH235	CONDUIT	89.5	0.2929	0.0100
STMP98	STMH15	STMH137	CONDUIT	29.4	3.3716	0.0100
STMP99	STMH137	STMH196	CONDUIT	97.5	1.6318	0.0100
SYMP182	STMH202	STMH38	CONDUIT	141.2	1.4237	0.0100
STMP187_PUMP	J76	J77	IDEAL PUMP			

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C100	CIRCULAR	0.90	0.64	0.23	0.90	1	915.97
C101	CIRCULAR	1.20	1.13	0.30	1.20	1	2968.54
C102	CIRCULAR	1.05	0.87	0.26	1.05	1	2197.46
C103	CIRCULAR	1.05	0.87	0.26	1.05	1	7032.30
C104	CIRCULAR	1.05	0.87	0.26	1.05	1	6555.37
C105	CIRCULAR	0.75	0.44	0.19	0.75	1	1798.88
C106	CIRCULAR	0.75	0.44	0.19	0.75	1	1459.75
C107	CIRCULAR	0.75	0.44	0.19	0.75	1	1445.50
C108	CIRCULAR	0.90	0.64	0.23	0.90	1	2777.92
C109	CIRCULAR	0.90	0.64	0.23	0.90	1	4877.52
C110	CIRCULAR	0.90	0.64	0.23	0.90	1	2945.34
C93	CIRCULAR	0.90	0.64	0.23	0.90	2	2875.88
C96	CIRCULAR	1.05	0.87	0.26	1.05	1	5172.85
C98	CIRCULAR	0.90	0.64	0.23	0.90	1	4572.17
C99	TRAPEZOIDAL	2.00	5.00	0.83	4.00	1	59738.45
DRDI117	TRAPEZOIDAL	1.00	3.60	0.52	6.60	1	23389.71
DRDI27	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76654.24
DRDI28	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76659.66
DRDI4	TRAPEZOIDAL	1.50	14.25	0.98	14.00	1	76761.44
DRDI5	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76218.52

DRDI6	TRAPEZOIDAL	2.00	12.00	0.95	12.00	1	132287.57
STMP10	CIRCULAR	0.60	0.28	0.15	0.60	1	802.66
STMP100	CIRCULAR	1.20	1.13	0.30	1.20	1	3778.42
STMP101	CIRCULAR	1.20	1.13	0.30	1.20	1	2378.05
STMP103	CIRCULAR	0.90	0.64	0.23	0.90	1	1749.20
STMP106	CIRCULAR	1.20	1.13	0.30	1.20	1	4572.62
STMP107	CIRCULAR	1.20	1.13	0.30	1.20	1	4089.94
STMP1086	CIRCULAR	0.90	0.64	0.23	0.90	1	1899.52
STMP11	CIRCULAR	0.60	0.28	0.15	0.60	1	799.28
STMP1170	CIRCULAR	0.60	0.28	0.15	0.60	1	745.86
STMP118	CIRCULAR	0.60	0.28	0.15	0.60	1	276.99
STMP12	CIRCULAR	0.60	0.28	0.15	0.60	1	791.19
STMP120	CIRCULAR	0.60	0.28	0.15	0.60	1	564.13
STMP123	CIRCULAR	0.75	0.44	0.19	0.75	1	1621.26
STMP1289	CIRCULAR	0.40	0.13	0.10	0.40	1	1858.16
STMP13	CIRCULAR	0.90	0.64	0.23	0.90	1	2349.12
STMP131	CIRCULAR	1.20	1.13	0.30	1.20	1	3555.25
STMP14	CIRCULAR	0.90	0.64	0.23	0.90	1	2586.51
STMP150	CIRCULAR	0.60	0.28	0.15	0.60	1	563.87
STMP1513	CIRCULAR	0.80	0.50	0.20	0.80	1	3158.49
STMP1516	CIRCULAR	0.90	0.64	0.23	0.90	1	1672.85
STMP155	CIRCULAR	0.50	0.20	0.12	0.50	1	235.13
STMP156A	CIRCULAR	0.60	0.28	0.15	0.60	1	563.28
STMP156B	CIRCULAR	0.60	0.28	0.15	0.60	1	415.93
STMP1604	CIRCULAR	0.90	0.64	0.23	0.90	1	2388.56
STMP161	CIRCULAR	0.50	0.20	0.12	0.50	1	844.93
STMP170	CIRCULAR	0.80	0.50	0.20	0.80	3	1897.65
STMP183	CIRCULAR	0.75	0.44	0.19	0.75	1	2095.23
STMP184	CIRCULAR	0.90	0.64	0.23	0.90	1	1661.02
STMP20	CIRCULAR	0.50	0.20	0.12	0.50	1	347.62
STMP248	CIRCULAR	0.90	0.64	0.23	0.90	1	1672.29
STMP249	CIRCULAR	0.90	0.64	0.23	0.90	1	1668.40
STMP274	CIRCULAR	0.60	0.28	0.15	0.60	1	564.32
STMP276	CIRCULAR	0.75	0.44	0.19	0.75	1	1426.50
STMP29	CIRCULAR	1.05	0.87	0.26	1.05	1	6569.95
STMP308	CIRCULAR	0.45	0.16	0.11	0.45	1	714.48
STMP309	CIRCULAR	0.60	0.28	0.15	0.60	1	1304.47
STMP393	CIRCULAR	0.90	0.64	0.23	0.90	1	1374.18
STMP394	CIRCULAR	0.90	0.64	0.23	0.90	1	1509.26
STMP427	CIRCULAR	0.75	0.44	0.19	0.75	1	885.69
STMP428	CIRCULAR	0.75	0.44	0.19	0.75	1	1159.26
STMP435	CIRCULAR	0.90	0.64	0.23	0.90	1	2652.05
STMP521	CIRCULAR	1.20	1.13	0.30	1.20	1	3674.31
STMP524	CIRCULAR	0.75	0.44	0.19	0.75	1	2195.09

STMP525	CIRCULAR	0.75	0.44	0.19	0.75	1	2245.15
STMP554	CIRCULAR	1.20	1.13	0.30	1.20	1	3595.95
STMP555	CIRCULAR	1.20	1.13	0.30	1.20	1	3585.27
STMP556	CIRCULAR	1.20	1.13	0.30	1.20	1	3619.50
STMP591	CIRCULAR	1.20	1.13	0.30	1.20	1	3538.89
STMP594	CIRCULAR	1.20	1.13	0.30	1.20	1	3211.22
STMP595	CIRCULAR	1.20	1.13	0.30	1.20	1	3272.95
STMP692	CIRCULAR	0.50	0.20	0.12	0.50	1	348.98
STMP749	CIRCULAR	0.75	0.44	0.19	0.75	1	3861.49
STMP77	CIRCULAR	0.90	0.64	0.23	0.90	1	7523.31
STMP79	CIRCULAR	0.75	0.44	0.19	0.75	1	1054.36
STMP800	CIRCULAR	0.50	0.20	0.12	0.50	1	348.14
STMP801	CIRCULAR	0.50	0.20	0.12	0.50	1	345.45
STMP823	CIRCULAR	0.60	0.28	0.15	0.60	1	657.72
STMP824	CIRCULAR	0.60	0.28	0.15	0.60	1	653.92
STMP850	CIRCULAR	0.90	0.64	0.23	0.90	1	2886.48
STMP88	CIRCULAR	0.75	0.44	0.19	0.75	1	1069.45
STMP89	CIRCULAR	0.75	0.44	0.19	0.75	1	1443.65
STMP9	CIRCULAR	0.75	0.44	0.19	0.75	1	1054.66
STMP90	CIRCULAR	1.20	1.13	0.30	1.20	1	3602.16
STMP914	CIRCULAR	0.60	0.28	0.15	0.60	1	1030.27
STMP915	CIRCULAR	0.60	0.28	0.15	0.60	1	818.35
STMP964	CIRCULAR	0.90	0.64	0.23	0.90	1	1273.68
STMP98	CIRCULAR	0.90	0.64	0.23	0.90	1	4321.53
STMP99	CIRCULAR	0.90	0.64	0.23	0.90	1	3006.49
SYMP182	CIRCULAR	0.75	0.44	0.19	0.75	1	1726.93

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Control Actions Taken
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Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	15.516	16.560
Evaporation Loss	0.000	0.000
Infiltration Loss	10.009	10.683
Surface Runoff	5.150	5.496
Final Surface Storage	0.525	0.560
Continuity Error (%)	-1.083	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	5.147	51.471
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	4.682	46.821
Internal Outflow	0.463	4.630
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.005	0.048
Continuity Error (%)	-0.055	

Time-Step Critical Elements

Link STMP749 (48.51%)
Link STMP1513 (17.05%)
Link STMP12 (8.56%)
Link C98 (7.17%)
Link STMP77 (5.11%)

Highest Flow Instability Indexes

Link STMP1516 (20)
Link STMP101 (15)
Link STMP249 (10)
Link STMP393 (8)
Link STMP692 (7)

Routing Time Step Summary

Minimum Time Step	:	0.50 sec
Average Time Step	:	3.98 sec
Maximum Time Step	:	30.00 sec

Percent in Steady State	:	0.00
Average Iterations per Step	:	4.11
Percent Not Converging	:	26.83

Subcatchment Runoff Summary

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
S13-A	16.56	0.00	0.00	4.97	10.91	1.58	1649.18	0.659
S13-B	16.56	0.00	0.00	4.97	10.85	1.54	1451.26	0.655
S13-C	16.56	0.00	0.00	5.63	10.28	0.52	534.35	0.621
S13-D	16.56	0.00	0.00	3.81	12.13	0.35	382.76	0.733
S13-E	16.56	0.00	0.00	5.30	10.63	0.55	595.46	0.642
S13-F	16.56	0.00	0.00	8.28	7.71	0.59	499.18	0.465
S13-G	16.56	0.00	0.00	8.61	7.62	0.10	114.07	0.460
S13-H	16.56	0.00	0.00	7.12	9.08	0.14	152.83	0.548
S23-A	16.56	0.00	0.00	5.13	10.67	1.69	1523.34	0.644
S23-B	16.56	0.00	0.00	6.13	9.92	0.39	432.45	0.599
S23-C	16.56	0.00	0.00	9.11	7.06	0.56	613.76	0.426
S25-A	16.56	0.00	0.00	6.46	9.35	2.11	1539.59	0.564
S25-B	16.56	0.00	0.00	7.45	8.58	0.58	608.11	0.518
S25-C	16.56	0.00	0.00	7.95	8.11	0.59	616.90	0.490
S25-D	16.56	0.00	0.00	7.45	8.55	0.92	925.98	0.517
S25-E	16.56	0.00	0.00	8.45	7.65	0.78	826.31	0.462
S25-F	16.56	0.00	0.00	9.27	6.79	2.83	2425.74	0.410
S25-G	16.56	0.00	0.00	8.45	7.73	0.25	282.49	0.467
S25-H	16.56	0.00	0.00	9.77	6.46	0.22	246.83	0.390
S25-I	16.56	0.00	0.00	5.46	10.40	2.10	2053.76	0.628
S25-J	16.56	0.00	0.00	4.64	11.08	2.72	2225.43	0.669
S32-A	16.56	0.00	0.00	8.28	6.92	3.76	1094.02	0.418
S32-B	16.56	0.00	0.00	8.28	7.71	0.41	350.05	0.465
S38-A	16.56	0.00	0.00	3.48	12.34	2.01	2141.95	0.745
S38-B	16.56	0.00	0.00	3.97	11.87	2.18	2318.10	0.717
S38-C	16.56	0.00	0.00	3.48	12.33	1.03	1089.11	0.744
S38-D	16.56	0.00	0.00	4.47	11.35	0.54	542.42	0.686
S38-Z1	16.56	0.00	0.00	14.90	1.61	2.19	2409.68	0.097
S38-Z2	16.56	0.00	0.00	14.90	1.61	0.09	100.64	0.097
S3-A	16.56	0.00	0.00	6.13	9.85	0.84	903.45	0.595

S3-B	16.56	0.00	0.00	6.29	9.73	0.19	211.10	0.587
S3-C	16.56	0.00	0.00	6.46	9.57	0.34	372.10	0.578
S3-D	16.56	0.00	0.00	3.31	12.61	0.27	294.71	0.762
S3-E	16.56	0.00	0.00	3.97	11.99	0.71	786.13	0.724
S3-F	16.56	0.00	0.00	6.96	9.32	0.18	196.72	0.563
S3-G	16.56	0.00	0.00	6.62	9.59	0.31	345.35	0.579
S3-Z1	16.56	0.00	0.00	14.90	1.60	3.87	4265.78	0.097
S4-A	16.56	0.00	0.00	3.81	12.23	0.47	519.48	0.738
S4-B	16.56	0.00	0.00	3.31	12.39	0.51	472.37	0.748
S4-C	16.56	0.00	0.00	4.47	11.36	0.77	787.44	0.686
S5-A	16.56	0.00	0.00	5.96	9.99	0.89	951.67	0.604
S5-B	16.56	0.00	0.00	3.31	12.44	0.22	218.66	0.751
S5-C	16.56	0.00	0.00	3.31	12.43	0.31	308.09	0.750
S5-D	16.56	0.00	0.00	3.31	12.46	0.16	164.51	0.752
S5-E	16.56	0.00	0.00	3.48	12.35	0.50	530.43	0.746
S5-F	16.56	0.00	0.00	3.31	12.62	0.13	142.66	0.762
S5-G	16.56	0.00	0.00	3.81	11.90	0.49	439.68	0.719
S5-H	16.56	0.00	0.00	4.47	11.26	0.42	359.64	0.680
S5-I	16.56	0.00	0.00	4.80	11.10	1.14	1225.68	0.670
S5-J	16.56	0.00	0.00	6.62	9.51	0.56	623.49	0.574
S5-K	16.56	0.00	0.00	7.62	8.45	2.42	2619.83	0.510
S5-Z1	16.56	0.00	0.00	14.90	1.61	1.41	1549.34	0.097
S7-A	16.56	0.00	0.00	7.29	8.68	0.65	620.76	0.524
S7-B	16.56	0.00	0.00	12.92	3.52	0.14	151.51	0.213
S13-I	16.56	0.00	0.00	0.85	13.75	0.29	239.14	0.830

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J1	JUNCTION	0.51	2.90	447.82	0 00:18
STMH286	JUNCTION	0.73	3.40	447.71	0 00:18
STMH56	JUNCTION	0.75	3.20	447.18	0 00:17
STMH54	JUNCTION	0.82	4.10	447.07	0 00:17
STMH178	JUNCTION	1.02	3.20	444.49	0 00:17
STMH177	JUNCTION	0.77	2.60	443.38	0 00:17
STMH398	JUNCTION	0.45	1.51	441.93	0 00:18
STMH188	JUNCTION	0.47	3.40	449.42	0 00:18

STMH64	JUNCTION	0.44	3.40	448.96	0	00:18
STMH161	JUNCTION	0.51	3.00	447.09	0	00:18
STMH165	JUNCTION	0.77	3.60	447.16	0	00:17
STMH63	JUNCTION	0.40	2.97	448.05	0	00:18
STMH62	JUNCTION	0.36	2.80	447.78	0	00:18
STMH77	JUNCTION	0.23	0.65	454.80	0	00:20
STMH74	JUNCTION	0.22	0.62	453.50	0	00:20
STMH83	JUNCTION	0.81	3.00	444.98	0	00:16
STMH79	JUNCTION	0.85	2.60	443.98	0	00:16
STMH235	JUNCTION	0.60	1.90	444.34	0	00:16
J22	JUNCTION	0.54	1.90	444.65	0	00:16
STMH139	JUNCTION	0.50	2.56	455.65	0	00:20
STMH138	JUNCTION	0.51	2.69	455.68	0	00:17
STMH183	JUNCTION	0.51	2.60	455.36	0	00:17
STMH6	JUNCTION	0.52	2.56	455.04	0	00:17
STMH7	JUNCTION	0.53	2.22	454.32	0	00:17
STMH184	JUNCTION	0.53	2.38	454.27	0	00:17
STMH185	JUNCTION	0.52	2.22	453.97	0	00:17
STMH12	JUNCTION	0.52	2.10	453.79	0	00:17
J33	JUNCTION	0.42	2.50	461.58	0	00:20
J34	JUNCTION	0.09	0.24	455.60	0	00:20
STMH17	JUNCTION	0.13	0.37	454.36	0	00:20
STMH254	JUNCTION	0.17	0.45	453.69	0	00:21
STMH93	JUNCTION	0.24	1.24	453.12	0	00:20
J37	JUNCTION	0.20	0.55	454.04	0	00:20
J38	JUNCTION	0.09	0.25	454.61	0	00:20
STMH190	JUNCTION	0.59	4.43	454.15	0	00:18
STMH133	JUNCTION	0.60	3.90	454.18	0	00:18
STMH135	JUNCTION	0.53	3.80	454.81	0	00:18
STMH131	JUNCTION	0.70	3.70	454.91	0	00:18
STMH196	JUNCTION	0.63	3.00	454.69	0	00:17
STMH137	JUNCTION	0.43	2.60	455.88	0	00:17
STMH15	JUNCTION	0.33	1.80	456.07	0	00:18
J46	JUNCTION	0.28	5.00	460.31	0	00:18
STMH4	JUNCTION	0.30	3.10	455.67	0	00:17
STMH216	JUNCTION	0.36	3.10	455.25	0	00:17
STMH197	JUNCTION	0.50	2.70	454.65	0	00:17
STMH2	JUNCTION	0.33	1.80	454.86	0	00:18
STMH28	JUNCTION	0.61	1.90	455.10	0	00:15
STMH147	JUNCTION	0.59	2.90	456.65	0	00:16
STMH194	JUNCTION	0.61	1.80	455.80	0	00:15
STMH253	JUNCTION	0.69	2.00	456.49	0	00:15
J56	JUNCTION	0.37	2.60	457.98	0	00:16
STMH212	JUNCTION	0.56	1.20	456.05	0	00:15

STMH298	JUNCTION	0.22	1.60	441.87	0	00:19
STMH297	JUNCTION	0.29	3.90	444.54	0	00:18
STMH26	JUNCTION	0.06	0.16	452.65	0	00:20
STMH22	JUNCTION	0.13	0.35	454.54	0	00:20
STMH23	JUNCTION	0.30	2.01	456.39	0	00:17
STMH225	JUNCTION	0.52	2.25	452.44	0	00:17
STMH226	JUNCTION	0.84	3.04	451.10	0	00:18
STMH202	JUNCTION	0.41	3.02	449.73	0	00:18
STMH38	JUNCTION	0.48	2.75	447.45	0	00:18
STMH205	JUNCTION	0.41	3.20	445.10	0	00:18
STMH204	JUNCTION	0.68	3.60	444.55	0	00:18
STMH109	JUNCTION	0.60	1.85	442.32	0	00:18
STMH37	JUNCTION	0.75	2.50	453.12	0	00:16
STMH244	JUNCTION	0.52	1.80	441.60	0	00:18
STMH362	JUNCTION	0.46	1.54	440.99	0	00:20
J73	JUNCTION	0.16	0.38	439.66	0	00:20
J74	JUNCTION	0.19	0.46	438.73	0	00:21
J75	JUNCTION	0.21	0.46	438.08	0	00:22
J76	JUNCTION	0.00	0.00	437.10	0	00:00
J77	JUNCTION	0.41	0.74	442.74	0	00:22
J78	JUNCTION	0.27	0.65	438.65	0	00:22
J79	JUNCTION	0.38	4.62	459.40	0	00:18
STMH116	JUNCTION	0.50	2.30	456.30	0	00:16
DRCB64	JUNCTION	0.22	0.51	451.87	0	00:20
DRCB40	JUNCTION	0.30	0.76	446.37	0	00:20
J83	JUNCTION	0.26	0.78	459.27	0	00:20
J84	JUNCTION	0.10	0.24	437.60	0	00:20
J85	JUNCTION	0.17	0.42	457.79	0	00:20
STMH78	JUNCTION	0.27	0.93	447.57	0	00:20
J86	JUNCTION	0.54	2.50	460.96	0	00:16
J87	JUNCTION	0.09	0.25	458.82	0	00:20
J88	JUNCTION	0.09	0.25	458.50	0	00:20
J89	JUNCTION	0.00	0.00	456.77	0	00:00
J90	JUNCTION	0.00	0.00	459.23	0	00:00
J91	JUNCTION	0.00	0.00	457.00	0	00:00
DRCB258	JUNCTION	0.45	1.31	441.10	0	00:20
DRCB260	JUNCTION	0.93	1.50	440.45	0	00:19
J94	JUNCTION	0.18	0.23	437.07	0	00:20
STMH246-DIV	JUNCTION	0.20	0.63	456.55	0	00:20
DROF13	OUTFALL	0.43	0.90	441.11	0	00:18
DROF38	OUTFALL	0.59	1.05	441.90	0	00:15
DROF3	OUTFALL	0.48	1.20	452.54	0	00:17
DROF4	OUTFALL	0.24	0.75	452.36	0	00:19
DROF5	OUTFALL	0.55	1.20	450.65	0	00:18

DROF7	OUTFALL	0.21	0.60	440.62	0	00:19
DROF25	OUTFALL	0.41	0.74	440.74	0	00:22
DROF23	OUTFALL	0.30	0.90	444.80	0	00:20
DRFI2017	OUTFALL	0.18	0.23	436.65	0	00:21

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	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	239.14	448.02	0 00:18	0.291	0.301	-0.219
STMH286	JUNCTION	1649.16	1715.02	0 00:20	1.58	1.83	0.036
STMH56	JUNCTION	0.00	1336.57	0 00:22	0	1.77	0.047
STMH54	JUNCTION	595.45	3043.68	0 00:20	0.555	4.41	-0.049
STMH178	JUNCTION	499.18	3543.22	0 00:20	0.591	5	0.002
STMH177	JUNCTION	114.07	2778.89	0 00:20	0.103	4.84	0.005
STMH398	JUNCTION	152.83	2931.65	0 00:20	0.138	4.98	0.006
STMH188	JUNCTION	1451.24	1451.24	0 00:20	1.54	1.54	0.019
STMH64	JUNCTION	0.00	1188.73	0 00:22	0	1.5	0.000
STMH161	JUNCTION	382.76	1523.64	0 00:20	0.346	1.84	-0.123
STMH165	JUNCTION	534.34	1553.28	0 00:18	0.517	2.03	-0.064
STMH63	JUNCTION	0.00	1188.82	0 00:22	0	1.5	-0.028
STMH62	JUNCTION	0.00	1189.15	0 00:22	0	1.5	-0.084
STMH77	JUNCTION	0.00	4587.40	0 00:20	0	4.29	0.001
STMH74	JUNCTION	0.00	4607.02	0 00:20	0	4.29	-0.003
STMH83	JUNCTION	0.00	5586.53	0 00:21	0	6.58	0.109
STMH79	JUNCTION	542.41	4252.50	0 00:20	0.536	6.68	-0.129
STMH235	JUNCTION	0.00	3211.66	0 00:21	0	2.38	-0.299
J22	JUNCTION	2318.07	2318.07	0 00:20	2.18	2.18	0.216
STMH139	JUNCTION	0.00	3938.25	0 00:20	0	4.72	0.004
STMH138	JUNCTION	294.71	4205.51	0 00:20	0.266	4.99	0.006
STMH183	JUNCTION	0.00	4206.70	0 00:20	0	4.99	0.002
STMH6	JUNCTION	372.10	4547.10	0 00:20	0.34	5.33	0.015
STMH7	JUNCTION	211.09	4742.68	0 00:20	0.193	5.52	-0.016
STMH184	JUNCTION	0.00	4743.22	0 00:20	0	5.52	-0.003
STMH185	JUNCTION	0.00	4743.67	0 00:20	0	5.52	-0.004
STMH12	JUNCTION	903.44	5598.05	0 00:20	0.84	6.36	0.005
J33	JUNCTION	4462.44	4462.44	0 00:20	4.05	4.05	0.003

J34	JUNCTION	519.47	519.47	0	00:20	0.469	0.468	0.024
STMH17	JUNCTION	0.00	511.19	0	00:20	0	0.468	-0.021
STMH254	JUNCTION	0.00	951.09	0	00:20	0	0.974	0.054
STMH93	JUNCTION	787.43	1660.30	0	00:20	0.768	1.74	-0.008
J37	JUNCTION	472.37	958.59	0	00:20	0.505	0.974	0.020
J38	JUNCTION	0.00	508.76	0	00:20	0	0.468	0.000
STMH190	JUNCTION	0.00	5642.45	0	00:20	0	7.6	-0.017
STMH133	JUNCTION	951.66	5641.76	0	00:20	0.895	7.6	0.007
STMH135	JUNCTION	218.66	4691.96	0	00:20	0.217	6.71	0.003
STMH131	JUNCTION	308.09	4474.07	0	00:20	0.311	6.49	0.014
STMH196	JUNCTION	164.51	4216.63	0	00:23	0.16	6.19	-0.004
STMH137	JUNCTION	0.00	2982.71	0	00:17	0	3.69	-0.042
STMH15	JUNCTION	142.66	4308.91	0	00:20	0.129	3.96	-0.022
J46	JUNCTION	4169.11	4169.11	0	00:20	3.84	3.83	-0.007
STMH4	JUNCTION	530.42	530.42	0	00:20	0.495	0.495	-0.064
STMH216	JUNCTION	0.00	530.25	0	00:20	0	0.495	-0.046
STMH197	JUNCTION	0.00	1095.44	0	00:26	0	1.84	0.018
STMH2	JUNCTION	439.68	1006.72	0	00:18	0.488	1.84	-0.032
STMH28	JUNCTION	0.00	672.18	0	00:18	0	1.39	-0.028
STMH147	JUNCTION	359.64	672.16	0	00:18	0.418	1.39	-0.010
STMH194	JUNCTION	0.00	519.49	0	00:15	0	0.99	-0.041
STMH253	JUNCTION	0.00	665.42	0	00:15	0	1.06	-0.086
J56	JUNCTION	623.48	623.48	0	00:20	0.562	0.562	-0.125
STMH212	JUNCTION	1225.67	1500.54	0	00:20	1.14	1.21	0.003
STMH298	JUNCTION	0.00	762.02	0	00:20	0	0.785	0.003
STMH297	JUNCTION	151.51	762.10	0	00:20	0.137	0.786	-0.003
STMH26	JUNCTION	0.00	616.38	0	00:20	0	0.648	0.007
STMH22	JUNCTION	0.00	620.69	0	00:20	0	0.648	0.021
STMH23	JUNCTION	620.75	620.75	0	00:20	0.649	0.649	0.005
STMH225	JUNCTION	608.10	1499.20	0	00:18	0.575	2.43	0.019
STMH226	JUNCTION	0.00	1499.29	0	00:18	0	2.43	-0.088
STMH202	JUNCTION	616.89	1855.78	0	00:18	0.589	2.94	0.011
STMH38	JUNCTION	925.97	2521.90	0	00:20	0.915	3.85	0.011
STMH205	JUNCTION	282.49	2621.33	0	00:20	0.255	4.09	-0.050
STMH204	JUNCTION	0.00	2621.21	0	00:20	0	4.09	0.017
STMH109	JUNCTION	0.00	2622.16	0	00:20	0	4.09	0.020
STMH37	JUNCTION	1539.58	1539.58	0	00:20	2.11	2.11	0.005
STMH244	JUNCTION	246.83	2510.52	0	00:19	0.223	4.23	0.000
STMH362	JUNCTION	0.00	2510.13	0	00:19	0	4.23	-0.054
J73	JUNCTION	2425.72	5127.48	0	00:20	2.83	7.06	0.034
J74	JUNCTION	826.30	5911.82	0	00:20	0.778	7.84	0.094
J75	JUNCTION	2053.74	7286.87	0	00:22	2.1	9.93	0.043
J76	JUNCTION	0.00	9300.71	0	00:22	0	12.6	0.000
J77	JUNCTION	0.00	9300.71	0	00:22	0	12.6	0.008

J78	JUNCTION	0.00	5700.01	0	00:21	0	7.83	0.069
J79	JUNCTION	0.00	4167.68	0	00:20	0	3.83	0.002
STMH116	JUNCTION	1523.33	1523.33	0	00:20	1.69	1.69	-0.002
DRCB64	JUNCTION	432.44	1358.09	0	00:20	0.391	1.93	0.003
DRCB40	JUNCTION	613.75	1952.53	0	00:20	0.56	2.49	0.052
J83	JUNCTION	4652.21	4652.21	0	00:20	4.29	4.29	0.011
J84	JUNCTION	2225.42	2225.42	0	00:20	2.72	2.72	0.021
J85	JUNCTION	0.00	3147.67	0	00:20	0	4.01	0.004
STMH78	JUNCTION	1089.10	5618.99	0	00:20	1.03	5.32	0.147
J86	JUNCTION	0.00	4460.83	0	00:20	0	4.05	-0.011
J87	JUNCTION	345.34	345.34	0	00:20	0.313	0.313	-0.005
J88	JUNCTION	0.00	345.99	0	00:20	0	0.313	0.049
J89	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
J90	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
J91	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
DRCB258	JUNCTION	1247.74	1247.74	0	00:30	4.15	4.16	0.005
DRCB260	JUNCTION	0.00	1248.14	0	00:30	0	4.16	0.075
J94	JUNCTION	0.00	810.94	0	00:21	0	3.54	0.094
STMH246-DIV	JUNCTION	786.12	3919.60	0	00:20	0.71	4.72	-0.005
DROF13	OUTFALL	0.00	2931.68	0	00:20	0	4.98	0.000
DROF38	OUTFALL	0.00	4252.48	0	00:20	0	6.69	0.000
DROF3	OUTFALL	0.00	5598.74	0	00:20	0	6.36	0.000
DROF4	OUTFALL	0.00	1660.39	0	00:20	0	1.74	0.000
DROF5	OUTFALL	0.00	5643.01	0	00:20	0	7.6	0.000
DROF7	OUTFALL	0.00	761.96	0	00:20	0	0.785	0.000
DROF25	OUTFALL	0.00	9355.27	0	00:22	0	12.6	0.000
DROF23	OUTFALL	0.00	1937.44	0	00:20	0	2.49	0.000
DRFI2017	OUTFALL	0.00	820.93	0	00:21	0	3.54	0.000

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Node Surcharge Summary
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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
J1	JUNCTION	0.22	2.400	0.000
STMH286	JUNCTION	0.25	2.650	0.000
STMH56	JUNCTION	0.27	2.450	0.000
STMH54	JUNCTION	0.26	3.200	0.000

