DOWNTOWN SOUTH

RALEIGH, NORTH CAROLINA

DOWNSTREAM IMPACT ANALYSIS

PRELIMINARY

PROJECT NUMBER: KAN-19020

DESIGNED BY: DANIEL WIEBKE, PE, CFM
CAMERON JAMES, PE
LAURYN KABRICH, EI
TOMMY DABOLT

DATE: NOVEMBER 2020

Daniel Wiebke
Nov 12 2020 1:45 AM

MCADAMS

2905 MERIDIAN PARKWAY
DURHAM, NORTH CAROLINA 27713
NC LIC. # C-0293

MCADAMS

November 12, 2020

Greg Kuruc
Director - Development
Kane Realty Corporation
4321 Lassiter at North Hills Avenue Suite 250, Raleigh, NC 27609

RE: Downtown South – Preliminary Downstream Impact Analysis (Raleigh, North Carolina)

Dear Mr. Kuruc,

Provided herein is an updated preliminary assessment of downstream impacts along Walnut Creek, which has additional detail at the request of both City Staff and some portions of the Kris Bass letter and was prepared with regard and in response to the proposed Downtown South development in Raleigh, North Carolina. Downtown South is currently planned to encompass several parcels located between Lake Wheeler Road and S. Wilmington Street along the I-40 corridor. Proposed development for Downtown South will be a mixed-use development combining lodging, retail, multi-family residential, recreation, and other uses. Downtown South is currently slated to have an overall impervious percentage less than 95. Both proprietary and green stormwater infrastructure (GSI) techniques will be utilized to provide treatment of stormwater runoff in the post-development condition, which drains directly to Walnut Creek. The purpose of this analysis is to determine, at a preliminary level, the potential impact on flooding that the Downtown South development may cause downstream along Walnut Creek and what the impacts of this development are if detention of stormwater were implemented.

The magnitude and timing of flows discharging from Downtown South in the post-developed condition was estimated and compared to values determined for the Predevelopment condition and a condition in which 10-year detention was simulated at each of the three sites. The 2-year, 10-year, 50-year, and 100-year storm events were analyzed at each of the (now five total) analysis points: S. Wilmington Street, Garner Road, UT to Walnut Creek, S. State Street and Rose Lane. These comparisons were completed for five locations along Walnut Creek downstream of the development. The development of each parcel was conservatively estimated to be 95% impervious outside the 1% annual chance floodplain, 15% imperious within the flood fringe (located within floodplain but outside the floodway), and 0% impervious within the floodway. The first downstream analysis point is directly upstream of S. Wilmington Street, the second is at Garner Road, the third is on UT to Walnut Creek at Bailey Drive, the fourth adjacent to the Rochester Heights neighborhood (of particular concern due to existing flooding issues), just upstream of S. State Street and the final is downstream at Rose Lane.

HEC-HMS by the Army Corps of Engineers was primarily utilized to predict the watershed behavior of Walnut Creek at the five locations, the HEC-HMS model was received from NC Floodplain Mapping. The HEC-HMS model is the basis for the flows utilized in FEMA Floodplain Maps and was compared to FEMA published values to confirm

validity. Further, USGS StreamStats routines were run for 3 of the downstream locations to confirm general magnitude of flows and behavior.

The USGS StreamStats tool was used to determine the drainage area to three downstream analysis points along Walnut Creek. The total drainage area of Walnut Creek to S. Wilmington Street was determined to be 17.2 square miles, or 11,000 acres, with a time of concentration of 4.9 hours determined using the Kirpich Equation. The total drainage area of Walnut Creek to S. Slate Street, adjacent to the Rochester Heights neighborhood, was determined to be 23.4 square miles, or 15,000 acres, with a time of concentration of 5.4 hours determined using the Kirpich Equation. The total drainage area of Walnut Creek to Rose Ln. was determined to be 28.2 square miles, or 18,000 acres, with a time of concentration of 6.2 hours determined using the Kirpich Equation. FEMA preliminary Flood Insurance Study (FIS) data indicates a 100-year discharge of 4,835 cfs at the S. Wilmington Street location. FEMA preliminary FIS data indicates a 100-year discharge of 9,159 cfs at the Rochester Heights location. This significant increase in peak discharge is due to the confluence of Walnut Creek and Rocky Branch between S. Wilmington Street and Hammond Road. FEMA preliminary FIS data indicates a 100-year discharge of 8,376 cfs at Rose Lane location. All these flows are commensurate with what is represented in the HEC-HMS model utilized in this preliminary analysis. Figure 1 (attached) shows the overall Walnut Creek drainage area to these three downstream points.

A USGS Streamstats report has been included for the drainage area of the UT to Bailey Drive, which shows that approximately 0.47 square miles, or 300 acres, drains along this tributary through the Rochester Heights subdivision. Updated graphs have been provided showing the impact of isolated site runoff (from the Downtown South development with curve numbers updated as noted in the paragraph above) at each downstream analysis point along Walnut Creek for the 2-year, 10-year, 50-year, and 100-year storms. The UT to Bailey Dr. exhibits peak discharges of 536 cfs, 874 cfs, and 1,009 cfs during the 10-year, 50-year, and 100-year storms, respectively, and is not impacted by isolated site runoff (as indicated on the graphs) from the Downtown South development. Peak discharges along this tributary likely attribute to the flooding currently being experienced in the Rochester Heights subdivision.

The proposed Downtown South development consists of three main areas, referred to as Area A, Area B, and Area C, respectively, each of which is made up of multiple parcels. The total project area is approximately 150 acres, which represents approximately 1.4% of the total Walnut Creek watershed area at the project's most downstream point. Web Soil Survey was used to determine the hydrologic soil group of the onsite soils, and the times of concentration were calculated using SCS TR-55 methodology (Segmental Approach, 1986). The maximum total travel time for the site is represented by the sum of the time concentration and the reach times. For both the pre-development and post development flows each of the areas was removed from its respective subbasin within the HMS model and a subbasin representative of the Area (A, B1, B2, and C) were added to the HMS model with the commensurate Area, Curve Number and Lag Time (based on Tc).

A graph has been prepared for each downstream analysis point that shows three separate data series: inflow hydrograph of the total upstream watershed (considers Downtown South site in its current state), inflow

hydrograph from the proposed Downtown South development (based on post-developed condition assumption), and a combined inflow hydrograph representing the total upstream watershed (considers Downtown South site as developed).

For the 10-year detention condition PondPack Version V8i was used to determine a realistic detention configuration. Sub-basins representative of each site were created in the pre-development condition and connected through representative reaches, all ultimately discharging to the east toward Wilmington Street. Four points at existing property boundaries were utilized to check detention compliance for all areas. Large rectangular structures with constant areas at each elevation, a 10-year flow orifice, an overflow weir and an outflow pipe were used to simulate detention for each area.

Once detention at each property line was met, the stage-storage and stage-discharge information from the respective detention structure for each area was exported. This stage-storage and stage-discharge information was then input as attenuation structures in the HMS model just downstream of the respective area as it previously tied back into the Walnut Creek Watershed model.

The resulting flows for both the current hydrology at S. Wilmington Street, Garner Road, S. State Street and Rose Lane and the hydrology with the addition of the Downtown South Site are shown in the attached graphs. For the 100-year storm at S. Wilmington Street, the site peaks over 4 hours before the ultimate watershed peak experienced at this location. At Garner Road decreases are attributed to isolated site runoff reaching Garner Road approximately two hours earlier than the overall watershed's peak. For example, the HEC-HMS modeled peak discharge of the isolated site runoff experienced at Garner Road is 304 cfs during the 10-year storm, however, by the time the overall watershed's peak occurs (about two hours later), the site discharge contributes 0 cfs to the overall 5,800 cfs peak. The State Street location gets the site flows through approximately 1.5 hours before the ultimate watershed peak. The peak discharge at Rose Ln increases by 30 cfs during the 10-year storm between the HMS Pre-Site and Post-development un-detained condition. Due to the greater time between the site peak and the peak of the overall watershed at S. Wilmington Street, the HEC-HMS modeled flow with the developed site only increases by 5 cfs than in its existing condition. Further downstream at Garner Road and S. State Street, the watershed peak and site peak are much closer in time, such that the diminishing flows of the site minimally contribute to the over 9,000 cfs peak.

Of particular note within the existing HEC-HMS model for Walnut Creek that the peak discharge at Garner Rd (Junction J_WildB_1_WC-20) is greater than the peak further downstream at S. State St. (Junction J_WC-18) for all design storms. The HEC-HMS model was originally set up by Dewberry to account for attenuation via stream routing and reservoir routing. The reach within HEC-HMS corresponding to the segment connecting Garner Rd. to S. State St., R_WC_18, is defined by a storage/discharge curve that exhibits a higher storage capacity than the next upstream reach (R_WC_19 - connecting Hammond Rd. to Garner Rd.). The increased storage for R_WC_18 may be attributed to the increase in floodway area from Hammond Rd. to S. Slate St., which provides a greater flood storage when accounting for stream routing attenuation.

MCADAMS

As indicated on the graphs, peak runoff rates from the proposed Downtown South development are anticipated to reach the downstream analysis points earlier than the overall peak of the total contributing watershed. If detention of stormwater runoff is provided as part of the Downtown South development, this would attenuate and delay flows to be released into Walnut Creek at a later time. Delaying the release of larger events would likely extend the duration of high to moderate flow rates and thus increase the likelihood of the elevated site discharge and watershed peak aligning. Increased alignment of the watershed peak with increased rates from the site would create larger overall flow rates within Walnut Creek and would further exacerbate existing downstream flooding issues.

Overall, this presumption was validated by the increase in peak flows as a result of simulated 10-year detention for all storms and locations except for at Rose Lane. These increased flow rates are shown in the summary of results accompanying this letter. Additionally, flow velocities associated with pre and post development flow rates at cross-sections taken from the FEMA HEC-RAS model associated with Walnut Creek are summarized and shown as an attachment.

If you have any further questions regarding this analysis, please feel free to contact me at 919-361-5000.

Sincerely,
MCADAMS

Daniel Wiebke, PE, CFM
Project Manager, Water Resources

RELEASE RATE MANAGEMENT RESULTS - HEC HMS

S. Wilmington St. (HMS Junction J_WC_21)					
Return Period	**Pre-Dev** [cfs]	**Post-Dev Undetained** [cfs]	**Post-Dev 10-Yr Detained** at Site [cfs]	**% Increase Pre-Dev vs.** Post-Dev Undetained [%]	**% Increase Pre-Dev _____** vs. Post-Dev 10-Yr detained [%]
2-Year	1741.67	1749.22	1761.20	0.4%	1.1%
10-Year	2721.21	2725.99	2760.60	0.2%	1.4%
50-Year	4067.81	4075.65	4109.60	0.2%	1.0%
100-Year	4824.35	4831.32	4862.10	0.1%	0.8%

Garner Rd. (HMS Junction J_WildB_1_WC_20)					
Return Period	**Pre-Dev** [cfs]	**Post-Dev Undetained** [cfs]	**Post-Dev 10-Yr Detained** at Site [cfs]	**% Increase Pre-Dev vs.** Post-Dev Undetained [%]	**% Increase Pre-Dev _____** vs. Post-Dev 10-Yr detained [%]
2-Year	3424.08	3433.72	3448.60	0.3%	0.7%
10-Year	5779.62	5783.64	5812.70	0.1%	0.6%
50-Year	8577.30	8574.71	8618.24	0.0%	0.5%
100-Year	9549.54	9546.63	9594.50	0.0%	0.5%

S. State St. / Rochester Heights Subdivision (HMS Junction J_WC_18)					
Return Period	**Pre-Dev** [cfs]	**Post-Dev Undetained** [cfs]	**Post-Dev 10-Yr Detained** at Site [cfs]	**% Increase Pre-Dev vs.** Post-Dev Undetained [%]	**% Increase Pre-Dev _____** vs. Post-Dev 10-Yr detained [%]
2-Year	3013.07	3043.36	3034.20	1.0%	0.7%
10-Year	5285.86	5304.92	5306.30	0.4%	0.4%
50-Year	7954.63	7966.83	7985.49	0.2%	0.4%
100-Year	9130.46	9137.17	9163.30	0.1%	0.4%

Unnamed Tributary to Bailey Drive (HMS Junction J_WCT_11_1)					
Return Period	**Pre-Dev** [cfs]	**Post-Dev Undetained** [cfs]	**Post-Dev 10-Yr Detained** at Site [cfs]	**% Increase Pre-Dev vs.** Post-Dev Undetained [%]	**% Increase Pre-Dev _____** vs. Post-Dev 10-Yr detained [%]
2-Year	283.78	283.78	283.78	0.0%	0.0%
10-Year	535.55	535.55	535.55	0.0%	0.0%
50-Year	874.19	874.19	874.19	0.0%	0.0%
100-Year	1009.28	1009.28	1009.28	0.0%	0.0%

Rose Ln. (HMS Junction J_WCT7_1_WC_12)					
Return Period	**Pre-Dev** [cfs]	**Post-Dev Undetained** [cfs]	**Post-Dev 10-Yr Detained** at Site [cfs]	**% Increase Pre-Dev vs.** Post-Dev Undetained [%]	**% Increase Pre-Dev _____** vs. Post-Dev 10-Yr detained [%]
2-Year	2692.30	2723.17	2705.30	1.1%	0.5%
10-Year	4803.74	4833.89	4818.58	0.6%	0.3%
50-Year	7275.95	7302.88	7293.24	0.4%	0.2%
100-Year	8401.00	8436.51	8426.50	0.4%	0.3%

Summary of Result Post Development 10-year Detained				
Nodes	**10 year event**		**100 year event**	
	Pre	**Post**	**Pre**	**Post**
Area A	73.51	60.55	117.59	110.94
Area B-1	11.22	9.98	26.14	28.19
Area B-2	47.52	43.75	91.87	83.95
Area C-1	34.16	36.88	49.83	96.02
Area C-2	117.05		171.8	
J-WC-22	108.86	69.66	180.22	135.84
J-WC-23	82.79	60.04	139.7	136.33
Property Line	146.37	142.45	255.4	302.89
South Saunders	82.79	69.66	139.7	135.84
WCT12	47.52	43.74	91.87	83.95
WCT13	11.22	9.98	26.14	28.34
Wilmington Street	227.3	147.74	379.78	302.68
10-year Point of Analysis				