STMH178	JUNCTION	0.35	2.300	0.000
STMH177	JUNCTION	0.33	1.700	0.000
STMH398	JUNCTION	0.22	0.606	1.594
STMH188	JUNCTION	0.18	2.800	0.000
STMH64	JUNCTION	0.18	2.800	0.000
STMH161	JUNCTION	0.19	2.100	0.000
STMH165	JUNCTION	0.28	2.850	0.000
STMH63	JUNCTION	0.17	2.369	0.331
STMH62	JUNCTION	0.14	1.900	0.000
STMH83	JUNCTION	0.25	1.730	0.000
STMH79	JUNCTION	0.33	1.325	0.000
STMH235	JUNCTION	0.24	0.950	0.000
J22	JUNCTION	0.21	1.000	0.000
STMH139	JUNCTION	0.11	1.363	1.477
STMH138	JUNCTION	0.11	1.486	0.724
STMH183	JUNCTION	0.12	1.397	0.513
STMH6	JUNCTION	0.13	1.364	0.406
STMH7	JUNCTION	0.15	1.016	1.684
STMH184	JUNCTION	0.16	1.177	2.023
STMH185	JUNCTION	0.15	1.017	2.223
STMH12	JUNCTION	0.16	0.901	2.299
J33	JUNCTION	0.15	1.596	0.004
STMH93	JUNCTION	0.04	0.486	2.664
STMH190	JUNCTION	0.20	3.228	0.272
STMH133	JUNCTION	0.18	2.699	0.501
STMH135	JUNCTION	0.12	2.600	0.000
STMH131	JUNCTION	0.17	2.500	0.000
STMH196	JUNCTION	0.14	1.800	0.000
STMH137	JUNCTION	0.12	1.700	0.000
STMH15	JUNCTION	0.11	0.900	0.000
J46	JUNCTION	0.08	4.100	0.000
STMH4	JUNCTION	0.13	2.500	0.000
STMH216	JUNCTION	0.17	2.500	0.000
STMH197	JUNCTION	0.16	1.800	0.000
STMH2	JUNCTION	0.11	1.050	0.000
STMH28	JUNCTION	0.52	1.300	0.000
STMH147	JUNCTION	0.43	2.300	0.000
STMH194	JUNCTION	0.47	1.300	0.000
STMH253	JUNCTION	0.47	1.400	0.000
J56	JUNCTION	0.24	2.000	0.000
STMH212	JUNCTION	0.45	0.700	0.000
STMH298	JUNCTION	0.07	1.000	0.000
STMH297	JUNCTION	0.10	3.300	0.000
STMH23	JUNCTION	0.17	1.508	1.292

STMH225	JUNCTION	0.26	1.652	0.188
STMH226	JUNCTION	0.20	1.040	0.000
STMH202	JUNCTION	0.13	2.270	0.000
STMH38	JUNCTION	0.17	2.000	0.000
STMH205	JUNCTION	0.19	2.450	0.000
STMH204	JUNCTION	0.26	2.700	0.000
STMH109	JUNCTION	0.25	0.950	0.000
STMH37	JUNCTION	0.36	1.900	0.000
STMH244	JUNCTION	0.23	0.900	0.000
STMH362	JUNCTION	0.01	0.636	0.564
J79	JUNCTION	0.10	3.721	0.079
STMH116	JUNCTION	0.22	1.850	0.000
J86	JUNCTION	0.17	1.600	0.000
DRCB258	JUNCTION	0.01	0.507	0.193
DRCB260	JUNCTION	0.63	0.700	0.000

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

Node	Hours Flooded	Maximum Rate LPS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
J1	0.09	434.89	0 00:18	0.046	0.000
STMH286	0.07	378.26	0 00:20	0.051	0.000
STMH56	0.13	885.63	0 00:20	0.255	0.000
STMH54	0.01	1033.14	0 00:17	0.003	0.000
STMH178	0.14	877.39	0 00:20	0.256	0.000
STMH177	0.01	425.49	0 00:17	0.001	0.000
STMH188	0.06	308.50	0 00:20	0.038	0.000
STMH64	0.01	27.76	0 00:18	0.000	0.000
STMH161	0.03	1249.49	0 00:18	0.019	0.000
STMH165	0.01	281.34	0 00:17	0.001	0.000
STMH62	0.01	910.98	0 00:18	0.008	0.000
STMH83	0.01	1156.47	0 00:16	0.004	0.000
STMH79	0.01	835.54	0 00:16	0.003	0.000
STMH235	0.18	3211.65	0 00:21	1.120	0.000
J22	0.12	926.72	0 00:20	0.219	0.000
STMH135	0.01	753.39	0 00:18	0.002	0.000

STMH131	0.01	55.07	0 00:18	0.000	0.000
STMH196	0.01	320.73	0 00:17	0.001	0.000
STMH137	0.01	249.66	0 00:17	0.000	0.000
STMH15	0.08	1672.03	0 00:20	0.273	0.000
J46	0.01	523.23	0 00:18	0.001	0.000
STMH4	0.01	144.78	0 00:17	0.000	0.000
STMH216	0.01	193.99	0 00:17	0.000	0.000
STMH197	0.01	29.43	0 00:17	0.000	0.000
STMH2	0.01	535.78	0 00:18	0.008	0.000
STMH28	0.08	197.58	0 00:20	0.035	0.000
STMH147	0.01	104.75	0 00:16	0.000	0.000
STMH194	0.08	129.93	0 00:15	0.017	0.000
STMH253	0.01	266.71	0 00:15	0.002	0.000
J56	0.01	202.82	0 00:16	0.001	0.000
STMH212	0.38	1497.81	0 00:20	0.710	0.000
STMH298	0.01	78.34	0 00:19	0.000	0.000
STMH297	0.01	77.58	0 00:18	0.000	0.000
STMH226	0.10	377.96	0 00:20	0.079	0.000
STMH202	0.01	404.18	0 00:18	0.002	0.000
STMH38	0.04	410.65	0 00:18	0.018	0.000
STMH205	0.01	278.52	0 00:18	0.000	0.000
STMH204	0.01	217.67	0 00:18	0.000	0.000
STMH109	0.09	386.62	0 00:20	0.084	0.000
STMH37	0.18	788.22	0 00:20	0.257	0.000
STMH244	0.01	287.58	0 00:18	0.001	0.000
STMH116	0.15	595.88	0 00:20	0.146	0.000
J86	0.12	1646.86	0 00:20	0.350	0.000
DRCB260	0.55	437.86	0 00:30	0.613	0.000

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
DROF13	99.60	1162.14	2931.68	4.979
DROF38	99.60	1582.33	4252.48	6.687
DROF3	99.60	1500.76	5598.74	6.361
DROF4	99.60	403.49	1660.39	1.741
DROF5	99.56	1768.64	5643.01	7.599

DROF7	99.41	181.25	761.96	0.785	
DROF25	99.60	2880.46	9355.27	12.641	
DROF23	99.60	577.81	1937.44	2.490	
DRFI2017	99.45	586.45	820.93	3.537	
System	99.55	10643.33	32037.20	46.821	

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Link Flow Summary
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Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C100	CONDUIT	1822.02	0 00:21	2.86	1.99	1.00
C101	CONDUIT	3765.41	0 00:21	3.33	1.27	1.00
C102	CONDUIT	4252.48	0 00:20	4.91	1.94	1.00
C103	CONDUIT	4598.95	0 00:20	7.07	0.65	0.74
C104	CONDUIT	5586.53	0 00:21	6.68	0.85	0.94
C105	CONDUIT	2808.31	0 00:20	7.62	1.56	0.78
C106	CONDUIT	345.99	0 00:20	2.72	0.24	0.33
C107	CONDUIT	339.67	0 00:20	1.78	0.23	0.45
C108	CONDUIT	0.00	0 00:00	0.00	0.00	0.13
C109	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
C110	CONDUIT	0.00	0 00:00	0.00	0.00	0.13
C93	CONDUIT	4167.68	0 00:20	3.28	0.72	1.00
C96	CONDUIT	4587.40	0 00:20	6.82	0.89	0.74
C98	CONDUIT	4460.83	0 00:20	7.01	0.98	1.00
C99	CONDUIT	3145.94	0 00:20	5.45	0.05	0.26
DRDI117	CONDUIT	820.93	0 00:21	2.77	0.04	0.23
DRDI27	CONDUIT	5153.92	0 00:20	2.47	0.07	0.27
DRDI28	CONDUIT	5700.01	0 00:21	1.92	0.07	0.36
DRDI4	CONDUIT	7350.03	0 00:22	5.74	0.10	0.15
DRDI5	CONDUIT	2239.07	0 00:20	4.46	0.03	0.08
DRDI6	CONDUIT	9355.27	0 00:22	5.68	0.07	0.37
STMP10	CONDUIT	1188.73	0 00:22	4.20	1.48	1.00
STMP100	CONDUIT	4216.66	0 00:23	3.73	1.12	1.00
STMP101	CONDUIT	4474.64	0 00:20	3.96	1.88	1.00
STMP103	CONDUIT	1096.74	0 00:26	1.89	0.63	1.00
STMP106	CONDUIT	4693.78	0 00:20	4.15	1.03	1.00
STMP107	CONDUIT	5642.45	0 00:20	4.99	1.38	1.00

STMP1086	CONDUIT	1937.44	0	00:20	3.40	1.02	0.92
STMP11	CONDUIT	1188.82	0	00:22	4.20	1.49	1.00
STMP1170	CONDUIT	810.94	0	00:21	3.95	1.09	0.69
STMP118	CONDUIT	672.13	0	00:18	2.52	2.43	1.00
STMP12	CONDUIT	1189.15	0	00:22	4.25	1.50	1.00
STMP120	CONDUIT	672.18	0	00:18	2.38	1.19	1.00
STMP123	CONDUIT	1095.44	0	00:26	2.97	0.68	1.00
STMP1289	CONDUIT	615.99	0	00:20	6.57	0.33	0.70
STMP13	CONDUIT	1189.62	0	00:22	3.05	0.51	1.00
STMP131	CONDUIT	5643.01	0	00:20	4.99	1.59	1.00
STMP14	CONDUIT	1507.50	0	00:20	2.40	0.58	1.00
STMP150	CONDUIT	1045.49	0	00:18	3.70	1.85	1.00
STMP1513	CONDUIT	1248.14	0	00:30	3.21	0.40	1.00
STMP1516	CONDUIT	2726.52	0	00:20	5.87	1.63	0.71
STMP155	CONDUIT	620.69	0	00:20	3.50	2.64	0.85
STMP156A	CONDUIT	761.96	0	00:20	2.69	1.35	1.00
STMP156B	CONDUIT	762.02	0	00:20	2.70	1.83	1.00
STMP1604	CONDUIT	2931.68	0	00:20	4.61	1.23	1.00
STMP161	CONDUIT	616.38	0	00:20	6.17	0.73	0.51
STMP170	CONDUIT	5608.68	0	00:22	5.10	0.99	0.69
STMP183	CONDUIT	2353.19	0	00:21	6.03	1.12	1.00
STMP184	CONDUIT	2622.16	0	00:20	4.12	1.58	1.00
STMP20	CONDUIT	278.24	0	00:18	1.43	0.80	1.00
STMP248	CONDUIT	2309.38	0	00:24	3.63	1.38	1.00
STMP249	CONDUIT	2510.13	0	00:19	3.96	1.50	1.00
STMP274	CONDUIT	623.43	0	00:20	2.20	1.10	1.00
STMP276	CONDUIT	953.39	0	00:21	2.52	0.67	0.80
STMP29	CONDUIT	4607.02	0	00:20	8.24	0.70	0.62
STMP308	CONDUIT	936.24	0	00:24	5.89	1.31	1.00
STMP309	CONDUIT	1345.25	0	00:20	4.92	1.03	0.93
STMP393	CONDUIT	2778.83	0	00:20	4.37	2.02	1.00
STMP394	CONDUIT	2708.58	0	00:26	4.26	1.79	1.00
STMP427	CONDUIT	1145.16	0	00:17	2.60	1.29	1.00
STMP428	CONDUIT	1549.44	0	00:18	3.51	1.34	1.00
STMP435	CONDUIT	3044.04	0	00:20	4.78	1.15	1.00
STMP521	CONDUIT	3940.37	0	00:20	3.48	1.07	1.00
STMP524	CONDUIT	511.19	0	00:20	2.93	0.23	0.42
STMP525	CONDUIT	508.76	0	00:20	3.98	0.23	0.33
STMP554	CONDUIT	4548.04	0	00:20	4.02	1.26	1.00
STMP555	CONDUIT	4206.70	0	00:20	3.72	1.17	1.00
STMP556	CONDUIT	4207.74	0	00:20	3.72	1.16	1.00
STMP591	CONDUIT	4743.22	0	00:20	4.19	1.34	1.00
STMP594	CONDUIT	4743.67	0	00:20	4.19	1.48	1.00
STMP595	CONDUIT	4744.09	0	00:20	4.19	1.45	1.00

STMP692	CONDUIT	498.66	0	00:15	2.56	1.43	1.00
STMP749	CONDUIT	2621.21	0	00:20	5.93	0.68	1.00
STMP77	CONDUIT	3938.25	0	00:20	7.09	0.52	0.85
STMP79	CONDUIT	511.60	0	00:20	1.80	0.49	0.62
STMP800	CONDUIT	519.49	0	00:15	2.66	1.49	1.00
STMP801	CONDUIT	417.14	0	00:15	2.12	1.21	1.00
STMP823	CONDUIT	530.30	0	00:20	1.88	0.81	1.00
STMP824	CONDUIT	530.25	0	00:20	2.03	0.81	1.00
STMP850	CONDUIT	4166.53	0	00:20	6.55	1.44	1.00
STMP88	CONDUIT	951.09	0	00:20	3.06	0.89	0.67
STMP89	CONDUIT	1660.39	0	00:20	3.76	1.15	1.00
STMP9	CONDUIT	1336.57	0	00:22	3.03	1.27	1.00
STMP90	CONDUIT	5598.74	0	00:20	4.95	1.55	1.00
STMP914	CONDUIT	1499.29	0	00:18	5.30	1.46	1.00
STMP915	CONDUIT	1338.91	0	00:18	4.74	1.64	1.00
STMP964	CONDUIT	1389.91	0	00:24	2.18	1.09	1.00
STMP98	CONDUIT	2982.71	0	00:17	5.88	0.69	1.00
STMP99	CONDUIT	2864.20	0	00:23	4.50	0.95	1.00
SYMP182	CONDUIT	1706.78	0	00:18	4.26	0.99	1.00
STMP187_PUMP	PUMP	9300.71	0	00:22			

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Flow Classification Summary
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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
C100	1.00	0.00	0.00	0.00	0.34	0.00	0.00	0.66	0.00	0.00
C101	1.00	0.00	0.00	0.00	0.39	0.06	0.00	0.54	0.02	0.00
C102	1.00	0.00	0.00	0.00	0.41	0.58	0.00	0.00	0.67	0.00
C103	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.92	0.00
C104	1.00	0.00	0.00	0.00	0.00	0.69	0.00	0.30	0.25	0.00
C105	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.00
C106	1.00	0.00	0.00	0.00	0.10	0.90	0.00	0.00	0.89	0.00
C107	1.00	0.00	0.00	0.00	0.50	0.49	0.00	0.00	0.54	0.00
C108	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C109	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C110	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C93	1.00	0.00	0.00	0.00	0.09	0.91	0.00	0.00	0.86	0.00
C96	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00

C98	1.00	0.00	0.00	0.00	0.13	0.87	0.00	0.00	0.85	0.00
C99	1.00	0.00	0.00	0.00	0.19	0.81	0.00	0.00	0.93	0.00
DRDI117	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.66	0.00
DRDI27	1.00	0.00	0.00	0.00	0.08	0.92	0.00	0.00	0.88	0.00
DRDI28	1.00	0.00	0.00	0.00	0.82	0.17	0.00	0.00	0.72	0.00
DRDI4	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
DRDI5	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
DRDI6	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.81	0.00
STMP10	1.00	0.00	0.00	0.00	0.15	0.84	0.00	0.00	0.63	0.00
STMP100	1.00	0.00	0.00	0.00	0.27	0.73	0.00	0.00	0.74	0.00
STMP101	1.00	0.00	0.00	0.00	0.18	0.81	0.00	0.00	0.18	0.00
STMP103	1.00	0.00	0.00	0.00	0.55	0.45	0.00	0.00	0.67	0.00
STMP106	1.00	0.00	0.00	0.00	0.18	0.82	0.00	0.00	0.82	0.00
STMP107	1.00	0.00	0.00	0.00	0.19	0.81	0.00	0.00	0.78	0.00
STMP1086	1.00	0.00	0.00	0.00	0.01	0.98	0.00	0.00	0.73	0.00
STMP11	1.00	0.00	0.00	0.00	0.16	0.84	0.00	0.00	0.85	0.00
STMP1170	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.01	0.00
STMP118	1.00	0.00	0.00	0.00	0.39	0.60	0.00	0.00	0.04	0.00
STMP12	1.00	0.00	0.00	0.00	0.15	0.85	0.00	0.00	0.32	0.00
STMP120	1.00	0.00	0.00	0.00	0.94	0.06	0.00	0.00	0.75	0.00
STMP123	1.00	0.00	0.00	0.00	0.16	0.83	0.00	0.00	0.87	0.00
STMP1289	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.97	0.00
STMP13	1.00	0.00	0.00	0.00	0.19	0.80	0.00	0.00	0.49	0.00
STMP131	1.00	0.00	0.00	0.00	0.19	0.80	0.00	0.00	0.73	0.00
STMP14	1.00	0.00	0.00	0.00	0.30	0.70	0.00	0.00	0.86	0.00
STMP150	1.00	0.00	0.00	0.00	0.26	0.73	0.00	0.00	0.10	0.00
STMP1513	1.00	0.00	0.00	0.00	0.54	0.46	0.00	0.00	0.73	0.00
STMP1516	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.24	0.00
STMP155	1.00	0.00	0.00	0.00	0.02	0.98	0.00	0.00	0.00	0.00
STMP156A	1.00	0.00	0.00	0.00	0.08	0.92	0.00	0.00	0.72	0.00
STMP156B	1.00	0.00	0.00	0.00	0.30	0.69	0.00	0.00	0.07	0.00
STMP1604	1.00	0.00	0.00	0.00	0.22	0.78	0.00	0.00	0.69	0.00
STMP161	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.02	0.00
STMP170	1.00	0.00	0.00	0.00	0.04	0.96	0.00	0.00	0.22	0.00
STMP183	1.00	0.00	0.00	0.00	0.14	0.85	0.00	0.00	0.03	0.00
STMP184	1.00	0.00	0.00	0.00	0.27	0.73	0.00	0.00	0.82	0.00
STMP20	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.89	0.00
STMP248	1.00	0.00	0.00	0.00	0.30	0.70	0.00	0.00	0.84	0.00
STMP249	1.00	0.00	0.00	0.00	0.27	0.72	0.00	0.00	0.81	0.00
STMP274	1.00	0.00	0.00	0.00	0.98	0.02	0.00	0.00	0.79	0.00
STMP276	1.00	0.00	0.00	0.00	0.06	0.93	0.00	0.00	0.92	0.00
STMP29	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
STMP308	1.00	0.00	0.00	0.00	0.09	0.90	0.00	0.00	0.86	0.00
STMP309	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.94	0.00

STMP393	1.00	0.00	0.00	0.00	0.25	0.75	0.00	0.00	0.20	0.00
STMP394	1.00	0.00	0.00	0.00	0.43	0.57	0.00	0.00	0.79	0.00
STMP427	1.00	0.00	0.00	0.00	0.34	0.66	0.00	0.00	0.61	0.00
STMP428	1.00	0.00	0.00	0.00	0.32	0.68	0.00	0.00	0.82	0.00
STMP435	1.00	0.00	0.00	0.00	0.30	0.70	0.00	0.00	0.81	0.00
STMP521	1.00	0.00	0.00	0.00	0.17	0.82	0.00	0.00	0.66	0.00
STMP524	1.00	0.00	0.00	0.00	0.04	0.96	0.00	0.00	0.90	0.00
STMP525	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.91	0.00
STMP554	1.00	0.00	0.00	0.00	0.20	0.80	0.00	0.00	0.84	0.00
STMP555	1.00	0.00	0.00	0.00	0.17	0.83	0.00	0.00	0.85	0.00
STMP556	1.00	0.00	0.00	0.00	0.19	0.81	0.00	0.00	0.81	0.00
STMP591	1.00	0.00	0.00	0.00	0.20	0.80	0.00	0.00	0.72	0.00
STMP594	1.00	0.00	0.00	0.00	0.21	0.79	0.00	0.00	0.47	0.00
STMP595	1.00	0.00	0.00	0.00	0.31	0.69	0.00	0.00	0.62	0.00
STMP692	1.00	0.00	0.00	0.00	0.63	0.36	0.00	0.00	0.77	0.00
STMP749	1.00	0.00	0.00	0.00	0.17	0.83	0.00	0.00	0.87	0.00
STMP77	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.93	0.00
STMP79	1.00	0.00	0.00	0.00	0.92	0.07	0.00	0.00	0.92	0.00
STMP800	1.00	0.00	0.00	0.00	0.50	0.50	0.00	0.00	0.76	0.00
STMP801	1.00	0.00	0.00	0.00	0.81	0.18	0.00	0.00	0.75	0.00
STMP823	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.85	0.00
STMP824	1.00	0.00	0.00	0.00	0.21	0.79	0.00	0.00	0.86	0.00
STMP850	1.00	0.00	0.00	0.00	0.08	0.91	0.00	0.00	0.11	0.00
STMP88	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.24	0.00
STMP89	1.00	0.00	0.00	0.00	0.04	0.95	0.00	0.00	0.68	0.00
STMP9	1.00	0.00	0.00	0.00	0.31	0.69	0.00	0.00	0.77	0.00
STMP90	1.00	0.00	0.00	0.00	0.17	0.83	0.00	0.00	0.79	0.00
STMP914	1.00	0.00	0.00	0.00	0.16	0.00	0.00	0.83	0.00	0.00
STMP915	1.00	0.00	0.00	0.00	0.14	0.85	0.00	0.00	0.03	0.00
STMP964	1.00	0.00	0.00	0.00	0.34	0.15	0.00	0.51	0.06	0.00
STMP98	1.00	0.00	0.00	0.00	0.09	0.91	0.00	0.00	0.88	0.00
STMP99	1.00	0.00	0.00	0.00	0.32	0.68	0.00	0.00	0.86	0.00
SYMP182	1.00	0.00	0.00	0.00	0.12	0.88	0.00	0.00	0.87	0.00

****
Conduit Surcharge Summary
****

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

C100	0.25	0.25	0.25	0.10	0.07
C101	0.28	0.28	0.28	0.22	0.21
C102	0.38	0.38	0.38	0.41	0.38
C105	0.01	0.01	0.01	0.21	0.01
C93	0.08	0.08	0.08	0.09	0.01
C98	0.15	0.15	0.16	0.01	0.01
STMP10	0.17	0.17	0.17	0.16	0.15
STMP100	0.14	0.14	0.14	0.12	0.12
STMP101	0.12	0.12	0.13	0.29	0.12
STMP103	0.16	0.16	0.16	0.01	0.01
STMP106	0.12	0.12	0.13	0.07	0.08
STMP107	0.18	0.18	0.18	0.16	0.15
STMP1086	0.01	0.01	0.01	0.02	0.01
STMP11	0.17	0.17	0.17	0.16	0.14
STMP1170	0.01	0.01	0.01	0.60	0.01
STMP118	0.13	0.13	0.13	0.59	0.13
STMP12	0.17	0.17	0.17	0.17	0.14
STMP120	0.43	0.43	0.43	0.33	0.33
STMP123	0.11	0.11	0.11	0.01	0.01
STMP13	0.14	0.14	0.14	0.01	0.01
STMP131	0.20	0.20	0.20	0.22	0.20
STMP14	0.19	0.19	0.19	0.01	0.01
STMP150	0.26	0.26	0.26	0.41	0.26
STMP1513	0.01	0.01	0.01	0.01	0.01
STMP1516	0.01	0.01	0.01	0.31	0.01
STMP155	0.01	0.01	0.01	0.28	0.01
STMP156A	0.06	0.06	0.07	0.09	0.06
STMP156B	0.07	0.07	0.07	0.16	0.07
STMP1604	0.22	0.22	0.22	0.24	0.22
STMP170	0.01	0.01	0.01	0.45	0.01
STMP183	0.17	0.17	0.17	0.11	0.10
STMP184	0.25	0.25	0.25	0.29	0.25
STMP20	0.22	0.22	0.22	0.01	0.01
STMP248	0.23	0.23	0.23	0.29	0.23
STMP249	0.01	0.01	0.01	0.31	0.01
STMP274	0.24	0.24	0.24	0.03	0.03
STMP308	0.11	0.11	0.11	0.23	0.11
STMP309	0.01	0.01	0.01	0.04	0.01
STMP393	0.22	0.22	0.22	0.42	0.22
STMP394	0.33	0.33	0.34	0.38	0.33
STMP427	0.26	0.26	0.26	0.07	0.05
STMP428	0.28	0.28	0.28	0.07	0.06
STMP435	0.26	0.26	0.27	0.09	0.10
STMP521	0.11	0.11	0.11	0.07	0.07

STMP554	0.13	0.13	0.13	0.12	0.11
STMP555	0.11	0.11	0.11	0.11	0.10
STMP556	0.12	0.12	0.12	0.10	0.10
STMP591	0.15	0.15	0.15	0.13	0.12
STMP594	0.15	0.15	0.15	0.16	0.15
STMP595	0.15	0.15	0.15	0.16	0.14
STMP692	0.46	0.46	0.46	0.42	0.36
STMP749	0.19	0.19	0.19	0.01	0.01
STMP800	0.47	0.47	0.47	0.43	0.37
STMP801	0.45	0.45	0.45	0.01	0.01
STMP823	0.17	0.17	0.17	0.01	0.01
STMP824	0.13	0.13	0.13	0.01	0.01
STMP850	0.10	0.10	0.10	0.08	0.07
STMP89	0.04	0.04	0.04	0.07	0.04
STMP9	0.25	0.25	0.25	0.12	0.11
STMP90	0.16	0.16	0.16	0.17	0.16
STMP914	0.26	0.26	0.26	0.28	0.26
STMP915	0.17	0.17	0.17	0.38	0.17
STMP964	0.21	0.21	0.21	0.11	0.12
STMP98	0.11	0.11	0.11	0.01	0.01
STMP99	0.12	0.12	0.12	0.01	0.01
SYMP182	0.13	0.13	0.13	0.01	0.01

****
Pumping Summary
****

Pump	Percent Utilized	Number of Start-Ups	Min Flow LPS	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr	Power Usage Kw-hr	% Time Off Pump Low	% Time Off Curve High
STMP187_PUMP	97.50	1	0.00	2881.34	9300.71	12.641	188.04	0.0	0.0

Analysis begun on: Thu Sep 01 15:57:04 2016
Analysis ended on: Thu Sep 01 15:57:05 2016
Total elapsed time: 00:00:01

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.007)

WARNING 02: maximum depth increased for Node J77

****
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 ..... LPS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... DYNWAVE
Starting Date NOV-05-2015 00:00:00
Ending Date NOV-05-2015 03:00:00
Antecedent Dry Days 0.0
Report Time Step 00:05:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00
Routing Time Step ..... 30.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Head Tolerance ..... 0.004921 m

****
Element Count
****
Number of rain gages 1
Number of subcatchments ... 55
Number of nodes 100

Number of links 91
Number of pollutants 0
Number of land uses 0

****
Raingage Summary
****

Name	Data Source	Data Type	Recording Interval
_Current	CC2_AES_1hr_100yr	VOLUME	5 min.

****
Subcatchment Summary
****

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
S13-A	14.43	1550.00	70.00	2.5000	_Current	STMH286
S13-B	14.18	1060.00	70.00	1.9000	_Current	STMH188
S13-C	5.03	705.00	66.00	1.1000	_Current	STMH165
S13-D	2.85	632.00	77.00	3.2000	_Current	STMH161
S13-E	5.22	727.00	68.00	2.1000	_Current	STMH54
S13-F	7.67	569.00	50.00	0.5000	_Current	STMH178
S13-G	1.35	351.00	48.00	2.0000	_Current	STMH177
S13-H	1.52	473.00	57.00	3.1000	_Current	STMH398
S23-A	15.82	1095.00	69.00	1.6000	_Current	STMH116
S23-B	3.94	770.00	63.00	2.6000	_Current	DRCB64
S23-C	7.93	966.00	45.00	2.1000	_Current	DRCB40
S25-A	22.61	902.00	61.00	1.3000	_Current	STMH37
S25-B	6.70	737.00	55.00	1.7000	_Current	STMH225
S25-C	7.26	921.00	52.00	1.0000	_Current	STMH202
S25-D	10.70	1063.00	55.00	1.2000	_Current	STMH38
S25-E	10.16	1039.00	49.00	1.7000	_Current	J74
S25-F	41.71	2239.00	44.00	0.8000	_Current	J73
S25-G	3.30	633.00	49.00	1.9000	_Current	STMH205
S25-H	3.45	674.00	41.00	1.2000	_Current	STMH244
S25-I	20.24	1568.00	67.00	2.1000	_Current	J75
S25-J	24.53	1501.00	72.00	1.3000	_Current	J84
S32-A	54.37	400.00	50.00	0.5000	_Current	DRCB258
S32-B	5.37	400.00	50.00	0.5000	_Current	DRCB258
S38-A	16.25	1798.00	79.00	4.1000	_Current	J83
S38-B	18.36	1574.00	76.00	5.9000	_Current	J22

S38-C	8.37	802.00	79.00	4.5000	_Current	STMH78
S38-D	4.72	558.00	73.00	1.5000	_Current	STMH79
S38-Z1	136.40	7480.00	10.00	30.3000	_Current	J83
S38-Z2	5.70	1120.00	10.00	10.4000	_Current	J83
S3-A	8.53	955.00	63.00	2.9000	_Current	STMH12
S3-B	1.98	392.00	62.00	1.5000	_Current	STMH7
S3-C	3.55	735.00	61.00	1.3000	_Current	STMH6
S3-D	2.11	617.00	80.00	2.1000	_Current	STMH138
S3-E	5.92	588.00	76.00	17.2000	_Current	STMH246-DIV
S3-F	1.92	586.00	58.00	13.7000	_Current	J33
S3-G	3.26	655.00	60.00	13.0000	_Current	J87
S3-Z1	241.50	6550.00	10.00	34.0000	_Current	J33
S4-A	3.83	547.00	77.00	19.1000	_Current	J34
S4-B	4.08	379.00	80.00	1.5000	_Current	J37
S4-C	6.76	577.00	73.00	3.3000	_Current	STMH93
S5-A	8.95	974.00	64.00	2.6000	_Current	STMH133
S5-B	1.74	288.00	80.00	0.9000	_Current	STMH135
S5-C	2.50	464.00	80.00	0.6000	_Current	STMH131
S5-D	1.28	206.00	80.00	1.2000	_Current	STMH196
S5-E	4.01	610.00	79.00	2.3000	_Current	STMH4
S5-F	1.02	184.00	80.00	6.0000	_Current	STMH15
S5-G	4.10	727.00	77.00	0.3000	_Current	STMH2
S5-H	3.71	473.00	73.00	0.4000	_Current	STMH147
S5-I	10.27	885.00	71.00	6.2000	_Current	STMH212
S5-J	5.91	831.00	60.00	9.1000	_Current	J56
S5-K	28.67	1446.00	54.00	11.9000	_Current	J46
S5-Z1	87.70	4910.00	10.00	36.0000	_Current	J46
S7-A	7.47	684.00	56.00	0.9000	_Current	STMH23
S7-B	3.90	411.00	22.00	7.3000	_Current	STMH297
S13-I	2.12	370.00	60.00	1.0000	_Current	J1

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Node Summary
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Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J1	JUNCTION	444.92	2.90	0.0	
STMH286	JUNCTION	444.31	3.40	0.0	
STMH56	JUNCTION	443.98	3.20	0.0	
STMH54	JUNCTION	442.97	4.10	0.0	
STMH178	JUNCTION	441.29	3.20	0.0	
STMH177	JUNCTION	440.78	2.60	0.0	

STMH398	JUNCTION	440.42	3.10	0.0
STMH188	JUNCTION	446.02	3.40	0.0
STMH64	JUNCTION	445.56	3.40	0.0
STMH161	JUNCTION	444.09	3.00	0.0
STMH165	JUNCTION	443.56	3.60	0.0
STMH63	JUNCTION	445.08	3.30	0.0
STMH62	JUNCTION	444.98	2.80	0.0
STMH77	JUNCTION	454.15	2.20	0.0
STMH74	JUNCTION	452.88	3.20	0.0
STMH83	JUNCTION	441.98	3.00	0.0
STMH79	JUNCTION	441.38	2.60	0.0
STMH235	JUNCTION	442.44	1.90	0.0
J22	JUNCTION	442.75	1.90	0.0
STMH139	JUNCTION	453.09	4.04	0.0
STMH138	JUNCTION	452.99	3.41	0.0
STMH183	JUNCTION	452.76	3.11	0.0
STMH6	JUNCTION	452.48	2.97	0.0
STMH7	JUNCTION	452.10	3.90	0.0
STMH184	JUNCTION	451.89	4.40	0.0
STMH185	JUNCTION	451.75	4.44	0.0
STMH12	JUNCTION	451.69	4.40	0.0
J33	JUNCTION	459.08	2.50	0.0
J34	JUNCTION	455.36	2.50	0.0
STMH17	JUNCTION	453.99	1.60	0.0
STMH254	JUNCTION	453.24	2.60	0.0
STMH93	JUNCTION	451.88	3.90	0.0
J37	JUNCTION	453.49	2.00	0.0
J38	JUNCTION	454.36	2.50	0.0
STMH190	JUNCTION	449.72	4.70	0.0
STMH133	JUNCTION	450.28	4.40	0.0
STMH135	JUNCTION	451.01	3.80	0.0
STMH131	JUNCTION	451.21	3.70	0.0
STMH196	JUNCTION	451.69	3.00	0.0
STMH137	JUNCTION	453.28	2.60	0.0
STMH15	JUNCTION	454.27	1.80	0.0
J46	JUNCTION	455.31	5.00	0.0
STMH4	JUNCTION	452.57	3.10	0.0
STMH216	JUNCTION	452.15	3.10	0.0
STMH197	JUNCTION	451.95	2.70	0.0
STMH2	JUNCTION	453.06	1.80	0.0
STMH28	JUNCTION	453.20	1.90	0.0
STMH147	JUNCTION	453.75	2.90	0.0
STMH194	JUNCTION	454.00	1.80	0.0
STMH253	JUNCTION	454.49	2.00	0.0

J56	JUNCTION	455.38	2.60	0.0
STMH212	JUNCTION	454.85	1.20	0.0
STMH298	JUNCTION	440.27	1.60	0.0
STMH297	JUNCTION	440.64	3.90	0.0
STMH26	JUNCTION	452.49	5.00	0.0
STMH22	JUNCTION	454.19	3.70	0.0
STMH23	JUNCTION	454.38	3.30	0.0
STMH225	JUNCTION	450.19	2.44	0.0
STMH226	JUNCTION	448.06	3.04	0.0
STMH202	JUNCTION	446.71	3.02	0.0
STMH38	JUNCTION	444.70	2.75	0.0
STMH205	JUNCTION	441.90	3.20	0.0
STMH204	JUNCTION	440.95	3.60	0.0
STMH109	JUNCTION	440.47	1.85	0.0
STMH37	JUNCTION	450.62	2.50	0.0
STMH244	JUNCTION	439.80	1.80	0.0
STMH362	JUNCTION	439.45	2.10	0.0
J73	JUNCTION	439.28	1.50	0.0
J74	JUNCTION	438.27	1.50	0.0
J75	JUNCTION	437.62	1.50	0.0
J76	JUNCTION	437.10	1.80	0.0
J77	JUNCTION	442.00	2.00	0.0
J78	JUNCTION	438.00	1.50	0.0
J79	JUNCTION	454.78	4.70	0.0
STMH116	JUNCTION	454.00	2.30	0.0
DRCB64	JUNCTION	451.36	2.50	0.0
DRCB40	JUNCTION	445.61	2.50	0.0
J83	JUNCTION	458.49	2.80	0.0
J84	JUNCTION	437.36	1.50	0.0
J85	JUNCTION	457.37	2.50	0.0
STMH78	JUNCTION	446.63	2.90	0.0
J86	JUNCTION	458.46	2.50	0.0
J87	JUNCTION	458.57	2.50	0.0
J88	JUNCTION	458.25	2.50	0.0
J89	JUNCTION	456.77	2.50	0.0
J90	JUNCTION	459.23	2.50	0.0
J91	JUNCTION	457.00	2.50	0.0
DRCB258	JUNCTION	439.79	1.50	0.0
DRCB260	JUNCTION	438.95	1.50	0.0
J94	JUNCTION	436.84	1.50	0.0
STMH246-DIV	JUNCTION	455.92	2.50	0.0
DROF13	OUTFALL	440.21	0.90	0.0
DROF38	OUTFALL	440.85	1.05	0.0
DROF3	OUTFALL	451.34	1.20	0.0

DROF4	OUTFALL	451.61	0.75	0.0
DROF5	OUTFALL	449.45	1.20	0.0
DROF7	OUTFALL	440.02	0.60	0.0
DROF25	OUTFALL	440.00	2.00	0.0
DROF23	OUTFALL	443.90	0.90	0.0
DRFI2017	OUTFALL	436.42	1.00	0.0

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Link Summary
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Name	From Node	To Node	Type	Length	%Slope	Roughness
C100	STMH235	STMH83	CONDUIT	61.4	0.1515	0.0100
C101	STMH83	STMH79	CONDUIT	153.1	0.3430	0.0100
C102	STMH79	DROF38	CONDUIT	137.0	0.3831	0.0100
C103	STMH74	STMH78	CONDUIT	159.2	3.9237	0.0100
C104	STMH78	STMH83	CONDUIT	132.9	3.4096	0.0100
C105	J86	J85	CONDUIT	70.6	1.5447	0.0100
C106	J87	J88	CONDUIT	31.5	1.0172	0.0100
C107	J88	J85	CONDUIT	88.2	0.9974	0.0100
C108	J89	J34	CONDUIT	101.2	1.3931	0.0100
C109	J90	J91	CONDUIT	52.0	4.2949	0.0100
C110	J91	J34	CONDUIT	104.7	1.5661	0.0100
C93	J46	J79	CONDUIT	35.5	1.4931	0.0100
C96	J83	STMH77	CONDUIT	202.0	2.1231	0.0100
C98	J33	J86	CONDUIT	16.4	3.7740	0.0100
C99	J85	STMH246-DIV	CONDUIT	79.7	1.8201	0.0100
DRDI117	J94	DRFI2017	CONDUIT	41.6	1.0097	0.0100
DRDI27	J73	J74	CONDUIT	251.8	0.4012	0.0100
DRDI28	J74	J78	CONDUIT	67.3	0.4013	0.0100
DRDI4	J75	J76	CONDUIT	175.3	0.2966	0.0100
DRDI5	J84	J76	CONDUIT	65.5	0.3966	0.0100
DRDI6	J77	DROF25	CONDUIT	153.4	1.3036	0.0100
STMP10	STMH188	STMH64	CONDUIT	45.5	1.0110	0.0100
STMP100	STMH196	STMH131	CONDUIT	86.4	0.5557	0.0100
STMP101	STMH131	STMH135	CONDUIT	90.9	0.2201	0.0100
STMP103	STMH197	STMH196	CONDUIT	47.1	0.5524	0.0100
STMP106	STMH135	STMH133	CONDUIT	89.7	0.8139	0.0100
STMP107	STMH133	STMH190	CONDUIT	86.0	0.6511	0.0100
STMP1086	DRCB40	DROF23	CONDUIT	262.5	0.6514	0.0100
STMP11	STMH64	STMH63	CONDUIT	47.9	1.0026	0.0100
STMP1170	DRCB260	J94	CONDUIT	241.7	0.8730	0.0100
STMP118	STMH28	STMH2	CONDUIT	116.3	0.1204	0.0100

STMP12	STMH63	STMH62	CONDUIT	10.2	0.9824	0.0100
STMP120	STMH147	STMH28	CONDUIT	110.1	0.4994	0.0100
STMP123	STMH2	STMH197	CONDUIT	88.5	1.2548	0.0100
STMP1289	STMH26	STMH297	CONDUIT	27.8	47.1005	0.0100
STMP13	STMH62	STMH161	CONDUIT	89.3	0.9962	0.0100
STMP131	STMH190	DROF5	CONDUIT	54.9	0.4920	0.0100
STMP14	STMH161	STMH54	CONDUIT	92.7	1.2078	0.0100
STMP150	STMH37	STMH225	CONDUIT	86.2	0.4990	0.0100
STMP1513	DRCB258	DRCB260	CONDUIT	24.9	3.3754	0.0100
STMP1516	STMH362	J73	CONDUIT	33.6	0.5052	0.0100
STMP155	STMH23	STMH22	CONDUIT	82.8	0.2294	0.0100
STMP156A	STMH298	DROF7	CONDUIT	50.2	0.4979	0.0100
STMP156B	STMH297	STMH298	CONDUIT	136.3	0.2715	0.0100
STMP1604	STMH398	DROF13	CONDUIT	20.4	1.0300	0.0100
STMP161	STMH22	STMH26	CONDUIT	57.4	2.9625	0.0100
STMP170	J78	J75	CONDUIT	31.2	1.2184	0.0100
STMP183	STMH38	STMH205	CONDUIT	133.6	2.0956	0.0100
STMP184	STMH204	STMH109	CONDUIT	96.4	0.4981	0.0100
STMP20	J1	STMH286	CONDUIT	121.6	0.5014	0.0100
STMP248	STMH109	STMH244	CONDUIT	132.7	0.5049	0.0100
STMP249	STMH244	STMH362	CONDUIT	69.7	0.5025	0.0100
STMP274	J56	STMH253	CONDUIT	178.1	0.4998	0.0100
STMP276	STMH254	STMH93	CONDUIT	140.0	0.9714	0.0100
STMP29	STMH77	STMH74	CONDUIT	35.8	3.4248	0.0100
STMP308	STMH116	DRCB64	CONDUIT	71.1	3.7156	0.0100
STMP309	DRCB64	DRCB40	CONDUIT	215.4	2.6704	0.0100
STMP393	STMH177	STMH398	CONDUIT	105.6	0.3409	0.0100
STMP394	STMH178	STMH177	CONDUIT	124.0	0.4112	0.0100
STMP427	STMH56	STMH165	CONDUIT	112.2	0.3745	0.0100
STMP428	STMH165	STMH54	CONDUIT	92.0	0.6415	0.0100
STMP435	STMH54	STMH178	CONDUIT	132.3	1.2698	0.0100
STMP521	STMH139	STMH138	CONDUIT	19.0	0.5255	0.0100
STMP524	J38	STMH17	CONDUIT	16.1	2.3002	0.0100
STMP525	J34	J38	CONDUIT	41.6	2.4063	0.0100
STMP554	STMH6	STMH7	CONDUIT	75.5	0.5033	0.0100
STMP555	STMH138	STMH183	CONDUIT	46.0	0.5003	0.0100
STMP556	STMH183	STMH6	CONDUIT	54.9	0.5099	0.0100
STMP591	STMH7	STMH184	CONDUIT	43.1	0.4875	0.0100
STMP594	STMH184	STMH185	CONDUIT	34.9	0.4014	0.0100
STMP595	STMH185	STMH12	CONDUIT	14.4	0.4170	0.0100
STMP692	STMH194	STMH147	CONDUIT	49.5	0.5054	0.0100
STMP749	STMH205	STMH204	CONDUIT	13.4	7.1181	0.0100
STMP77	STMH246-DIV	STMH139	CONDUIT	27.8	10.2182	0.0100
STMP79	STMH17	J37	CONDUIT	94.2	0.5307	0.0100

STMP800	STMH253	STMH194	CONDUIT	97.4	0.5029	0.0100
STMP801	STMH212	STMH253	CONDUIT	72.7	0.4952	0.0100
STMP823	STMH216	STMH196	CONDUIT	67.8	0.6789	0.0100
STMP824	STMH4	STMH216	CONDUIT	62.6	0.6710	0.0100
STMP850	J79	STMH15	CONDUIT	33.9	1.5042	0.0100
STMP88	J37	STMH254	CONDUIT	45.8	0.5460	0.0100
STMP89	STMH93	DROF4	CONDUIT	27.1	0.9949	0.0100
STMP9	STMH286	STMH56	CONDUIT	62.1	0.5310	0.0100
STMP90	STMH12	DROF3	CONDUIT	69.3	0.5051	0.0100
STMP914	STMH225	STMH226	CONDUIT	43.8	1.6658	0.0100
STMP915	STMH226	STMH202	CONDUIT	128.5	1.0510	0.0100
STMP964	J22	STMH235	CONDUIT	89.5	0.2929	0.0100
STMP98	STMH15	STMH137	CONDUIT	29.4	3.3716	0.0100
STMP99	STMH137	STMH196	CONDUIT	97.5	1.6318	0.0100
SYMP182	STMH202	STMH38	CONDUIT	141.2	1.4237	0.0100
STMP187_PUMP	J76	J77	IDEAL PUMP			

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C100	CIRCULAR	0.90	0.64	0.23	0.90	1	915.97
C101	CIRCULAR	1.20	1.13	0.30	1.20	1	2968.54
C102	CIRCULAR	1.05	0.87	0.26	1.05	1	2197.46
C103	CIRCULAR	1.05	0.87	0.26	1.05	1	7032.30
C104	CIRCULAR	1.05	0.87	0.26	1.05	1	6555.37
C105	CIRCULAR	0.75	0.44	0.19	0.75	1	1798.88
C106	CIRCULAR	0.75	0.44	0.19	0.75	1	1459.75
C107	CIRCULAR	0.75	0.44	0.19	0.75	1	1445.50
C108	CIRCULAR	0.90	0.64	0.23	0.90	1	2777.92
C109	CIRCULAR	0.90	0.64	0.23	0.90	1	4877.52
C110	CIRCULAR	0.90	0.64	0.23	0.90	1	2945.34
C93	CIRCULAR	0.90	0.64	0.23	0.90	2	2875.88
C96	CIRCULAR	1.05	0.87	0.26	1.05	1	5172.85
C98	CIRCULAR	0.90	0.64	0.23	0.90	1	4572.17
C99	TRAPEZOIDAL	2.00	5.00	0.83	4.00	1	59738.45
DRDI117	TRAPEZOIDAL	1.00	3.60	0.52	6.60	1	23389.71
DRDI27	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76654.24
DRDI28	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76659.66
DRDI4	TRAPEZOIDAL	1.50	14.25	0.98	14.00	1	76761.44
DRDI5	TRAPEZOIDAL	1.50	12.60	0.94	12.90	1	76218.52

DRDI6	TRAPEZOIDAL	2.00	12.00	0.95	12.00	1	132287.57
STMP10	CIRCULAR	0.60	0.28	0.15	0.60	1	802.66
STMP100	CIRCULAR	1.20	1.13	0.30	1.20	1	3778.42
STMP101	CIRCULAR	1.20	1.13	0.30	1.20	1	2378.05
STMP103	CIRCULAR	0.90	0.64	0.23	0.90	1	1749.20
STMP106	CIRCULAR	1.20	1.13	0.30	1.20	1	4572.62
STMP107	CIRCULAR	1.20	1.13	0.30	1.20	1	4089.94
STMP1086	CIRCULAR	0.90	0.64	0.23	0.90	1	1899.52
STMP11	CIRCULAR	0.60	0.28	0.15	0.60	1	799.28
STMP1170	CIRCULAR	0.60	0.28	0.15	0.60	1	745.86
STMP118	CIRCULAR	0.60	0.28	0.15	0.60	1	276.99
STMP12	CIRCULAR	0.60	0.28	0.15	0.60	1	791.19
STMP120	CIRCULAR	0.60	0.28	0.15	0.60	1	564.13
STMP123	CIRCULAR	0.75	0.44	0.19	0.75	1	1621.26
STMP1289	CIRCULAR	0.40	0.13	0.10	0.40	1	1858.16
STMP13	CIRCULAR	0.90	0.64	0.23	0.90	1	2349.12
STMP131	CIRCULAR	1.20	1.13	0.30	1.20	1	3555.25
STMP14	CIRCULAR	0.90	0.64	0.23	0.90	1	2586.51
STMP150	CIRCULAR	0.60	0.28	0.15	0.60	1	563.87
STMP1513	CIRCULAR	0.80	0.50	0.20	0.80	1	3158.49
STMP1516	CIRCULAR	0.90	0.64	0.23	0.90	1	1672.85
STMP155	CIRCULAR	0.50	0.20	0.12	0.50	1	235.13
STMP156A	CIRCULAR	0.60	0.28	0.15	0.60	1	563.28
STMP156B	CIRCULAR	0.60	0.28	0.15	0.60	1	415.93
STMP1604	CIRCULAR	0.90	0.64	0.23	0.90	1	2388.56
STMP161	CIRCULAR	0.50	0.20	0.12	0.50	1	844.93
STMP170	CIRCULAR	0.80	0.50	0.20	0.80	3	1897.65
STMP183	CIRCULAR	0.75	0.44	0.19	0.75	1	2095.23
STMP184	CIRCULAR	0.90	0.64	0.23	0.90	1	1661.02
STMP20	CIRCULAR	0.50	0.20	0.12	0.50	1	347.62
STMP248	CIRCULAR	0.90	0.64	0.23	0.90	1	1672.29
STMP249	CIRCULAR	0.90	0.64	0.23	0.90	1	1668.40
STMP274	CIRCULAR	0.60	0.28	0.15	0.60	1	564.32
STMP276	CIRCULAR	0.75	0.44	0.19	0.75	1	1426.50
STMP29	CIRCULAR	1.05	0.87	0.26	1.05	1	6569.95
STMP308	CIRCULAR	0.45	0.16	0.11	0.45	1	714.48
STMP309	CIRCULAR	0.60	0.28	0.15	0.60	1	1304.47
STMP393	CIRCULAR	0.90	0.64	0.23	0.90	1	1374.18
STMP394	CIRCULAR	0.90	0.64	0.23	0.90	1	1509.26
STMP427	CIRCULAR	0.75	0.44	0.19	0.75	1	885.69
STMP428	CIRCULAR	0.75	0.44	0.19	0.75	1	1159.26
STMP435	CIRCULAR	0.90	0.64	0.23	0.90	1	2652.05
STMP521	CIRCULAR	1.20	1.13	0.30	1.20	1	3674.31
STMP524	CIRCULAR	0.75	0.44	0.19	0.75	1	2195.09

STMP525	CIRCULAR	0.75	0.44	0.19	0.75	1	2245.15
STMP554	CIRCULAR	1.20	1.13	0.30	1.20	1	3595.95
STMP555	CIRCULAR	1.20	1.13	0.30	1.20	1	3585.27
STMP556	CIRCULAR	1.20	1.13	0.30	1.20	1	3619.50
STMP591	CIRCULAR	1.20	1.13	0.30	1.20	1	3538.89
STMP594	CIRCULAR	1.20	1.13	0.30	1.20	1	3211.22
STMP595	CIRCULAR	1.20	1.13	0.30	1.20	1	3272.95
STMP692	CIRCULAR	0.50	0.20	0.12	0.50	1	348.98
STMP749	CIRCULAR	0.75	0.44	0.19	0.75	1	3861.49
STMP77	CIRCULAR	0.90	0.64	0.23	0.90	1	7523.31
STMP79	CIRCULAR	0.75	0.44	0.19	0.75	1	1054.36
STMP800	CIRCULAR	0.50	0.20	0.12	0.50	1	348.14
STMP801	CIRCULAR	0.50	0.20	0.12	0.50	1	345.45
STMP823	CIRCULAR	0.60	0.28	0.15	0.60	1	657.72
STMP824	CIRCULAR	0.60	0.28	0.15	0.60	1	653.92
STMP850	CIRCULAR	0.90	0.64	0.23	0.90	1	2886.48
STMP88	CIRCULAR	0.75	0.44	0.19	0.75	1	1069.45
STMP89	CIRCULAR	0.75	0.44	0.19	0.75	1	1443.65
STMP9	CIRCULAR	0.75	0.44	0.19	0.75	1	1054.66
STMP90	CIRCULAR	1.20	1.13	0.30	1.20	1	3602.16
STMP914	CIRCULAR	0.60	0.28	0.15	0.60	1	1030.27
STMP915	CIRCULAR	0.60	0.28	0.15	0.60	1	818.35
STMP964	CIRCULAR	0.90	0.64	0.23	0.90	1	1273.68
STMP98	CIRCULAR	0.90	0.64	0.23	0.90	1	4321.53
STMP99	CIRCULAR	0.90	0.64	0.23	0.90	1	3006.49
SYMP182	CIRCULAR	0.75	0.44	0.19	0.75	1	1726.93

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Control Actions Taken
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Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	28.155	30.050
Evaporation Loss	0.000	0.000
Infiltration Loss	18.161	19.384
Surface Runoff	9.697	10.349
Final Surface Storage	0.530	0.565
Continuity Error (%)	-0.827	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	9.693	96.935
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	7.199	71.993
Internal Outflow	2.492	24.917
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.005	0.051
Continuity Error (%)	-0.026	

Time-Step Critical Elements

Link STMP749 (35.04%)
Link STMP1513 (20.95%)
Link STMP1289 (8.21%)
Link STMP12 (7.55%)
Link STMP77 (6.54%)

Highest Flow Instability Indexes

Link STMP1516 (30)
Link STMP12 (16)
Link STMP393 (16)
Link STMP1513 (15)
Link STMP11 (12)

Routing Time Step Summary

Minimum Time Step	:	0.50 sec
Average Time Step	:	3.56 sec
Maximum Time Step	:	30.00 sec

Percent in Steady State	:	0.00
Average Iterations per Step	:	4.74
Percent Not Converging	:	35.01

Subcatchment Runoff Summary

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
S13-A	30.05	0.00	0.00	9.01	20.59	2.97	3156.10	0.685
S13-B	30.05	0.00	0.00	9.02	20.53	2.91	2949.19	0.683
S13-C	30.05	0.00	0.00	10.22	19.40	0.98	1031.28	0.646
S13-D	30.05	0.00	0.00	6.91	22.65	0.65	701.58	0.754
S13-E	30.05	0.00	0.00	9.62	20.01	1.04	1120.58	0.666
S13-F	30.05	0.00	0.00	15.02	14.62	1.12	1069.39	0.486
S13-G	30.05	0.00	0.00	15.63	14.10	0.19	207.65	0.469
S13-H	30.05	0.00	0.00	12.92	16.73	0.25	277.76	0.557
S23-A	30.05	0.00	0.00	9.32	20.21	3.20	3165.28	0.672
S23-B	30.05	0.00	0.00	11.12	18.54	0.73	793.31	0.617
S23-C	30.05	0.00	0.00	16.53	13.24	1.05	1136.12	0.441
S25-A	30.05	0.00	0.00	11.72	17.76	4.02	3495.09	0.591
S25-B	30.05	0.00	0.00	13.52	16.18	1.08	1156.23	0.538
S25-C	30.05	0.00	0.00	14.42	15.29	1.11	1179.98	0.509
S25-D	30.05	0.00	0.00	13.52	16.22	1.74	1830.67	0.540
S25-E	30.05	0.00	0.00	15.33	14.42	1.46	1565.49	0.480
S25-F	30.05	0.00	0.00	16.83	12.87	5.37	5163.14	0.428
S25-G	30.05	0.00	0.00	15.33	14.41	0.48	517.19	0.480
S25-H	30.05	0.00	0.00	17.73	12.06	0.42	452.28	0.401
S25-I	30.05	0.00	0.00	9.92	19.66	3.98	4099.44	0.654
S25-J	30.05	0.00	0.00	8.41	21.03	5.16	4831.07	0.700
S32-A	30.05	0.00	0.00	15.02	13.64	7.42	2570.23	0.454
S32-B	30.05	0.00	0.00	15.02	14.62	0.78	749.41	0.486
S38-A	30.05	0.00	0.00	6.31	23.24	3.78	4044.75	0.773
S38-B	30.05	0.00	0.00	7.21	22.36	4.11	4389.30	0.744
S38-C	30.05	0.00	0.00	6.31	23.24	1.94	2073.19	0.773
S38-D	30.05	0.00	0.00	8.11	21.45	1.01	1060.24	0.714
S38-Z1	30.05	0.00	0.00	27.05	2.92	3.98	4373.67	0.097
S38-Z2	30.05	0.00	0.00	27.05	2.92	0.17	182.74	0.097
S3-A	30.05	0.00	0.00	11.12	18.54	1.58	1697.83	0.617

S3-B	30.05	0.00	0.00	11.42	18.25	0.36	390.81	0.607
S3-C	30.05	0.00	0.00	11.72	17.95	0.64	689.24	0.597
S3-D	30.05	0.00	0.00	6.01	23.54	0.50	539.80	0.783
S3-E	30.05	0.00	0.00	7.21	22.36	1.32	1439.09	0.744
S3-F	30.05	0.00	0.00	12.62	16.96	0.33	357.09	0.564
S3-G	30.05	0.00	0.00	12.02	17.59	0.57	627.17	0.585
S3-Z1	30.05	0.00	0.00	27.05	2.93	7.07	7743.87	0.097
S4-A	30.05	0.00	0.00	6.91	22.61	0.87	945.17	0.753
S4-B	30.05	0.00	0.00	6.01	23.45	0.96	964.76	0.780
S4-C	30.05	0.00	0.00	8.11	21.45	1.45	1527.40	0.714
S5-A	30.05	0.00	0.00	10.82	18.83	1.69	1801.88	0.627
S5-B	30.05	0.00	0.00	6.01	23.50	0.41	427.92	0.782
S5-C	30.05	0.00	0.00	6.01	23.49	0.59	609.44	0.782
S5-D	30.05	0.00	0.00	6.01	23.52	0.30	317.85	0.783
S5-E	30.05	0.00	0.00	6.31	23.25	0.93	999.41	0.774
S5-F	30.05	0.00	0.00	6.01	23.53	0.24	261.04	0.783
S5-G	30.05	0.00	0.00	6.91	22.55	0.92	914.45	0.750
S5-H	30.05	0.00	0.00	8.11	21.35	0.79	763.97	0.711
S5-I	30.05	0.00	0.00	8.71	20.89	2.15	2303.61	0.695
S5-J	30.05	0.00	0.00	12.02	17.63	1.04	1136.00	0.587
S5-K	30.05	0.00	0.00	13.82	15.89	4.56	4902.57	0.529
S5-Z1	30.05	0.00	0.00	27.05	2.92	2.56	2811.90	0.097
S7-A	30.05	0.00	0.00	13.22	16.43	1.23	1252.15	0.547
S7-B	30.05	0.00	0.00	23.44	6.45	0.25	275.11	0.214
S13-I	30.05	0.00	0.00	0.85	27.48	0.58	508.83	0.914

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days	hr:min
J1	JUNCTION	0.94	2.90	447.82	0	00:14
STMH286	JUNCTION	1.18	3.40	447.71	0	00:14
STMH56	JUNCTION	1.18	3.20	447.18	0	00:14
STMH54	JUNCTION	1.29	4.10	447.07	0	00:14
STMH178	JUNCTION	1.38	3.20	444.49	0	00:13
STMH177	JUNCTION	0.98	2.60	443.38	0	00:14
STMH398	JUNCTION	0.52	1.51	441.93	0	00:14
STMH188	JUNCTION	0.87	3.40	449.42	0	00:15

STMH64	JUNCTION	0.78	3.34	448.90	0	00:15
STMH161	JUNCTION	0.89	3.00	447.09	0	00:14
STMH165	JUNCTION	1.23	3.60	447.16	0	00:14
STMH63	JUNCTION	0.68	2.89	447.97	0	00:15
STMH62	JUNCTION	0.64	2.80	447.78	0	00:15
STMH77	JUNCTION	0.28	0.85	455.00	0	00:17
STMH74	JUNCTION	0.28	0.92	453.80	0	00:17
STMH83	JUNCTION	1.09	3.00	444.98	0	00:13
STMH79	JUNCTION	1.06	2.60	443.98	0	00:13
STMH235	JUNCTION	0.80	1.90	444.34	0	00:13
J22	JUNCTION	0.75	1.90	444.65	0	00:13
STMH139	JUNCTION	0.78	3.44	456.53	0	00:20
STMH138	JUNCTION	0.78	3.37	456.36	0	00:20
STMH183	JUNCTION	0.77	3.11	455.87	0	00:18
STMH6	JUNCTION	0.77	2.97	455.45	0	00:13
STMH7	JUNCTION	0.74	3.90	456.00	0	00:13
STMH184	JUNCTION	0.72	3.76	455.65	0	00:13
STMH185	JUNCTION	0.69	3.13	454.88	0	00:13
STMH12	JUNCTION	0.68	2.89	454.58	0	00:13
J33	JUNCTION	0.64	2.50	461.58	0	00:15
J34	JUNCTION	0.11	0.46	455.82	0	00:20
STMH17	JUNCTION	0.22	1.60	455.59	0	00:19
STMH254	JUNCTION	0.27	2.48	455.72	0	00:18
STMH93	JUNCTION	0.35	1.67	453.55	0	00:19
J37	JUNCTION	0.32	2.00	455.49	0	00:18
J38	JUNCTION	0.16	2.50	456.86	0	00:19
STMH190	JUNCTION	0.72	4.70	454.42	0	00:14
STMH133	JUNCTION	0.81	4.40	454.68	0	00:14
STMH135	JUNCTION	0.74	3.80	454.81	0	00:14
STMH131	JUNCTION	0.95	3.70	454.91	0	00:14
STMH196	JUNCTION	0.89	3.00	454.69	0	00:14
STMH137	JUNCTION	0.65	2.48	455.76	0	00:14
STMH15	JUNCTION	0.48	1.80	456.07	0	00:14
J46	JUNCTION	0.58	5.00	460.31	0	00:14
STMH4	JUNCTION	0.59	3.10	455.67	0	00:14
STMH216	JUNCTION	0.66	3.10	455.25	0	00:14
STMH197	JUNCTION	0.76	2.70	454.65	0	00:14
STMH2	JUNCTION	0.49	1.80	454.86	0	00:15
STMH28	JUNCTION	0.75	1.90	455.10	0	00:13
STMH147	JUNCTION	0.76	2.90	456.65	0	00:13
STMH194	JUNCTION	0.75	1.80	455.80	0	00:12
STMH253	JUNCTION	0.82	2.00	456.49	0	00:12
J56	JUNCTION	0.59	2.60	457.98	0	00:13
STMH212	JUNCTION	0.63	1.20	456.05	0	00:12