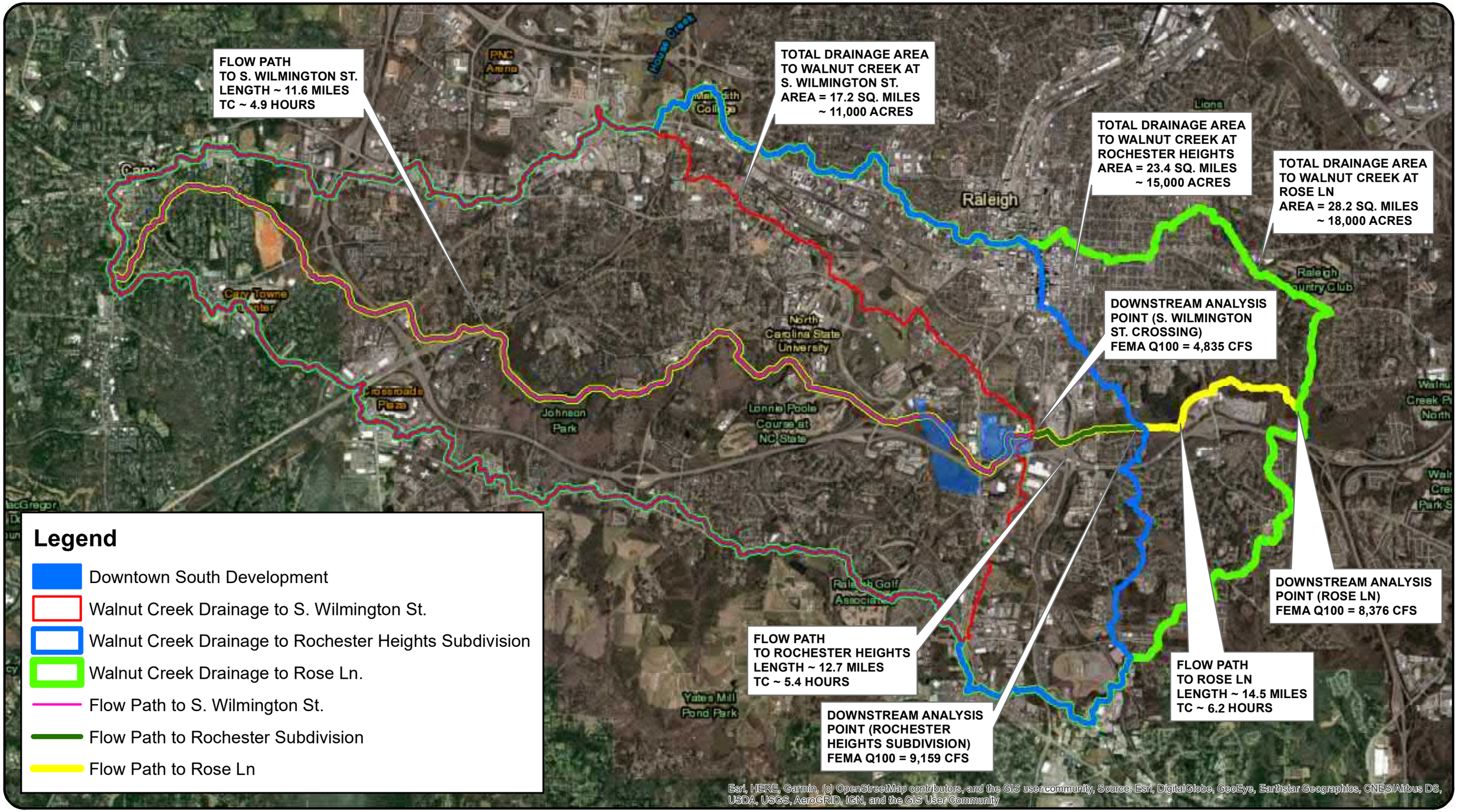
SUMMARY OF FLOW VELOCITIES - FLOWMASTER

S. Wilmington St. (HMS Junction J_WC_21)			
Return Period	**Pre-Dev** [ft/s]	**Post-Dev 10-Yr** Detained at Site [ft/s]	**% Increase** [%]
2-Year	8.33	8.36	0.4%
10-Year	6.59	6.60	0.2%
50-Year	6.97	6.98	0.1%
100-Year	7.02	6.98	-0.6%

Garner Rd. (HMS Junction J_WildB_1_WC_20)			
Return Period	**Pre-Dev** [ft/s]	**Post-Dev 10-Yr** Detained at Site [ft/s]	**% Increase** [%]
2-Year	1.93	1.93	0.0%
10-Year	2.24	2.24	0.0%
50-Year	2.52	2.53	0.4%
100-Year	2.62	2.63	0.4%

S. State St. / Rochester Heights Subdivision (HMS Junction			
Return Period	**Pre-Dev** [ft/s]	**Post-Dev 10-Yr** Detained at Site [ft/s]	**% Increase** [%]
2-Year	1.53	1.53	0.0%
10-Year	1.73	1.74	0.6%
50-Year	2.00	2.00	0.0%
100-Year	2.11	2.11	0.0%

Rose Ln. (HMS Junction J_WCT7_1_WC_12)			
Return Period	**Pre-Dev** [ft/s]	**Post-Dev 10-Yr** Detained at Site [ft/s]	**% Increase** [%]
2-Year	1.44	1.45	0.7%
10-Year	1.80	1.80	0.0%
50-Year	2.11	2.12	0.5%
100-Year	2.24	2.24	0.0%



N

0 2,500 5,000 Feet

1 inch = 5,000 feet

WALNUT CREEK DOWNSTREAM IMPACT ANALYSIS

FIGURE 1. TOTAL DRAINAGE TO S. WILMINGTON ST., ROCHESTER HEIGHTS AND ROSE LN.

RALEIGH, NORTH CAROLINA

McAdams

EXISTING
MAYWOOD AVENUE
(VARIABLE WIDTH PUBLIC R/W)

AREA A
AREA = 1,580,415 SF
(36.28 AC)

REACH 1

REACH 2

EXISTING
S. SAUNDERS STREET
(VARIABLE WIDTH PUBLIC R/W)

AREA C
AREA = 2,763,814 SF
(63.45 AC)

J-1

POA

REACH 5

EXISTING
S. WILMINGTON STREET
(200' PUBLIC R/W)

J-2

REACH 3

AREA B1
AREA = 532,434 SF
(12.22 AC)

EXISTING
I-40
(260' CONTROLLED ACCESS R/W)

REACH 4

AREA B2
AREA = 1,643,933 SF
(37.74 AC)

LEGEND

SUBBASIN LINE
REACH
PROPERTY LINE

GRAPHIC SCALE
0 100 200 400
1 inch = 200 ft.

PRELIMINARY DRAWING - NOT RELEASED FOR CONSTRUCTION

X:\Projects\KAN\KAN-19020\Storm\DIA\Current Drawing\KAN19020 DIA.dwg, 10/28/2020 10:09:15 AM, Dabolt, Tommy

McADAMS
The John R. McAdams Company, Inc.
2905 Meridian Parkway
Durham, NC 27713

phone 919. 361. 5000
fax 919. 361. 2269
license number: C-0293, C-187

www.mcadamsco.com

CLIENT

KANE REALTY
4321 LASSITER AT NORTH HILLS AVE., SUITE250
RALEIGH, NORTH CAROLINA

KANE
REALTY CORPORATION

DOWNTOWN SOUTH
DRAINAGE AREA MAP
RALEIGH, NORTH CAROLINA

REVISIONS

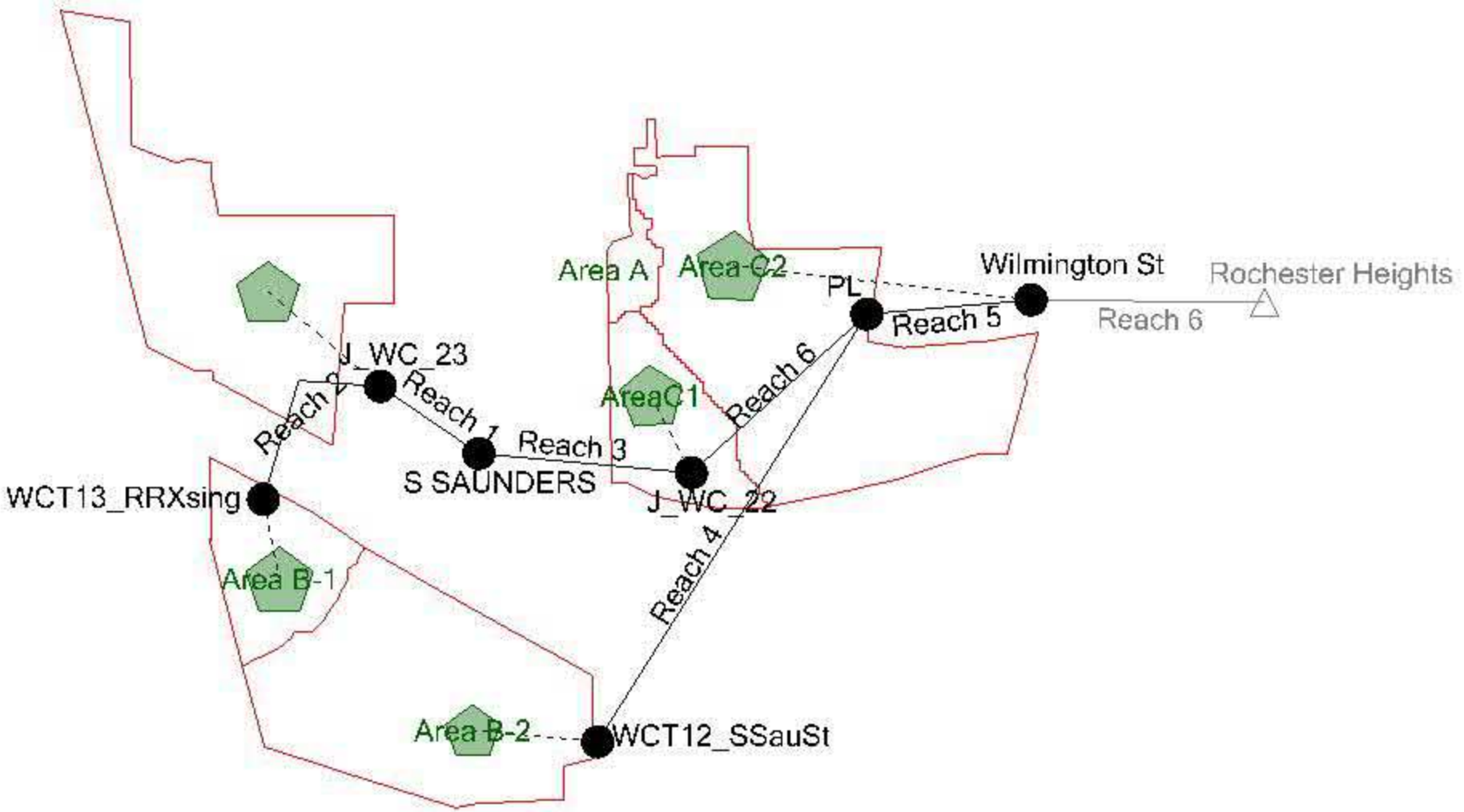
NO. DATE

PLAN INFORMATION

PROJECT NO.	KAN-19020
FILENAME	KAN19020 DIA
CHECKED BY	DCW
DRAWN BY	TKD
SCALE	1"=200'
DATE	10. 27. 2020

SHEET

FIGURE 2


Area A
Area C2
Wilmington St
Rochester Heights
PL
Reach 5
Reach 6
J_WC_23
Reach 2
Reach 1
Reach 3
Reach 6
AreaC1
S SAUNDERS
J_WC_22
WCT13_RRXsing
Area B-1
Reach 4
Area B-2
WCT12_SSauSt

PRE-DEVELOPMENT HYDROLOGY

Summary of Results

HYDROLOGY INPUT SUMMARY

Sub-basin ID	Onsite Area [acres]					Offsite Area [acres]					Total Area [acres]	SCS CN	Tc [min]
	Impervious	Open	Wooded	Pond	Total	Impervious	Open	Wooded	Pond	Total			
Area A	3.69	1.44	34.03	0.00	39.16	0.00	0.00	0.00	0.00	0.00	39.16	78	34.22
Area B-1	0.00	0.48	11.75	0.00	12.22	0.00	0.00	0.00	0.00	0.00	12.22	57	17.15
Area B-2	0.03	2.32	31.89	3.50	37.74	0.00	0.00	0.00	0.00	0.00	37.74	65	25.62
Area C1	2.96	8.78	0.61	0.00	12.35	0.00	0.00	0.00	0.00	0.00	12.35	65	23.86
Area C2	15.59	22.31	10.32	0.00	48.21	0.00	0.00	0.00	0.00	0.00	48.21	84	31.76
Totals =	22.27	35.31	88.60	3.50	**149.68**	0.00	0.00	0.00	0.00	**0.00**	**149.68**		

PRE-DEVELOPMENT HYDROLOGY

Area A

I. SCS CURVE NUMBERS

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	0.0%
HSG 'C' =	14.3%
HSG 'D' =	85.7%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	79	Assume good condition
Wooded	76	Assume good condition

II. PRE-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roadway Area	0	0.00
Driveway / Parking Lot	0	0.00
Roof	0	0.00
Sidewalk / Patio	0	0.00
Other	0	0.00
Totals	0	0.00

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	160,945	3.69	-
Onsite open	79	62,557	1.44	Assume good condition
Onsite wooded	76	1,482,395	34.03	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	79	0	0.00	Assume good condition
Offsite wooded	76	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	39.16	acres
	1,705,897	sf
Composite SCS CN =	78	
% Impervious =	9.4%	

C. Time of Concentration Information

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Segment 1: Overland Flow

Length =	100	ft
Top Elev =	292.00	ft
Bot Elev =	290.00	ft
Height =	2	ft
Slope =	0.0200	ft/ft
Manning's n =	0.40	wooded
P (2-year/24-hour) =	3.49	inches (Raleigh, NC)
Segment Time =	***20.54***	***minutes***

Segment 2: Concentrated Flow

Length =	464	ft
Top Elev =	290.00	ft
Bot Elev =	238.00	ft
Height =	52	ft
Slope =	0.1121	ft/ft
Paved ? =	No	
Velocity =	5.40	ft/sec
Segment Time =	***1.43***	***minutes***

Segment 3: Channel Flow

Length =	2223	ft
Top Elev =	238.00	
Bot Elev =	234.00	
Height =	4	ft
Slope =	0.0018	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	120.00	sf (assume 30'w x 4'h channel)
Wetted Perimeter =	38.00	lf (assume 30' x 4' channel)
Channel Velocity =	3.02	ft/sec
Segment Time =	***12.26***	***minutes***

Time of Concentration =	34.22	minutes
SCS Lag Time =	20.53	minutes (SCS Lag = 0.6* Tc)
Time Increment =	5.96	minutes (= 0.29*SCS Lag)

PRE-DEVELOPMENT HYDROLOGY

Area B-1

I. SCS CURVE NUMBERS

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	22.4%
HSG 'B' =	43.6%
HSG 'C' =	0.0%
HSG 'D' =	34.0%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	63	Assume good condition
Wooded	57	Assume good condition

II. PRE-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roadway Area	0	0.00
Driveway / Parking Lot	0	0.00
Roof	0	0.00
Sidewalk / Patio	0	0.00
Other	0	0.00
Totals	0	0.00

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	0	0.00	-
Onsite open	63	20,805	0.48	Assume good condition
Onsite wooded	57	511,629	11.75	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	63	0	0.00	Assume good condition
Offsite wooded	57	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	12.22	acres
	532,434	sf
Composite SCS CN =	57	
% Impervious =	0.0%	

C. Time of Concentration Information

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Segment 1: Overland Flow

Length =	100	ft
Top Elev =	280.00	ft
Bot Elev =	272.00	ft
Height =	8	ft
Slope =	0.0801	ft/ft
Manning's n =	0.40	wooded
P (2-year/24-hour) =	3.49	inches (Raleigh, NC)
Segment Time =	***11.80***	***minutes***

Segment 2: Concentrated Flow

Length =	910	ft
Top Elev =	272.00	ft
Bot Elev =	244.00	ft
Height =	28	ft
Slope =	0.0308	ft/ft
Paved ? =	No	
Velocity =	2.83	ft/sec
Segment Time =	***5.36***	***minutes***

Time of Concentration =	17.15	minutes
SCS Lag Time =	10.29	minutes (SCS Lag = 0.6* Tc)
Time Increment =	2.98	minutes (= 0.29*SCS Lag)

PRE-DEVELOPMENT HYDROLOGY

Area B-2

I. SCS CURVE NUMBERS

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	29.3%
HSG 'B' =	11.9%
HSG 'C' =	0.0%
HSG 'D' =	58.8%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	66	Assume good condition
Wooded	61	Assume good condition

II. PRE-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roadway Area	0	0.00
Driveway / Parking Lot	0	0.00
Roof	0	0.00
Sidewalk / Patio	0	0.00
Other	1,462	0.03
Totals	1,462	0.03