STMH298	JUNCTION	0.32	1.60	441.87	0	00:15
STMH297	JUNCTION	0.58	3.90	444.54	0	00:14
STMH26	JUNCTION	0.08	0.19	452.68	0	00:21
STMH22	JUNCTION	0.20	1.82	456.01	0	00:17
STMH23	JUNCTION	0.58	3.30	457.68	0	00:17
STMH225	JUNCTION	0.79	2.44	452.63	0	00:13
STMH226	JUNCTION	1.20	3.04	451.10	0	00:14
STMH202	JUNCTION	0.70	3.02	449.73	0	00:15
STMH38	JUNCTION	0.77	2.75	447.45	0	00:15
STMH205	JUNCTION	0.67	3.20	445.10	0	00:15
STMH204	JUNCTION	0.98	3.60	444.55	0	00:15
STMH109	JUNCTION	0.80	1.85	442.32	0	00:14
STMH37	JUNCTION	1.04	2.50	453.12	0	00:13
STMH244	JUNCTION	0.63	1.80	441.60	0	00:14
STMH362	JUNCTION	0.51	1.98	441.43	0	00:24
J73	JUNCTION	0.20	0.47	439.75	0	00:20
J74	JUNCTION	0.24	0.68	438.95	0	00:22
J75	JUNCTION	0.25	0.58	438.20	0	00:20
J76	JUNCTION	0.00	0.00	437.10	0	00:00
J77	JUNCTION	0.46	0.93	442.93	0	00:20
J78	JUNCTION	0.35	1.02	439.02	0	00:21
J79	JUNCTION	0.68	4.69	459.47	0	00:14
STMH116	JUNCTION	0.79	2.30	456.30	0	00:13
DRCB64	JUNCTION	0.38	2.50	453.86	0	00:16
DRCB40	JUNCTION	0.42	2.50	448.11	0	00:17
J83	JUNCTION	0.44	2.80	461.29	0	00:17
J84	JUNCTION	0.13	0.35	437.71	0	00:20
J85	JUNCTION	0.20	0.45	457.82	0	00:20
STMH78	JUNCTION	0.50	2.90	449.54	0	00:16
J86	JUNCTION	0.76	2.50	460.96	0	00:12
J87	JUNCTION	0.11	0.35	458.92	0	00:20
J88	JUNCTION	0.11	0.34	458.59	0	00:20
J89	JUNCTION	0.00	0.00	456.77	0	00:00
J90	JUNCTION	0.00	0.00	459.23	0	00:00
J91	JUNCTION	0.00	0.00	457.00	0	00:00
DRCB258	JUNCTION	0.74	1.50	441.29	0	00:16
DRCB260	JUNCTION	1.09	1.50	440.45	0	00:16
J94	JUNCTION	0.20	0.23	437.07	0	00:17
STMH246-DIV	JUNCTION	0.31	1.70	457.62	0	00:21
DROF13	OUTFALL	0.49	0.90	441.11	0	00:14
DROF38	OUTFALL	0.62	1.05	441.90	0	00:13
DROF3	OUTFALL	0.57	1.20	452.54	0	00:13
DROF4	OUTFALL	0.30	0.75	452.36	0	00:15
DROF5	OUTFALL	0.63	1.20	450.65	0	00:14

DROF7	OUTFALL	0.26	0.60	440.62	0	00:15
DROF25	OUTFALL	0.46	0.92	440.92	0	00:20
DROF23	OUTFALL	0.37	0.90	444.80	0	00:15
DRFI2017	OUTFALL	0.20	0.23	436.65	0	00:17

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	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	508.09	508.09	0 00:19	0.583	0.593	-0.063
STMH286	JUNCTION	3151.97	3298.75	0 00:19	2.97	3.36	0.024
STMH56	JUNCTION	0.00	1336.57	0 00:26	0	2.66	0.022
STMH54	JUNCTION	1119.18	3150.11	0 00:19	1.04	6.37	-0.035
STMH178	JUNCTION	1067.73	4218.00	0 00:19	1.12	7.49	0.000
STMH177	JUNCTION	207.42	2813.14	0 00:19	0.19	6.6	-0.016
STMH398	JUNCTION	277.45	3090.66	0 00:19	0.254	6.85	0.001
STMH188	JUNCTION	2944.91	2944.91	0 00:19	2.91	2.91	0.011
STMH64	JUNCTION	0.00	1205.44	0 00:28	0	2.26	0.006
STMH161	JUNCTION	700.78	1842.78	0 00:19	0.646	2.9	-0.040
STMH165	JUNCTION	1029.91	1592.93	0 00:14	0.976	2.71	-0.016
STMH63	JUNCTION	0.00	1205.51	0 00:28	0	2.26	-0.020
STMH62	JUNCTION	0.00	1206.13	0 00:28	0	2.26	-0.075
STMH77	JUNCTION	0.00	6137.83	0 00:22	0	7.51	-0.000
STMH74	JUNCTION	0.00	6147.90	0 00:17	0	7.51	-0.001
STMH83	JUNCTION	0.00	6576.58	0 00:23	0	10.2	0.243
STMH79	JUNCTION	1058.80	5155.50	0 00:19	1.01	9.48	-0.300
STMH235	JUNCTION	0.00	3787.13	0 00:23	0	4.49	-0.229
J22	JUNCTION	4383.70	4383.70	0 00:19	4.11	4.1	0.327
STMH139	JUNCTION	0.00	4700.32	0 00:21	0	7.21	0.003
STMH138	JUNCTION	539.19	5169.95	0 00:21	0.497	7.71	0.005
STMH183	JUNCTION	0.00	5168.59	0 00:21	0	7.71	0.010
STMH6	JUNCTION	688.41	5119.66	0 00:19	0.637	8.19	-0.002
STMH7	JUNCTION	390.35	5314.04	0 00:23	0.361	8.51	-0.023
STMH184	JUNCTION	0.00	5314.46	0 00:23	0	8.51	0.003
STMH185	JUNCTION	0.00	5315.67	0 00:23	0	8.51	-0.004
STMH12	JUNCTION	1695.71	6876.94	0 00:19	1.58	10.1	0.018
J33	JUNCTION	8092.21	8092.21	0 00:19	7.4	7.39	-0.033

J34	JUNCTION	944.13	944.13	0	00:19	0.866	0.866	0.019
STMH17	JUNCTION	0.00	873.77	0	00:21	0	0.866	-0.048
STMH254	JUNCTION	0.00	1510.34	0	00:22	0	1.78	0.031
STMH93	JUNCTION	1525.34	3005.66	0	00:19	1.45	3.23	-0.000
J37	JUNCTION	963.35	1509.99	0	00:22	0.957	1.78	-0.000
J38	JUNCTION	0.00	873.85	0	00:20	0	0.866	-0.056
STMH190	JUNCTION	0.00	6407.96	0	00:19	0	11.2	-0.011
STMH133	JUNCTION	1799.59	6408.29	0	00:19	1.69	11.2	0.003
STMH135	JUNCTION	427.34	4737.99	0	00:23	0.409	9.53	0.002
STMH131	JUNCTION	608.59	4498.80	0	00:24	0.587	9.13	0.006
STMH196	JUNCTION	317.43	4219.10	0	00:28	0.301	8.55	-0.022
STMH137	JUNCTION	0.00	3146.15	0	00:14	0	5.24	-0.002
STMH15	JUNCTION	260.75	7667.85	0	00:20	0.24	7.35	-0.020
J46	JUNCTION	7705.40	7705.40	0	00:19	7.12	7.12	-0.001
STMH4	JUNCTION	998.15	998.15	0	00:19	0.932	0.932	-0.041
STMH216	JUNCTION	0.00	718.65	0	00:22	0	0.884	-0.018
STMH197	JUNCTION	0.00	1021.26	0	00:34	0	2.26	0.058
STMH2	JUNCTION	913.08	1275.76	0	00:19	0.924	2.44	-0.068
STMH28	JUNCTION	0.00	687.25	0	00:13	0	1.71	-0.068
STMH147	JUNCTION	762.79	762.79	0	00:19	0.792	1.72	0.047
STMH194	JUNCTION	0.00	553.23	0	00:12	0	1.14	-0.042
STMH253	JUNCTION	0.00	835.70	0	00:12	0	1.38	-0.052
J56	JUNCTION	1134.74	1134.74	0	00:19	1.04	1.04	-0.060
STMH212	JUNCTION	2300.73	2653.37	0	00:19	2.15	2.4	0.020
STMH298	JUNCTION	0.00	1140.82	0	00:19	0	1.41	0.004
STMH297	JUNCTION	274.81	1140.85	0	00:19	0.251	1.41	-0.012
STMH26	JUNCTION	0.00	866.12	0	00:21	0	1.16	0.005
STMH22	JUNCTION	0.00	888.40	0	00:17	0	1.16	0.009
STMH23	JUNCTION	1250.35	1250.35	0	00:19	1.23	1.23	-0.000
STMH225	JUNCTION	1154.74	1756.68	0	00:19	1.08	3.36	0.016
STMH226	JUNCTION	0.00	1501.87	0	00:14	0	3.33	-0.091
STMH202	JUNCTION	1178.44	2002.84	0	00:19	1.11	4.05	-0.007
STMH38	JUNCTION	1828.15	3667.30	0	00:19	1.74	5.77	0.006
STMH205	JUNCTION	516.60	2785.00	0	00:19	0.476	5.79	-0.017
STMH204	JUNCTION	0.00	2785.08	0	00:20	0	5.79	0.008
STMH109	JUNCTION	0.00	2785.94	0	00:20	0	5.79	0.027
STMH37	JUNCTION	3490.47	3490.47	0	00:20	4.01	4.01	0.008
STMH244	JUNCTION	451.76	2640.00	0	00:19	0.416	5.86	0.001
STMH362	JUNCTION	0.00	2640.08	0	00:19	0	5.86	-0.083
J73	JUNCTION	5155.21	7862.49	0	00:20	5.37	11.2	0.001
J74	JUNCTION	1563.50	9263.42	0	00:20	1.46	12.7	0.086
J75	JUNCTION	4093.65	11550.31	0	00:20	3.98	16.7	0.027
J76	JUNCTION	0.00	16446.53	0	00:20	0	21.8	0.000
J77	JUNCTION	0.00	16446.53	0	00:20	0	21.8	0.001

J78	JUNCTION	0.00	8209.80	0	00:21	0	12.7	0.054
J79	JUNCTION	0.00	7409.45	0	00:20	0	7.11	0.012
STMH116	JUNCTION	3160.56	3160.56	0	00:19	3.2	3.2	0.003
DRCB64	JUNCTION	792.40	1479.05	0	00:19	0.731	2.79	-0.008
DRCB40	JUNCTION	1134.77	2479.45	0	00:19	1.05	3.83	0.031
J83	JUNCTION	8591.14	8591.14	0	00:19	7.93	7.93	0.035
J84	JUNCTION	4823.60	4823.60	0	00:20	5.16	5.16	0.008
J85	JUNCTION	0.00	3443.56	0	00:20	0	5.89	-0.001
STMH78	JUNCTION	2070.52	8208.93	0	00:19	1.95	9.46	0.100
J86	JUNCTION	0.00	4570.54	0	00:23	0	6.49	-0.006
J87	JUNCTION	626.49	626.49	0	00:19	0.573	0.573	-0.003
J88	JUNCTION	0.00	628.12	0	00:20	0	0.573	0.035
J89	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
J90	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
J91	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 ltr
DRCB258	JUNCTION	2955.69	2955.69	0	00:25	8.17	8.18	0.002
DRCB260	JUNCTION	0.00	2956.12	0	00:25	0	8.17	0.056
J94	JUNCTION	0.00	810.86	0	00:17	0	4.33	0.089
STMH246-DIV	JUNCTION	1437.45	4857.57	0	00:20	1.32	7.21	-0.000
DROF13	OUTFALL	0.00	3090.60	0	00:19	0	6.85	0.000
DROF38	OUTFALL	0.00	4368.67	0	00:25	0	9.23	0.000
DROF3	OUTFALL	0.00	6877.50	0	00:20	0	10.1	0.000
DROF4	OUTFALL	0.00	3005.69	0	00:19	0	3.23	0.000
DROF5	OUTFALL	0.00	6408.07	0	00:19	0	11.2	0.000
DROF7	OUTFALL	0.00	1140.83	0	00:19	0	1.41	0.000
DROF25	OUTFALL	0.00	16712.84	0	00:20	0	21.8	0.000
DROF23	OUTFALL	0.00	2479.47	0	00:19	0	3.83	0.000
DRFI2017	OUTFALL	0.00	820.16	0	00:17	0	4.33	0.000

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Node Surcharge Summary
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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
J1	JUNCTION	0.46	2.400	0.000
STMH286	JUNCTION	0.49	2.650	0.000
STMH56	JUNCTION	0.50	2.450	0.000
STMH54	JUNCTION	0.49	3.200	0.000

STMH178	JUNCTION	0.56	2.300	0.000
STMH177	JUNCTION	0.55	1.700	0.000
STMH398	JUNCTION	0.46	0.608	1.592
STMH188	JUNCTION	0.40	2.800	0.000
STMH64	JUNCTION	0.41	2.738	0.062
STMH161	JUNCTION	0.43	2.100	0.000
STMH165	JUNCTION	0.51	2.850	0.000
STMH63	JUNCTION	0.41	2.291	0.409
STMH62	JUNCTION	0.37	1.900	0.000
STMH83	JUNCTION	0.48	1.730	0.000
STMH79	JUNCTION	0.53	1.325	0.000
STMH235	JUNCTION	0.47	0.950	0.000
J22	JUNCTION	0.45	1.000	0.000
STMH139	JUNCTION	0.28	2.239	0.601
STMH138	JUNCTION	0.29	2.173	0.037
STMH183	JUNCTION	0.31	1.910	0.000
STMH6	JUNCTION	0.32	1.770	0.000
STMH7	JUNCTION	0.34	2.700	0.000
STMH184	JUNCTION	0.36	2.556	0.644
STMH185	JUNCTION	0.36	1.931	1.309
STMH12	JUNCTION	0.37	1.692	1.508
J33	JUNCTION	0.34	1.600	0.000
STMH17	JUNCTION	0.09	0.850	0.000
STMH254	JUNCTION	0.11	1.734	0.116
STMH93	JUNCTION	0.20	0.920	2.230
J37	JUNCTION	0.12	1.250	0.000
J38	JUNCTION	0.08	1.750	0.000
STMH190	JUNCTION	0.43	3.500	0.000
STMH133	JUNCTION	0.40	3.200	0.000
STMH135	JUNCTION	0.32	2.600	0.000
STMH131	JUNCTION	0.39	2.500	0.000
STMH196	JUNCTION	0.35	1.800	0.000
STMH137	JUNCTION	0.31	1.583	0.117
STMH15	JUNCTION	0.28	0.900	0.000
J46	JUNCTION	0.24	4.100	0.000
STMH4	JUNCTION	0.34	2.500	0.000
STMH216	JUNCTION	0.38	2.500	0.000
STMH197	JUNCTION	0.37	1.800	0.000
STMH2	JUNCTION	0.30	1.050	0.000
STMH28	JUNCTION	0.65	1.300	0.000
STMH147	JUNCTION	0.59	2.300	0.000
STMH194	JUNCTION	0.63	1.300	0.000
STMH253	JUNCTION	0.62	1.400	0.000
J56	JUNCTION	0.46	2.000	0.000

STMH212	JUNCTION	0.62	0.700	0.000
STMH298	JUNCTION	0.24	1.000	0.000
STMH297	JUNCTION	0.30	3.300	0.000
STMH22	JUNCTION	0.11	1.325	1.875
STMH23	JUNCTION	0.39	2.800	0.000
STMH225	JUNCTION	0.48	1.840	0.000
STMH226	JUNCTION	0.44	1.040	0.000
STMH202	JUNCTION	0.35	2.270	0.000
STMH38	JUNCTION	0.40	2.000	0.000
STMH205	JUNCTION	0.43	2.450	0.000
STMH204	JUNCTION	0.49	2.700	0.000
STMH109	JUNCTION	0.49	0.950	0.000
STMH37	JUNCTION	0.56	1.900	0.000
STMH244	JUNCTION	0.47	0.900	0.000
STMH362	JUNCTION	0.02	1.082	0.118
J79	JUNCTION	0.27	3.786	0.014
STMH116	JUNCTION	0.45	1.850	0.000
DRCB64	JUNCTION	0.14	1.900	0.000
DRCB40	JUNCTION	0.12	1.600	0.000
J83	JUNCTION	0.11	1.750	0.000
STMH78	JUNCTION	0.14	1.850	0.000
J86	JUNCTION	0.39	1.600	0.000
DRCB258	JUNCTION	0.66	0.700	0.000
DRCB260	JUNCTION	0.95	0.700	0.000

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

Node	Hours Flooded	Maximum Rate LPS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
J1	0.30	450.94	0 00:14	0.206	0.000
STMH286	0.23	1961.05	0 00:20	0.687	0.000
STMH56	0.36	1136.30	0 00:22	0.926	0.000
STMH54	0.01	1015.22	0 00:14	0.003	0.000
STMH178	0.37	1611.82	0 00:20	1.082	0.000
STMH177	0.01	965.39	0 00:14	0.004	0.000
STMH188	0.23	1802.30	0 00:20	0.652	0.000

STMH161	0.16	1304.76	0 00:14	0.203	0.000
STMH165	0.12	415.61	0 00:20	0.078	0.000
STMH62	0.01	948.59	0 00:15	0.009	0.000
STMH83	0.13	937.26	0 00:13	0.049	0.000
STMH79	0.15	1800.49	0 00:13	0.285	0.000
STMH235	0.40	3787.13	0 00:23	3.292	0.000
J22	0.29	2992.05	0 00:20	1.239	0.000
STMH183	0.09	735.61	0 00:21	0.152	0.000
STMH6	0.07	457.78	0 00:13	0.041	0.000
STMH7	0.01	496.18	0 00:13	0.001	0.000
J33	0.14	3517.08	0 00:20	0.903	0.000
STMH17	0.06	286.99	0 00:20	0.039	0.000
J37	0.01	28.78	0 00:18	0.000	0.000
J38	0.01	234.09	0 00:19	0.000	0.000
STMH190	0.01	797.43	0 00:14	0.001	0.000
STMH133	0.01	56.45	0 00:14	0.000	0.000
STMH135	0.01	708.38	0 00:14	0.002	0.000
STMH131	0.01	153.69	0 00:14	0.000	0.000
STMH196	0.01	713.96	0 00:14	0.002	0.000
STMH15	0.23	5197.42	0 00:20	2.105	0.000
J46	0.01	294.51	0 00:20	0.007	0.000
STMH4	0.10	299.76	0 00:20	0.049	0.000
STMH216	0.01	267.47	0 00:14	0.000	0.000
STMH197	0.12	621.52	0 00:20	0.140	0.000
STMH2	0.16	640.44	0 00:15	0.197	0.000
STMH28	0.24	401.14	0 00:13	0.190	0.000
STMH147	0.01	66.66	0 00:13	0.000	0.000
STMH194	0.25	496.50	0 00:20	0.207	0.000
STMH253	0.01	431.23	0 00:12	0.003	0.000
J56	0.12	388.24	0 00:20	0.080	0.000
STMH212	0.56	2652.41	0 00:20	1.980	0.000
STMH298	0.01	90.00	0 00:15	0.000	0.000
STMH297	0.01	73.31	0 00:14	0.000	0.000
STMH23	0.09	384.05	0 00:20	0.067	0.000
STMH225	0.08	264.79	0 00:20	0.035	0.000
STMH226	0.29	667.07	0 00:21	0.391	0.000
STMH202	0.05	523.90	0 00:15	0.016	0.000
STMH38	0.19	1398.47	0 00:20	0.460	0.000
STMH205	0.01	464.32	0 00:15	0.000	0.000
STMH204	0.01	100.10	0 00:15	0.000	0.000
STMH109	0.28	598.25	0 00:20	0.344	0.000
STMH37	0.41	2887.98	0 00:20	1.734	0.000
STMH244	0.01	301.53	0 00:14	0.001	0.000
STMH116	0.36	2473.52	0 00:20	1.133	0.000

DRCB64	0.04	133.59	0 00:20	0.010	0.000
DRCB40	0.01	239.91	0 00:17	0.001	0.000
J83	0.09	2449.08	0 00:20	0.412	0.000
STMH78	0.12	1631.66	0 00:20	0.474	0.000
J86	0.26	1760.35	0 00:16	1.180	0.000
DRCB258	0.01	170.65	0 00:16	0.000	0.000
DRCB260	0.88	2145.43	0 00:25	3.842	0.000

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
DROF13	99.64	1400.05	3090.60	6.850
DROF38	99.64	1904.14	4368.67	9.226
DROF3	99.64	2044.46	6877.50	10.093
DROF4	99.64	636.52	3005.69	3.234
DROF5	99.64	2266.70	6408.07	11.216
DROF7	99.51	279.04	1140.83	1.412
DROF25	99.67	4296.80	16712.84	21.805
DROF23	99.64	772.29	2479.47	3.832
DRFI2017	99.54	643.91	820.16	4.325
System	99.62	14243.91	44551.85	71.992

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Link Flow Summary
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Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C100	CONDUIT	2397.22	0 00:23	3.77	2.62	1.00
C101	CONDUIT	4096.96	0 00:23	3.62	1.38	1.00
C102	CONDUIT	4368.67	0 00:25	5.05	1.99	1.00
C103	CONDUIT	6209.43	0 00:18	7.41	0.88	0.94

C104	CONDUIT	6576.58	0	00:23	7.60	1.00	1.00
C105	CONDUIT	2823.96	0	00:20	7.62	1.57	0.80
C106	CONDUIT	628.12	0	00:20	3.19	0.43	0.46
C107	CONDUIT	620.08	0	00:20	2.64	0.43	0.53
C108	CONDUIT	0.00	0	00:00	0.00	0.00	0.26
C109	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C110	CONDUIT	0.00	0	00:00	0.00	0.00	0.26
C93	CONDUIT	7409.45	0	00:20	5.82	1.29	1.00
C96	CONDUIT	6137.83	0	00:22	7.18	1.19	1.00
C98	CONDUIT	4570.54	0	00:23	7.18	1.00	1.00
C99	CONDUIT	3439.35	0	00:20	5.51	0.06	0.54
DRDI117	CONDUIT	820.16	0	00:17	2.77	0.04	0.23
DRDI27	CONDUIT	7834.46	0	00:20	2.56	0.10	0.37
DRDI28	CONDUIT	8209.80	0	00:21	1.93	0.11	0.57
DRDI4	CONDUIT	11676.40	0	00:20	6.99	0.15	0.19
DRDI5	CONDUIT	4856.67	0	00:20	6.32	0.06	0.12
DRDI6	CONDUIT	16712.84	0	00:20	6.57	0.13	0.46
STMP10	CONDUIT	1205.44	0	00:28	4.26	1.50	1.00
STMP100	CONDUIT	4219.19	0	00:28	3.73	1.12	1.00
STMP101	CONDUIT	4499.41	0	00:24	3.98	1.89	1.00
STMP103	CONDUIT	1021.05	0	00:34	1.96	0.58	1.00
STMP106	CONDUIT	4738.48	0	00:23	4.19	1.04	1.00
STMP107	CONDUIT	6407.96	0	00:19	5.67	1.57	1.00
STMP1086	CONDUIT	2479.47	0	00:19	3.90	1.31	1.00
STMP11	CONDUIT	1205.51	0	00:28	4.26	1.51	1.00
STMP1170	CONDUIT	810.86	0	00:17	3.97	1.09	0.69
STMP118	CONDUIT	671.50	0	00:14	2.74	2.42	1.00
STMP12	CONDUIT	1206.13	0	00:28	4.29	1.52	1.00
STMP120	CONDUIT	687.25	0	00:13	2.48	1.22	1.00
STMP123	CONDUIT	1021.26	0	00:34	2.96	0.63	1.00
STMP1289	CONDUIT	866.11	0	00:21	8.69	0.47	0.74
STMP13	CONDUIT	1206.21	0	00:28	3.03	0.51	1.00
STMP131	CONDUIT	6408.07	0	00:19	5.67	1.80	1.00
STMP14	CONDUIT	1508.14	0	00:24	2.52	0.58	1.00
STMP150	CONDUIT	1031.54	0	00:39	3.65	1.83	1.00
STMP1513	CONDUIT	2956.12	0	00:25	5.88	0.94	1.00
STMP1516	CONDUIT	2743.44	0	00:19	5.81	1.64	0.75
STMP155	CONDUIT	888.40	0	00:17	4.53	3.78	1.00
STMP156A	CONDUIT	1140.83	0	00:19	4.03	2.03	1.00
STMP156B	CONDUIT	1140.82	0	00:19	4.03	2.74	1.00
STMP1604	CONDUIT	3090.60	0	00:19	4.86	1.29	1.00
STMP161	CONDUIT	866.12	0	00:21	6.48	1.03	0.69
STMP170	CONDUIT	8062.01	0	00:22	5.93	1.42	0.86
STMP183	CONDUIT	2361.04	0	00:26	6.02	1.13	1.00

STMP184	CONDUIT	2785.94	0	00:20	4.38	1.68	1.00
STMP20	CONDUIT	298.21	0	00:14	1.52	0.86	1.00
STMP248	CONDUIT	2313.71	0	00:31	3.64	1.38	1.00
STMP249	CONDUIT	2640.08	0	00:19	4.16	1.58	1.00
STMP274	CONDUIT	745.92	0	00:21	2.64	1.32	1.00
STMP276	CONDUIT	1510.37	0	00:22	3.42	1.06	1.00
STMP29	CONDUIT	6147.90	0	00:17	8.66	0.94	0.80
STMP308	CONDUIT	936.87	0	00:31	5.90	1.31	1.00
STMP309	CONDUIT	1384.04	0	00:17	4.98	1.06	1.00
STMP393	CONDUIT	2813.21	0	00:19	4.42	2.05	1.00
STMP394	CONDUIT	2707.46	0	00:36	4.26	1.79	1.00
STMP427	CONDUIT	1173.49	0	00:14	2.66	1.32	1.00
STMP428	CONDUIT	1591.57	0	00:14	3.60	1.37	1.00
STMP435	CONDUIT	3150.26	0	00:19	4.95	1.19	1.00
STMP521	CONDUIT	4701.93	0	00:21	4.16	1.28	1.00
STMP524	CONDUIT	873.77	0	00:21	3.15	0.40	1.00
STMP525	CONDUIT	873.85	0	00:20	4.30	0.39	0.81
STMP554	CONDUIT	5084.54	0	00:23	4.50	1.41	1.00
STMP555	CONDUIT	5168.59	0	00:21	4.57	1.44	1.00
STMP556	CONDUIT	4682.17	0	00:24	4.14	1.29	1.00
STMP591	CONDUIT	5314.46	0	00:23	4.70	1.50	1.00
STMP594	CONDUIT	5315.67	0	00:23	4.70	1.66	1.00
STMP595	CONDUIT	5316.76	0	00:23	4.70	1.62	1.00
STMP692	CONDUIT	502.36	0	00:13	2.66	1.44	1.00
STMP749	CONDUIT	2785.08	0	00:20	6.30	0.72	1.00
STMP77	CONDUIT	4700.32	0	00:21	7.39	0.62	1.00
STMP79	CONDUIT	785.05	0	00:23	1.89	0.74	1.00
STMP800	CONDUIT	553.23	0	00:12	2.83	1.59	1.00
STMP801	CONDUIT	565.03	0	00:12	2.88	1.64	1.00
STMP823	CONDUIT	718.55	0	00:22	2.54	1.09	1.00
STMP824	CONDUIT	718.65	0	00:22	2.54	1.10	1.00
STMP850	CONDUIT	7409.06	0	00:20	11.65	2.57	1.00
STMP88	CONDUIT	1510.34	0	00:22	3.42	1.41	1.00
STMP89	CONDUIT	3005.69	0	00:19	6.80	2.08	1.00
STMP9	CONDUIT	1336.57	0	00:26	3.03	1.27	1.00
STMP90	CONDUIT	6877.50	0	00:20	6.08	1.91	1.00
STMP914	CONDUIT	1501.87	0	00:14	5.31	1.46	1.00
STMP915	CONDUIT	1349.32	0	00:15	4.77	1.65	1.00
STMP964	CONDUIT	1389.91	0	00:31	2.27	1.09	1.00
STMP98	CONDUIT	3146.15	0	00:14	5.85	0.73	1.00
STMP99	CONDUIT	3060.18	0	00:14	4.81	1.02	1.00
SYMP182	CONDUIT	1839.18	0	00:21	4.27	1.06	1.00
STMP187_PUMP	PUMP	16446.53	0	00:20			

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Flow Classification Summary
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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
C100	1.00	0.00	0.00	0.00	0.43	0.00	0.00	0.57	0.00	0.00
C101	1.00	0.00	0.00	0.00	0.47	0.03	0.00	0.50	0.02	0.00
C102	1.00	0.00	0.00	0.00	0.48	0.51	0.00	0.00	0.66	0.00
C103	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.88	0.00
C104	1.00	0.00	0.00	0.00	0.09	0.61	0.00	0.29	0.24	0.00
C105	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
C106	1.00	0.00	0.00	0.00	0.13	0.87	0.00	0.00	0.89	0.00
C107	1.00	0.00	0.00	0.00	0.42	0.57	0.00	0.00	0.51	0.00
C108	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C109	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C110	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C93	1.00	0.00	0.00	0.00	0.19	0.81	0.00	0.00	0.79	0.00
C96	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
C98	1.00	0.00	0.00	0.00	0.24	0.75	0.00	0.00	0.80	0.00
C99	1.00	0.00	0.00	0.00	0.28	0.71	0.00	0.00	0.95	0.00
DRDI117	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.59	0.00
DRDI27	1.00	0.00	0.00	0.00	0.09	0.91	0.00	0.00	0.88	0.00
DRDI28	1.00	0.00	0.00	0.00	0.88	0.12	0.00	0.00	0.69	0.00
DRDI4	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
DRDI5	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
DRDI6	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.85	0.00
STMP10	1.00	0.00	0.00	0.00	0.30	0.70	0.00	0.00	0.62	0.00
STMP100	1.00	0.00	0.00	0.00	0.43	0.56	0.00	0.00	0.71	0.00
STMP101	1.00	0.00	0.00	0.00	0.32	0.68	0.00	0.00	0.16	0.00
STMP103	1.00	0.00	0.00	0.00	0.55	0.45	0.00	0.00	0.65	0.00
STMP106	1.00	0.00	0.00	0.00	0.31	0.69	0.00	0.00	0.77	0.00
STMP107	1.00	0.00	0.00	0.00	0.32	0.67	0.00	0.00	0.75	0.00
STMP1086	1.00	0.00	0.00	0.00	0.11	0.89	0.00	0.00	0.73	0.00
STMP11	1.00	0.00	0.00	0.00	0.30	0.69	0.00	0.00	0.79	0.00
STMP1170	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
STMP118	1.00	0.00	0.00	0.00	0.53	0.47	0.00	0.00	0.04	0.00
STMP12	1.00	0.00	0.00	0.00	0.30	0.70	0.00	0.00	0.27	0.00
STMP120	1.00	0.00	0.00	0.00	0.95	0.04	0.00	0.00	0.71	0.00
STMP123	1.00	0.00	0.00	0.00	0.29	0.70	0.00	0.00	0.80	0.00

STMP1289	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.97	0.00
STMP13	1.00	0.00	0.00	0.00	0.34	0.65	0.00	0.00	0.50	0.00
STMP131	1.00	0.00	0.00	0.00	0.33	0.67	0.00	0.00	0.70	0.00
STMP14	1.00	0.00	0.00	0.00	0.42	0.57	0.00	0.00	0.78	0.00
STMP150	1.00	0.00	0.00	0.00	0.40	0.60	0.00	0.00	0.09	0.00
STMP1513	1.00	0.00	0.00	0.00	0.67	0.33	0.00	0.00	0.63	0.00
STMP1516	1.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.20	0.00
STMP155	1.00	0.00	0.00	0.00	0.09	0.91	0.00	0.00	0.00	0.00
STMP156A	1.00	0.00	0.00	0.00	0.19	0.81	0.00	0.00	0.71	0.00
STMP156B	1.00	0.00	0.00	0.00	0.46	0.54	0.00	0.00	0.07	0.00
STMP1604	1.00	0.00	0.00	0.00	0.36	0.63	0.00	0.00	0.67	0.00
STMP161	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.00
STMP170	1.00	0.00	0.00	0.00	0.03	0.96	0.00	0.00	0.21	0.00
STMP183	1.00	0.00	0.00	0.00	0.29	0.71	0.00	0.00	0.03	0.00
STMP184	1.00	0.00	0.00	0.00	0.41	0.59	0.00	0.00	0.75	0.00
STMP20	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.81	0.00
STMP248	1.00	0.00	0.00	0.00	0.43	0.57	0.00	0.00	0.78	0.00
STMP249	1.00	0.00	0.00	0.00	0.41	0.59	0.00	0.00	0.75	0.00
STMP274	1.00	0.00	0.00	0.00	0.99	0.01	0.00	0.00	0.73	0.00
STMP276	1.00	0.00	0.00	0.00	0.15	0.85	0.00	0.00	0.89	0.00
STMP29	1.00	0.00	0.00	0.00	0.00	0.07	0.00	0.93	0.00	0.00
STMP308	1.00	0.00	0.00	0.00	0.20	0.79	0.00	0.00	0.79	0.00
STMP309	1.00	0.00	0.00	0.00	0.09	0.90	0.00	0.00	0.88	0.00
STMP393	1.00	0.00	0.00	0.00	0.40	0.60	0.00	0.00	0.18	0.00
STMP394	1.00	0.00	0.00	0.00	0.50	0.50	0.00	0.00	0.74	0.00
STMP427	1.00	0.00	0.00	0.00	0.48	0.52	0.00	0.00	0.54	0.00
STMP428	1.00	0.00	0.00	0.00	0.44	0.56	0.00	0.00	0.76	0.00
STMP435	1.00	0.00	0.00	0.00	0.42	0.58	0.00	0.00	0.75	0.00
STMP521	1.00	0.00	0.00	0.00	0.31	0.68	0.00	0.00	0.64	0.00
STMP524	1.00	0.00	0.00	0.00	0.10	0.90	0.00	0.00	0.87	0.00
STMP525	1.00	0.00	0.00	0.00	0.04	0.95	0.00	0.00	0.89	0.00
STMP554	1.00	0.00	0.00	0.00	0.34	0.66	0.00	0.00	0.78	0.00
STMP555	1.00	0.00	0.00	0.00	0.29	0.71	0.00	0.00	0.79	0.00
STMP556	1.00	0.00	0.00	0.00	0.35	0.65	0.00	0.00	0.75	0.00
STMP591	1.00	0.00	0.00	0.00	0.33	0.66	0.00	0.00	0.68	0.00
STMP594	1.00	0.00	0.00	0.00	0.36	0.64	0.00	0.00	0.48	0.00
STMP595	1.00	0.00	0.00	0.00	0.48	0.52	0.00	0.00	0.58	0.00
STMP692	1.00	0.00	0.00	0.00	0.71	0.29	0.00	0.00	0.71	0.00
STMP749	1.00	0.00	0.00	0.00	0.32	0.68	0.00	0.00	0.79	0.00
STMP77	1.00	0.00	0.00	0.00	0.09	0.91	0.00	0.00	0.88	0.00
STMP79	1.00	0.00	0.00	0.00	0.99	0.01	0.00	0.00	0.89	0.00
STMP800	1.00	0.00	0.00	0.00	0.53	0.46	0.00	0.00	0.71	0.00
STMP801	1.00	0.00	0.00	0.00	0.87	0.13	0.00	0.00	0.72	0.00
STMP823	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.79	0.00

STMP824	1.00	0.00	0.00	0.00	0.34	0.66	0.00	0.00	0.79	0.00
STMP850	1.00	0.00	0.00	0.00	0.18	0.81	0.00	0.00	0.11	0.00
STMP88	1.00	0.00	0.00	0.00	0.08	0.91	0.00	0.00	0.24	0.00
STMP89	1.00	0.00	0.00	0.00	0.14	0.86	0.00	0.00	0.65	0.00
STMP9	1.00	0.00	0.00	0.00	0.44	0.56	0.00	0.00	0.74	0.00
STMP90	1.00	0.00	0.00	0.00	0.31	0.69	0.00	0.00	0.73	0.00
STMP914	1.00	0.00	0.00	0.00	0.32	0.00	0.00	0.68	0.00	0.00
STMP915	1.00	0.00	0.00	0.00	0.28	0.71	0.00	0.00	0.06	0.00
STMP964	1.00	0.00	0.00	0.00	0.44	0.06	0.00	0.49	0.03	0.00
STMP98	1.00	0.00	0.00	0.00	0.19	0.80	0.00	0.00	0.83	0.00
STMP99	1.00	0.00	0.00	0.00	0.47	0.52	0.00	0.00	0.80	0.00
SYMP182	1.00	0.00	0.00	0.00	0.27	0.73	0.00	0.00	0.81	0.00

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Conduit Surcharge Summary
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Conduit	Hours Full (Both Ends)	Hours Full (Upstream)	Hours Full (Dnstream)	Hours Above Full Normal Flow	Hours Capacity Limited
C100	0.48	0.48	0.48	0.25	0.05
C101	0.50	0.50	0.50	0.45	0.44
C102	0.57	0.57	0.57	0.58	0.57
C104	0.14	0.14	0.14	0.11	0.12
C105	0.01	0.01	0.01	0.43	0.01
C93	0.24	0.24	0.24	0.24	0.08
C96	0.11	0.11	0.11	0.13	0.11
C98	0.34	0.34	0.34	0.01	0.01
STMP10	0.40	0.40	0.40	0.38	0.36
STMP100	0.35	0.35	0.35	0.25	0.25
STMP101	0.32	0.32	0.32	0.50	0.32
STMP103	0.37	0.37	0.37	0.01	0.01
STMP106	0.32	0.32	0.32	0.22	0.23
STMP107	0.40	0.40	0.40	0.37	0.36
STMP1086	0.12	0.12	0.12	0.17	0.12
STMP11	0.40	0.40	0.40	0.38	0.35
STMP1170	0.01	0.01	0.01	0.93	0.01
STMP118	0.32	0.32	0.32	0.71	0.32
STMP12	0.41	0.41	0.41	0.38	0.36
STMP120	0.59	0.59	0.59	0.54	0.52
STMP123	0.29	0.29	0.30	0.01	0.01

STMP13	0.37	0.37	0.37	0.01	0.01
STMP131	0.42	0.42	0.43	0.44	0.42
STMP14	0.43	0.43	0.43	0.01	0.01
STMP150	0.48	0.48	0.48	0.60	0.48
STMP1513	0.66	0.66	0.66	0.01	0.01
STMP1516	0.01	0.01	0.01	0.53	0.01
STMP155	0.11	0.11	0.11	0.50	0.11
STMP156A	0.23	0.23	0.24	0.26	0.23
STMP156B	0.23	0.23	0.24	0.37	0.23
STMP1604	0.46	0.46	0.46	0.48	0.46
STMP161	0.01	0.01	0.01	0.10	0.01
STMP170	0.01	0.01	0.01	0.62	0.01
STMP183	0.40	0.40	0.40	0.31	0.31
STMP184	0.49	0.49	0.49	0.52	0.49
STMP20	0.46	0.46	0.46	0.01	0.01
STMP248	0.47	0.47	0.47	0.52	0.47
STMP249	0.02	0.02	0.03	0.53	0.02
STMP274	0.46	0.46	0.46	0.16	0.17
STMP276	0.11	0.11	0.11	0.07	0.07
STMP308	0.26	0.26	0.26	0.41	0.20
STMP309	0.14	0.14	0.14	0.17	0.12
STMP393	0.46	0.46	0.46	0.59	0.46
STMP394	0.55	0.55	0.55	0.58	0.55
STMP427	0.50	0.50	0.50	0.10	0.09
STMP428	0.51	0.51	0.51	0.11	0.10
STMP435	0.49	0.49	0.49	0.29	0.29
STMP521	0.28	0.28	0.28	0.21	0.21
STMP524	0.07	0.07	0.08	0.01	0.01
STMP554	0.32	0.32	0.32	0.27	0.26
STMP555	0.29	0.29	0.29	0.26	0.26
STMP556	0.31	0.31	0.31	0.26	0.25
STMP591	0.34	0.34	0.35	0.30	0.29
STMP594	0.36	0.36	0.36	0.36	0.36
STMP595	0.36	0.36	0.36	0.36	0.35
STMP692	0.61	0.61	0.62	0.37	0.32
STMP749	0.43	0.43	0.43	0.01	0.01
STMP77	0.14	0.14	0.14	0.01	0.01
STMP79	0.09	0.09	0.09	0.01	0.01
STMP800	0.63	0.63	0.63	0.51	0.48
STMP801	0.61	0.61	0.61	0.13	0.01
STMP823	0.38	0.38	0.38	0.11	0.11
STMP824	0.34	0.34	0.34	0.11	0.11
STMP850	0.27	0.27	0.27	0.23	0.22
STMP88	0.11	0.11	0.11	0.15	0.11

STMP89	0.20	0.20	0.20	0.22	0.20
STMP9	0.49	0.49	0.49	0.34	0.33
STMP90	0.37	0.37	0.37	0.39	0.37
STMP914	0.48	0.48	0.48	0.50	0.48
STMP915	0.39	0.39	0.39	0.58	0.39
STMP964	0.45	0.45	0.45	0.32	0.31
STMP98	0.28	0.28	0.28	0.01	0.01
STMP99	0.31	0.31	0.31	0.01	0.01
SYMP182	0.35	0.35	0.35	0.09	0.10

****
Pumping Summary
****

Pump	Percent Utilized	Number of Start-Ups	Min Flow LPS	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr	Power Usage Kw-hr	% Time Off Pump Curve Low	% Time Off Pump Curve High
STMP187_PUMP	97.50	1	0.00	4296.32	16446.53	21.805	332.48	0.0	0.0

Analysis begun on: Thu Sep 01 15:57:43 2016
Analysis ended on: Thu Sep 01 15:57:43 2016
Total elapsed time: < 1 sec

APPENDIX F

Cost Estimate Breakdowns
(Infrastructure Upgrade Projects)

Revelstoke SWM

Budget Estimate

Summary Sheet

Section	Title	Amount
1	Pearkes Drive & Laforme Boulevard	$630,070.00
2	Trans Canada Hwy No 1	$0.00
3	Campbell Avenue	$285,600.00
4	Victoria Road	$110,880.00
5	Oscar Street	$379,015.00
6	Edward Street & Eighth Street	$1,373,750.00
7	Pearson Street	$695,660.00
8	Additional Camera Inspection	$0.00
	Total	$3,474,975.00

This is an estimate of probable costs and not a guaranteed amount.

Estimates are in '2016' dollars.

*Pricing is based on the conceptual design.

Date: 29-Aug-16

By: Kris Koenig

WSP | MMM GROUP

Revelstoke SWM

Item #	Item Description	Unit	Quantity	Unit Price	Amount
1	**Pearkes Drive & Laforme Boulevard**				
1.1	Existing asphalt sawcutting, removal and disposal	m2	1500	$15.00	$22,500.00
1.2	Existing pipe removal and disposal	l.m.	500	$15.00	$7,500.00
1.3	900mm PVC storm pipe c/w manholes	l.m.	225	$750.00	$168,750.00
1.4	750mm PVC storm pipe c/w manholes	l.m.	266	$550.00	$146,300.00
1.5	Road Subbase gravels	m2	1500	$15.00	$22,500.00
1.6	Road Base gravels	m2	1500	$15.00	$22,500.00
1.7	50mm thick asphalt	m2	1500	$40.00	$60,000.00
		Sub-Total			**$450,050.00**
		Contingency (25%)			**$112,512.50**
		Engineering (15%)			**$67,507.50**
		Sub-Total			**$630,070.00**

Date: 29-Aug-16

By: Kris Koenig

WSP | MMM GROUP

Revelstoke SWM

Item #	Item Description	Unit	Quantity	Unit Price	Amount
2	Trans Canada Hwy No 1				
2.1					
2.2					
2.3					
		Sub-Total			
		Contingency (25%)			
		Engineering (15%)			
		Sub-Total			

Date: 29-Aug-16

By: Kris Koenig

WSP | MMM GROUP

Revelstoke SWM

Item #	Item Description	Unit	Quantity	Unit Price	Amount
3	**Campbell Avenue**				
3.1	Existing asphalt sawcutting, removal and disposal	m2	600	$15.00	$9,000.00
3.2	Existing pipe removal and disposal	l.m.	200	$15.00	$3,000.00
3.3	900mm PVC storm pipe c/w manholes	l.m.	200	$750.00	$150,000.00
3.4	Road Subbase gravels	m2	600	$15.00	$9,000.00
3.5	Road Base gravels	m2	600	$15.00	$9,000.00
3.6	50mm thick asphalt	m2	600	$40.00	$24,000.00
		Sub-Total			**$204,000.00**
		Contingency (25%)			**$51,000.00**
		Engineering (15%)			**$30,600.00**
		Sub-Total			**$285,600.00**

Date: 29-Aug-16

By: Kris Koenig

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Revelstoke SWM

Item #	Item Description	Unit	Quantity	Unit Price	Amount
4	**Victoria Road**				
4.1	Existing asphalt sawcutting, removal and disposal	m2	330	$15.00	$4,950.00
4.2	Existing pipe removal and disposal	l.m.	110	$15.00	$1,650.00
4.3	600mm PVC storm pipe c/w manholes	l.m.	110	$450.00	$49,500.00
4.4	Road Subbase gravels	m2	330	$15.00	$4,950.00
4.5	Road Base gravels	m2	330	$15.00	$4,950.00
4.6	50mm thick asphalt	m2	330	$40.00	$13,200.00
		Sub-Total			**$79,200.00**
		Contingency (25%)			**$19,800.00**
		Engineering (15%)			**$11,880.00**
		Sub-Total			**$110,880.00**

Date: 29-Aug-16
By: Kris Koenig

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Revelstoke SWM

Item #	Item Description	Unit	Quantity	Unit Price	Amount
5	**Oscar Street**				
5.1	Existing asphalt sawcutting, removal and disposal	m2	800	$15.00	$12,000.00
5.2	Existing pipe removal and disposal	l.m.	265	$15.00	$3,975.00
5.3	900mm PVC storm pipe c/w manholes	l.m.	265	$750.00	$198,750.00
5.4	Road Subbase gravels	m2	800	$15.00	$12,000.00
5.5	Road Base gravels	m2	800	$15.00	$12,000.00
5.6	50mm thick asphalt	m2	800	$40.00	$32,000.00
		Sub-Total			**$270,725.00**
		Contingency (25%)			**$67,681.25**
		Engineering (15%)			**$40,608.75**
		Sub-Total			**$379,015.00**

Date: 29-Aug-16

By: Kris Koenig

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Revelstoke SWM

Item #	Item Description	Unit	Quantity	Unit Price	Amount
6	**Edward Street & Eighth Street**				
6.1	Existing asphalt sawcutting, removal and disposal	m2	1875	$15.00	$28,125.00
6.2	Existing pipe removal and disposal	l.m.	625	$15.00	$9,375.00
6.3	900mm PVC storm pipe c/w manholes	l.m.	625	$750.00	$468,750.00
6.4	750mm PVC storm pipe c/w manholes	l.m.	625	$550.00	$343,750.00
6.5	Road Subbase gravels	m2	1875	$15.00	$28,125.00
6.6	Road Base gravels	m2	1875	$15.00	$28,125.00
6.7	50mm thick asphalt	m2	1875	$40.00	$75,000.00
	Sub-Total				**$981,250.00**
	Contingency (25%)				**$245,312.50**
	Engineering (15%)				**$147,187.50**
	Sub-Total				**$1,373,750.00**

Date: 29-Aug-16
By: Kris Koenig

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Revelstoke SWM

Item #	Item Description	Unit	Quantity	Unit Price	Amount
7	**Additional Camera Inspection**				
7.1	Existin asphalt sawcutting, removal and disposal	m2	1100	$15.00	$16,500.00
7.2	Existin pipe removal and disposal	l.m.	360	$15.00	$5,400.00
7.3	1200mm PVC storm pipe c/w manholes	l.m.	360	$1,050.00	$378,000.00
7.4	High capacity Catch Basin	ea.	4	$5,000.00	$20,000.00
7.5	Road Subbase gravels	m2	1100	$15.00	$16,500.00
7.6	Road Base gravels	m2	1100	$15.00	$16,500.00
7.7	50mm thick asphalt	m2	1100	$40.00	$44,000.00
		Sub-Total			**$496,900.00**
		Contingency (25%)			**$124,225.00**
		Engineering (15%)			**$74,535.00**
		Sub-Total			**$695,660.00**

Date: 29-Aug-16
By: Kris Koenig

WSP | MMM GROUP

APPENDIX G

Existing City Bylaw (No. 1846)

DESIGN STANDARDS

3. DRAINAGE

3.1 Run-Off Analysis

3.2 Minor System Design

3.3 Major System Design

3.4 Stormwater Storage

3.5 Erosion and Sedimentation Control

DESIGN STANDARDS

3. Drainage

3.1 Run-Off Analysis

This section describes the methods acceptable to the City of Revelstoke for use in the determination of the rate and amount of storm water run-off for the design of storm drainage conveyance and storage facilities.

Hydrologic aspects of urban drainage (peak flows, volume and durations) directly affect the success of the design. Errors in analysis may result in under designing of facilities, over sizing them and incurring unnecessary expenditures, or both. In the interest of the public good, a conservative approach to all designs is warranted.

The hydrologic criteria needed to calculate basin runoff are rainfall, soil types, vegetation and ground cover, extent of development and land slope and shape. It is expected that the design consultant will use criteria that is justifiable for the location of the development.

Application of computer simulation models is recommended for all analysis and detailed design, however, the rational method may be used for pre-design analysis and for detailed design of minor systems with contributing areas less than 10 ha.

a) Rational Method

The Rational Method may be used for pre-design system analysis and for detailed design of minor system components with contributing areas less than 10 ha. The Rational Method shall not be used for the design of major system components or storage facilities.

The Rational Formula is expressed as:

$$Q = CIA/360$$

where; Q = peak runoff, m^3/s

C = runoff coefficient
A = area, hectares
I = rainfall intensity, mm/hr

Runoff Coefficient, (C).

C values should be established based on the proposed land uses, proposed developments and hydro geological information. Calculations and justification for the determination of C values are to accompany development submissions. Developers and consultants are encouraged to look for ways to reduce the amount of Effective Impervious Area within their developments to reduce the amount of runoff generated and the costs associated with storm water infrastructure. "Default" C values, as shown on Table 1 can also be used.

In a case of applying the Rational Method to a mixed land use in a drainage area, a weighted average C value should be used and can be calculated from the following formula:

$$C_{avg} = \frac{S\ A_i\ C_i}{A}$$

where; Ai is the area with the same type of land use correlated to run-off coefficient Ri, and A is the sum total of all areas, Ai.

Rainfall Intensity, (I).

The value of the design rainfall intensity (I) for the Rational Formula is selected from the appropriate Intensity Duration Frequency (IDF) curve, with a duration chosen to coincide with the Time of Concentration. The Time of Concentration is the time required for run-off flow to become established and reach the design location from the furthest point within the contributing basin.

Time of concentration is the sum of two components, the "inlet time" and the "travel time".

The inlet time is the overland flow time for run-off to enter the conveyance system. It varies with size of the catchment area and surface imperviousness. In developed urban areas where paved surfaces drain directly to catch basins, an inlet time of 10 minutes shall be utilized for assessment of 5 year and smaller design storms. Inlet times for higher intensity design storm events are as follows:

Event	Inlet Time (min.)
5	10
10	9
25	8
50	7
100	5

For inlet times in rural areas, the overland flow time must be calculated using appropriate formulas.

The travel time is the length of time required for flow to travel within the conveyance system from the point of inflow to the location being analyzed.

Rainfall:

Standard Drawing COR-S21 shows the rainfall intensity-duration-frequency (IDF) curve for the City of Revelstoke, which was developed from the Atmospheric Environment Service recording station located at the Revelstoke International Airport.

b) Computer Simulation of Run-off

All minor storm drainage components draining areas larger than 10 ha. and all major storm drainage systems and storage facilities must be designed using computer-modeling techniques. The selection and the proper application of computer models is the responsibility of the Developer and the Consultant. It is necessary to utilize computer models which have the capability to generate hydrographs and which can route these hydrographs through a network of open channels, conduits and storage facilities showing volumes, hydraulic grade lines, the ability to simulate the minor and major system and their interrelation and the ability to simulate submerged and/or surcharged conditions.

3.2 Minor System Design

An urbanized area will have two separate and distinct drainage systems, whether these systems are planned and designed or not. The "minor system" includes street gutters, catch basin inlets and the network of underground pipes and facilities associated with the collection, conveyance and water quality treatment of minor, or frequently occurring rainfall events.

a) **Service Level**

The storm mains shall be designed for free-flow conditions for the 1:5 year storm (the rainfall that has a 20% probability of occurrence in any given year). The interception capacity of the system of street gutters and catch basins must be compatible with the design capacity of the storm mains.

b) **Streets, Gutters and Ditches**

i. Urban Cross-Sections

The flooding depths for a 1:5 year storm, which will be permitted on streets, while the streets are acting as part of the minor drainage system, are as follows:

a. There shall be no curb overtopping.
b. Maximum depth of ponding at sag locations or inlets will be 150 mm. On local roads, the flow may spread to the crown except where curb over-topping will occur.
c. On collector roads, the flow spread must leave one lane or a road surface equivalent free of water to ensure access for emergency vehicles (fire, ambulance).
d. On arterial roads, the flow spread must leave one lane in each direction free of water.

Flow across urban road intersections shall not be permitted for storms with a return frequency of 5 years or less.

ii. Rural Cross-Sections

Rural roads, gravel or paved, shall be constructed with swales or ditches that ensure adequate road sub-grade drainage (in compliance with Standard Road Design). Where ditching for minor drainage is provided, ditch design shall consider the following:

a. Rip-rap as necessary to eliminate incising and erosion.
b. Freeboard of 0.3 m.
c. Free surface elevations permitting agricultural tile drainage where required.
d. Stable side slopes.
e. Road sub grade.

c) **Catch Basins**

i. To ensure that the capture or inlet capacity matches the storm main capacity, the spacing of catch basins on streets may be varied; however, they shall generally meet the following criteria:

a. Spacing

I. Road grades less or equal to 3%, space 150 m maximum or 675 m^2 of paved area.

II. Road grades greater than 3%, space 100 m maximum or 450 m^2 of total area.

b. Space catch basins to ensure no overflows to driveways, boulevards, sidewalks, or private property.

c. Space at intersection so as not to interfere with cross walks.

d. Side inlet catch basins are required for all curbed roads.

ii. All catch basin leads are to be a minimum diameter of 200 mm and sized to convey the design inlet capacity.

iii. All catch basin leads are to discharge into a manhole.

d) Storm Mains

i. Capacity

Hydraulic capacity shall be calculated using Manning's formula. A roughness coefficient of 0.013 shall be used for concrete and 0.011 shall be used for smooth plastic pipe.

ii. Velocity

Minimum velocity shall be 0.75 m/s at the design flow rate.

iii. Minimum Sizes

250 mom/

iv. Location, Alignment and Grade

a. Storm mains must be located within the road right-of-way as noted in the applicable Standard Drawing Typical Cross-Section for that road.

b. When the storm main is required to cross private land(s), the right-of-way must be a minimum of 4.5 m wide, however, the width must be suitable to accommodate excavations based on WCB regulations for side slopes.

c. When a storm main is located within a statutory right-of-way and appurtenances, which require maintenance are located within the right-of-way, the landowner/developer must ensure that maintenance access is available. For large structures or structures requiring an enhanced maintenance level such as oil/sediment chambers, control structures and pond inlet/outlet chambers, an access route adequate to support the maintenance vehicles is to be provided. The surface of the route may be gravel, paves or asphalt depending on the location and the context of the site.

v. Depth of Cover

a. Provide 1.2 m in traveled areas and 1.0 m otherwise. However, these minimum's are to be used only when conflicts with other utilities will not occur and all upstream catchment areas are serviceable by gravity.

b. For Catch basin leads 0.9 m minimum cover shall be used. If 0.9 m is not available, design to protect from freezing and traffic loads, design calculations must be provided.

vi. Curvilinear Mains

If horizontal or vertical curves are used to maintain a constant offset, the radius of the curve is to be no less than 1.5 times the recommended manufacturer's minimum radius of curvature. The design velocity must exceed 0.91 m/sec. and the curve midpoint and two quarter points are to be located by survey and shown on the as-constructed drawings with an elevation and offset of the invert at each point.

e) Manholes

i. Storm manhole spacing is to be related to pipe main size as follows:

a. 250 and 300 mm diameter - 135 m maximum spacing;
b. over 300 mm to 600 mm diameter - 120 m maximum spacing, and
c. over 600 mm diameter - 100 m maximum spacing.

ii. Manholes are required at:

a. all grade or alignment changes (except curved sections)
b. pipe size changes
c. all intersecting mains
d. all upstream ends of mains
e. upstream and downstream end of all curvilinear mains unless a constant offset is maintained from the curb
f. all catch basin connections
g. outfalls to the major system (i.e. creeks, channels, lake) in order to isolate the upstream main to facilitate cleaning. The manhole is to be located as close as possible to the point of discharge.

iii. Manhole sizing shall be in accordance with the Standard Detail Drawing.

iv. To ensure manhole construction will not cause a loss in hydraulic capacity, the design gradient shall be continuous through the manhole; otherwise, where the inlet is not at 180° to the outlet, a minimum drop of 30 mm shall be provided.

f) Ground Water Recharge Systems

i. To promote interception of pollutants and reduction in downstream impacts, ground water recharge systems must be utilized to the maximum extent possible as determined by a qualified professional experienced in this field.

ii. Mains may be sized according to the required capacity taking 50% or the groundwater recharge capability into consideration. The groundwater recharge component must be calculated and justified by a qualified hydro geologist/engineer experienced in this field. Minimum sizes of mains must still be utilized.

g) Storm Services

i. Minimum diameter of storm services shall be 100 mm.

ii. Minimum Grades for storm sewer services shall be 2%.

iii. Storm services to properties shall not be permitted from storm drains located in rights-of-way unless a clean-out is provided and the nature of the development will permit access to the right-of-way for inspection, maintenance and repair, as necessary.

h) Roof Leaders

Roof drainage leaders are to be connected to the storm service connection only where geotechnical requirements dictate the need. The evaluation of this requirement is to be included in the scope of the Hydro-geotechnical Study. Otherwise, roof leaders are to be directed to a splash pad for dispersal to the ground. Roof leaders shall not be directed onto driveways, which drain directly onto city right-of-way or areas draining directly onto neighboring properties.

i) Water Quality Treatment

i. Water quality treatment is required for frequently occurring events. All flows up to 50% of the 2year (1 hour duration) post-development flow must be routed through some form of water quality treatment facility utilizing "best management practices" to remove suspended solids and floatables. The facility can be an in-ground structure, which passes flow through or an aboveground facility such as a treatment wetland. Wetlands can be incorporated into larger storm water management facilities for the attenuation of large events. Allowable discharge criteria are identified in the City of Revelstoke Sewer Regulations Bylaw #1683.

ii. Any form of water quality treatment must be designed to allow for future maintenance activities associated with the removal of the collected material and access to incoming and/or outgoing piping.

j) Lot Grading/Swales and Driveways

Lot grading shall be carried out in accordance with the BC Building Code and the following:

i. Grade lots to drain to a municipal minor or major drainage system or a natural drainage path. Use 1% minimum grade.

ii. Swales shall have a minimum slope of 1 percent. Swales shall be lined with turf on minimum 100mm topsoil or lined with a non-erodable hard surface. All such swales serving two or more parcels of property shall be designed to accommodate the anticipated flows and the right of way shall be sized accordingly (3.0 m minimum).

iii. Avoid drainage across adjacent lots. If cross-lot drainage is unavoidable, provide a swale to divert runoff away from the lower lots.

iv. Grade areas around buildings away from foundations.

v. To ensure flooding is avoided, carports or garages attached to residential buildings shall not be constructed with their floor level below the adjacent curb of City street or crown of pavement of City street, unless:

a. the drainage of the driveway serving the carport or garage is connected by gravity to a City storm sewer meeting the connection criteria, or

b. is above the 100 year flood line, or

c. the runoff water from the driveway may flow past the carport/garage without accumulating and entering. Properties utilizing this method must have an Engineer seal the design. All other relevant criteria of this document must also be met.

3.3 Major System Design

Storm runoff generated by less frequent, higher intensity rainstorms may exceed the capacity of the minor system. Runoff from these events will pond in depressions and follow whatever overflow route is available. This network of ponding and overland flows is called the "major system". If the major system is properly planned, it can alleviate the potential inconvenience and property damage caused by large rainfall events.

a) Major System

i. The major system includes all drainage infrastructures, which convey, detain, divert and intercept the 100-year design storm runoff. In general, all components of the major system must be designed to accommodate the flows generated by the upstream contributing area.

ii. The following section describes the major system provisions and technical requirements for use in planning and design of the major drainage system. The depth of flooding permitted for the major event is as follows:

a. For all classes of roads, the depth shall not exceed 0.3 m.
b. One lane, or a 3.5 m width at the crown shall be free from flooding.
c. Flooding is not permitted on private property

iii. To meet the criteria for major storm runoff, sags or low points in roads or subdivisions must be designed with a safe overland outlet flow route.

b) Outfalls

i. Ministry of Environment approval is required on all storm water outfalls to natural watercourses or water bodies.

ii. Outfalls into lakes are to be constructed to have minimum bury according to the following:

a. soft bottom, 0.6 metres to allow for seasonal sand erosion and deposition
b. rock bottom, criteria to be confirmed by Coast Guard
c. exposed pipes must be a minimum of 2.4 metres deep during lake "low water" to allow safe passage of deep keel vessels

iii. Lake outfalls require approval from the Canadian Coast Guard.

c) Control Structures

i. Control structures, such as the one shown on Standard Drawing COR- S20 shall be used to provide consistent control for design storm flows of different return periods. These can be modified to include multi-stage inlets. For example, three orifices located vertically on a control structure are normally designed such that the lower, smaller orifice restricts frequent storms and the large upper orifices control less frequent larger storms. Safe overflow must still be available above the highest orifice.

ii. Considerations shall be given for the design of smaller sediment trap basins at the points of discharge to the detention/retention facilities. Normally, basin inlets shall be designed to provide sediment containment. Build up of sediment shall not restrict inflows and suitable designs shall be provided to allow ease of sediment removals.

d) Culvert and Bridge Capacity

i. The following service levels are to be used for design:

Road Class	Design Flood Frequency Bridges. Culverts
Arterial and Collector	1:200 year flood
Local	1:100 year storm plus provision for overflow if on major channel

ii. Culverts over 30 m in length and/or 300 mm and larger in diameter shall be constructed with headwalls and end walls. The headwall shall be constructed with a free-swinging, weighted grating. To protect against entry, the City may require a locking mechanism, which limits the range of movement of the grating.

e) Ground Recharge Systems

Ground recharge systems are not normally considered for major flood routing. However, given the soil conditions in the Revelstoke area, geotechnical investigations may support the retention and ground infiltration of major events in some areas. Further details are provided in Section 4.

f) Ditch and Swale Construction

Velocity of flow in ditches and/or swales is not to exceed the limits given below for the various types of materials used as the conveyance surface.