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	1,462	0.03	-
Onsite open	66	100,987	2.32	Assume good condition
Onsite wooded	61	1,389,068	31.89	Assume good condition
Onsite pond	100	152,416	3.50	-
Offsite impervious	98	0	0.00	-
Offsite open	66	0	0.00	Assume good condition
Offsite wooded	61	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	37.74	acres
	1,643,933	sf
Composite SCS CN =	65	
% Impervious =	0.1%	

C. Time of Concentration Information

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Segment 1: Overland Flow

Length =	100	ft
Top Elev =	278.00	ft
Bot Elev =	273.00	ft
Height =	5	ft
Slope =	0.0501	ft/ft
Manning's n =	0.40	wooded
P (2-year/24-hour) =	3.49	inches (Raleigh, NC)
Segment Time =	***14.24***	***minutes***

Segment 2: Concentrated Flow

Length =	618	ft
Top Elev =	273.00	ft
Bot Elev =	246.00	ft
Height =	27	ft
Slope =	0.0437	ft/ft
Paved ? =	No	
Velocity =	3.37	ft/sec
Segment Time =	***3.05***	***minutes***

Segment 3: Channel Flow

Length =	1612	ft
Top Elev =	246.00	
Bot Elev =	234.00	
Height =	12	ft
Slope =	0.0074	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	12.00	sf (assume 6'w x 2'h channel)
Wetted Perimeter =	10.00	lf (assume 6' x 2' channel)
Channel Velocity =	3.23	ft/sec
Segment Time =	***8.33***	***minutes***

Time of Concentration =	25.62	minutes
SCS Lag Time =	15.37	minutes (SCS Lag = 0.6* Tc)
Time Increment =	4.46	minutes (= 0.29*SCS Lag)

PRE-DEVELOPMENT HYDROLOGY

Area C1

I. SCS CURVE NUMBERS

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	0.0%
HSG 'C' =	0.0%
HSG 'D' =	100.0%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	80	Assume good condition
Wooded	77	Assume good condition

II. PRE-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roadway Area	0	0.00
Driveway / Parking Lot	0	0.00
Roof	0	0.00
Sidewalk / Patio	0	0.00
Other	0	0.00
Totals	0	0.00

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	128,760	2.96	-
Onsite open	80	382,340	8.78	Assume good condition
Onsite wooded	77	26,702	0.61	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	80	0	0.00	Assume good condition
Offsite wooded	77	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	12.35	acres
	537,802	sf
Composite SCS CN =	84	
% Impervious =	23.9%	

C. Time of Concentration Information

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Segment 1: Overland Flow

Length =	100	ft
Top Elev =	258.00	ft
Bot Elev =	256.00	ft
Height =	2	ft
Slope =	0.0200	ft/ft
Manning's n =	0.24	dense grasses
P (2-year/24-hour) =	3.49	inches (Raleigh, NC)
Segment Time =	***13.65***	***minutes***

Segment 2: Concentrated Flow

Length =	75	ft
Top Elev =	256.00	ft
Bot Elev =	252.00	ft
Height =	4	ft
Slope =	0.0533	ft/ft
Paved ? =	No	
Velocity =	3.73	ft/sec
Segment Time =	***0.34***	***minutes***

Segment 3: Concentrated Flow

Length =	157	ft
Top Elev =	252.00	ft
Bot Elev =	251.75	ft
Height =	0	ft
Slope =	0.0016	ft/ft
Paved ? =	Yes	
Velocity =	0.81	ft/sec
Segment Time =	***3.23***	***minutes***

Segment 4: Concentrated Flow

Length =	583	ft
Top Elev =	251.75	ft
Bot Elev =	228.00	ft
Height =	24	ft
Slope =	0.0407	ft/ft
Paved ? =	No	
Velocity =	3.26	ft/sec
Segment Time =	***2.98***	***minutes***

Segment 5: Channel Flow

Length =	789	ft
Top Elev =	228.00	
Bot Elev =	226.00	
Height =	2	ft
Slope =	0.0025	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	120.00	sf (assume 30'w x 4'h channel)
Wetted Perimeter =	38.00	lf (assume 30' x 4' channel)
Channel Velocity =	3.59	ft/sec
Segment Time =	***3.66***	***minutes***

Time of Concentration =	23.86	minutes
SCS Lag Time =	14.31	minutes (SCS Lag = 0.6* Tc)
Time Increment =	4.15	minutes (= 0.29*SCS Lag)

PRE-DEVELOPMENT HYDROLOGY

Area C2

I. SCS CURVE NUMBERS

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	0.0%
HSG 'C' =	0.0%
HSG 'D' =	100.0%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	80	Assume good condition
Wooded	77	Assume good condition

II. PRE-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roadway Area	0	0.00
Driveway / Parking Lot	0	0.00
Roof	0	0.00
Sidewalk / Patio	0	0.00
Other	0	0.00
Totals	0	0.00

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	678,966	15.59	-
Onsite open	80	971,616	22.31	Assume good condition
Onsite wooded	77	449,545	10.32	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	80	0	0.00	Assume good condition
Offsite wooded	77	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	48.21	acres
	2,100,127	sf
Composite SCS CN =	85	
% Impervious =	32.3%	

C. Time of Concentration Information

Time of concentration is calculated using the SCS Segmental Approach (TR-55).

Segment 1: Overland Flow

Length =	100	ft
Top Elev =	284.00	ft
Bot Elev =	283.00	ft
Height =	1	ft
Slope =	0.0100	ft/ft
Manning's n =	0.24	dense grasses
P (2-year/24-hour) =	3.49	inches (Raleigh, NC)
Segment Time =	***18.01***	***minutes***

Segment 2: Concentrated Flow

Length =	508	ft
Top Elev =	283.00	ft
Bot Elev =	250.00	ft
Height =	33	ft
Slope =	0.0650	ft/ft
Paved ? =	No	
Velocity =	4.11	ft/sec
Segment Time =	***2.06***	***minutes***

Segment 2: Concentrated Flow

Length =	190	ft
Top Elev =	250.00	ft
Bot Elev =	249.00	ft
Height =	1	ft
Slope =	0.0053	ft/ft
Paved ? =	Yes	
Velocity =	1.47	ft/sec
Segment Time =	***2.15***	***minutes***

Segment 2: Concentrated Flow

Length =	664	ft
Top Elev =	249.00	ft
Bot Elev =	226.00	ft
Height =	23	ft
Slope =	0.0346	ft/ft
Paved ? =	No	
Velocity =	3.00	ft/sec
Segment Time =	***3.69***	***minutes***

Segment 3: Channel Flow

Length =	1360	ft
Top Elev =	226.00	
Bot Elev =	222.00	
Height =	4	ft
Slope =	0.0029	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	120.00	sf (assume 30'w x 4'h channel)
Wetted Perimeter =	38.00	lf (assume 30' x 4' channel)
Channel Velocity =	3.87	ft/sec
Segment Time =	***5.86***	***minutes***

Time of Concentration =	31.76	minutes
SCS Lag Time =	19.06	minutes (SCS Lag = 0.6* Tc)
Time Increment =	5.53	minutes (= 0.29*SCS Lag)

REACH DATA

Reach 1 - J_WC_23 to S Saunders

Segment 1: Channel Flow

Length =	917	ft
Top Elev =	234.00	ft
Bot Elev =	230.00	ft
Height =	4	ft
Slope =	0.0044	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	120.00	sf (assume 30'w x 4'h channel)
Wetted Perimeter =	38.00	lf (assume 30' x 4' channel)
Channel Velocity =	4.71	ft/sec
Reach Travel Time =	***3.25***	***minutes***

Total Travel Time = ***3.25*** ***minutes***

Reach 2 - WCT13_RRXsing to J_WC_23

Segment 1: Channel Flow

Length =	645	ft
Top Elev =	238.00	ft
Bot Elev =	234.00	ft
Height =	4	ft
Slope =	0.0062	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	16.00	sf (assume 8'w x 2'h channel)
Wetted Perimeter =	12.00	lf (assume 8'w x 2'h channel)
Channel Velocity =	3.16	ft/sec
Reach Travel Time =	***3.40***	***minutes***

Total Travel Time = ***3.40*** ***minutes***

Reach 3 - S. Saunders Street to J_WC_22

Segment 1: Channel Flow

Length =	367	ft
Top Elev =	230.00	ft
Bot Elev =	228.00	ft
Height =	2	ft
Slope =	0.0054	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	120.00	sf (assume 30'w x 4'h channel)
Wetted Perimeter =	38.00	lf (assume 30' x 4' channel)
Channel Velocity =	5.26	ft/sec
Reach Travel Time =	***1.16***	***minutes***

Total Travel Time = ***1.16*** ***minutes***

Reach 4 - WCT12_SSauSt to PL

Segment 1: Channel Flow

Length =	3080	ft
Top Elev =	234.00	ft
Bot Elev =	226.00	ft
Height =	8	ft
Slope =	0.0026	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	16.00	sf (assume 8'w x 2'h channel)
Wetted Perimeter =	12.00	lf (assume 8'w x 2'h channel)
Channel Velocity =	2.04	ft/sec
Reach Travel Time =	***25.11***	***minutes***

Total Travel Time = ***25.11*** ***minutes***

Reach 5 - PL to S. Wilmington Street

Segment 1: Channel Flow

Length =	1101	ft
Top Elev =	226.00	ft
Bot Elev =	222.00	ft
Height =	4	ft
Slope =	0.0036	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	120.00	sf (assume 30'w x 4'h channel)
Wetted Perimeter =	38.00	lf (assume 30' x 4' channel)
Channel Velocity =	4.30	ft/sec
Reach Travel Time =	***4.27***	***minutes***

Total Travel Time = ***4.27*** ***minutes***

Reach 6 - J_WC_22 to PL

Segment 1: Channel Flow

Length =	1190	ft
Top Elev =	228.00	ft
Bot Elev =	225.00	ft
Height =	3	ft
Slope =	0.0025	ft/ft
Manning's n =	0.045	natural channel
Flow Area =	120.00	sf (assume 30'w x 4'h channel)
Wetted Perimeter =	38.00	lf (assume 30' x 4' channel)
Channel Velocity =	3.58	ft/sec
Reach Travel Time =	*5.54*	***minutes***

Total Travel Time = *5.54* ***minutes***

Reach 7 - S. Wilmington Street to Slate Street

Tc determined to S Slate Street =	322	min.
Tc determined to S Wilmington Street =	294	min.
Difference Between =	28	min.

Total Travel Time = *28.00* ***minutes***

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)
Area B-2	Pre-Development 2yr	2	2.322	738.000	19.47
Area B-2	Pre-Development 10yr	10	5.340	735.000	47.52
Area B-2	Pre-Development 50yr	50	9.277	735.000	78.65
Area B-2	Pre-Development 100yr	100	11.189	735.000	91.87
Area B-1	Pre-Development 2yr	2	0.416	735.000	2.81
Area B-1	Pre-Development 10yr	10	1.165	732.000	11.22
Area B-1	Pre-Development 50yr	50	2.229	729.000	21.51
Area B-1	Pre-Development 100yr	100	2.764	729.000	26.14
Area A	Pre-Development 2yr	2	4.808	741.000	41.51
Area A	Pre-Development 10yr	10	9.012	741.000	73.51
Area A	Pre-Development 50yr	50	13.989	741.000	104.89
Area A	Pre-Development 100yr	100	16.301	741.000	117.59
Area C2	Pre-Development 2yr	2	7.996	738.000	74.20
Area C2	Pre-Development 10yr	10	13.758	738.000	117.05
Area C2	Pre-Development 50yr	50	20.315	738.000	156.36
Area C2	Pre-Development 100yr	100	23.310	738.000	171.80
AreaC1	Pre-Development 2yr	2	1.972	735.000	21.65
AreaC1	Pre-Development 10yr	10	3.431	732.000	34.16
AreaC1	Pre-Development 50yr	50	5.099	732.000	45.46
AreaC1	Pre-Development 100yr	100	5.862	732.000	49.83

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)
PL	Pre-Development 2yr	2	9.454	756.000	73.40
PL	Pre-Development 10yr	10	18.837	756.000	146.37
PL	Pre-Development 50yr	50	30.438	756.000	223.17
PL	Pre-Development 100yr	100	35.950	756.000	255.40
J_WC_23	Pre-Development 2yr	2	5.223	741.000	44.15
J_WC_23	Pre-Development 10yr	10	10.176	738.000	82.79
J_WC_23	Pre-Development 50yr	50	16.215	738.000	123.07

Node Summary

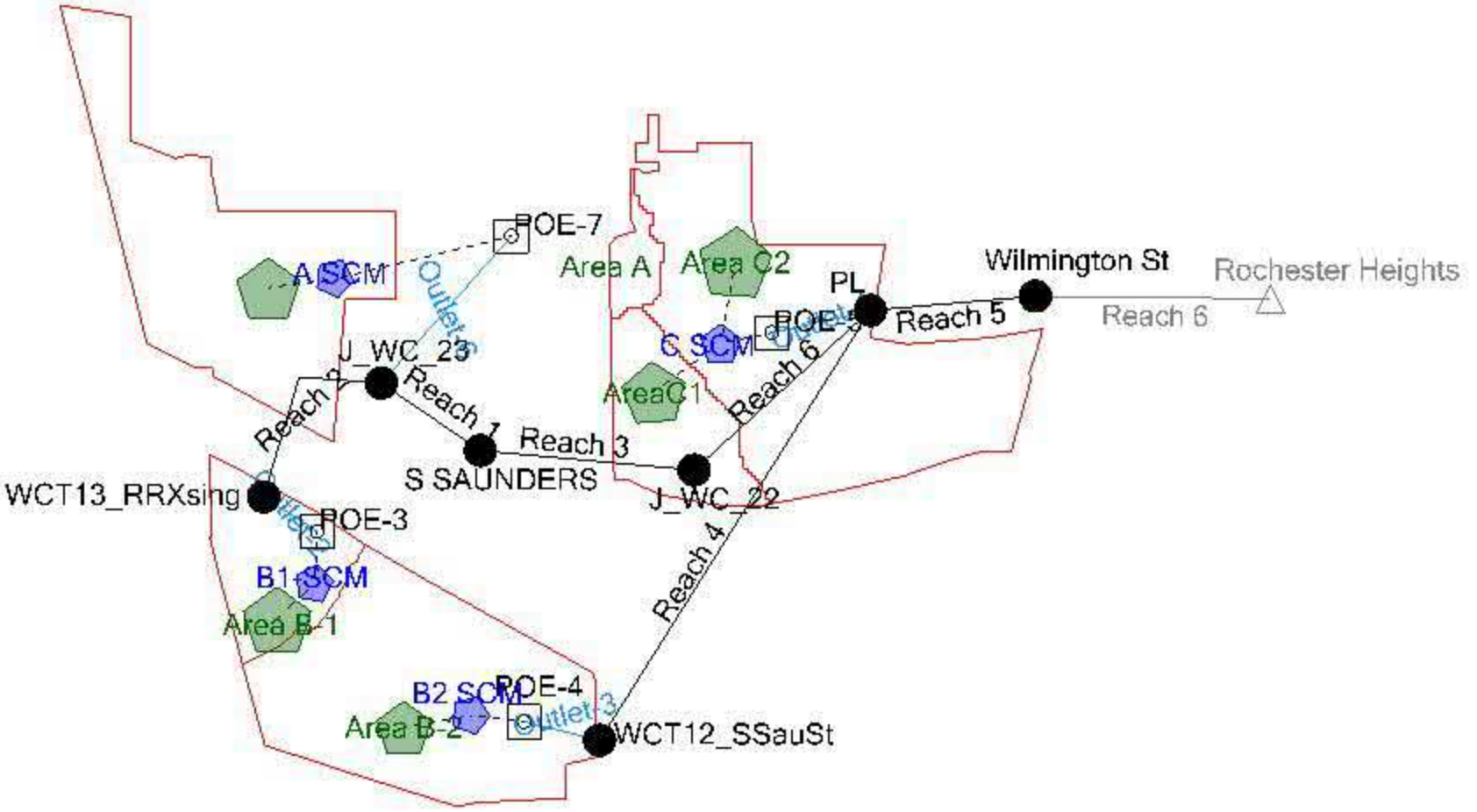
Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)
J_WC_23	Pre-Development 100yr	100	19.063	738.000	139.70
WCT13_RRXsing	Pre-Development 2yr	2	0.416	735.000	2.81
WCT13_RRXsing	Pre-Development 10yr	10	1.165	732.000	11.22
WCT13_RRXsing	Pre-Development 50yr	50	2.229	729.000	21.51
WCT13_RRXsing	Pre-Development 100yr	100	2.764	729.000	26.14
WCT12_SSauSt	Pre-Development 2yr	2	2.322	738.000	19.47
WCT12_SSauSt	Pre-Development 10yr	10	5.340	735.000	47.52
WCT12_SSauSt	Pre-Development 50yr	50	9.277	735.000	78.65
WCT12_SSauSt	Pre-Development 100yr	100	11.189	735.000	91.87
Wilmington St	Pre-Development 2yr	2	17.438	750.000	124.93
Wilmington St	Pre-Development 10yr	10	32.573	753.000	227.30
Wilmington St	Pre-Development 50yr	50	50.723	753.000	334.81
Wilmington St	Pre-Development 100yr	100	59.229	753.000	379.78
J_WC_22	Pre-Development 2yr	2	7.181	744.000	59.24
J_WC_22	Pre-Development 10yr	10	13.584	741.000	108.86
J_WC_22	Pre-Development 50yr	50	21.283	741.000	159.42
J_WC_22	Pre-Development 100yr	100	24.892	741.000	180.22
S SAUNDERS	Pre-Development 2yr	2	5.216	744.000	44.15
S SAUNDERS	Pre-Development 10yr	10	10.165	741.000	82.79
S SAUNDERS	Pre-Development 50yr	50	16.199	741.000	123.07
S SAUNDERS	Pre-Development 100yr	100	19.046	741.000	139.70

MCADAMS

FlexTable: Catchment Table (KAN19020 DIA-PRE.ppc)

Current Time: 0.00 min

Label	Area (acres)	SCS CN	Time of Concentration (min)
Area B-2	37.74	65	25.62
Area B-1	12.22	57	17.15
Area A	39.16	78	34.22
Area C2	48.21	85	31.76
AreaC1	12.35	84	23.86


POE-7
A SCM
Outlet 6
Area A
Area C2
PL
Wilmington St
Rochester Heights
Reach 6
POE-5
Reach 5
C SCM
Outlet 5
J_WC_23
Reach 2
Reach 1
AreaC1
Reach 6
Reach 3
S SAUNDERS
J_WC_22
WCT13_RRXsing
Outlet 1
POE-3
B1 SCM
Area B-1
Reach 4
B2 SCM
POE-4
Area B-2
Outlet 3
WCT12_SSauSt

POST-DEVELOPMENT HYDROLOGY

Summary of Results

HYDROLOGY INPUT SUMMARY

Sub-basin ID	Onsite Area [acres]					Offsite Area [acres]					Total Area [acres]	SCS CN	Tc [min]
	Impervious	Open	Wooded	Pond	Total	Impervious	Open	Wooded	Pond	Total			
Area A	16.20	20.08	0.00	0.00	36.28	0.00	0.00	0.00	0.00	0.00	36.28	88	5.00
Area B-1	11.61	0.61	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	12.22	96	5.00
Area B-2	35.85	1.89	0.00	0.00	37.74	0.00	0.00	0.00	0.00	0.00	37.74	96	5.00
Area C	50.48	12.96	0.00	0.00	63.45	0.00	0.00	0.00	0.00	0.00	63.45	94	5.00
Totals =	114.15	35.54	0.00	0.00	**149.69**	0.00	0.00	0.00	0.00	**0.00**	**149.69**		

POST-DEVELOPMENT HYDROLOGY

Area A

I. SCS CURVE NUMBERS

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	0.0%
HSG 'C' =	14.3%
HSG 'D' =	85.7%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	79	Assume good condition
Wooded	76	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roadway Area	0	0.00
Driveway / Parking Lot	0	0.00
Roof	0	0.00
15% Impervious Area	79,675	1.83
95% Impervious Area	626,112	14.37
Totals	705,787	16.20

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	705,787	16.20	-
Onsite open	79	874,628	20.08	Assume good condition
Onsite wooded	76	0	0.00	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	79	0	0.00	Assume good condition
Offsite wooded	76	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	36.28	acres
	1,580,415	sf
Composite SCS CN =	88	
% Impervious =	44.7%	

C. Time of Concentration Information

Time of concentration is assumed to be 5 minutes.

Time of Concentration =	5.00	minutes
SCS Lag Time =	3.00	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.87	minutes (= 0.29*SCS Lag)

I. SCS CURVE NUMBERS

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	22.4%
HSG 'B' =	43.6%
HSG 'C' =	0.0%
HSG 'D' =	34.0%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	63	Assume good condition
Wooded	57	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roadway Area	0	0.00
Driveway / Parking Lot	0	0.00
Roof	0	0.00
15% Impervious Area	0	0.00
95% Impervious Area	505,812	11.61
Totals	505,812	11.61

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	505,812	11.61	-
Onsite open	63	26,622	0.61	Assume good condition
Onsite wooded	57	0	0.00	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	63	0	0.00	Assume good condition
Offsite wooded	57	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	12.22	acres
	532,434	sf
Composite SCS CN =	96	
% Impervious =	95.0%	

C. Time of Concentration Information

Time of concentration is assumed to be 5 minutes.

Time of Concentration =	5.00	minutes
SCS Lag Time =	3.00	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.87	minutes (= 0.29*SCS Lag)

I. SCS CURVE NUMBERS

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	29.3%
HSG 'B' =	11.9%
HSG 'C' =	0.0%
HSG 'D' =	58.8%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	66	Assume good condition
Wooded	61	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roadway Area	0	0.00
Driveway / Parking Lot	0	0.00
Roof	0	0.00
15% Impervious Area	0	0.00
95% Impervious Area	1,561,736	35.85
Totals	1,561,736	35.85

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	1,561,736	35.85	-
Onsite open	66	82,197	1.89	Assume good condition
Onsite wooded	61	0	0.00	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	66	0	0.00	Assume good condition
Offsite wooded	61	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	37.74	acres
	1,643,933	sf
Composite SCS CN =	96	
% Impervious =	95.0%	

C. Time of Concentration Information

Time of concentration is assumed to be 5 minutes.

Time of Concentration =	5.00	minutes
SCS Lag Time =	3.00	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.87	minutes (= 0.29*SCS Lag)

I. SCS CURVE NUMBERS

HSG	Impervious	Open	Wooded
A	98	39	30
B	98	61	55
C	98	74	70
D	98	80	77

Assume:

HSG 'A' =	0.0%
HSG 'B' =	0.0%
HSG 'C' =	0.0%
HSG 'D' =	100.0%

Cover Condition	SCS CN	Comments
Impervious	98	-
Open	80	Assume good condition
Wooded	77	Assume good condition

II. POST-DEVELOPMENT

A. Onsite Impervious Breakdown

Contributing Area	Area [sf]	Area [ac]
Roadway Area	0	0.00
Driveway / Parking Lot	0	0.00
Roof	0	0.00
15% Impervious Area	30,632	0.70
95% Impervious Area	2,168,472	49.78
Totals	2,199,104	50.48

B. Watershed Land Use Breakdown

Contributing Area	SCS CN	Area [sf]	Area [acres]	Comments
Onsite impervious	98	2,199,104	50.48	-
Onsite open	80	564,710	12.96	Assume good condition
Onsite wooded	77	0	0.00	Assume good condition
Onsite pond	100	0	0.00	-
Offsite impervious	98	0	0.00	-
Offsite open	80	0	0.00	Assume good condition
Offsite wooded	77	0	0.00	Assume good condition
Offsite pond	100	0	0.00	-

Total area =	63.45	acres
	2,763,814	sf
Composite SCS CN =	94	
% Impervious =	79.6%	

C. Time of Concentration Information

Time of concentration is assumed to be 5 minutes.

Time of Concentration =	5.00	minutes
SCS Lag Time =	3.00	minutes (SCS Lag = 0.6* Tc)
Time Increment =	0.87	minutes (= 0.29*SCS Lag)

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)
Area B-2	Post-Development 2yr	2	9.537	720.000	179.71
Area B-2	Post-Development 10yr	10	14.523	720.000	235.71
Area B-2	Post-Development 50yr	50	19.968	720.000	281.56
Area B-2	Post-Development 100yr	100	22.413	720.000	298.98
Area B-1	Post-Development 2yr	2	3.089	720.000	58.20
Area B-1	Post-Development 10yr	10	4.704	720.000	76.34
Area B-1	Post-Development 50yr	50	6.467	720.000	91.19
Area B-1	Post-Development 100yr	100	7.259	720.000	96.83
Area A	Post-Development 2yr	2	7.365	720.000	145.76
Area A	Post-Development 10yr	10	12.239	720.000	211.57
Area A	Post-Development 50yr	50	17.699	720.000	266.25
Area A	Post-Development 100yr	100	20.175	720.000	286.90
Area C2	Post-Development 2yr	2	11.342	720.000	218.85
Area C2	Post-Development 10yr	10	17.648	720.000	293.27
Area C2	Post-Development 50yr	50	24.566	720.000	353.93
Area C2	Post-Development 100yr	100	27.678	720.000	376.88
AreaC1	Post-Development 2yr	2	2.905	720.000	56.04
AreaC1	Post-Development 10yr	10	4.519	720.000	75.10
AreaC1	Post-Development 50yr	50	6.291	720.000	90.64
AreaC1	Post-Development 100yr	100	7.088	720.000	96.51

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)
PL	Post-Development 2yr	2	29.089	762.000	91.24
PL	Post-Development 10yr	10	47.250	756.000	141.54
PL	Post-Development 50yr	50	67.357	762.000	183.33
PL	Post-Development 100yr	100	76.422	762.000	198.29

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)
J_WC_23	Post-Development 2yr	2	9.486	735.000	38.68
J_WC_23	Post-Development 10yr	10	15.762	732.000	70.66
J_WC_23	Post-Development 50yr	50	22.785	732.000	95.82
J_WC_23	Post-Development 100yr	100	25.975	732.000	103.65
WCT13_RRXsing	Post-Development 2yr	2	2.743	756.000	5.83
WCT13_RRXsing	Post-Development 10yr	10	4.275	756.000	7.21
WCT13_RRXsing	Post-Development 50yr	50	5.937	762.000	8.35
WCT13_RRXsing	Post-Development 100yr	100	6.674	783.000	8.84
WCT12_SSauSt	Post-Development 2yr	2	8.597	750.000	31.55
WCT12_SSauSt	Post-Development 10yr	10	13.388	753.000	44.87
WCT12_SSauSt	Post-Development 50yr	50	18.686	753.000	55.02
WCT12_SSauSt	Post-Development 100yr	100	21.095	753.000	58.84
Wilmington St	Post-Development 2yr	2	29.052	765.000	91.24
Wilmington St	Post-Development 10yr	10	47.195	759.000	141.54
Wilmington St	Post-Development 50yr	50	67.283	765.000	183.33
Wilmington St	Post-Development 100yr	100	76.339	765.000	198.29
J_WC_22	Post-Development 2yr	2	9.466	741.000	38.68
J_WC_22	Post-Development 10yr	10	15.731	738.000	70.66
J_WC_22	Post-Development 50yr	50	22.744	738.000	95.82
J_WC_22	Post-Development 100yr	100	25.930	738.000	103.65
S SAUNDERS	Post-Development 2yr	2	9.476	738.000	38.68
S SAUNDERS	Post-Development 10yr	10	15.747	735.000	70.66
S SAUNDERS	Post-Development 50yr	50	22.765	735.000	95.82
S SAUNDERS	Post-Development 100yr	100	25.952	735.000	103.65

Pond Summary

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
A SCM (IN)	Post-Development 2yr	2	7.365	720.000	145.76	(N/A)	(N/A)
A SCM (OUT)	Post-Development 2yr	2	6.746	735.000	33.28	102.63	3.018
A SCM (IN)	Post-Development 10yr	10	12.239	720.000	211.57	(N/A)	(N/A)
A SCM (OUT)	Post-Development 10yr	10	11.492	732.000	64.04	103.91	4.491
A SCM (IN)	Post-Development 50yr	50	17.699	720.000	266.25	(N/A)	(N/A)
A SCM (OUT)	Post-Development 50yr	50	16.855	732.000	88.28	105.05	5.798
A SCM (IN)	Post-Development 100yr	100	20.175	720.000	286.90	(N/A)	(N/A)
A SCM (OUT)	Post-Development 100yr	100	19.308	732.000	95.73	105.52	6.334
B1-SCM (IN)	Post-Development 2yr	2	3.089	720.000	58.20	(N/A)	(N/A)
B1-SCM (OUT)	Post-Development 2yr	2	2.743	756.000	5.83	102.43	1.676
B1-SCM (IN)	Post-Development 10yr	10	4.704	720.000	76.34	(N/A)	(N/A)
B1-SCM (OUT)	Post-Development 10yr	10	4.275	756.000	7.21	103.62	2.492
B1-SCM (IN)	Post-Development 50yr	50	6.467	720.000	91.19	(N/A)	(N/A)
B1-SCM (OUT)	Post-Development 50yr	50	5.937	762.000	8.35	104.86	3.344
B1-SCM (IN)	Post-Development 100yr	100	7.259	720.000	96.83	(N/A)	(N/A)
B1-SCM (OUT)	Post-Development 100yr	100	6.674	783.000	8.84	105.44	3.745
B2 SCM (IN)	Post-Development 2yr	2	9.537	720.000	179.71	(N/A)	(N/A)
B2 SCM (OUT)	Post-Development 2yr	2	8.597	750.000	31.55	103.07	4.576

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
B2 SCM (IN)	Post-Development 10yr	10	14.523	720.000	235.71	(N/A)	(N/A)
B2 SCM (OUT)	Post-Development 10yr	10	13.388	753.000	44.87	104.35	6.497
B2 SCM (IN)	Post-Development 50yr	50	19.968	720.000	281.56	(N/A)	(N/A)
B2 SCM (OUT)	Post-Development 50yr	50	18.686	753.000	55.02	105.69	8.486
B2 SCM (IN)	Post-Development 100yr	100	22.413	720.000	298.98	(N/A)	(N/A)
B2 SCM (OUT)	Post-Development 100yr	100	21.095	753.000	58.84	106.26	9.339
C SCM (IN)	Post-Development 2yr	2	14.247	720.000	274.89	(N/A)	(N/A)
C SCM (OUT)	Post-Development 2yr	2	11.115	756.000	21.81	102.89	8.551
C SCM (IN)	Post-Development 10yr	10	22.167	720.000	368.37	(N/A)	(N/A)
C SCM (OUT)	Post-Development 10yr	10	18.259	759.000	30.68	104.38	12.977
C SCM (IN)	Post-Development 50yr	50	30.857	720.000	444.57	(N/A)	(N/A)
C SCM (OUT)	Post-Development 50yr	50	26.087	780.000	37.83	105.96	17.640
C SCM (IN)	Post-Development 100yr	100	34.765	720.000	473.39	(N/A)	(N/A)
C SCM (OUT)	Post-Development 100yr	100	29.566	783.000	40.69	106.68	19.777

MCADAMS

FlexTable: Catchment Table (KAN19020 DIA-POST.ppc)

Current Time: 0.00 min

Label	Area (acres)	SCS CN	Time of Concentration (min)
Area B-2	37.740	96	5.00
Area B-1	12.223	96	5.00
Area A	39.162	88	5.00
Area C2	48.212	94	5.00
AreaC1	12.346	94	5.00