Lining Materials	Maximum Permissible Velocity m/s
Fine sand	0.45
Fine gravel	0.75
Stiff clay	1.00

For velocities higher than the above maximums, the Rip Rap Design Chart Standard Drawing COR-S22 is to be used.

3.4 Stormwater Storage

This section identifies the general design parameters and requirements that must be considered by development proponents in the planning and design of storm water storage facilities.

a) Peak Flow Control

i. Control on peak flow rates and volumes in the City are necessary:

a. To minimize impacts on watercourses and downstream developments from flow increases which will result from land development, and

b. To maintain or lessen flows in watercourses so that creek channels and existing structures, such as bridges and culverts, will continue to operate without being flooded or damaged.

ii. In consideration of the above, the City has the following objectives and requirements:

a. Impact and expenditures to existing downstream users shall not be increased.

b. Increases in peak storm flows and volumes to the watercourses and receiving waters shall be limited.

c. The number of storage facilities shall be minimized. (Permanent detention will not be permitted under private ownership, unless incorporated on-site within a private development).

d. Permanent storage facilities are to be owned and maintained by the City.

e. Where land developments occur in advance of permanent detention facilities, the City may consider temporary storage facilities on an individual basis.

f. Maintenance charges and responsibility for temporary storage facilities will be borne by the developer.

g. Storage facilities may be surface or underground. Rooftop or parking lot storage may be considered, where appropriate.

h. Private property owners are to indemnify the City from liability arising out of private facilities.

b) Basis For Detailed Design

i. Level of Service

a. Developments near lakes and/or watercourses are required to provide water quality treatment for flows up to 50% of the 2 year event. Flows generated from rainfall events greater than this can be discharged directly to a receiving body of water provided the required minor and major systems exist and approval from the City of Revelstoke and the Ministry of Environment is obtained.

b. Developments within other areas of the City of Revelstoke are required to provide water quality treatment for flows up to 50% of the 2 year event and to provide storage up to the 100 year (plus 10% volumetric safety factor) event with a maximum outlet rate based upon the 5 year pre-development rate generated by the catchment area. The release rate is to be based up on the post-development outlet hydrograph mirroring the pre-development runoff hydrograph up to the 5 year level. Release rates not based on this criteria may be allowed by the City of Revelstoke based on downstream conveyance system protection, stream protection, flood protection or water quality.

c. An overflow shall be provided to route any excess water to the designated one hundred year flood route. Such an overflow can be in the form of a spillway or may be incorporated in the flow control structure through over sizing of downstream pipes, provision of overflow pipes or such other arrangement as the designer may devise.

ii. Geotechnical Considerations

a. Special geotechnical investigations to address issues related to the design of all storm water management lakes and dry ponds are to be undertaken as part of the planning and design studies, and are a prerequisite to the final design of such facilities.

b. Wherever possible, the storm water storage facility shall be excavated in natural, stable ground. Should topography dictate that a berm be constructed along one or more sides of the basin, the berm shall be designed by a qualified professional engineer registered to practice in the Province of British Columbia and with relevant training and experience.

iii. Staged Construction - Standards for Interim Facilities

When storm water management storage facilities are to be implemented in stages, the standards applicable to the design and construction of the interim facilities are to be generally in accordance with the standards set out herein for permanent facilities of that type. (e.g. Where an interim dry pond facility is proposed as a preliminary stage in the implementation of a storm water lake, it shall be designed and constructed in accordance with the criteria and standards applicable to a permanent dry pond.)

c) Design Requirements Common To Stormwater Management Storage Facilities

i. Land Dedication

a. Generally, the area of land covered by water when the basin is at the 5-year water level will be dedicated to the City. This dedication will also apply to all accesses to inlets/outlets, any structures and maintenance access routes to the facility.

b. Land that is adjacent to a basin which is subject to flooding as per the design standard established, but which is part of a privately owned developed parcel, will be required to carry rights-of-way, to allow for encroachment of water onto the affected land. The right-of-way documents shall be prepared by the development proponent, naming the City as grantee.

c. A restrictive covenant will be placed on lots abutting the facility to control lot development so as not to compromise design requirements at the HWL. This is to ensure an adequate freeboard is maintained.

ii. Maintenance Access Requirements

An all-weather access for maintenance vehicles must be provided to all facility works. A vehicle access route shall also be provided to the edge of all SWM lakes suitable to carry maintenance vehicles and for use as a boat launch point. The access surface shall be a minimum of 4.5 m wide, shall extend into the lake beyond the lake edge at normal water depth to a point where the normal water depth is 1.0 m, and shall be accessible from and extend to a public road. Sharp bends are to be avoided, and it shall have a straight run of 12 m or more leading to the lake edge (to permit a straight run in for launching of boats).

iii. Emergency Overflow Provisions

The feasibility of an emergency overflow spillway is to be evaluated for each storage facility design and, where feasible, such provisions are to be incorporated in the facility design. The consultant is to identify the probable frequency of operation of the emergency spillway. Where provision of an emergency spillway or overflow route is found to be unfeasible, the design is to include an analysis of the impact of overtopping of the storage facility and the probable frequency of occurrence of overtopping. The functional requirements of the spillway, and the impact analysis for the absence of one, are to consider the possible consequences of blockage of the system outlet or overloading due to consecutive runoff events, such that the storage capacity of the facility may be partially or completely unavailable at the beginning of a runoff event.

iv. Landscaping Requirements

Landscaping plans for areas bounding the facility shall be submitted as part of the Engineering Drawings. Landscaping of all proposed public lands included for purposes of the facility and of all proposed rights-of-way on proposed private property up to the design high water level, is to be part of the lake construction requirement and be dependant on the location and the context of the facility. The requirement for landscaping may be irrigated turf, constructed to the satisfaction of the Parks Department.

v. Sediment Removal Provisions

The facility design shall incorporate the ability for sediment capture and efficient removal for the control of solids, which may be washed to the facility.

vi. Maintenance and Service Manual

a. As part of the responsibility for design of a storm water management storage facility the development proponent shall prepare and provide a maintenance and service manual for the facility.

b. Six complete copies of the manual are to be provided to the City of Revelstoke prior to the time when the operation responsibility of the facility is transferred to the City of Revelstoke, which will generally be at the time of substantial completion. The manual shall include complete equipment manufacturer's operation, maintenance, service and repair instructions, and complete parts lists for any mechanized or electrical equipment incorporated in the design.

c. The manual is to include, at a minimum, the following information:

I. A copy of the approved Engineering Drawings relating to the Storm water Storage Facility and appurtenances, updated to "As-Constructed".
II. Schematic diagrams of the inlet and outlet arrangements, connections to and arrangement of upstream and downstream systems, including all controls, shutoff valves, bypasses, overflows, and any other operation or control features.
III. Location plans for all operating devices and controls, access points and routes, planned overflow routes, or likely point of overlapping in the case of exceedance of the design containment volume.
IV. Stage Discharge Curves with clear relationships of the stages relative to surrounding features.

vii. Signage for Safety

The design for SWM Facilities shall include the installation of signage to warn of anticipated water level fluctuations, with demarcation of maximum water levels to be expected for design conditions. Warning signs will be provided and installed by the development proponent.

viii. Engineering Drawing Requirements

The engineering drawings for any SWM Facility are to include the following information, in addition to the physical dimensions:

a. Stage-Volume and Stage-Area Curves;

b. elevations at Normal Water Level (NWL), 5 Year Level and High Water Level (HWL);

c. volumes at NWL, 5 year Level and HWL;

d. freeboard elevation;

e. notation indicating the lowest allowable building elevation for lots abutting the lake;

f. contributing basin size (ha);

g. measurements to locate submerged inlet(s), outlet(s) and sediment traps referenced to identifiable, permanent features which are not submerged at NWL.

d) Design Details For Stormwater Management Lakes (Wet Ponds)

i. Side Slopes

a. Areas normally or infrequently covered by water, from the design high water level down to a point 1.0 m below the normal water level shall have a maximum slope of 5 (horizontal) to 1 (vertical).

b. A slope of 3 (horizontal) to 1 (vertical) may be required from the 1.0 m depth point (below normal water level) to the pond bottom. The requirement for maximized slopes below water is an attempt to discourage the growth of unwanted vegetation.

c. In the case of constructed wetlands, benched areas above and below the NWL to encourage growth of aquatic and riparian plants is desirable.

ii. Lake Bottom Material

a. For areas where the groundwater table is below the NWL, the lake bottom and side slopes are to be composed of impervious material with a suitably low permeability (e.g. with a permeability coefficient in the order of 1×10^{-6} cm/s).

b. For areas where the groundwater table is expected to be near or above the NWL, the lake bottom may be of a pervious material as dictated by geotechnical considerations.

iii. Circulation Requirements

a. Narrow or dead bay areas where floating debris may accumulate are to be avoided. Inlets and outlets should be located with consideration of the need to maximize detention time and circulation within the lake water body.

b. The length of the wet pond relative to the width should not be less than 3:1 or greater than 6:1 so as to promote natural water circulation and avoid water quality deterioration associated with stagnant reaches within the facility.

iv. Outflow Control Works

The outlet from a storm water management storage system must incorporate appropriate means for control of outflow. In addition, the outlet works must include provisions for operational flexibility, and to address unintentional blockage of the outlet and the possible need to either stop outflow or increase the rate of outflow.

v. Draw down Provisions

The means should be provided to permit discharge from storage facilities at the maximum rate of flow, which the downstream system can accommodate after storm runoff peak flows have passed and the flows from other contributing areas have decreased or ended. The rate of discharge to be provided for draw down purposes is to be sufficient to restore availability of storage capacity of facilities sufficiently to accommodate subsequent runoff events within a reasonable time frame. To achieve this purpose, draw down of facilities is to be possible at rates to satisfy the following relationship of available volume to the time from commencing draw down with the facility at the design high level.

Time After Commencing Draw down From Full Level	Available Volume Required Below Design Full Level
24 hours	Volume equivalent of 1 in 10 year run-off
72 hours	100% of total storage volume

vi. Submergence of Inlets and Outlets

Inlets and outlets are to be fully submerged, with the crown of the pipe at least 0.5 m below normal water level. Inlet and outlet pipe inverts are to be a minimum 0.1 m above the lake bottom.

vii. Provision for Free Outfall from Inlets to Lakes

The invert elevation at the first manhole upstream from the lake in a minor system shall be at or above the normal water level of the lake to avoid deposition of sediments in the inlet pipe. To avoid backwater effects on the upstream sewers leading to the lake, the obvert of the inlet sewer at the first manhole upstream from the lake shall be at or above the lake level for the 1 in5 year storm. A drop structure upstream from the lake will generally be required to achieve this. "Inlet" and "outlet" control calculations are required to verify the mode of operation of the lake inlets.

viii. Provisions for Lowering the Lake Level

The provision of the means to drain the lake completely by gravity drainage is desirable. The incorporation of this provision with the outlet control bypass should be considered. Where a gravity drain is not feasible, provisions are to be made in association with the outlet works or otherwise, so that mobile pumping equipment may be installed and used to drain the lake.

ix. Lake Edge Treatment

a. Edge treatment or shore protection is required and shall be compatible with the adjacent land use. The treatment used shall meet criteria for low maintenance, safety, and ease of access to the waters edge.

b. The edge treatment is to cover ground surfaces exposed or covered by water during a lake level fluctuation to 0.3 m below or above the normal water elevation, and shall be adequate to prevent erosion of the lake edge due to wave action. The typical acceptable edge treatment shall be, but is not limited to, a 250 mm deep layer of well graded washed rock with a 75 mm minimum size or vegetated strip consisting of hardy materials suitable for this application.

c. The proposal of variations to the edge treatment minimum is encouraged. The final selection of edge treatment being subject to the approval of the City.

e) Design Standards For Dry Ponds

i. Outflow Control Works

The outlet from a storm water management storage system must incorporate appropriate means for control of outflow. In addition, the outlet works must include provisions for operational flexibility, and to address unintentional blockage of the outlet and the possible need to either stop outflow or increase the rate of outflow.

ii. Draw down Provisions

The means should be provided to permit discharge from storage facilities at the maximum rate of flow, which the downstream system can accommodate after storm runoff peak flows have passed and the flows from other contributing areas have decreased or ended. The rate of discharge to be provided for draw down purposes is to be sufficient to restore availability of storage capacity of facilities sufficiently to accommodate subsequent runoff events within a reasonable time frame. To achieve this purpose, draw down of facilities is to be possible at rates to satisfy the following relationship of available volume to the time from commencing draw down with the facility at the design high level.

Time After Commencing Drawdown From Full Level	Available Volume Required Below Design Full Level
24 hours	Volume equivalent of 1 in 10 year run-off
72 hours	100% of total storage volume

iii. Frequency of Operation

All dry ponds shall be designed to temporarily detain excess runoff and thereby reduce the peak outflow rates to the connected downstream system. They shall not detain runoff for storms with post-development return periods of less than 2 years except where special provisions are made to facilitate clean up (i.e. paved bottom areas, etc.).

iv. Depth of Ponding

The maximum live storage limit in a dry pond is 3.0 m, as measured from the invert elevation of the outlet pipe.

v. Dry Pond Bottom Grading and Drainage

The dry pond shall be graded to properly drain all areas after its operation. The dry pond bottom shall have a slope of 1.0% or greater. Sub-surface drains or similar means may be required where it is anticipated that these slopes will not properly drain the dry pond bottom, or where dictated by multiple use or other special considerations.

vi. Side Slopes

25% of the side slopes subject to inundation upon filling of the dry pond shall have a maximum slope of 5 (horizontal) to 1 (vertical). An alternate method of egress (e.g. stairs) may be required in steep areas.

vii. Safety Provisions at Inlets and Outlets

a. All inlet and outlet structures associated with dry ponds shall have grates provided over their openings to restrict access and prevent entry into sewers by children or other persons. A maximum clear bar spacing of 0.15 m shall be used for gratings.

b. Grated outlet structures are to be designed with a hydraulic capacity of at least twice the required capacity to allow for possible plugging. Further, the arrangement of the structures and the location of the grating shall be such that the velocity of the flow passing through the grating will not exceed 1.0 m/s. Appropriate fencing and guard-rails are to be provided to restrict access and reduce the hazard presented by the structure headwalls and wingwalls.

viii. Other Considerations

An on-stream dry pond may be constructed upstream of a road crossing as long as geotechnical evaluations conclude that construction is appropriate. Facilities must be constructed to allow overtopping without causing undue erosion or damage. All facilities on fish bearing streams shall be designed to pass fish.

f) Design Standards For Infiltration Basins

i. Outlet Design

Infiltration basins do not have a formal outlet structure. As such, the storage volume must be based upon the complete runoff generated by the 1:100 year storm with no provision for outlet during the event, plus a 50% safety factor.

ii. Depth of Ponding

The maximum live storage limit in a basin is 3.0 m.

iii. Side Slopes

Side slopes subject to inundation upon filling of the basin shall have a maximum slope of 5 (horizontal) to 1 (vertical).

iv. Safety Provisions at Inlets

a. All inlet structures associated with infiltration basins shall have grates provided over their openings to restrict access and prevent entry into sewers by children or other persons. A maximum clear bar spacing of 0.15 m shall be used for gratings.

b. Appropriate fencing and guard-rails are to be provided to restrict access and reduce the hazard presented by the structure headwalls and wingwalls.

v. Other Considerations

a. A detailed hydro geological investigation must be conducted to support the proposed infiltration basin. The investigation must assess impacts to upstream and downstream properties and identify measures to alleviate impacts, if necessary.

b. To address the issue of sediment plugging during development in the catchment area, the basin is to be constructed to 90% of its ultimate depth and volume. When development in the catchment reaches 90%, the infiltration basin is to be completed.

3.5 Erosion and Sedimentation Control

All proposed projects must provide erosion and sedimentation controls to prevent the displacement of soil and the transport of sediment from the project site resulting from land-disturbing activities. To prevent the displacement of soil and the sediment transport during land-disturbing activities, Erosion and Sedimentation Control (ESC) measures are required and shall be performed as described below. Both temporary and permanent erosion and sedimentation controls shall be implemented.

The objective of erosion and sedimentation control is to prevent the displacement of soil and the transport of sediment to streams, wetlands, lakes, drainage systems, and adjacent properties. Erosion on construction sites can result in excessive sediment transport to adjacent properties and to surface waters. Sediment transport can result in adverse impacts such as flooding due to obstructed drainage systems, smothering of aquatic habitat and the creation of algal blooms in lakes, among others.

a) ESC

i. The following ESC documents detail methods of control:

a. Best Management Practices for Erosion & Sediment Control
b. Land Development Guidelines for the Protection of Aquatic Habitat, Department of Fisheries and Oceans and the BC Ministry of Environment (1992)

ii. In general, erosion and sedimentation controls shall address the following:

a. Clearing Limits:

Prior to any site clearing or grading, areas to remain undisturbed during project construction shall be delineated and marked on-site by flagging or other method. At a minimum, clearing limit delineation shall be installed at the edges of all sensitive area buffers. Retain existing vegetation, as much as possible.

b. Cover Measures:

Temporary and permanent cover measures shall be provided when necessary to protect disturbed areas as detailed in the ESC Documents. Temporary cover shall be installed if an area is to remain unworked for more than seven days, unless otherwise determined by the City. Any area to remain unworked for more than 30 days shall be seeded or sodded, unless the City determines that winter weather makes vegetation establishment infeasible. Slopes and stockpiles 3H:1V or steeper and with more than 3 metres of vertical relief shall be covered if they are to remain unworked for more than 12 hours. The intent of these measures is to have as much area as possible covered during any period of precipitation.

c. Perimeter Protection:

Perimeter protection to contain sediment from sheet flow shall be provided down slope of all disturbed areas when necessary as detailed in the ESC Documents. Such protection shall be installed prior to upslope grading. Perimeter protection includes the use of vegetated strips, as well as more conventional constructed measures such as silt fences.

d. Traffic Area Stabilization:

Unsurfaced entrances, roads, and parking areas used by construction traffic shall be stabilized to minimize erosion and tracking of sediment offsite as detailed in the ESC Documents.

e. Sediment Retention:

Surface water collected from disturbed areas of the site shall be routed through a sediment pond or trap prior to release from the site as detailed in the ESC Documents, except areas at the perimeter of the site small enough to be treated solely with perimeter protection. Sediment retention facilities shall be installed prior to grading of any contributing area.

f. Surface Water Controls:

Surface water controls shall be installed to intercept and convey all surface water from disturbed areas to a sediment pond or trap and discharge it down slope of any disturbed areas as detailed in the ESC Documents, except areas at the perimeter of the site small enough to be treated solely with perimeter protection. Significant sources of upslope surface water that drain onto disturbed areas shall be intercepted and conveyed to a stabilized discharge point down slope of the disturbed areas.

b) Implementation requirements

i. ESC Plan

All proposed projects must submit a plan for providing ESC measures. All ESC measures shall conform to the details and specifications in the ESC documents unless the City approves an alternative.

ii. Construction within Sensitive Areas and Buffers

Any construction that will result in disturbed areas on or within a stream or associated buffer, within a wetland or associated buffer, or within 15 metres of a lake shall be subject to the Best Management Practices for Erosion & Sediment Control – In-stream Works (1998). These provisions include phasing the project whenever possible so that construction in these areas is limited to the dry season.

iii. Maintenance

All ESC measures shall be maintained as per the Erosion and Sedimentation Control Plans. The consulting engineer shall be responsible for maintenance and review of ESC and for compliance with all conditions relating to ESC.

iv. Final Stabilization

Prior to obtaining total performance, the site shall be stabilized and the structural ESC measures (such as silt fences and sediment traps) shall be removed and drainage facilities cleaned as specified.

TABLE 1- Rational Method "C" Coefficients for Design

Description of Area		Minor Storm	Major Storm
Commercial		0.85	0.90
Residential	Single-Family areas	0.40	0.50
	Multi-units, detached	0.50	0.60
	Multi-units, attached	0.60	0.70
Apartments		0.75	0.80
Industrial		0.75	0.80
Parks		0.20	0.25
Natural Areas		*	*
Streets	Asphaltic	0.85	0.95
	Concrete	0.85	0.95
Drives and walks		0.80	0.90
Roofs		0.80	0.90

* - to be determined by site specific conditions

APPENDIX H

Proposed Draft City Bylaw

SECTION 3

STORM DRAINAGE SYSTEMS

3.0 STORM DRAINAGE SYSTEMS

3.1. GENERAL

The purpose of the drainage design criteria is to standardize the procedures for designing common drainage facilities in the City of Revelstoke. All drainage works will be designed with considerations for public safety, regulatory requirements, and the natural environment. *Consulting Professionals* will consult with the (e . g . Environment, Parks and Engineering Department, City of Revelstoke) to determine what existing information may be of assistance to them.

The presence of an existing municipal drainage system does not mean, or imply, that the system has adequate capacity to receive the proposed design flows, nor does it indicate that the existing system pattern is acceptable to the City of Revelstoke.
Existing facilities that are undersized or inadequate to accept additional drainage must be upgraded at the *Owner's* expense to accommodate the appropriate flows. Alternative drainage proposals may be considered.

3.2. OBJECTIVES

Three goals define the City of Revelstoke objectives for stormwater management:

Goal #1 - Preserve and improve the environment and natural resources for present and future generations by:

- Minimizing the potential stormwater impacts of *Development*, such as increased or decreased streamflows, changes in groundwater regime, alteration of fish and wildlife habitat, increased pollution, and increased erosion and sediment transport.
- Where feasible, maintaining the shape and composition (geomorphology) of the natural stream channels or ravine geometry, natural biological indicator conditions and the flow conditions (hydrogeometric regime).
- Employing stream protection measures to prevent adverse hydrological and water quality impacts, for all recognized watercourses within the City of Revelstoke.
- Infiltrating rainwater to maintain and enhance the hydrological regime. •

Promoting sound *Development* that respects the natural environment.

- Where feasible and where opportunities allow, restoring watercourses that are currently enclosed, to open channels.

Goal #2 - Reduce the risk of health hazards, loss of life and property damage by:

- Providing both major and minor drainage protection for life, livelihood and property.

- Controlling the incidence of nuisance or damage related to surface ponding and

flooding to within an acceptable frequency.

- Requiring infrastructure that will respond to climate change through adaptation. • Protecting municipal infrastructure.

Goal #3 - Conserve social and financial resources by:

- Treating stormwater as a resource rather than a waste product, ensuring that stormwater facilities are functional and aesthetically pleasing, and integrating multi-use objectives where possible.
- Providing a system of infrastructure and services that enhances general public convenience and safety, enhances aesthetics, and allows *Development* to proceed according to the community plan.
- Sustaining future *Development*, supporting orderly and managed *Development* of resources and integration of land uses within the City of Revelstoke.
- Using best available technologies and management practices where feasible.
- Encouraging economic design of drainage systems. In other words, new drainage systems, as well as upgrades to existing systems, should be designed and built to ensure longevity and resilience to climate change and other impacts. This with the ultimate view of minimizing future operation and maintenance costs, and extending the lifespan of this infrastructure, so future tax burden on residents of City of Revelstoke are minimized.
- Providing consistency and a basis of fairness for balanced and planned *Development* within the community.

Comment [BW1]: This point was queried on City markup.
WSP view is that it should remain. It is consistent with best practice and with Revelstoke OCP goals.

3.3. DEFINITIONS ~~(Preliminary list)~~

In a given storm drainage system:

3.1.1	Antecedent Moisture	is a term used in drainage modeling or hydrologic calculations where moisture from previous rainfalls may be accounted for in runoff calculations.
3.1.2	Design Frequency	is the average elapsed time between the occurrence of two events (storms, floods, etc.) equal to or exceeding a specified value (intensity, low, etc.).
3.1.3	Discharge	is the rate of flow of water flowing in a stream, usually expressed in cubic metres per second.
3.1.4	Drainage Basin	(1) is an area surrounded by a continuous height of land within which all runoff is expected to join into a single flow stream, and which extends to the point of junction of the flow stream with some predefined point of discharge at the lowest height of land in the

		drainage catchment area; or, (2) is the area served by a drainage system receiving storm and surface water, or by a watercourse.
3.1.5	Ecosystem	is any complex of living organisms together with all the other biotic and abiotic (non-living) factors that affect them. For example, a forest ecosystem is that part of a forest area that is uniform in climate, parent materials, physiography, vegetation, soils, animals and micro-organisms.
3.1.6	Floodplain	is the relatively flat or lowland area adjoining a river, stream, watercourse, ocean, lake or other body of standing water that has been or may be covered temporarily with floodwater. For administrative purposes, the floodplain may be defined as the area that would be inundated by the 1 in 200 year storm event.
3.1.7	Flood Proofing	is a combination of structural changes and adjustments to properties subject to flooding primarily for the reduction of flood damages.
3.1.8	Flood Construction Level (FCL)	is defined as the minimum elevation for main habitable floor areas in proposed buildings that are subject to flood hazards. The FCL applies to the underside of building wood floor systems or the top of concrete floor systems.
3.1.9	Hydrograph	is a graph showing the discharge of water with respect to time for a given point on a stream or conduit.
3.1.10	Hydrology	is the science of engineering that deals with the aspects of rainfall and the nature of its subsequent collection and discharge.
3.1.11	Hyetograph	is a graph showing rainfall, rainfall intensities or volume over specified areas with respect to time.
3.1.12	Impervious	is a term applied to a material through which water cannot pass, or through which water passes very slowly.
3.1.13	Imperviousness Coefficient	is the ratio of impervious surfaces to total surface area within a watershed or drainage area.
3.1.14	Infiltration	is (1) the entering of water through the interstices or pores of a soil or other porous medium; (2) the entrance of water from the ground into a

		sewer or drain through porous walls, breaks, or defective joints; or (3) the absorption of water by the soil either as it falls as precipitation, or from a stream flowing over the surface.
3.1.15	Integrated Stormwater Management Planning	is the process of setting goals, objectives, strategies and policies in a cooperative framework among all watershed resources and resource uses.
3.1.16	Intensity	is the rate at which precipitation falls in a given period, usually expressed in millimetres per hour or inches per hour.
3.1.17	Intermittent Stream	is a stream with a defined channel, but which is dry for periods of the year, usually the late summer and fall period of low precipitation and no snow melt.
3.1.18	Lag Time	is the time between two occurrences, such as between rainfall and runoff.
3.1.19	Major Drainage System	is the storm drainage system that carries the runoff from the major design storm, generally a 1 in 100 year event. It usually includes many features such as roads, ditches and overland flow paths.
3.1.20	Minor Drainage System	is the storm drainage system that is frequently used for collecting, transporting and disposing of minor flows, and storm runoff up to the capacity of the system; generally a 1 in 10 year event. The minor system may include many features ranging from storm sewer pipes, curbs and gutters, ditches and other open drainage ways.
3.1.21	New *Development*	refers to proposed *Development* in areas that are currently undeveloped.
3.1.22	Overland Flow	refers to the flow of water over the ground surface before it flows to channels, swales and ditches.
3.1.23	Pervious	applies to a material through which water passes relatively freely.
3.1.24	Planning	is the process of determining the goals and objectives of an enterprise, and the selection, through systematic consideration of alternatives, of the policies, programs and procedures for achieving them.
3.1.25	Precipitation	is any moisture that falls from the atmosphere, including snow, sleet, rain and hail.
3.1.26	Rainfall Mass Curve	is a plot of accumulated precipitation against time

		from the beginning of the storm.
3.1.27	Re-*Development*	refers to proposed *Development* in areas that have existing *Development* and *Works and Services* and are being redeveloped or changed to a new or higher density form of *Development*.
3.1.28	Runoff	is that part of the precipitation which results in surface flow and in turn reaches a stream, drain, sewer, etc., directly or indirectly.
3.1.29	Source Controls	refer to stormwater techniques and/or facilities for retaining and treating stormwater at its source to best preserve or mimic the natural hydrologic cycle for typically occurring storm events.
3.1.30	Storage, Detention, Retention	with respect to runoff analysis, is that water that is detained in a facility during a storm and is released at controlled rates.
3.1.31	Storm Drainage System	refers to all facilities used for conveying stormwater through and from a drainage area to a point of final outlet, consisting of any or all of the following: conduits and appurtenant features, canals, channels, ditches, streams, ravines, gullies, flumes, culverts and roads.
3.1.32	Stream	is a natural watercourse or source of water supply, whether usually containing water or not, and a lake, river, creek, spring, ravine, swamp and gulch.
3.1.33	Surcharge	is the flow condition occurring in closed conduits when the hydraulic grade line is above the conduit crown, or the transition from open channel to pressure flow.
3.1.34	Synthetic Unit Hydrograph	is a unit hydrograph developed for an ungauged drainage area, based on known physical characteristics of the basin.
3.1.35	Time of Concentration	is the time required for storm runoff to flow from the most remote point of a watershed or drainage area to the outlet or point under consideration. It is not a constant, but varies with depth of flow, grades, length and condition of conduit and/or channel.
3.1.36	Topography	is a general term that means the characteristics of the ground surface such as plains, hills and mountains, degree of relief, steepness of slopes, and other physiographic features.
3.1.37	Trash Rack	is a barrier constructed to catch debris and exclude it

		from a downstream conduit in a stream. An improperly maintained trash rack may render a conduit useless.
3.1.38	Unit Hydrograph	is a runoff hydrograph resulting from one inch (25.4mm) of excess rainfall applied to a given watershed over some specified time interval.
3.1.39	Watershed	See Drainage

3.4. DETERMINING STORMWATER RUNOFF UP AND DOWNSTREAM OF PROPOSED SUBDIVISION OR DEVELOPMENT

3.4.1. General Approach

The design catchment area shall include the entire area tributary to the storm drainage system. The catchment area should be shown on the Catchment Area and Storm Drainage Plan and shall be in accordance with District or City-wide Master Stormwater Management Plans developed by the City of Revelstoke. Detailed boundaries shall be established by the *Consulting Professional* in so far as they affect the proposed *Subdivision*.