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)
Area B-2	Post-Development 2yr	2	9.537	720.000	179.71
Area B-2	Post-Development 10yr	10	14.523	720.000	235.71
Area B-2	Post-Development 50yr	50	19.968	720.000	281.56
Area B-2	Post-Development 100yr	100	22.413	720.000	298.98
Area B-1	Post-Development 2yr	2	3.089	720.000	58.20
Area B-1	Post-Development 10yr	10	4.704	720.000	76.34
Area B-1	Post-Development 50yr	50	6.467	720.000	91.19
Area B-1	Post-Development 100yr	100	7.259	720.000	96.83
Area A	Post-Development 2yr	2	7.365	720.000	145.76
Area A	Post-Development 10yr	10	12.239	720.000	211.57
Area A	Post-Development 50yr	50	17.699	720.000	266.25
Area A	Post-Development 100yr	100	20.175	720.000	286.90
Area C2	Post-Development 2yr	2	11.342	720.000	218.85
Area C2	Post-Development 10yr	10	17.648	720.000	293.27
Area C2	Post-Development 50yr	50	24.566	720.000	353.93
Area C2	Post-Development 100yr	100	27.678	720.000	376.88
AreaC1	Post-Development 2yr	2	2.905	720.000	56.04
AreaC1	Post-Development 10yr	10	4.519	720.000	75.10
AreaC1	Post-Development 50yr	50	6.291	720.000	90.64
AreaC1	Post-Development 100yr	100	7.088	720.000	96.51

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)
PL	Post-Development 2yr	2	29.180	762.000	94.93
PL	Post-Development 10yr	10	47.460	762.000	147.75
PL	Post-Development 50yr	50	68.025	756.000	248.70
PL	Post-Development 100yr	100	77.385	753.000	302.68

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)
J_WC_23	Post-Development 2yr	2	9.638	735.000	40.38
J_WC_23	Post-Development 10yr	10	15.947	735.000	69.66
J_WC_23	Post-Development 50yr	50	23.052	735.000	109.21
J_WC_23	Post-Development 100yr	100	26.236	732.000	135.84
WCT13_RRXsing	Post-Development 2yr	2	2.870	753.000	7.71
WCT13_RRXsing	Post-Development 10yr	10	4.422	756.000	9.98
WCT13_RRXsing	Post-Development 50yr	50	6.155	750.000	23.36
WCT13_RRXsing	Post-Development 100yr	100	6.923	735.000	28.19
WCT12_SSauSt	Post-Development 2yr	2	8.507	750.000	30.49
WCT12_SSauSt	Post-Development 10yr	10	13.262	753.000	43.75
WCT12_SSauSt	Post-Development 50yr	50	18.537	750.000	71.27
WCT12_SSauSt	Post-Development 100yr	100	20.941	750.000	83.95
Wilmington St	Post-Development 2yr	2	29.143	765.000	94.93
Wilmington St	Post-Development 10yr	10	47.407	765.000	147.75
Wilmington St	Post-Development 50yr	50	67.961	759.000	248.70
Wilmington St	Post-Development 100yr	100	77.318	756.000	302.68
J_WC_22	Post-Development 2yr	2	9.618	741.000	40.38
J_WC_22	Post-Development 10yr	10	15.918	741.000	69.66
J_WC_22	Post-Development 50yr	50	23.015	741.000	109.21
J_WC_22	Post-Development 100yr	100	26.197	738.000	135.84
S SAUNDERS	Post-Development 2yr	2	9.628	738.000	40.38
S SAUNDERS	Post-Development 10yr	10	15.933	738.000	69.66
S SAUNDERS	Post-Development 50yr	50	23.033	738.000	109.21
S SAUNDERS	Post-Development 100yr	100	26.216	735.000	135.84

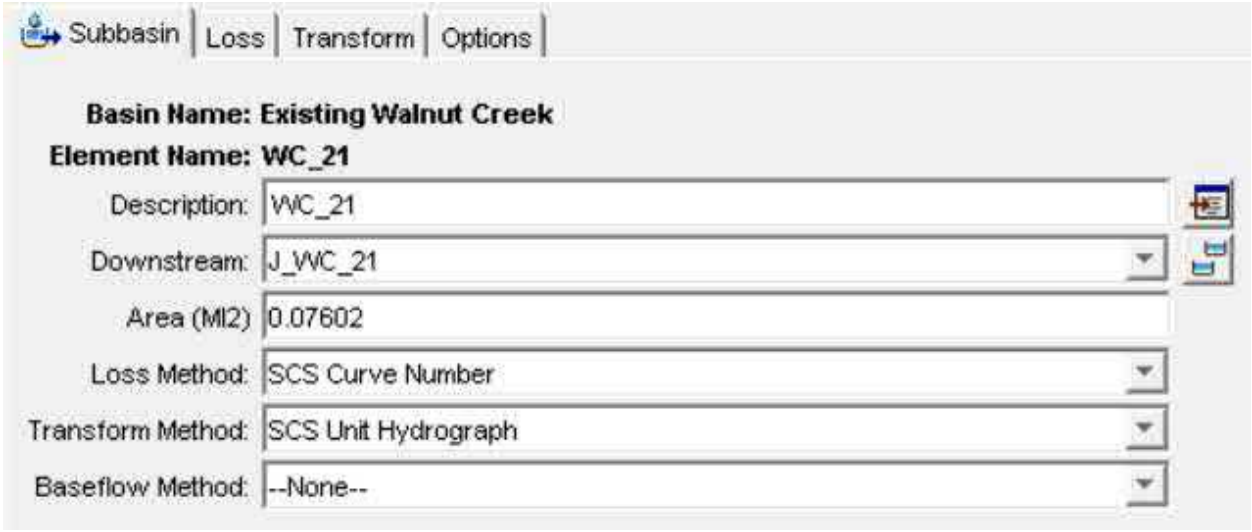
Pond Summary

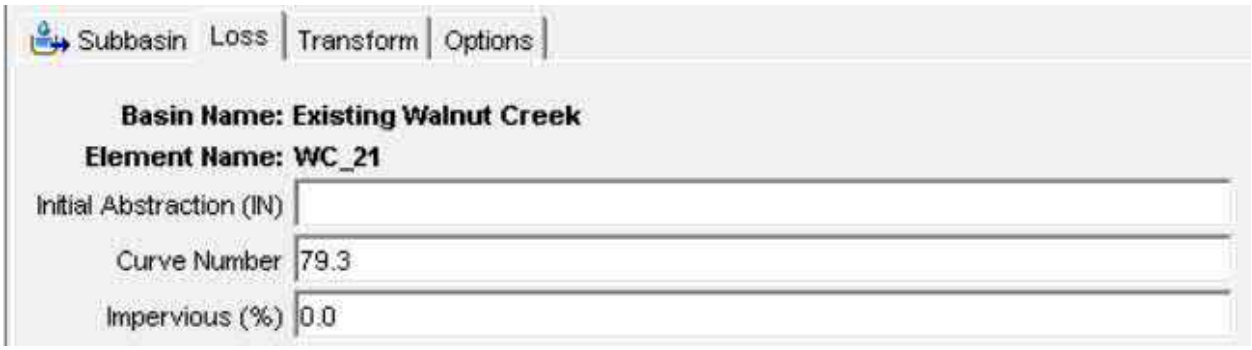
Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
A SCM (IN)	Post-Development 2yr	2	7.365	720.000	145.76	(N/A)	(N/A)
A SCM (OUT)	Post-Development 2yr	2	6.770	735.000	33.06	102.61	3.001
A SCM (IN)	Post-Development 10yr	10	12.239	720.000	211.57	(N/A)	(N/A)
A SCM (OUT)	Post-Development 10yr	10	11.529	732.000	60.55	103.90	4.482
A SCM (IN)	Post-Development 50yr	50	17.699	720.000	266.25	(N/A)	(N/A)
A SCM (OUT)	Post-Development 50yr	50	16.901	732.000	92.69	105.03	5.771
A SCM (IN)	Post-Development 100yr	100	20.175	720.000	286.90	(N/A)	(N/A)
A SCM (OUT)	Post-Development 100yr	100	19.317	729.000	110.94	105.41	6.204
B1-SCM (IN)	Post-Development 2yr	2	3.089	720.000	58.20	(N/A)	(N/A)
B1-SCM (OUT)	Post-Development 2yr	2	2.870	753.000	7.71	102.73	1.504
B1-SCM (IN)	Post-Development 10yr	10	4.704	720.000	76.34	(N/A)	(N/A)
B1-SCM (OUT)	Post-Development 10yr	10	4.422	756.000	9.98	104.02	2.215
B1-SCM (IN)	Post-Development 50yr	50	6.467	720.000	91.19	(N/A)	(N/A)
B1-SCM (OUT)	Post-Development 50yr	50	6.155	750.000	23.36	104.75	2.617
B1-SCM (IN)	Post-Development 100yr	100	7.259	720.000	96.83	(N/A)	(N/A)
B1-SCM (OUT)	Post-Development 100yr	100	6.923	735.000	28.19	104.91	2.707
B2 SCM (IN)	Post-Development 2yr	2	9.537	720.000	179.71	(N/A)	(N/A)
B2 SCM (OUT)	Post-Development 2yr	2	8.507	750.000	30.49	102.93	4.702

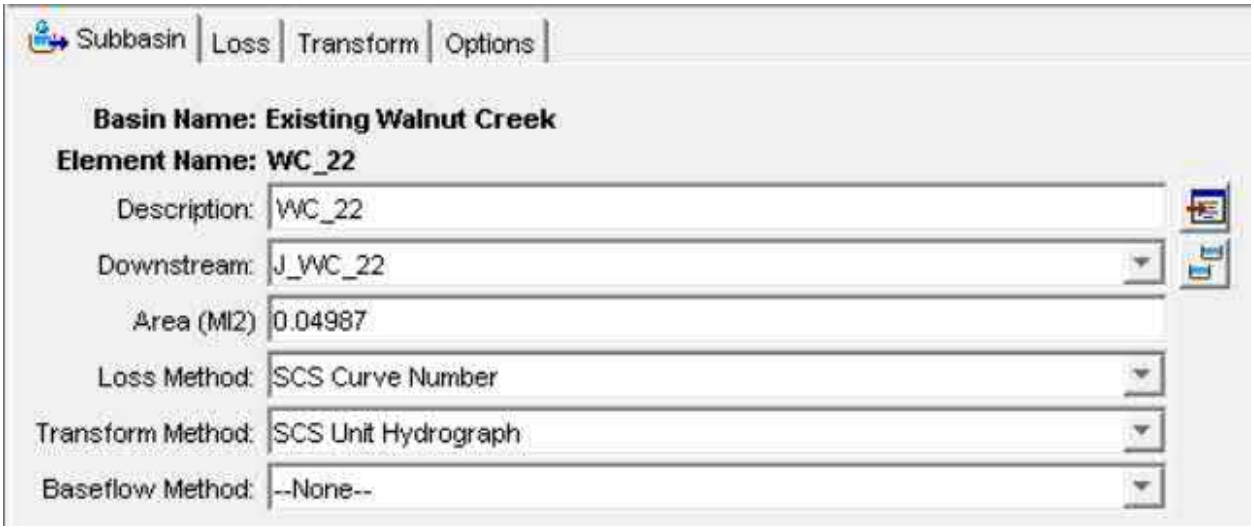
Pond Summary

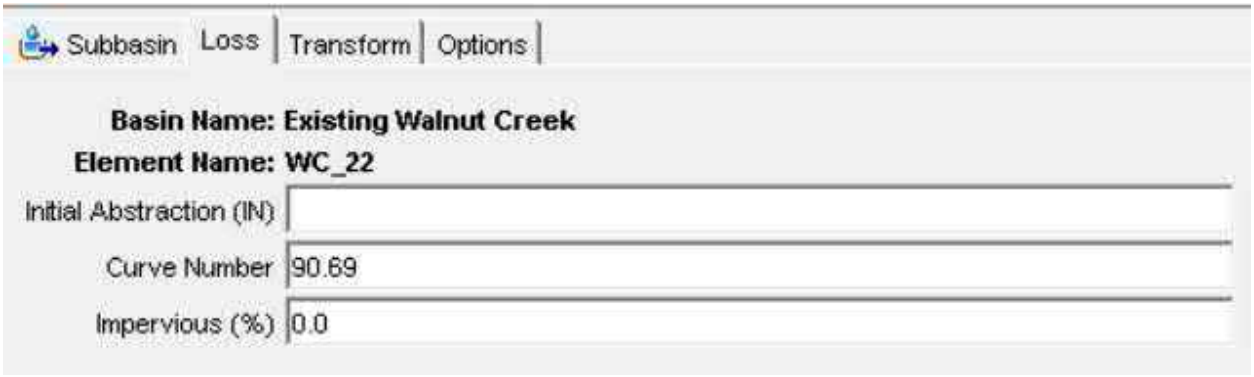
Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft^3/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
B2 SCM (IN)	Post-Development 10yr	10	14.523	720.000	235.71	(N/A)	(N/A)
B2 SCM (OUT)	Post-Development 10yr	10	13.262	753.000	43.75	104.17	6.694
B2 SCM (IN)	Post-Development 50yr	50	19.968	720.000	281.56	(N/A)	(N/A)
B2 SCM (OUT)	Post-Development 50yr	50	18.537	750.000	71.27	105.08	8.169
B2 SCM (IN)	Post-Development 100yr	100	22.413	720.000	298.98	(N/A)	(N/A)
B2 SCM (OUT)	Post-Development 100yr	100	20.941	750.000	83.95	105.36	8.621
C SCM (IN)	Post-Development 2yr	2	14.247	720.000	274.89	(N/A)	(N/A)
C SCM (OUT)	Post-Development 2yr	2	11.149	756.000	25.39	102.78	8.410
C SCM (IN)	Post-Development 10yr	10	22.167	720.000	368.37	(N/A)	(N/A)
C SCM (OUT)	Post-Development 10yr	10	18.411	756.000	36.88	104.18	12.660
C SCM (IN)	Post-Development 50yr	50	30.857	720.000	444.57	(N/A)	(N/A)
C SCM (OUT)	Post-Development 50yr	50	26.634	753.000	75.53	105.36	16.247
C SCM (IN)	Post-Development 100yr	100	34.765	720.000	473.39	(N/A)	(N/A)
C SCM (OUT)	Post-Development 100yr	100	30.415	753.000	96.02	105.77	17.470


Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: WC_21
Description: WC_21
Downstream: J_WC_21
Area (MI2) 0.07602
Loss Method: SCS Curve Number
Transform Method: SCS Unit Hydrograph
Baseflow Method: --None--


Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: WC_21
Initial Abstraction (IN)
Curve Number 79.3
Impervious (%) 0.0


Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: WC_21
Lag Time (MIN) 23.74


Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: WC_22
Description: WC_22
Downstream: J_WC_22
Area (MI2) 0.04987
Loss Method: SCS Curve Number
Transform Method: SCS Unit Hydrograph
Baseflow Method: --None--


Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: WC_22
Initial Abstraction (IN)
Curve Number 90.69
Impervious (%) 0.0


Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: WC_22
Lag Time (MIN) 9.85

Subbasin | Loss | Transform | Options

Basin Name: Existing Walnut Creek

Element Name: WC_23

Description:	WC_23
Downstream:	J_WC_23
Area (MI2)	0.52543
Loss Method:	SCS Curve Number
Transform Method:	SCS Unit Hydrograph
Baseflow Method:	--None--

Subbasin | Loss | Transform | Options

Basin Name: Existing Walnut Creek

Element Name: WC_23

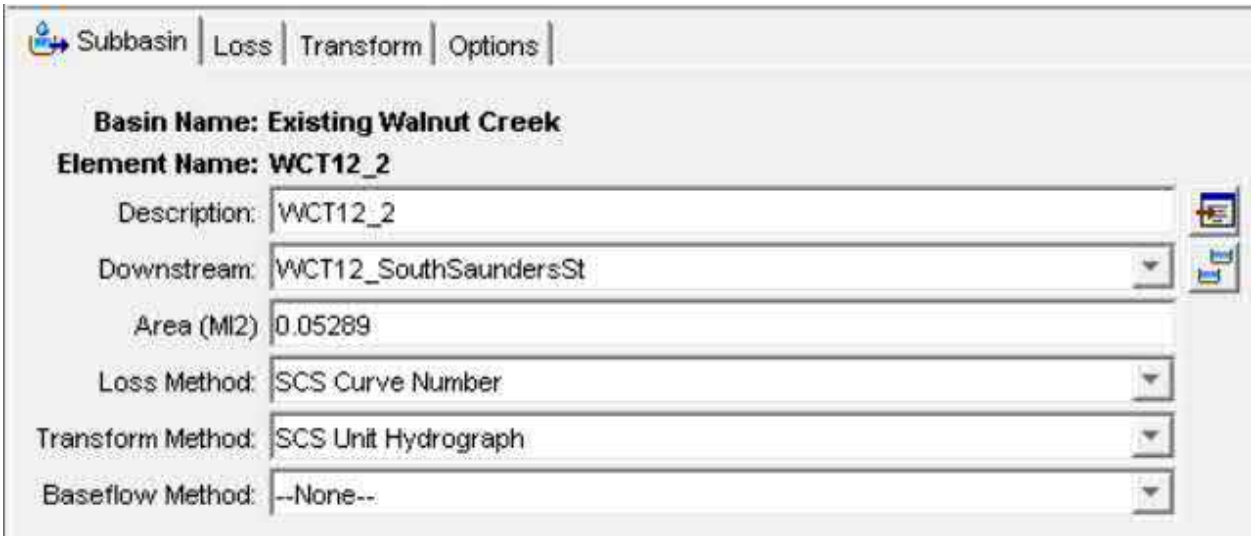
Initial Abstraction (IN)	
Curve Number	84.5
Impervious (%)	0.0

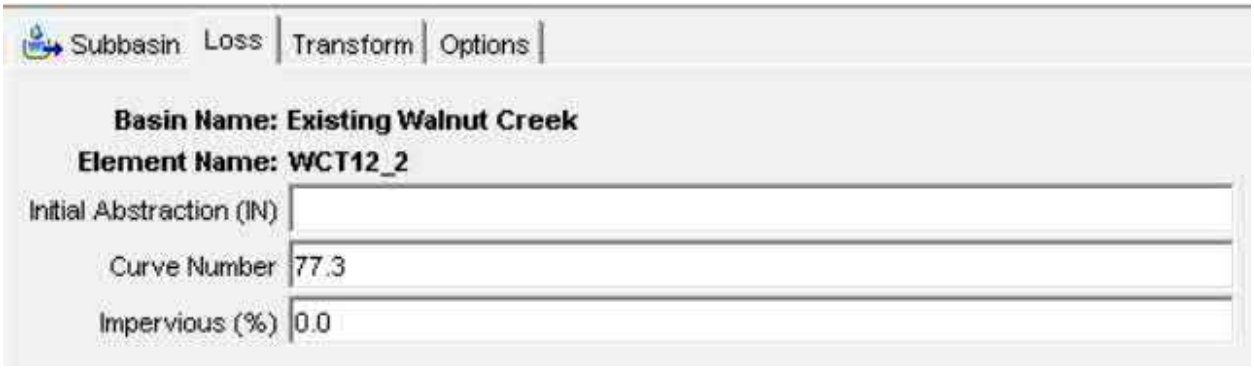
Subbasin | Loss | Transform | Options

Basin Name: Existing Walnut Creek

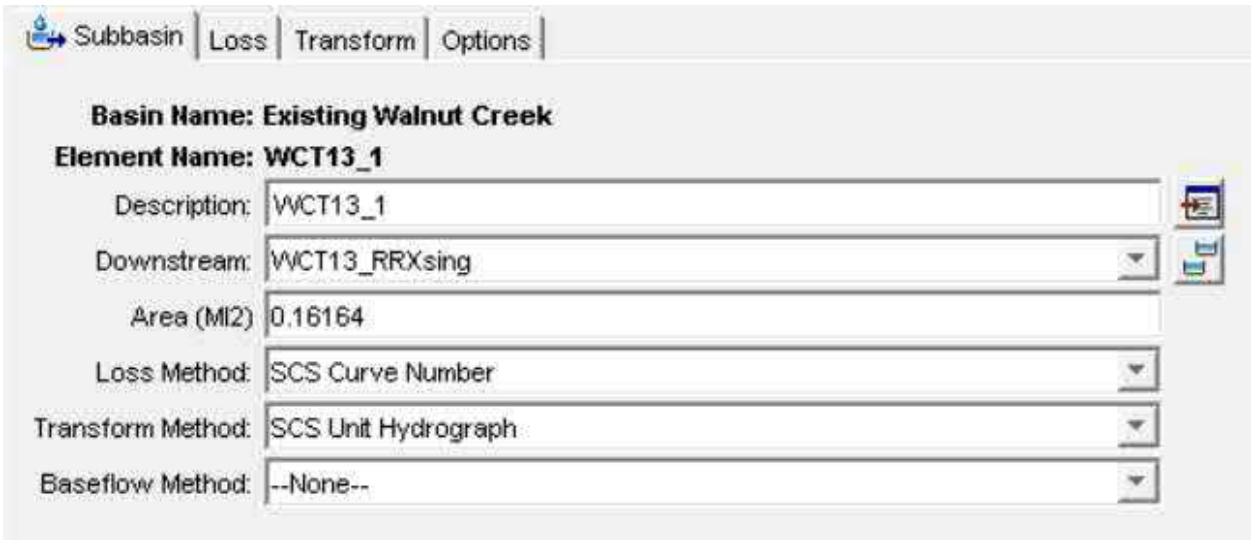
Element Name: WC_23

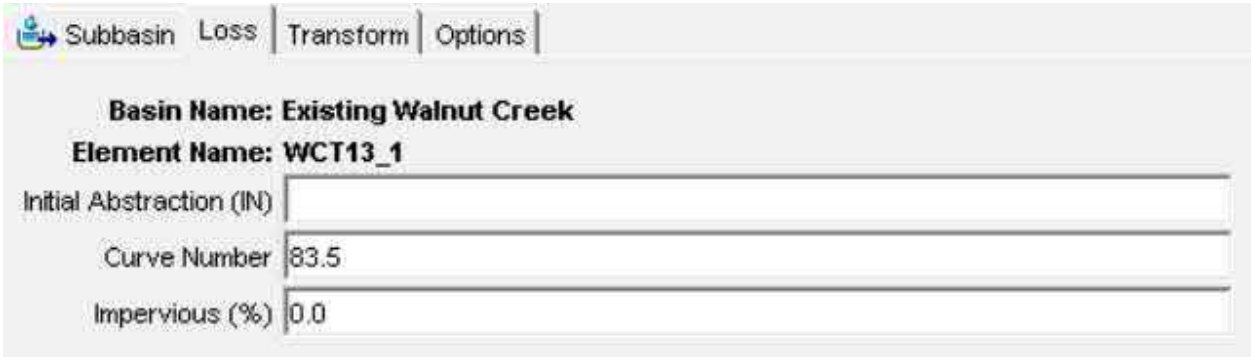
Lag Time (MIN)	28.41


Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: WCT12_2
Description: WCT12_2
Downstream: WCT12_SouthSaundersSt
Area (MI2) 0.05289
Loss Method: SCS Curve Number
Transform Method: SCS Unit Hydrograph
Baseflow Method: --None--

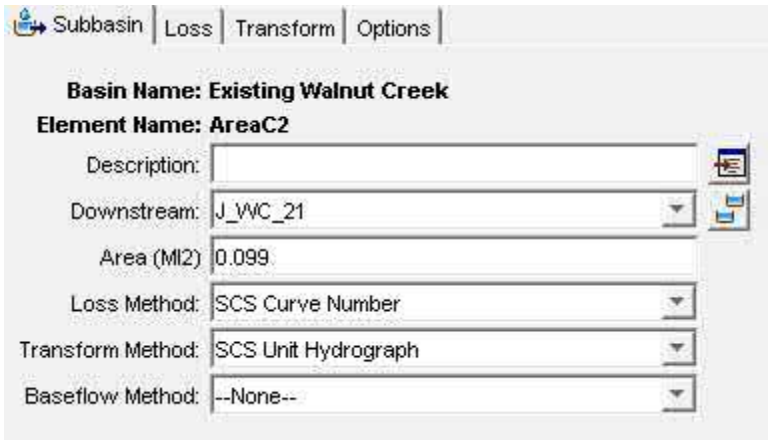

Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: WCT12_2
Initial Abstraction (IN)
Curve Number 77.3
Impervious (%) 0.0

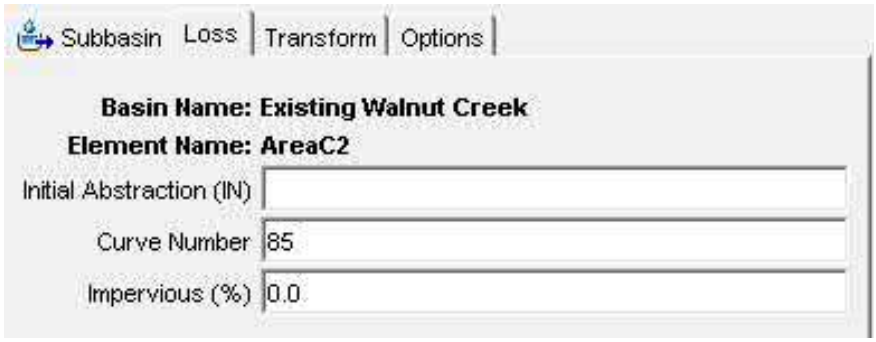

Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: WCT12_2
Lag Time (MIN) 19.63

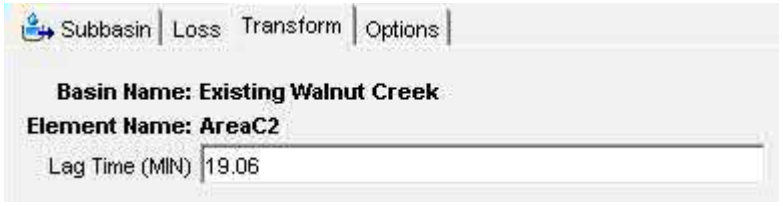

Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: WCT13_1
Description: WCT13_1
Downstream: WCT13_RRXsing
Area (MI2) 0.16164
Loss Method: SCS Curve Number
Transform Method: SCS Unit Hydrograph
Baseflow Method: --None--

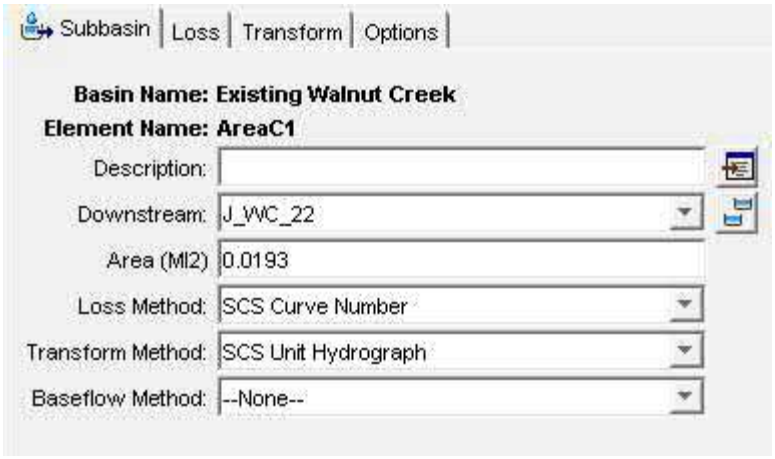

Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: WCT13_1
Initial Abstraction (IN)
Curve Number 83.5
Impervious (%) 0.0

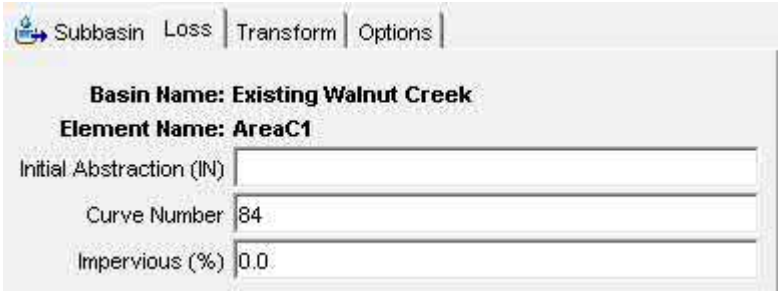

Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: WCT13_1
Lag Time (MIN) 27.32

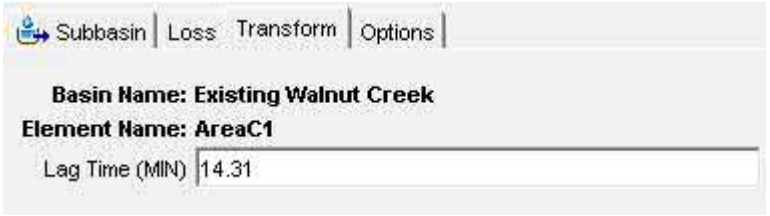

Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaC2
Description:
Downstream: J_WC_21
Area (MI2) 0.099
Loss Method: SCS Curve Number
Transform Method: SCS Unit Hydrograph
Baseflow Method: --None--

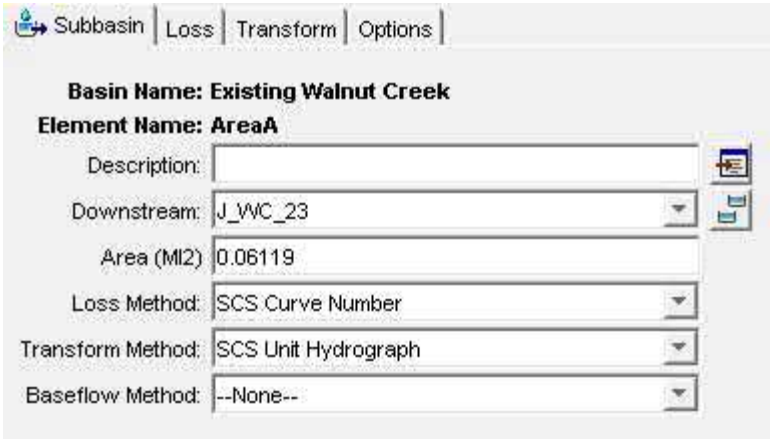

Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaC2
Initial Abstraction (IN)
Curve Number 85
Impervious (%) 0.0

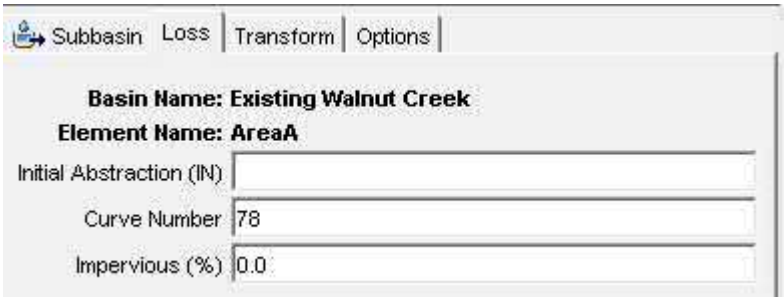

Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaC2
Lag Time (MIN) 19.06


Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaC1
Description:
Downstream: J_WC_22
Area (MI2) 0.0193
Loss Method: SCS Curve Number
Transform Method: SCS Unit Hydrograph
Baseflow Method: --None--