3.4.2. Stormwater Runoff Generation (Hydrology)

This section describes the rationale, methodology and parameters for determining the hydrologic variables such as rate and amount of stormwater runoff above, through and downstream of the proposed *Development*.

a) The capacity of storm drainage systems through the *Developments* will be designed to accommodate post-*Development* flows above and in the *Development*. All calculations pertinent to the design of the drainage system will be signed and sealed by the Consulting Engineer and submitted to the City of Revelstoke.

For *Developments* where the total tributary area is ~~10~~ 5 hectares or less, the Rational Method will be used to compute the peak runoffs.

For *Developments* where the total tributary area is greater than ~~10~~ 5 hectares, the Runoff Hydrograph Method will be used to compute the peak runoff. The Runoff Hydrograph Method will also be used for the design of storage facilities with tributary areas greater than ~~10~~ 5 hectares.

Comment [BW2]: Opinions on upper bound limit for use of Rational Method vary – typically in the range of 2 to 10 hectares. 5 hectares is considered appropriate.

b) In all cases the *Consulting Professional* (in determining the critical design conditions) is to consider the impact of snowmelt on the drainage system.

c) Rational Method

This method calculates the peak flow using the equation Q_T =RAIN

Where Q_T = Flow in cubic m per second, for a return period T

R = Runoff coefficient (see Table 3.1)

A = Drainage area in hectares

I_T = Average rainfall intensity in mm/hr for the return period T, during that period of time equal to T_C (see IDF curves on Figure 3.1)

N = 0.00278

i) Runoff coefficients

Table 3.1 - Runoff Coefficients

Description of Area	% impervious	5/10-year coefficient	100-year coefficient
Commercial	90	0.80	0.85
Industrial	90	0.80	0.85
~~Suburban~~ Rural Resi. (lots>0.4 ha)	20	0.35	0.40
Low Density Residential	~~40~~45	0.50	0.55
Medium Density Residential	~~65~~70	0.60	0.65
High Density Residential	~~78~~85	0.~~70~~75	0.~~75~~80
Woodlands	5	0.10	0.30
Parks, Playgrounds, Cemeteries	20	0.25	0.30
Agricultural Land	30	0.30	0.40
Institution, School, Church	80	0.75	0.80

Note:

- The above table assumes conventional site drainage of directing all surface drainage overland into streets and catch basins. The runoff coefficients account for antecedent wet conditions.
- In the case of mixed land use, a composite runoff coefficient is to be determined.
- The *Consulting Professional* is to verify the above values meet site specific conditions and if higher values are required.

ii) Drainage (or catchment) area

The extent of the tributary drainage areas for the storm drainage system being evaluated shall be determined using the natural and/or the proposed contours of the land taking into account future land use in accordance with the OCP.

It is stressed that it is the *Consulting Professional's* responsibility to confirm the extent of the drainage areas with the *Municipal Engineer* prior to final design, and to incorporate the previously determined storm planning flows into the overall system.

iii) Time of Concentration (Tc)

In *Developments* where substantial undeveloped areas remain, the contributing drainage area flows and corresponding Time of Concentration should be checked by trial and error to determine the maximum peak outflow rate. It is the cumulative sum of all flow times: overland, channel (swale or stream); and/or storm drain.

- Overland Flow Time:

Several equations for overland flow time may be used such as; the kinematic wave equation, the airport method, etc. It may be appropriate in fully developed basins as determined by the *Consulting Professional*, to use the minimum inlet times in the following table:

Development Type	Minimum (minutes)	Maximum (minutes)
Single Family	~~10~~8	15
Multi-family	~~8~~5	15
Commercial/Industrial	5	10

The minimum inlet times reflect roof leaders and parking lot drainage (hard surface) being discharged directly into a piped storm system. The maximum inlet times reflect roof leaders and parking lot drainage being discharged onto ground (grass, gravel, swales) and accounting for travel distances and other variables. It is the *Consulting Professional's* responsibility to verify that the above values are appropriate and provide recommendations to the City Engineer for approval where variations are appropriate.

- Channel Flow Time:

  When the channel characteristics and geometry are known, the preferred method of estimating channel flow time is to divide the channel length by the channel velocity obtained by using the Manning equation, assuming bank full conditions.

- Storm Drain Flow Time:

  When it is appropriate to separate flow time calculations, such as for urban storm drains, Manning's equation may be used to obtain flow velocities within pipes.

iv) Rainfall data

Data from the ~~[*name of nearby Airport*]~~Revelstoke Airport or other approved rainfall gauges will be used in evaluating and designing drainage infrastructure in the City of Revelstoke. This data is compiled in the rainfall Intensity Duration Frequency (IDF) curves for 5 minutes to 24-hour durations shown in the City of Revelstoke Standard Drawing COR-S21~~contained in Figure 3.1~~.

In order to account for the impacts of climate change on future rainfall patterns a 20% increase shall be applied to all rainfall depths and intensities calculated using the City IDF parameters for design purposes.

Other data that may become available is to be used or considered by the *Consulting Professional.*

v) Presentation of Rational Method Computations

The *Consulting Professional* shall tabulate the design calculations based on Manning's formula using a tabular format for submission with the Stormwater Management Plan.

d) Runoff Hydrograph Method

For basins larger than ~~10~~ 5 hectares, hydrologic programs will be used for runoff analyses. The Consulting Engineer will obtain acceptance from the City of Revelstoke on the selection of the proposed computer program. In view of very limited site specific calibration data available, the selection and proper application of appropriate computer programs should include a comprehensive review of the program's historical usage/application in other similar urban/urbanizing watersheds. This is primarily the responsibility of the Consulting Engineer. It is necessary to use computer models that have the capability to adequately represent the hydrologic characteristics of the watershed.

3.5. STORMWATER MANAGEMENT PLAN

3.5.1. Introduction

Stormwater management is the planning, analysis and control of storm runoff.
Stormwater management involves the planning and design necessary to mitigate the hydrological impacts of land development or land use changes. Adverse hydrological impacts include increased peak storm flows and frequency of flows, erosion, sedimentation, flooding, reduced surface infiltration, reduced minimum groundwater levels and reduced stream base flows, water quality deterioration and degradation of aquatic and wildlife habitats.

The City of Revelstoke is committed to the application of the latest drainage and engineering practices to maintain or improve biodiversity in

The design of storm drainage systems will incorporate:

- Development site and individual lot grading planning
- Source controls such as infiltration facilities, rain gardens, swales, absorbent landscapes and green roofs
- Subsurface disposal
- Detention storage (including roof storage)
- Erosion control and sediment removal
- Flood routing through minor and major drainage systems
- Other acceptable methods to mitigate the runoff impacts due to changes in land use and the severity of storm events

Consulting Professionals will consult with the City of Revelstoke's (Environment, Parks and Engineering Department) to determine what existing City of Revelstoke's stormwater master planning and record information may be of assistance to them in order to properly complete the drainage system design.

Comment [BW3]: City markup suggested inserting section on simplified single parcel design approach here – can we discuss this request further (possibly during visit for public session)? Metro Vancouver examples have been reviewed in detail and the conclusion reached is that it is not straightforward to transfer this approach to the Revelstoke bylaw document. We can see the attraction of having a simplified approach for applicants who may not have technical expertise, but this needs to be implemented carefully in order to not invalidate large sections of the remainder of the document.

3.5.2. General Approach

For subdivision applications, or any application covering an area of 1.0 hectare or greater, ~~A~~a Stormwater Management Plan (SMP)~~, which~~ is required ~~as part of the *Subdivision* application,~~ which describes in detail how the proposed *Development* will impact the existing drainage system and how the proposed major and minor drainage infrastructure meets the City of Revelstoke's drainage policies, masterplanning and design criteria.

The SMP must be provided for all *Developments* that alter the existing drainage characteristics.

For single lot parcel development applications (area less than 1.0 hectare) a simplified Stormwater Management Brief may be provided in place of the SMP, which demonstrates how the requirements of the City bylaw have been satisfied, and illustrates how the proposals will not affect downstream properties and drainage infrastructure.

The City of Revelstoke should be consulted in advance of submission to confirm the nature of the SWM documentation necessary to support the development application.

~~A SMP of the proposed *Subdivision* or *Development* must be developed in two phases at the expense of the *Owner*.~~ ~~The~~ Any Stormwater Management ~~Plan~~ submission made to the City must be developed or overseen by a Professional Engineer who is registered in the Province of British Columbia and is experienced in hydrologic analysis. The SMP should be conservative in calculation, coupled with sound engineering judgment. The economic aspects of the design must not be overlooked. Low maintenance and operational simplicity are preferred. Criteria and proposed solutions will be reviewed by the City of Revelstoke.

The *Owner's* Consulting Engineer will provide the City of Revelstoke with the technical information, and the City of Revelstoke may at its discretion undertake the hydrologic analyses by computer model to verify the suitability of the *Consulting Professional's* design.

It is also the *Consulting Professional's* responsibility to confirm the extent of the drainage catchments, and the required level of SMP detail, with the *Municipal Engineer* prior to design work commencing.

3.5.3. Minor and Major Drainage Systems

The minor drainage system comprises storm sewers, swales, channels and flow control facilities designed to collect and carry runoff from frequent storm events.

Flow control facilities include detention/retention ponds, exfiltration trenches, dry

Comment [BW4]: It seemed appropriate to split this section into application requirements for subdivisions and single parcel development, as they would typically require different levels of detail (far more for larger subdivision developments).

Comment [BW5]: 1.0 ha. considered an appropriate cut off point, however at the discretion of the City depending on typical applications that are received.

Comment [BW6]: Recommend encouraging developers to "pre-consult" with City staff to discuss/agree general approaches and submission requirements before submitting applications.

Comment [BW7]: We don't see the need for two phase development to be specified.

wells, and other acceptable methods suitable for reducing the rate of runoff into the downstream drainage system. In most *Subdivisions*, with the exception of sensitive hillsides and areas were aquifers can be contaminated, infiltration should be the preferred initial stormwater treatment in new *Subdivisions*.

The minor drainage system will be designed to prevent flooding and property damage and minimize public inconvenience caused by the frequent storm events up to the 10-year return period event. The runoff from the minor storm is referred to as the minor flow.

The major drainage system comprises surface flood paths, drainage outlets (i.e. designated storm sewers that convey the major flow), ditches, roadways, watercourses and flow control facilities designed to accommodate the runoff from rare and intense storms.

The major drainage system will be designed to protect the public and prevent significant property damage due to flooding caused by the rare storm events with the 100-year return period event.

The calculation of peak design flows used for the design of the major and minor drainage system will represent the unobstructed flow from the upstream hydrology and will not include attenuated flow from undersized culverts/bridges, retention ponds or similar facilities.

Roadways, overland flow paths, channels and watercourses will be designed to ensure that the maximum hydraulic grade line is below the lowest existing or proposed flood construction level (FCL) of adjacent buildings. Surcharging at the inlet under the major flow is acceptable provided the headwater profile does not rise above the proposed flood construction levels. Adequate erosion protection will be required where surcharging is proposed.

In the event that surface flow is not feasible or that the inlet facility is likely to be blocked or restricted, consideration will be given to sizing the storm sewer system to accommodate the major flow (i.e. creation of a drainage outlet).

3.5.4. The *Consulting Professional* will ensure that all downstream drainage infrastructure for a distance of 1.5 km (or to a distance where the contribution is insignificant) are capable of handling the projected increase in runoff created by the proposed new *Development* or redevelopment.

3.6. STORMWATER MANAGEMENT SYSTEMS: PERFORMANCE STANDARDS

Some Local Governments may wish to only specify Performance Standards and refer the *Consulting Professional* to BC and other Stormwater Management Guidelines. The District of Elkford has proposed the following provision in its draft SDS Bylaw. Some additions have been made from other bylaws.

3.6 STORMWATER MANAGEMENT SYSTEMS: PERFORMANCE STANDARDS

3.6.1. General Approach - Performance Standards adopted by the City of Revelstoke may be utilized as a starting point by qualified storm drainage professionals to determine the methods to develop the stormwater systems for the proposed *Development*, subject to the written approval of the City of Revelstoke.

3.6.2. Performance Standards:

a) No discharge from impervious surface areas for storm events with rainfall depths up to one half the 24-hour Mean Annual Rainfall (MAR).

b) Post-development runoff for the 2-year recurrence 24-hour storm shall be 50% of the pre-development runoff and the post-development runoff of the 5-year recurrence 24-hour storm shall not exceed the pre-development runoff.

c) For storm events exceed the 5-year recurrence, safe conveyance of runoff.

d) Proposals for Stormwater Management Systems using the Performance Approach shall be in report form, sealed by the responsible professional, and shall include information on the following to the satisfaction of the [*Name of Local Government*]:

i. Consideration of impact on the total watershed and recommendations in the City of Revelstoke's Master Stormwater Management Plan, Official Community Plan (OCP), or Neighbourhood Plan (NP) if applicable.

ii. Tributary areas to the *Development* including existing and ultimate land use in accordance with the OCP.

iii. The *Development* area within the drainage catchment including all features such as roads, natural watercourses, watercourse crossing structures, and low or poorly drained areas.

iv. Contour plan with 1.0 m elevation interval. Five metre contours may be considered for areas of steep terrain outside the developing lands to depict general drainage patterns. All contours must be labeled and easily discernible.

v. Existing watercourses including environmental classifications and/ or fish presence information.

vi. Continuous-flow modeling using currently accepted hydrologic and

Comment [BW8]: City markup included comment here stating "Would be interested in understanding how we could make this work".

Response:
Performance standards can give the applicant (and their consultant) more freedom in terms of how they address City SWM requirements. The end result should be the same (i.e. a set of development proposals compliant with City requirements) however the onus would be placed on City staff to review proposals on a more fundamental technical level to ensure they are achieving the target requirements. As an approach performance standards can be very effective, however they are not considered essential for implementation in this instance.

hydraulic modeling software and practices. Selection of computer programs requires review of the historical application of each program in watersheds similar to those under consideration. [*Name of Local Government*] approval of computer program selection should be obtained before design is commenced.

vii. Layouts of existing and proposed drainage ystems.

viii. Major and minor conveyance capacity.

ix. Impervious or runoff coefficient values for each catchment area based on future OCP land use.

x. Hydrologic calculations summarized in table form and supporting parameters to a point downstream of the discharge into an existing trunk storm sewer or as identified in the *Subdivision* Preliminary Letter of Approval or by the City of Revelstoke Engineer.

xi. 1:100 year flow routing internal and external to the *Development.*

xii. Conceptual lot grading patterns.

xiii. Design of proposed infiltration facilities, if appropriate, including location, sizing, detail cross sections and typical profiles. Results of on-site infiltration testing of soils at the elevation of the proposed infiltration.

xiv. Locations, sizes and hydraulic grade line (HGL) elevations of proposed detention facilities, if appropriate.

xv. Other proposed mitigation measures, if appropriate.

xvi. Proposed Minimum Building Elevations (MBE) and 100 year HGL of major flowpath (100 year storm).

xvii. Pre and post-development flows, with and without the impact mitigation measures.

xviii. Current and future upstream and downstream flows and system capacities.

xix. Plan for erosion and sediment control during all phases of construction.

xx. Plan for monitoring of performance by qualified professionals during construction and maintenance periods.

xxi. Plan for maintenance during the maintenance period.

xxii. Plan for maintenance of oil/water separators.

e) The proposed system shall be "equivalent‟ or better to the Prescriptive Standards.

3.6.3. Required Professional Qualifications for *Applicants* using the Performance Standards approach for Stormwater Management System Design:

a) Professional Engineer with a minimum of 5 years' experience in Stormwater Management Engineering.

b) Landscape Architect (BCSLA) with experience in Stormwater Management landscapes for soil / planting / irrigation design.

c) Professional Engineer with experience in Soil Hydraulics and/or Hydrogeology for soil infiltration capacity assessments.

3.7. STORMWATER VOLUME ANALYSIS

Stormwater management systems such as source controls for rainfall capture and detention facilities for runoff rate control will be designed using the following methodologies:

3.7.1. The *Consulting Professional* shall provide the City of Revelstoke with a written report as to how source controls such as rain gardens, absorbent landscapes, swales, infiltration facilities and green roofs were designed and sized.

3.7.2. Detention facilities will be designed to retain the greater volume between the 2-year and 10-year requirements, whichever governs. The 10-year volume is defined as the volume required to control the 10-year post development flow to a maximum rate to be accommodated in the existing downstream minor drainage system. The 2-year volume is defined differently for each *Development* or redevelopment as outlined under each subheading. Volume calculations and release rates are outlined in subsection 3.8.

- **For New *Development*:**

  In order to meet the stormwater capture criteria for new *Development* source controls, the runoff volume targets and drainflow output should not exceed 10% of the overall runoff.

  The 2-year volume is defined as the volume required to control 2-year, 24 hour post development flows to predevelopment levels or 3.5 litres per second per hectare (l/s/ha), whichever is less.

- **For Redevelopment with Existing *Development* <50% Imperviousness:**

  In order to meet the stormwater criteria for redevelopment (less than 50% imperviousness) source controls, the runoff volume target and drainflow output should not exceed existing conditions output.

  The 2-year volume is defined as the volume required to control 2-year, 24-hour post development flows to existing condition levels.

- **For Redevelopment with Existing *Development* >50% Imperviousness:**

  In order to meet the stormwater criteria for redevelopment (greater than 50% imperviousness) source controls, the post development runoff volume target and drainflow output should not exceed 50% of the overall runoff.

  The 2-year volume is defined as the volume required to control 2-year, 24-hour post development flows to 50% imperviousness condition levels.

Comment [BW9]: City markup included comment here stating, "Do these make sense?"

Response:
Yes, these are good volume (i.e. water balance) targets that can be implemented to encourage LID approaches for new developments. They set targets for volumes of rainfall that must be retained on site for certain events (depending on the nature of the site under development), and LID source control approaches are the only real mechanisms available to designers to achieve these goals. It is recommended that they are included in bylaw document.

3.8. STORMWATER MANAGEMENT FACILITIES

To meet the stormwater management principles outlined above, the following methodology will be applied:

Maintain natural features such as riparian corridors, streams, ponds, wetlands, surface depressions, soils and vegetation that are integral to the hydrologic cycle.

Artificially capture rainfall on-site and infiltrate, evaporate, transpire, or reuse it. Implement low impact development standards and source controls (rain gardens, absorbent landscaping, infiltration facilities, dry wells, infiltration trenches, swales, porous pavements, green roofs, rainwater reuse, etc).

Detain runoff and release at rates that approximate natural watershed conditions for all events up to the 100-year return period. Implement stormwater management facilities (i.e. storage facilities, detention ponds or tanks or diversions). Divert excess flows only (flows above 3.5 litres/second/hectare) directly to a large water body, if feasible – or to a safe overland flow path for conveyance to the receiving water body (note calculations required to justify capacity of downstream conveyance systems). Base flows and natural forested watershed flows (3.5 l/s/ha) to the creek system will be maintained.

Comment [BW10]: Recommended that developers be required to show how excess flows from the development site will be safely conveyed to a major system outfall (in order to protect downstream properties).

The Consulting Engineer should consult with the City of Revelstoke to determine appropriateness of the proposed storm water management measure.

For new *Development* and redevelopment areas that do not drain to a creek or river system but discharge directly to a large water body, storm water management facilities may not be required for hydrological control, but may be required for water quality treatment.

3.8.1. Upstream detention and routing through or around *Development*

As part of the SMP, the *Consulting Professional* will provide the rationale as to whether or not upstream stormwater detention and or treatment should be adopted. In some cases upstream *Development* may have additional capacity in dry detentions ponds.

Similarly, the rationale for routing flows through the site utilizing natural or man-made surface corridors must be presented as part of the drainage design philosophy adopted for

the proposed *Development*.

3.8.2. Lot Grading Plan

A comprehensive lot grading plan prepared by the *Consulting Professional* is required. This requirement may be waived by the *Municipal Engineer* if fewer than three new lots are created and there is no apparent impact on adjacent properties.

The first principle is to retain as many natural storm drainage features as possible.

Regardless of the size of *Development* the *Municipal Engineer* may require a report or grading plan prepared by the *Consulting Professional* analyzing the existing *Development* and impact on adjacent properties. This plan must illustrate a strategy that addresses both the compatibility of the grading on all lots within the *Development* area and the impact of these strategies on the existing adjacent *Development* area.

Items to be addressed are:

a) Pre- and post-development contours.

b) Identification of cut and fill areas. Areas of greater than 1 m of fill are to be identified and the Geotechnical Engineer is to provide comments on these areas pertaining to suitability for building construction.

c) Building envelopes within the proposed lots.

d) Grade elevations at property corners and any other change in grade.

e) A typical grading detail identifying general conditions and any special conditions for construction.

f) Minimum and maximum main floor elevations for buildings.

g) Directional arrows showing proposed drainage flow routes on each lot. Cumulative drainage of two or more properties is to be avoided and where necessary the *Consulting Professional* is to provide the rationale for this condition as well as propose a means of directing the flows to prevent impact on adjacent lots. This condition may require installation of special *Works and Services* by the *Applicant* and encumbrances registered on the lands.

h) The *Consulting Professional* will document any low impact development and source control solutions proposed.

i) Existing drainage patterns adjacent to the site.

j) Legend identifying all notations.

k) Lot numbering as per the final registered plan.

Confirmation of final elevations will be required prior to acceptance of *Works and Services*. The final grading plan submitted to provide guidance for the *Development* of buildings on the lots may omit pre-development contours and cut/fill notations. Covenants may be registered on lots to ensure compliance with the approved plan.

3.8.3. Stormwater source control

a) Stormwater source control shall be incorporated into *Subdivision* and lot *Development* to meet the requirements of stormwater management plans developed by the City of Revelstoke or *Developer* (in the absence of a City of Revelstoke Plan) for various watershed areas, and the requirements below.

b) Selection of stormwater source controls shall be made with regard to the topography, water table, soil or rock infiltration capacity, and downstream slope stability hazards. Stormwater source control use and sizing shall be customized by the *Consulting Professional* for each *Development*, subject to the following general guidelines and the approval of the [*Name of Local Government*]:

i. As a guideline all unpaved landscape areas shall have the following criteria (the Landscape *Consulting Professional* may motivate differently based on vegetation species. The final decision regarding these values will remain with City of Revelstoke).
   1. organic matter content of 15% dry weight in planting beds and 8% in turf areas;
   2. depth of 300 mm for turf;
   3. depth of 450 mm for shrubs/trees;
   4. depth of 300 mm around and below the root ball of all trees;
   5. pH from 6.0 to 8.0 or matching that of the original undisturbed soil;
   6. subsoils scarified to a depth of minimum 100 mm with some topsoil being incorporated into the subsoil;
   7. planting beds mulched with a minimum of 50 mm of organic material. The surface shall be vegetated or re-vegetated. Immediately before seeding or planting, the surface shall be cultivated to remove surface crusting, and compacted areas that do not exhibit free drainage shall be scarified; and
   8. landscape irrigation requirements as described in Section 7.

ii. Narrow paved areas, such as streets, driveways or walkways, shall be sloped to drain onto adjacent unpaved landscape areas designed as infiltration facilities in accordance with the guidelines below, to encourage runoff from these areas to infiltrate into the soil.

iii. Maximum ponding depth of infiltration areas shall be 150mm. All infiltration areas shall drain away from buildings, and shall have a provision for draining within 48 hours to the 5 year return period drainage system, and shall have an overflow to the 100 return period year flow path.

iv. The surface of unpaved landscape areas shall be designed for positive drainage away from pavements and buildings. Slopes of 1% to 3% are desirable to encourage infiltration of small rainfalls while facilitating drainage of large storms.

v. Infiltration-based stormwater source controls shall not be used in the following conditions:

Comment [BW11]: City markup included comments here stating, "How does this tie into current master plan?"

Response:
The SWM plan recommends the implementation of source control/LID approaches for new development wherever feasible, so these draft bylaw requirements are consistent with recommendations, and with the goals of the City's OCP.

- Areas within 30m of a slope that is steeper than 3 (horizontal) to 1 (vertical) and higher than 6m, or other unstable slopes.
- Areas where the post-development wet season groundwater table is less than 0.6m below the base of infiltration trenches.
- Areas where existing dwellings do not have foundation drains.

vi. In all *Developments* other than those listed in Section 3.8.3b(v), infiltration-based stormwater source controls with an overflow to the City of Revelstoke storm drain system are required, except when a Professional Engineer with experience in geotechnical engineering identifies conditions that would preclude the use of infiltration practices, with written recommendations to the approval of the City of Revelstoke. Required practices are:

- Infiltration Swales and/or Rain Gardens with reservoir and underdrain shall be installed where appropriate and with City of Revelstoke approval.
- Whereas the reservoir and underdrain are generally required, the underdrain and/or reservoir may be deleted in cases where a report by a professional engineer with experience in geotechnical engineering provides on-site infiltration test results that indicate that subsurface infiltration rates are adequate to allow absorption of one half the Mean Annual Rainfall (MAR) within the drainage area of the stormwater source control. In such cases the geotechnical engineering report shall recommend the appropriate detail.
- All utility crossings of infiltration-based stormwater source controls shall have trench dam installed as necessary to stop infiltration water from flowing down the utility trench to downstream basements or crawl spaces.

vii. Permeable pavers shall be allowed with the City of Revelstoke's approval in appropriate areas.

Comment [BW12]: City markup included comments here querying whether soil permeability/infiltration capacity should be prescriptive here.

Response:
Prescribing an soil infiltration rate below which infiltration facilities should not be proposed is considered a valid approach, however further work would be required to develop these requirements. A typical rate that would be considered at the limit is around 15 mm/hour – however there can still be significant benefits for systems that discharge to soil with slower rates, the facilities would just take longer to empty.

The following extract from the District of Elkford's draft SDS Bylaw may also be utilized.

A. Infiltration Swales shall meet the following design guidelines:

a) The swale infiltration area should be approximately 10-20% of the upstream impervious area that it serves, with its sizing preferably calculated by continuous flow modeling.

b) Flow to the swale should be distributed sheet flow, travelling through a grassy filter area at the swale verges (500 mm min., >3000 mm desirable). Provide pretreatment erosion control to avoid sedimentation in the swale. Provide non-erodible material, sediment cleanout basins, and weir flow spreaders at point source inlets.

c) Provide vegetated erosion control along all sides of weir and at drainage inlets.

d) Pavement edge at the swale may be wheel stop, flush curb, drop curb or side inlet curb.

Provide a 25mm drop at the edge of paving to the swale soil surface, to allow for positive drainage and buildup of road sanding/organic materials at this edge. Ensure positive drainage from curb into the swale invert.

e) Swale planting is typically sodded lawn. Low volume swales can be finished with a combination of grasses, shrub, groundcover and tree planting to provide a 100% vegetated cover within 2 years of planting. Meet the requirements in Section 7, Landscaping, for growing medium depth / volume where shrub and groundcover is used, and at planted trees.

f) Swale longitudinal slope should be 1-2%, or dished between weirs.

g) Swale bottom width - 600mm minimum, 2400mm maximum, flat in cross section.

h) Swale surface side slopes - 3(horizontal):1(vertical) maximum, 4:1 preferred for maintenance. Minimum sideslope shall exceed the slope of the road edge profile.

i) Weirs to have level top to spread flows and avoid channelization, keyed in 100mm minimum. Integrated mowing strip at the weir is desirable in lawn areas.

j) Design stormwater conveyance using Manning's formula, with attention to erosion and channel stability during maximum flows.

k) Maximum ponded level: 150mm.

l) Drawdown time for the maximum surface ponded volume - 48 hours maximum.

m)Minimum freeboard to adjacent paving: 100mm or in accordance with swale conveyance design.

n) Treatment soil depth: 350mm depth of growing medium is desirable, 150mm depth of growing medium is the minimum required. Both of these over 100 mm minimum depth of washed sand.

o) Drain rock reservoir bottom shall be level.

p) Underground weirs of undisturbed native material or constructed ditch blocks shall be provided to create underground pooling in the reservoir sufficient for infiltration performance.

q) A non-erodible outlet or spillway must be established to discharge overflow.

Comment [BW13]: City markup included comments here stating, "What do you think of these?"

Response:
These design specifications for source control features are aligned with best practice approaches. It would be beneficial to include these in the draft bylaw in the absence of any separate specific design guidelines that set out City expectations for SWM features. Alternatively, the City could leave the specs to applicants to propose, but this would increase the review burden on City staff, and may not result in significant benefits to the development proposals themselves.

B. Rain Gardens shall meet the following design guidelines:

a) The Rain Garden area should be 10-20% of the upstream impervious area that it serves2, preferably sized by continuous flow modeling. Common rain garden size is about 50m draining 250m^2 of impervious area, although this sizing and proportion will vary by rainfall and soil characteristics. Smaller, distributed Rain Gardens are better than single large-scale facilities.

b) Siting of Rain Gardens should be similar to other infiltration facilities.

c) Minimum of 30m from wells or unstable slopes, minimum 3 m downslope of building foundations, and only in areas where foundations have footing drains.

d) Provide pretreatment erosion control to avoid sedimentation in the garden.

e) Provide non-erodible material, sediment cleanout basins, and weir flow spreaders at point-source inlets. Flow to the swale should be distributed sheet flow, travelling through a grassy filter area or grass swale prior to entering the Rain Garden (500 mm minimum, greater than 3000 mm is a desirable grassy pretreatment swale length).

f) Rain Garden bottom flat cross section, with a longitudinal slope of 1 to 2%. Provide a 50mm - 75mm layer of organic mulch - well aged compost, bark mulch or similar weed free material. The mulch is important for both erosion control and maintaining infiltration capacity.

g) Rain Garden bottom width: 600mm minimum, 3000mm desirable, length:width ratio of 2:1 desirable.

h) Rain Garden side slopes: 2 horizontal: 1 vertical maximum, 4:1 desirable for maintenance. Provide organic mulch on side slopes similar to bottom of garden.

i) Maximum ponded level: 150mm.

j) Drawdown time for the maximum surface ponded volume: 48 hours.

k) Treatment soil depth: 450mm minimum, 1200mm desirable. Treatment soil should have a minimum infiltration rate of 13mm/hr, with 6mm/hr used for design. If a filter cloth is used over drain rock reservoir, provide clean washed sand over the filter cloth as a replacement for the lower 100mm of growing medium.

l) Slope of the drain rock reservoir bottom shall be level.

m)A non-erodible outlet or spillway must be established to discharge overflow.

n) Avoid utility or other crossings of the Rain Garden. Where utility trenches must be constructed crossing below the garden, install trench dams to avoid infiltration water following the utility trench.

o) Rain gardens can be constructed in a variety of shapes. Gain a letter of approval from a professional engineer with experience in geotechnical engineering prior to siting rain gardens closer than 3m to building foundations.

C. Pavers shall meet the following design guidelines and designs may be one of three types:

a) Full Infiltration - where all inflow is intended to infiltrate into the underlying subsoil.

b) Partial Infiltration - designed so that some water may infiltrate into the underlying soil while the remainder is drained by perforated pipes.

c) Partial Infiltration with Flow Restrictor - designed with a perforated pipe and flow restrictor located at the bottom of the drain rock reservoir. A small orifice in the flow restrictor allows the gradual decanting of water above the perforated pipe, with infiltration occurring as much as possible. These systems are essentially underground detention systems, and are used in cases where the underlying soil has low permeability or there is high water table.

D. Pavers shall meet the following design guidelines and designs may be one of three types:

a) Soil subgrade sampling and analysis should be provided by a professional engineer knowledgeable in the local soils. Testing of soil cores taken at the proposed area to be paved should include soil texture classification, sampled moisture content, 96 hour soaked California Bearing Ratio (CBR) with a target of at least 5% for light vehicular traffic, 15% for heavy vehicles, and on-site infiltration tests using a Double-Ring Infiltrometer taken at the elevation of the proposed base of the reservoir.

b) Minimum recommended tested infiltration rate for a full infiltration pavement design is 12.5 mm/hr. Sites with lower rates will require partial infiltration solutions with drain pipes, and care must be taken that the sub base will remain stable while saturated.

c) Where it is proposed to drain impermeable surfaces onto pervious pavement surfaces, it is recommended that a maximum ratio of 2:1 impermeable to permeable is used. This may vary by rainfall and soil characteristics as determined by modeling.

d) Permeable Unit Pavers should be selected and designed based on a manufacturer's tests that the installed unit paving system can maintain a minimum 28mm/hr infiltration rate over the pavement life (usually 20 years). This rate includes a factor of safety of 10 - the initial infiltration rate should be >280mm/hr.

e) Permeable unit pavers are usually 80mm depth. Provide edge restraint to contain the pavers, similar to standard unit paving. Edgers that use spikes are not recommended.

f) Permeable unit paving surface slope should be 1% minimum to avoid ponding on the surface, and related settlement of clay sized particles.

g) Provision of vegetated joints, and overhanging trees which drop needles onto the pavement have, in research studies, helped to maintain high infiltration capabilities of pervious unit paving. Vegetated joints are not suitable in heavily shaded areas such as under long-term parking.

h) Paver bedding material shall be wrapped with geotextile filter cloth on bottom and all sides. This is critical to the water quality performance of the pavement, and also keeps any intrusion of fines near the surface, where localized clogging could be repaired by replacing only the aggregate above the filter cloth and patching the cloth, reusing the pavers.

i) Bottom of reservoir: flat in full infiltration designs, minimum 0.1% slope to drain in piped systems.

j) If the pavement is being designed for heavy loads, optional reinforcing grids may be

included in the pavement sub-base.

k) With infiltration designs, the bottom and sides of all reservoir base and subbase courses shall be contained by a geotextile filter cloth. Geotextile shall be adhered to the drains.

l) Design reservoir water levels and stormwater detention using a continuous modelling program. Drawdown time for the reservoir: 96 hours maximum, 72 hours desirable.

m)If the design is for partial infiltration with a flow restrictor assembly, size the orifice for a design flow that meets local requirements or replicates base flow from the drainage area.

n) Provide a secondary overflow inlet and inspection chamber (catch basin or manhole) at the flow control assembly. If no secondary overflow inlet is installed, provide a non-erodible outlet or spillway to the major storm flow path.

o) Underground weirs of undisturbed native material or constructed ditch blocks shall be provided to create underground pooling in the reservoir sufficient for infiltration performance.

p) Avoid utility or other crossings of the pervious pavement area. Where utility trenches must be constructed crossing below the reservoir, install trench dams at exits to avoid infiltration water following the utility trench.

E. Infiltration Trench systems shall meet the following design guidelines:

a) Locate Infiltration Trench at least 3m from any building, 1.5m from property lines, and 6m from adjacent infiltration facilities (or as recommended by a geotechnical engineer).

b) If any surface water is to enter the system, provide pre-treatment erosion control to avoid sedimentation in the Infiltration Trench. Provide non-erodible material and sediment cleanout basins at point-source inlets. Do not allow drainage from land uses with a high risk for water pollution (e.g. refueling stations) to enter an infiltration trench.

c) Provide vegetated erosion control along any surface water conveyance swales (e.g. between rain water leader and sump inlet). Swale planting is typically sodded lawn. Low volume swales can be finished with a combination of grasses, shrub, groundcover and tree planting to provide a 100% vegetated cover within 2 years of planting.

d) Sump: Concrete, plastic, or other non-degradable box with strength suitable to withstand surface loads. Provide a lid for periodic inspection and cleanout. Include a T-inlet pipe to trap oils, sediments and debris. Provide weep holes to dewater the sump, for mosquito management. In high volume situations, an oil/grit separator will be required by the City of Revelstoke.

e) Infiltration Trench: installation of perforated distribution pipe and bottom of drain rock to be level. If more than one section of infiltration trench is required, design so that underground water is temporarily "ponded" in each infiltration section, using underground weirs of undisturbed native material or constructed ditch blocks designed to create underground pooling in the reservoir sufficient for infiltration performance.

f) Infiltration Trench bottom width - 600mm minimum, 2400mm maximum.

g) Install the Infiltration Trench in native ground, and avoid over-compaction of the trench sides and bottom, which reduces infiltration.

h) Install an observation well for each Infiltration Trench (optional): vertical standpipe, with perforated sides, and locking lid, to allow the monitoring of water depth.

i) Size the Infiltration Trench system by continuous flow modelling to provide rainfall capture of the design target.

j) A non-erodible outlet or spillway must be established to discharge overflow.

k) Avoid utility or other crossings of the Infiltration Trench. Where utility trenches must be constructed crossing below the Infiltration Trench, install trench dams to avoid infiltration water following the utility trench.

F. **Additional stormwater source controls** are described in the publication Stormwater Source Control Design Guidelines 2005 (GVSDD / GVRD). The following stormwater source controls are encouraged for use when appropriate, and shall require a custom design and specification document to be submitted for the approval by the City of Revelstoke:

a) Soakaway Manhole, with design supported by a hydrogeotechnical engineering report concerning groundwater quality.

G. Oil / Grit Separators shall meet the following requirements:

a) Treat a minimum of 90% of the annual runoff volume of the catchment area.

b) Provide an internal high flow bypass that regulates the flow rate into the treatment chamber and conveys high flows (10% or more of the annual runoff volume) directly to the outlet such that scour and re-suspension of material previously collected does not occur.

c) Be capable of removing 50% to 80% of the total suspended sediment load (TSS, including fine and clay particles) and 60% to 95% of the floatable free oil. Design calculations for sizing the structure shall be based on the drainage area, historic rainfall data, and shall meet the upper range of the removal targets (80% of TSS and 95% of oil). Average performance of the installation shall meet the lower range of the removal targets as a minimum (50% of TSS and 60% of oil).

d) Maintenance access both to the structure and within the structure shall be provided so that accumulated oils and sediments can be readily removed with a vacuum truck.

e) The oil/grit separator shall be enclosed in a concrete manhole or vault structure. The structure and lid shall meet H20 loading. Concrete joints shall be oil resistant and water tight.

f) Note that as a minimum any development application including commercial or industrial land uses should include use of appropriately sized water quality treatment devices – or justify alternative approaches that can achieve equivalent levels of treatment efficiency.

Comment [BW14]: Added per City markup comment.

H. **Stormwater Source Control practices** are intended to infiltrate the frequent minor storm events to provide recharge of ground water for stream base flows, and also to improve water quality. Unless proven by a Performance Standard calculation, stormwater source controls shall be assumed to not substantially reduce the quantity of storm runoff in events

exceeding one half of the Mean Annual Rainfall (MAR) depth.

I. Sediment Control Plan (City of Kamloops)

A Sediment Control Plan is a requirement of all *Development* projects and must clearly outline the measures to be taken to reduce sediment discharges from the site during the full construction period, which includes both City works and building construction. It is the *Consulting Professional's* responsibility to give consideration to the impact of sediment on existing infrastructure as well as watercourses. Some forms of sediment control may include:

a) Siltation ponds;

b) Bioswale filtration;

c) Point source control; and

d) Prefabricated sediment control systems.

J. Groundwater Interactions (City of Kamloops)

Where groundwater emergence can reasonably be expected, the *Consulting Professional* (or Geotechnical Engineer) must ensure this is addressed. Control of groundwater emergence and protection of City and private infrastructure from the negative impacts of groundwater must become part of the overall servicing strategy for a *Development.* Groundwater management must be accounted for in a site's infrastructure design. The use of cut-off drains or connecting servicing trenches to the storm sewer system are two possible solutions to this problem.

3.8.4. Detention of storm runoff

a) All *Developments* which are within the study boundary of a [*Name of Local Government*] approved stormwater or drainage plan must conform to the objectives and recommendations of the approved plan.

b) Where possible, stormwater runoff is to be directed to a regional detention system (whether existing or proposed) in an effort to maximize the tributary area of the regional detention systems. Where an engineering investigation concludes that connection to a regional system is not practical in the long term, independent drainage systems with direct drainage discharge to creek systems may be permitted, provided in all cases that water quality protection measures are provided to the approval of the City of Revelstoke. Local stormwater detention will generally be required in such cases.

c) Wet Detention Ponds

i. Wet detention ponds, complete with a permanent low level pool, are the preferred method of stormwater detention, however, for small *rcels*, where engineering studies have determined that wet detention ponds are not feasible, dry detention ponds, pipe-based, stormwater detention systems may be considered, but only if approved by the City of Revelstoke.

i. In general, wet detention pond designs should maximize habitat and structural complexity in order to fully utilize the benefits offered by the wet detention pond while avoiding undesirable habitats with few species resulting from simple wet detention pond designs. Aesthetics and multiple-use aspects should be emphasized throughout the design.

iii. All vegetation within the low level pool, pond and surrounding buffer shall conform to the detention pond landscaping criteria set out in this section.

iv. The surface area of the permanent low level pool should represent at least 1% of the total developed area.

v. The wet detention pond and outlet structure shall be designed such that the designed post-development discharge rate of the pond outflow does not exceed runoff levels generated by a pre-development 2 year storm event. If *Development* is located within the boundary of a [*Name of Local Government*] approved stormwater or drainage plan, refer to the appropriate plan for approved discharge rates.

vi. Primary spillway shall be designed to accommodate the post-development run-off generated by a 1:10 year storm event and an emergency spillway shall be designed to accommodate the post-development run-off generated by a 1:100 year storm event. The discharge path from the wet detention pond to the receiving environment shall be adequately protected from erosion.

vii. The depth of the permanent low level pool shall be maintained between 0.6 m and 1.2 m.

Comment [BW15]: City markup queried use of these clauses.

Response:
The clauses appear aimed at larger municipalities that may have multiple approved SWM plans applicable to different areas (with corresponding SWM control targets). Probably not applicable to Revelstoke and therefore should consider removing.

viii. The maximum depth of water during storm events shall not exceed 2.5 m.

ix. A minimum freeboard of 0.6 m shall be provided above the designed maximum water level.

x. The wet detention pond shape combined with meandering channels in the permanent low level pool shall maximize the distance between the inlet and the outlet.

xi. The wet detention pond walls shall be constructed with a minimum interior side slope of 4 (horizontal) to 1 (vertical) and a minimum exterior side slope of 3 (horizontal) to 1 (vertical).

xii. The top of the wet detention pond bank should be a minimum width of 3.0 m.

xiii. A pretreatment sump is to be provided at the inlet to the wet detention pond.

xiv. An oil/water separator structure or equivalent source control treatment set of best management practices such as infiltration swales, pervious pavements, or rain gardens is to be installed upstream of the pond inlet.

xv. The flow control structure is to be constructed with a removable orifice plate sized to restrict flows to the pre-development 1:2 year storm event, and a riser sized to handle the post-development 1:100 year storm event.

xvi. The flow control structure shall be located within a lockable manhole positioned within the embankment for purpose of maintenance, access, safety and aesthetics. The design of the outfall structure shall be determined based on the exit velocity of stormwater runoff from the wet detention pond.

xvii. Safety is to be provided by managing the contours of the wet detention pond to eliminate drop-offs and other hazards and by discouraging access to the permanent low level pool with appropriate vegetation on the safety bench in accordance with the detention pond landscaping criteria and Section 7. The safety bench, located at the toe of the side-slopes leading to the permanent low level pool, is to be 2 m wide with a maximum slope of 3% and is required around the entire perimeter of the wet detention pond. Where safety benches cannot be accommodated, fencing may be considered, subject to the approval of the City of Revelstoke.

xviii. A minimum of 4 signs shall be installed around the perimeter of the wet detention pond with the following wording:

xix.

DANGER!
Water levels are subject to sudden change
Please KEEP OUT
For information, call the City of Revelstoke, Operations Department

xx. A buffer strip of at least 7.5 m measured from the inside of the top bank

is to be provided around the entire perimeter of the wet detention pond.

xxi. A minimum distance of 12 m shall be maintained between the inside of the top bank and any structure.

xxii. Where possible, the wet detention pond's perimeter should be maintained as a forested buffer. In cases where retention of forest is not feasible, the buffer is to be landscaped in accordance with the detention pond landscaping criteria below with preference to native species.

xxiii. An access tract or road sufficient to accommodate maintenance vehicles shall be provided from the public right-of-way to the outlet structure.

xxiv. Pedestrian trails constructed to City of Revelstoke standards may be included where applicable and desired, subject to City of Revelstoke approval.

d) Detention Pond Landscaping Criteria

i. Where feasible, plantings should consist of native plants.

ii. All planting areas that are above permanent wetland pool shall be supplied with an automatic irrigation system. Planting and soils design shall anticipate that the irrigation system will be shut off approximately 3 years after planting, once the plants are established.

iii. Upon *Completion* of basic excavation of the wet detention pond, topsoil / wetland mulch amendments are to be incorporated. 0.30 m - 0.15 m of topsoil and/or wetland mulch is to be added to all depth zones.

iv. Grade to final elevations - after mulch and/or topsoil has been placed. All areas surrounding pond should be hydro seeded using a wet mix or other similar seed mix.

v. Provide standing time for wet pond - leave pond area for six to nine months to allow pond to experience storm flows. Details of the aquatic portion of the detention pond landscaping plan can be finalized using data collected during this time.

vi. All landscape/re-vegetation work in pond and surrounding areas must be performed by a competent landscape contractor, preferably experienced in aquatic/wetland re-vegetation.

Comment [BW16]: City queried whether these prescriptive SWM pond design criteria could be removed in favour of reference to 3rd party requirements.

Response:
Yes, this would a preferred approach – however it is not clear if design guidelines with this level of detail are available at a provincial level in BC. Further discussion required to understand City requirements (to balance level of detail, and simplicity of bylaw).

3.8.5. Major flood routing and flood control

a) Major Flow Routing

Unless the storm sewer system is oversized to accommodate the major flow (i.e. 100 year return period storm), provision for surface flow is required wherever the overland flows in excess of 0.05 cubic metres per second (m3/s) are anticipated. Major flow routing is generally accommodated along roadways, swales and watercourses. These designated flow paths will be protected by restrictive covenants or rights-of-ways and clearly identified in the Stormwater Management Plan.

The quantity of flow to be conveyed by the surface flow path is the total major flow less the capacity of the minor system. The design of the major flow routing will ensure to the satisfaction of the [*Name of Local Government*] that no endangering of public safety nor any substantial property damage will occur under the major flow conditions.

b) Roadway Surface Drainage

Roadways with barrier curbs and gutters can be designed as wide channels to convey major surface flow. The required freeboard between the water elevation at maximum ponding/flow and the lowest minimum building elevation of the adjacent buildings is specified in subsection 3.8.2. The maximum depths of flow will not exceed 150 mm above the gutter line. Flow velocities greater than 2.5 m/s ~~must be acceptable to~~ should be discussed with the City of Revelstoke, and options investigated for reducing potential flow velocity.

Comment [BW17]: Edited per City markup comment.

The Consulting Engineer will consider the impact of surface routing on the major flow hydraulic grade line (HGL) of adjacent lateral roads. Existing lateral roads designed with the major HGL below surface may preclude using surface flow routing on the road being designed.

Routing of major surface flow on roads with rollover curbs is discouraged.

The Consulting Engineer will submit calculations to verify that the surface flow is maintained within the road right-of-way and the water elevation at maximum ponding/flow is at least 0.35 metres below the lowest flood construction level (FCL) of adjacent buildings.

The design of the intersections will ensure that the surface flow can continue along the designated path crossing over lateral roads. Similar considerations are required if a change of surface flow direction is required at an intersection.

c) Ditches

Properly engineered ditches may be acceptable for permanent servicing of land *Development* projects in urban areas of the City of Revelstoke to reduce the storage required for stormwater management. As a guide, ditches adjacent to roadways should conform to the criteria indicated below.

In the case where the *Consulting Professional* wishes to adopt variations, these changes should be noted and the approval of the *Municipal Engineer* sought.

i. maximum depth ~~[*insert value*]~~1.0 m

ii. minimum bottom width ~~[*insert value*]~~0.5 m

iii. maximum side slope ~~[*insert value*]~~2.0(H): ~~[*insert value*]~~1.0(V)

iv. minimum grade ~~[*insert value*]~~0.5%

v. maximum velocity (Unlined ditch) ~~[*insert value*]~~1.0 m/s

Where soil conditions are suitable or where erosion protection is provided, higher velocities may be permitted. If grades are excessive, rip-rap lined bottoms and sides of ditches, erosion control structures or complete ditch enclosure may be required.

The minimum right-of-way width for a ditch will be [*insert value*] metres where the ditch crosses private property. The ditch will be offset in the right-of-way to permit a 3 metre wide access for maintenance vehicles. Additional right-of-way may be required to facilitate the ditch construction and access. The top of the ditch adjacent to the property line will be a minimum 0.5 metres away from that property line. Ditches will be designed to maximize infiltration.

d) Creeks

Natural creeks are integral components of the drainage system and the ecological system. If the process of *Development* or drainage design involves in-stream works, the Consulting Engineer will refer to the latest version of the "Land Development Guidelines for the Protection of Aquatic Habitat" prepared by the Department of Fisheries and Oceans (DFO) & the B.C. Ministry of Environment (MOE), and Section 9 of the *Water Act*.

Any activity within a creek corridor or wetland is subject to the provisions of the City of Revelstoke's Environmental Protection and Preservation Bylaw # [*insert bylaw number*] – and should be consistent with the City's Official Community Plan requirements.

Comment [BW18]: Edited per City markup comment.

All proposals for any works within a creek corridor must be forwarded (by the *Consulting Professional*) to the City of Revelstoke's Engineering and Development Services Department~~Engineering and Development Services Department~~, who will liaise with the Federal and Provincial Government agencies.

e) Culverts

Culverts on creeks will be designed to convey the major flow (200-year return period instantaneous flow) or greater with the design headwater not exceeding the top of the culvert. The Consulting Engineer will determine whether the culvert will operate under inlet or outlet control at design

conditions.

Concrete culverts are preferred for general uses. Corrugated steel culverts may be considered under special circumstances when their use can be justified.

The minimum diameter of culverts on creeks is 450 mm. The minimum diameter of driveway culverts that form part of the minor system is 300 mm. The average water velocity in culverts should not exceed:

- 1.2 m/s for lengths up to 24.4 metres
- 0.9 m/s for lengths greater than 24.4 metres

The minimum depth of cover over culverts is 0.3 metres, subject to the correct pipe loading criteria.

Inlet and outlet structures are required for all culverts designed for the 200-year return period instantaneous flow. Considerations for the installation of energy dissipation and erosion control will be included in the design.

Culverts on fish-bearing creeks must meet special conditions as specified by the City of Revelstoke's Environment, Parks and Engineering Department, Fisheries and Oceans Canada, and the BC Ministry of Environment (MOE). Such culverts will be required to be passable to fish. Habitat restoration works will generally be required. The Consulting Engineer will consult the City of Revelstoke to determine the requirement for individual projects.

Driveway culverts that form part of the minor system will have capacity for the runoff from the 10-year return period storm with the design headwater not to exceed the top of the culvert. All new driveway culverts will be sized to ensure that there is no adverse impact on adjacent properties under the 100-year return period runoff conditions.

Trash racks and/or debris barriers are required upstream of culvert installations, with the exception of driveway culverts with a diameter of 300 mm (or less). Refer to the Supplementary Standard Drawings.

f) Inlet and Outlet Structures

Refer to Supplementary Standard Drawings for the design of inlet and outlet structures for pipes up to 1200 mm diameter. Pipes larger than 1200 mm diameter and non-circular culverts require specially designed inlet and outlet structures. Outlets having discharge velocities in excess of 1 m/s require riprap and/or energy dissipating structures for erosion control.

Trash racks are required at the inlets and outlets of all pipes over 450 mm in diameter and exceeding 30 m in length (except large culverts in major watercourses). Trash racks may also be required on smaller diameter storm sewers at the discretion of the City of Revelstoke. See Supplementary Standard Drawings for trash rack details.

g) Flood Control and Debris Flow Hazards

Flood control provisions apply to *Development* on sites subject to flood-related hazards.

The need for site specific provisions will be determined by the [*Name of Local Government*] in consultation with the B.C. Ministry of Environment (MOE), and/or the City of Revelstoke's *Chief Building Official*. *Owners* and Consulting Engineers are directed to City of Revelstoke Creek Hazard Report, with respect to flood hazard reports which may need to be submitted in the case of properties located within identified flood and debris hazardous areas.

Steep creeks within the City of Revelstoke may be subject to debris flow or debris flood hazards, which are generally defined in the Overview Report on Debris Flow Hazards, prepared by [*insert name*], dated [*insert date*]. *Development* in such areas will require satisfactory mitigation of the respective hazards.

Creeks and rivers may also give rise to flood and erosion hazards which must be mitigated through implementation of flood construction levels (FCLs') and building setbacks as follows:

i. Proposed buildings that are subject to flood hazards require a specified FCL, which is the minimum elevation for main habitable floor areas. The FCL ensures that buildings are elevated sufficiently high that flood inundation will not occur up to the design flood condition. The FCL applies to the underside of wood floor systems, or the top of the concrete floor systems.

ii. FCLs are to be determined for any of the following conditions:

- 200-year return period flow for creeks and rivers (including 0.6 m freeboard).
- 100-year major flow path ~~plus~~ hydraulic gradeline (~~normally~~ plus 0.3 metres freeboard allowance~~unless acceptable to the~~).

Comment [BW19]: Referencing a document that may not exist within the City?

Comment [BW20]: Referencing a document that may not exist within the City?

Comment [BW21]: Highlighted by City in markup – this is a slightly odd way of explaining the requirements for building thresholds, but is considered valid. For simplicity it could be edited to reference the same (underside of foundation) elevation regardless of construction method.

- The Seymour River FCLs as shown on the floodplain map produced by MOE.

iii. The need for creek setbacks over and above the environmental protection requirements (in order to ensure safe building sites) will be determined on a site specific basis.

A gravity connection to the City of Revelstoke's storm drainage system may be made only where the habitable portion of a dwelling is above the major system hydraulic grade line.

Comment [BW22]: "Where does this fit in?"

Response:
It is intended to ensure that new developments that could be potentially at risk from major system flooding are not connected to the storm sewer system.

h) Limitations and Precautions to Implementing Source Controls in Hazardous Areas with Potential Slope Instability

The implementation of source controls is prohibited in potential slope instability areas. Source controls encourage infiltration that saturate soils and further reduces the stability of these hazardous slopes. Adequate setbacks from the top of these slopes must be delineated by a qualified Professional Geotechnical Engineer.

i)Groundwater Downslope Impact

A Hydrogeologist must be retained to assess the fate of infiltrated water to confirm that it does not pose an increased saturation/flooding risk to down slope areas and/or adjacent *Developed* or undeveloped sites.

Comment [BW23]: City comment. "What is the trigger for this review?"

Response:
It is recommended that a hydrogeologist respond to this question.

j)Overflows

As with all drainage works, source controls must be designed to ensure that facility overflows and interflows drain to the municipal minor/major drainage system or natural drainage path, and do not discharge to, or through, adjacent sites. Emergency overflows must be designed into all source controls.

3.8.6. Storm sewers and appurtenances (minor drainage system)

a) Scope

The emphasis of this section is on those criteria which determine the size and grade profiles of minor conveyance storm sewers and certain elements of the system arrangements, such as inlet requirements.

b) Level of service

The minor drainage system will be designed to convey the 5-year return period rainfall event runoff.

c) Storm Sewers

i. Sizing of Storm Sewers

Storm sewers shall be designed as open channels sized to provide the required capacity in free flow (not surcharged) conditions using Manning's formula. Manning's n of 0.013 shall be used for smooth wall plastic and concrete pipe, and 0.024 for corrugated pipes.

The minimum storm sewer size will be 200 mm inside diameter. Where ditches discharge directly into a storm sewer, the minimum pipe diameter will be 300 mm subject to the approval of the Municipal Engineer.

Downstream pipe sizes are not to be reduced unless the downstream pipe is 600 mm diameter or larger and increased grade provides adequate capacity. The maximum reduction is two pipe sizes and the system must be a closed pipe network or be protected with approved inlet structures. The Municipal Engineer must give approval to this condition.

ii. Surcharged Sewers

Surcharged sewers to convey the design flows are permitted only as

exceptions and with completion of a report by the Consulting Professional and approval of the Municipal Engineer. In all such cases, it must be clearly demonstrated that the projected highest hydraulic grade line has no impact on downstream properties.

iii. Storm Sewer Slope Requirements

All storm sewers shall be designed and constructed to give mean velocities, when flowing full, of 0.60 m/s or greater based on Manning's formula except that the minimum slope shall be 0.4% for the most upstream leg of any storm system (between the terminal manhole and the first manhole downstream there from) unless approved by the Municipal Engineer.

On steeper slopes the Consulting Professional is to consider if special provisions are required to protect against displacement of sewers by erosion or shock. No upper limit to flow velocities in storm sewers is defined, however, when supercritical flow does occur, (where steep grades are utilized), the Consulting Professional shall provide appropriate analysis and justification and make provisions in the design to ensure that structural stability and durability concerns are addressed. Flow throttling or energy dissipation measures to prevent scour may be required to control the flow velocity or to accommodate the transition back to subcritical flow.

For pipes on steep grades an approved anchoring system shall be provided in accordance with the Standard Drawings and Specifications.

iv. Location

Storm sewers are to be located as shown on the Standard Drawings within a Subdivision road right-of-way (ROW) or open lane. Where this is technically impractical and it is proposed to place storm sewers within private property the Consulting Professional is to provide rationale and analysis for consideration by the [Name of Local Government] Engineer. A minimum ROW width of 3.0 m will be required for maintenance purposes. Where storm and sanitary sewers are located in the same ROW, a minimum width of the ROW will be 5.0 m. ROW width requirements are to be approved by the Municipal Engineer

Comment [BW24]: Edit as per City markup comment.

v. Depth

Where the catchment is on both sides of a roadway, storm sewers shall be installed at a depth capable of servicing properties on both sides by gravity where economically feasible. Elevation of storm sewers at upstream tributary points must be of sufficient depth to service all of the tributary lands.

Sewers shall not be designed with pipe cover less than ~~[insert value]~~1.2 m above the crown of the pipe nor with depths in excess of [insert value] m (varies from city to city), unless there is justification by the Consulting Professional and approval is given by the Municipal Engineer.

Comment [BW25]: To be confirmed as acceptable by City.

Comment [BW26]: To be discussed with City to understand limits. Recommend a figure in the range of 5-6 m.

vi. Groundwater

Storm sewer connections to other utility trenches shall be provided where there is a possibility of groundwater infiltration. The Geotechnical Engineer is to provide a report and recommendations for review by the *Municipal Engineer*.

All roadway subsurface drainage systems are to be tied to the storm sewer system for positive drainage outfall, to the satisfaction of the Municipal Engineer.

Comment [BW27]: Edit as per City markup comment.

d) Manholes

Manholes are required at the following locations and as outlined in *MMCD*:

i. Every change in pipe size.

ii. Every change in grade, except as indicated in the Curved Pipes section.

iii. Every change in direction, except as indicated in the Curved Pipes section.

iv. Every pipe intersection except for 100mm and 150mm service connections, catch basin connections and junctions with trunk sewers 900mm diameter and larger.

v. Upstream end of every sewer line.

vi. 150m maximum spacing for pipes smaller than 900mm diameter.

vii. 250m maximum spacing for pipes 900mm diameter and larger.

e) Sump Manholes

Where ditches, swales or other open channels discharge into a storm sewer system, the initial connecting manhole shall be of a sump type unless this provision is provided by the receiving inlet structure.

f) Catch Basins

Catch basin design criteria are defined in *MMCD*.

g) Service connections

Each and every legal lot ~~and each unit of a residential duplex~~ shall be provided with a separate service connection.

Comment [BW28]: The need for individual residential duplex units to have separate storm sewer service connections is not clear.

Unless otherwise approved by the City of Revelstoke, connections are to serve the perimeter (foundation) drains of all buildings by gravity. Building elevations should be established accordingly. Pumped connections may be permitted if requested prior to sewer design and if appropriate covenants are provided.

i. Size

- Pipe size to accommodate peak design flow.
- Minimum pipe size diameters for service connections are 100mm except for industrial/commercial connections which shall have minimum diameter of 150mm.

ii. Location and Depth

- Connections to large lots are to be located at the lower portion of each

lot. For urban *Developments*, location of connection to follow the standard drawings.

- The connection elevation at the property line is to be above the minor system HGL.
- Other depth requirements are as indicated for storm sewer mains.

iii. Grade

Minimum grade from property line to storm sewer main:

- 100mm diameter pipe: 1.5%
- 150mm diameter pipe: 1.0%
- Larger sizes: Grade based on minimum velocity of 0.75 m/s

iv. Details

Use standard wye fittings for connections to new mains. For connections to existing mains, use wye saddles or insertable tees.

Connections exceeding 30m in length will be treated as mains.

- Service connections may be permitted into manholes if:
  - The connection is not oriented against the flow in the main.
  - Manhole hydraulic requirements are met.
  - Manholes are required on service connections larger than 250mm diameter.
- Inspection chambers are required on residential connections unless the service is less than 2.5m long and connect to a manhole.
- Inspection chambers to *MMCD* standards. Stormwater inspection chamber lids to be ~~green in colour~~specified in accordance with City of Revelstoke requirements.

h) Temporary clean outs

Temporary clean outs may be provided at terminal sections of a main provided that:

- Future extension of the main is designed as an overall phased development.
- Clean outs are not considered a permanent structure.

i)French drains

The use of French drains shall only be permitted where the topography and soil conditions are proven adequate to the acceptance of the City of Revelstoke. A soils report will be required to support the design.

j)Erosion and sediment control

i. The *Consulting Professional* will be required to demonstrate how work will be undertaken and *Completed* so as to prevent the release of silt, raw concrete and concrete leachate, and other deleterious substances into any ditch, storm drain, watercourse or ravine. Construction and excavation wastes, overburden soil or other deleterious substances must be disposed of or placed in such a manner as to prevent their entry into any water course, ravine, storm drain system, or restrictive covenant area.

ii. Should siltation or erosion controls be required, details of the proposed works are to be included in the approved drawings and must be installed as part of the works.

iii. All siltation control devices must be situated to provide ready access for cleaning and maintenance.

iv. Proposed siltation control structures must be maintained throughout the course of construction and to the end of the maintenance period (final acceptance). Changes in the design of the structure will be required if the proposed structure is found to be inadequate.

REFERENCE TO *MMCD* AND CITY OF REVELSTOKE's STANDARD DRAWINGS WOULD BE ADDED HERE WHEN PREPARING INDIVIDUAL BYLAWS