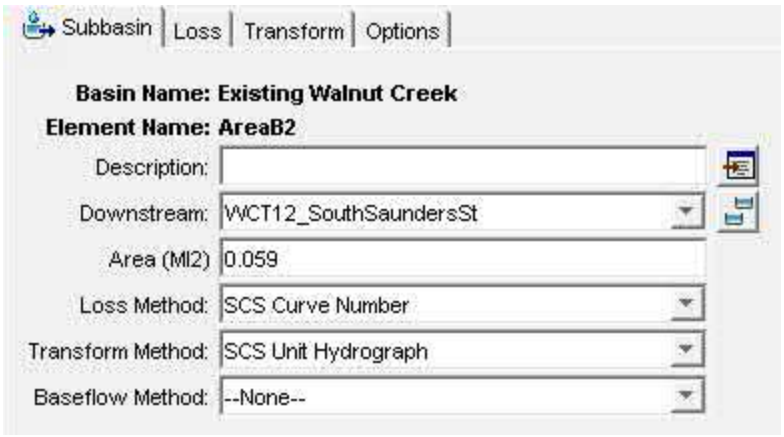

Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaC1
Initial Abstraction (IN)
Curve Number 84
Impervious (%) 0.0

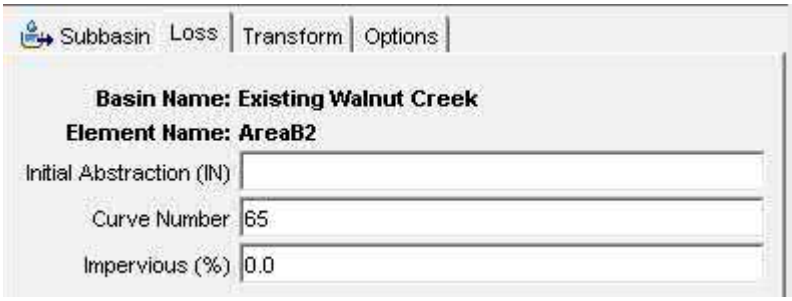

Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaC1
Lag Time (MIN) 14.31


Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaA
Description:
Downstream: J_WC_23
Area (MI2) 0.06119
Loss Method: SCS Curve Number
Transform Method: SCS Unit Hydrograph
Baseflow Method: --None--

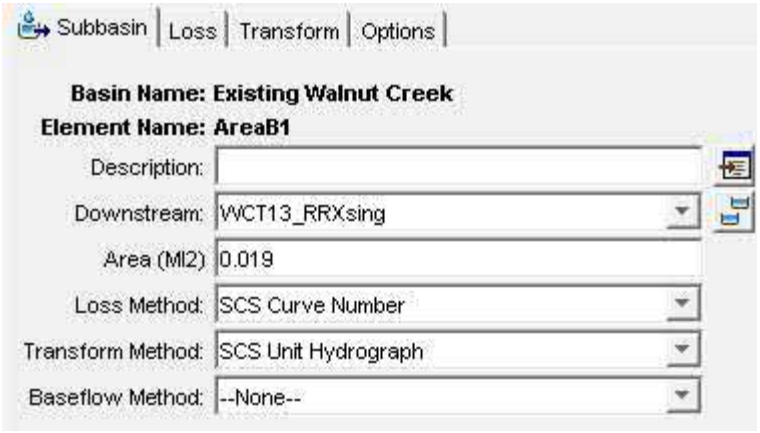

Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaA
Initial Abstraction (IN)
Curve Number 78
Impervious (%) 0.0

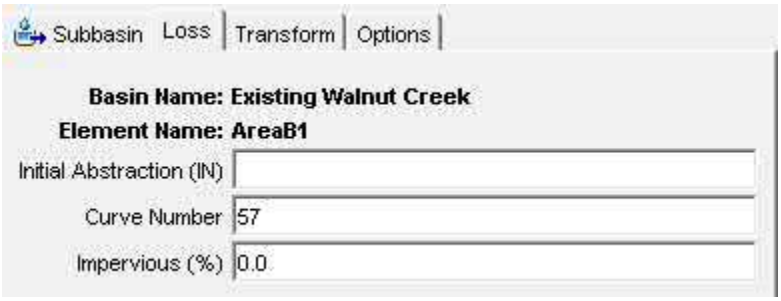

Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaA
Lag Time (MIN) 20.53


Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaB2
Description:
Downstream: WCT12_SouthSaundersSt
Area (MI2) 0.059
Loss Method: SCS Curve Number
Transform Method: SCS Unit Hydrograph
Baseflow Method: --None--

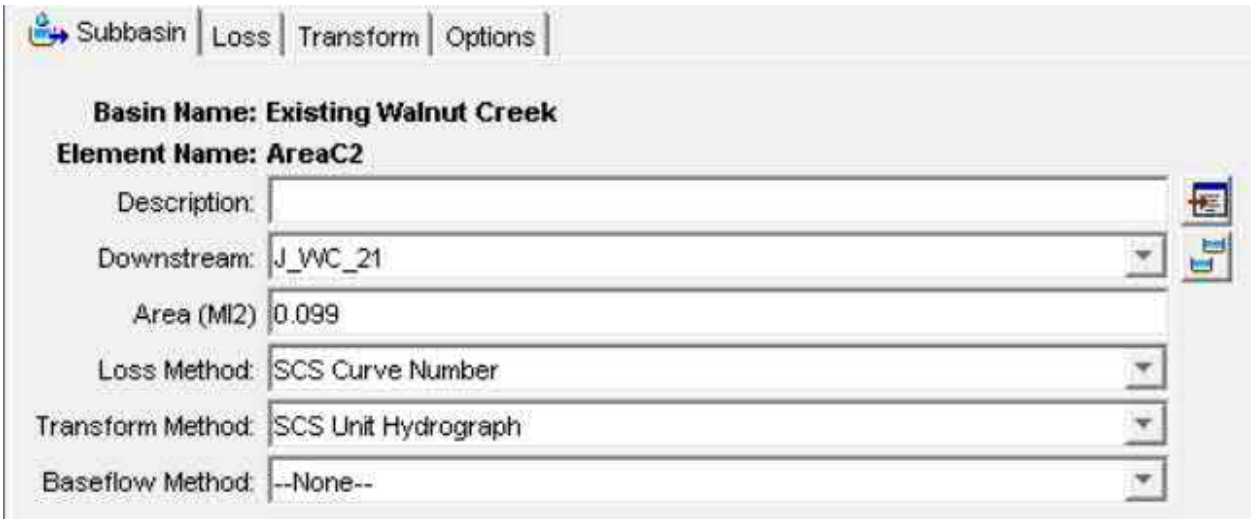

Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaB2
Initial Abstraction (IN)
Curve Number 65
Impervious (%) 0.0

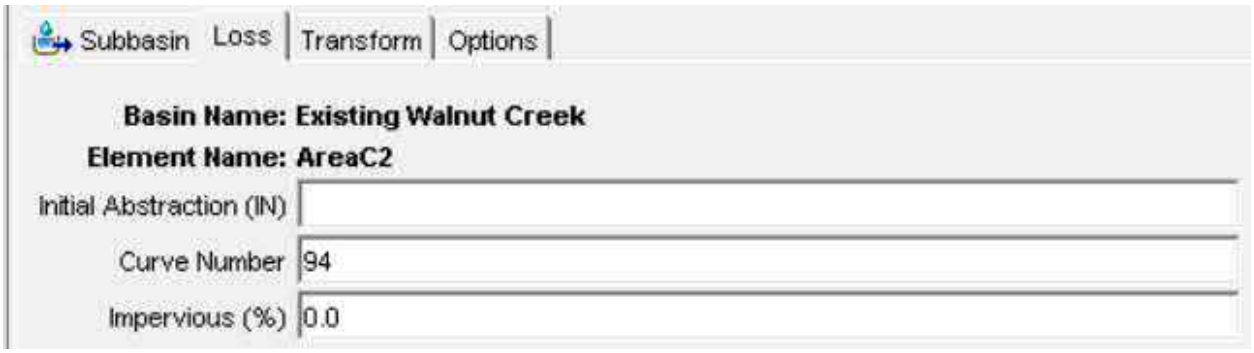

Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaB2
Lag Time (MIN) 15.37


Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaB1
Description:
Downstream: WCT13_RRXsing
Area (MI2) 0.019
Loss Method: SCS Curve Number
Transform Method: SCS Unit Hydrograph
Baseflow Method: --None--

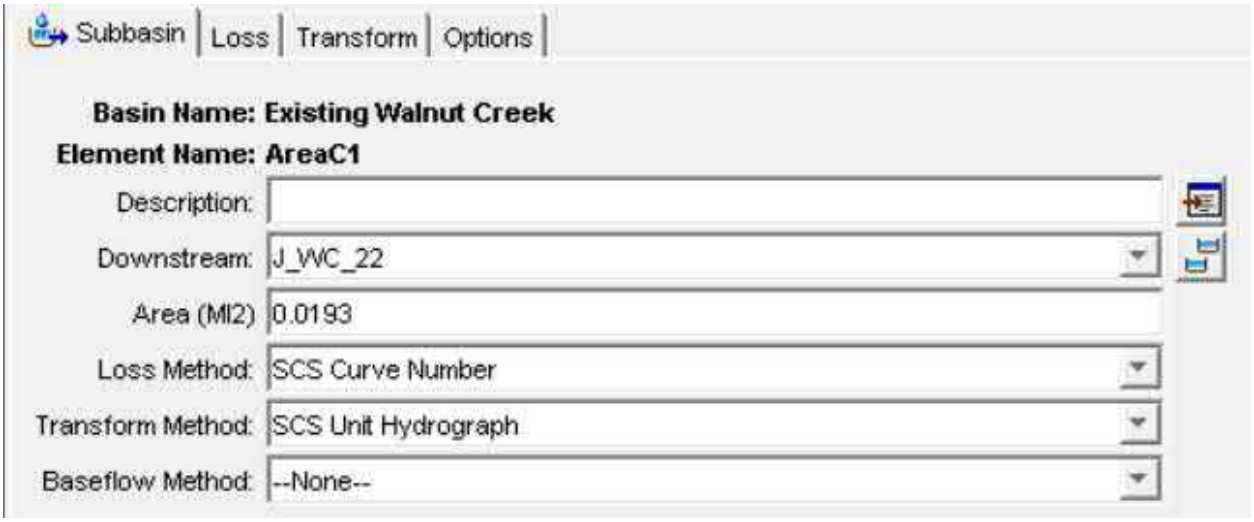

Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaB1
Initial Abstraction (IN)
Curve Number 57
Impervious (%) 0.0

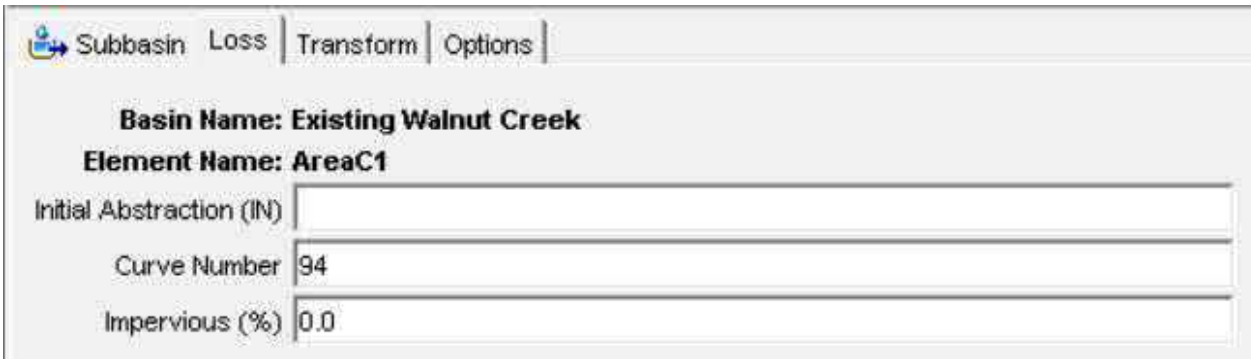

Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaB1
Lag Time (MIN) 10.29


Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaC2
Description:
Downstream: J_WC_21
Area (MI2) 0.099
Loss Method: SCS Curve Number
Transform Method: SCS Unit Hydrograph
Baseflow Method: --None--

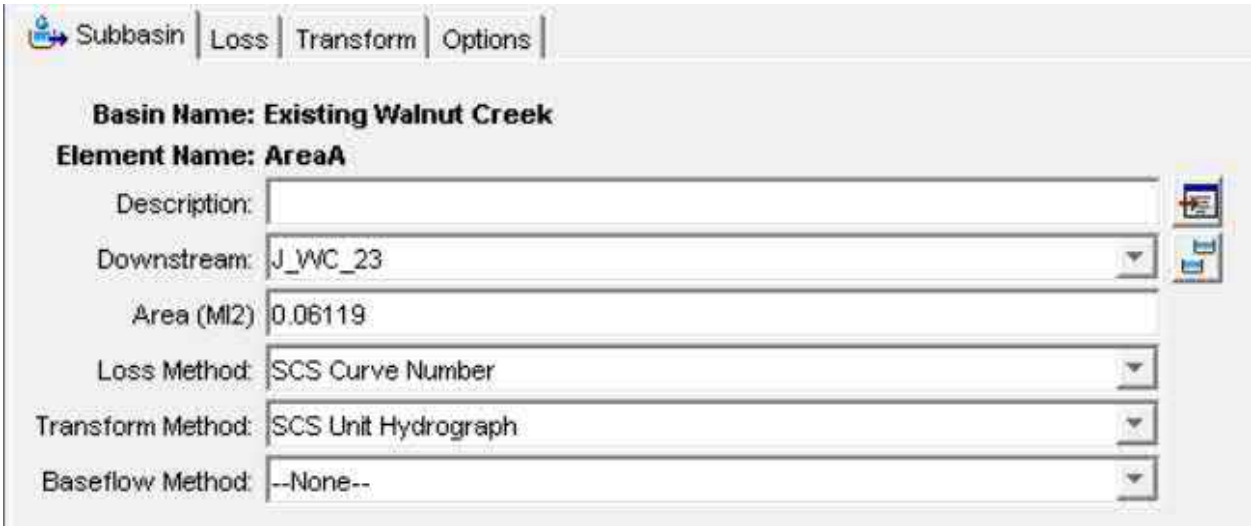

Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaC2
Initial Abstraction (IN)
Curve Number 94
Impervious (%) 0.0

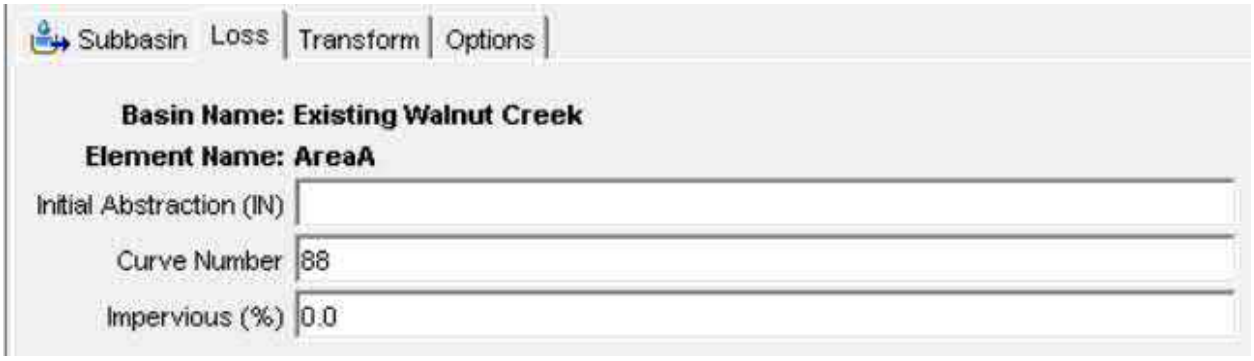

Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaC2
Lag Time (MIN) 3


Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaC1
Description:
Downstream: J_WC_22
Area (MI2) 0.0193
Loss Method: SCS Curve Number
Transform Method: SCS Unit Hydrograph
Baseflow Method: --None--

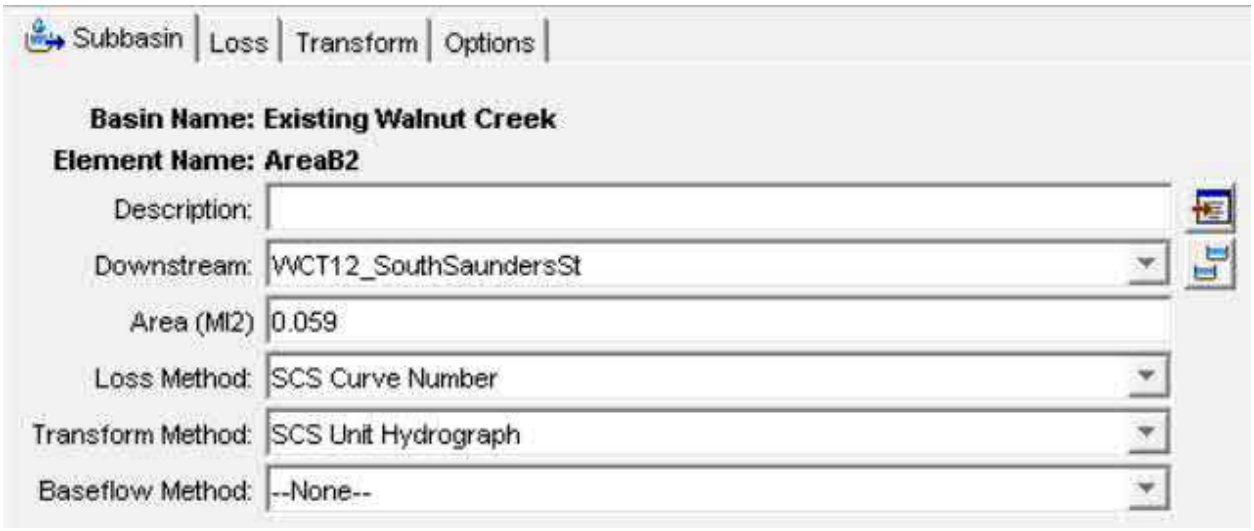

Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaC1
Initial Abstraction (IN)
Curve Number 94
Impervious (%) 0.0


Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaC1
Lag Time (MIN) 3


Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaA
Description:
Downstream: J_WC_23
Area (MI2) 0.06119
Loss Method: SCS Curve Number
Transform Method: SCS Unit Hydrograph
Baseflow Method: --None--

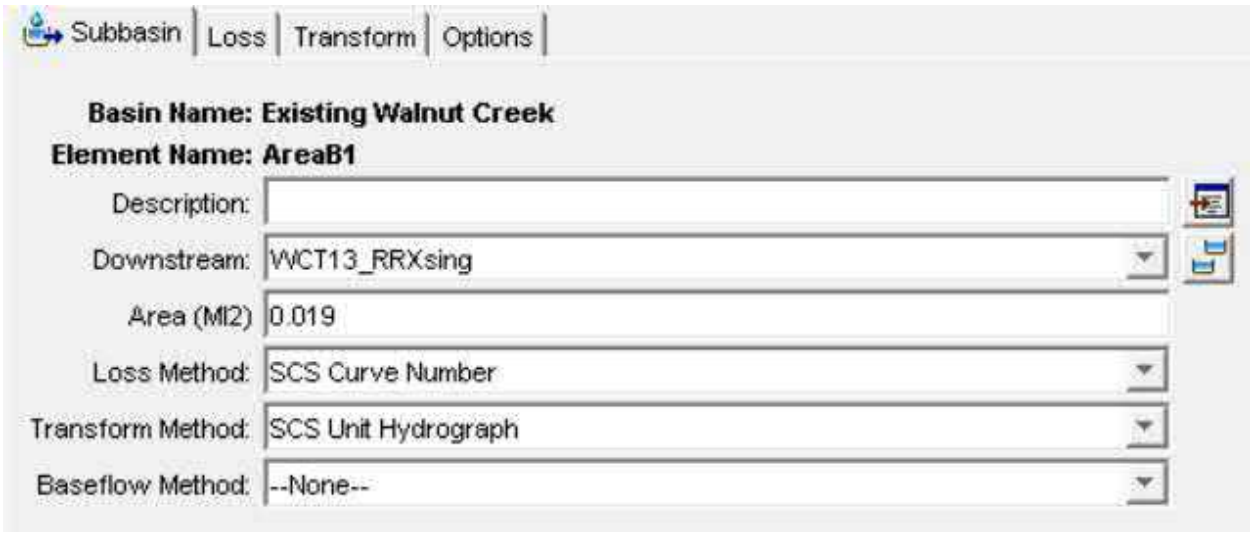

Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaA
Initial Abstraction (IN)
Curve Number 88
Impervious (%) 0.0

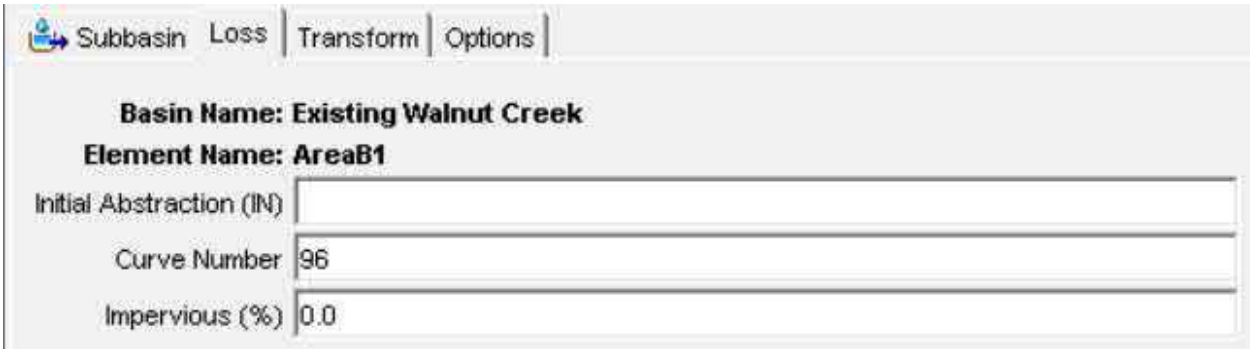

Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaA
Lag Time (MIN) 3


Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaB2
Description:
Downstream: WCT12_SouthSaundersSt
Area (MI2) 0.059
Loss Method: SCS Curve Number
Transform Method: SCS Unit Hydrograph
Baseflow Method: --None--


Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaB2
Initial Abstraction (IN)
Curve Number 96
Impervious (%) 0.0


Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaB2
Lag Time (MIN) 3


Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaB1
Description:
Downstream: WCT13_RRXsing
Area (MI2) 0.019
Loss Method: SCS Curve Number
Transform Method: SCS Unit Hydrograph
Baseflow Method: --None--


Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaB1
Initial Abstraction (IN)
Curve Number 96
Impervious (%) 0.0


Subbasin
Loss
Transform
Options
Basin Name: Existing Walnut Creek
Element Name: AreaB1
Lag Time (MIN) 3

A-Pond			
Stage	**Storage (cf)**	**CumStorage (cf)**	**Discharge (cfs)**
100	5000	0	0
100.1	5000	5000	0.06
100.2	5000	10000	0.25
100.3	5000	15000	0.58
100.4	5000	20000	1.02
100.5	5000	25000	1.57
100.6	5000	30000	2.24
100.7	5000	35000	3.03
100.8	5000	40000	3.95
100.9	5000	45000	4.95
101	5000	50000	6.07
101.1	5000	55000	7.28
101.2	5000	60000	8.61
101.3	5000	65000	10.02
101.4	5000	70000	11.4
101.5	5000	75000	12.76
101.6	5000	80000	14.17
101.7	5000	85000	15.66
101.8	5000	90000	17.22
101.9	5000	95000	18.83
102	5000	100000	20.54
102.1	5000	105000	22.31
102.2	5000	110000	24.16
102.3	5000	115000	26.13
102.4	5000	120000	28.17
102.5	5000	125000	30.31
102.6	5000	130000	32.54
102.7	5000	135000	34.95
102.8	5000	140000	37.46
102.9	5000	145000	40.04
103	5000	150000	42.34
103.1	5000	155000	44.7
103.2	5000	160000	47.18
103.3	5000	165000	49.71
103.4	5000	170000	52.38
103.5	5000	175000	55.1
103.6	5000	180000	56.52
103.7	5000	185000	57.87
103.8	5000	190000	59.22
103.9	5000	195000	60.58
104	5000	200000	61.86
104.1	5000	205000	63.14
104.2	5000	210000	64.42
104.3	5000	215000	66.44

104.4	5000	220000	69.03
104.5	5000	225000	71.96
104.6	5000	230000	75.31
104.7	5000	235000	78.92
104.8	5000	240000	82.73
104.9	5000	245000	86.89
105	5000	250000	91.3
105.1	5000	255000	95.76
105.2	5000	260000	100.55
105.3	5000	265000	105.51
105.4	5000	270000	110.65
105.5	5000	275000	115.98
105.6	5000	280000	121.5
105.7	5000	285000	127.17
105.8	5000	290000	133.02
105.9	5000	295000	139.04
106	5000	300000	145.19
106.1	5000	305000	151.54
106.2	5000	310000	158
106.3	5000	315000	164.59
106.4	5000	320000	171.36
106.5	5000	325000	178.26
106.6	5000	330000	185.33
106.7	5000	335000	192.51
106.8	5000	340000	199.73
106.9	5000	345000	206.79
107	5000	350000	213.79
107.1	5000	355000	220.82
107.2	5000	360000	227.87
107.3	5000	365000	234.94
107.4	5000	370000	242.01
107.5	5000	375000	249.15
107.6	5000	380000	256.31
107.7	5000	385000	263.46
107.8	5000	390000	270.69
107.9	5000	395000	277.97
108	5000	400000	285.26

Pond B1			
Stage	**Storage (cf)**	**CumStorage (cf)**	**Discharge (cfs)**
100	0	0	0
100.1	2400	2400	0.02
100.2	2400	4800	0.04
100.3	2400	7200	0.15
100.4	2400	9600	0.33
100.5	2400	12000	0.57
100.6	2400	14400	0.85
100.7	2400	16800	1.15
100.8	2400	19200	1.49
100.9	2400	21600	1.88
101	2400	24000	2.32
101.1	2400	26400	2.84
101.2	2400	28800	3.34
101.3	2400	31200	3.89
101.4	2400	33600	4.34
101.5	2400	36000	4.62
101.6	2400	38400	4.91
101.7	2400	40800	5.18
101.8	2400	43200	5.43
101.9	2400	45600	5.68
102	2400	48000	5.93
102.1	2400	50400	6.17
102.2	2400	52800	6.39
102.3	2400	55200	6.62
102.4	2400	57600	6.84
102.5	2400	60000	7.06
102.6	2400	62400	7.27
102.7	2400	64800	7.46
102.8	2400	67200	7.66
102.9	2400	69600	7.86
103	2400	72000	8.04
103.1	2400	74400	8.23
103.2	2400	76800	8.43
103.3	2400	79200	8.6
103.4	2400	81600	8.78
103.5	2400	84000	8.96
103.6	2400	86400	9.13
103.7	2400	88800	9.29
103.8	2400	91200	9.46
103.9	2400	93600	9.63
104	2400	96000	9.79
104.1	2400	98400	9.94
104.2	2400	100800	10.1
104.3	2400	103200	10.26

104.4	2400	105600	11.28
104.5	2400	108000	13.03
104.6	2400	110400	15.25
104.7	2400	112800	17.87
104.8	2400	115200	20.83
104.9	2400	117600	24.09
105	2400	120000	27.68
105.1	2400	122400	31.48
105.2	2400	124800	35.56
105.3	2400	127200	39.88
105.4	2400	129600	44.41
105.5	2400	132000	49.19
105.6	2400	134400	54.13
105.7	2400	136800	59.26
105.8	2400	139200	64.62
105.9	2400	141600	70.12
106	2400	144000	75.83
106.1	2400	146400	81.7
106.2	2400	148800	87.79
106.3	2400	151200	93.98
106.4	2400	153600	100.37
106.5	2400	156000	106.89
106.6	2400	158400	113.55
106.7	2400	160800	119.77
106.8	2400	163200	125.78
106.9	2400	165600	131.71
107	2400	168000	137.6
107.1	2400	170400	143.45
107.2	2400	172800	149.29
107.3	2400	175200	155.12
107.4	2400	177600	160.97
107.5	2400	180000	166.8
107.6	2400	182400	172.64
107.7	2400	184800	178.5
107.8	2400	187200	184.34
107.9	2400	189600	190.22
108	2400	192000	196.09

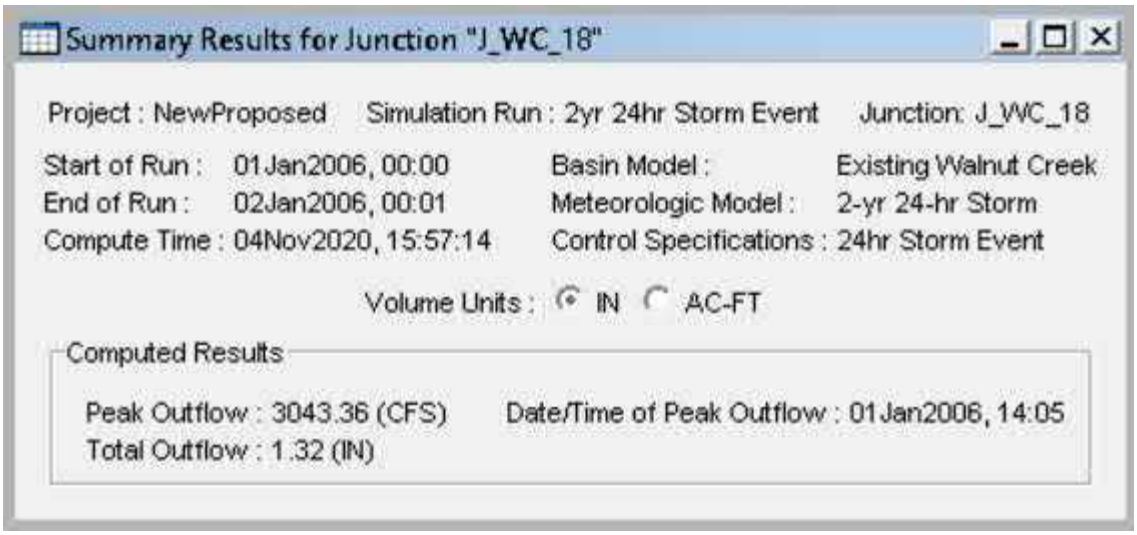
Pond B2			
Stage	**Storage (cf)**	**CumStorage (cf)**	**Discharge (cfs)**
100	0	0	0
100.1	7000	7000	0.04
100.2	7000	14000	0.15
100.3	7000	21000	0.33
100.4	7000	28000	0.57
100.5	7000	35000	0.85
100.6	7000	42000	1.15
100.7	7000	49000	1.49
100.8	7000	56000	1.88
100.9	7000	63000	2.32
101	7000	70000	2.84
101.1	7000	77000	3.34
101.2	7000	84000	3.89
101.3	7000	91000	4.34
101.4	7000	98000	4.62
101.5	7000	105000	4.91
101.6	7000	112000	5.18
101.7	7000	119000	5.43
101.8	7000	126000	5.68
101.9	7000	133000	5.93
102	7000	140000	6.17
102.1	7000	147000	6.39
102.2	7000	154000	6.62
102.3	7000	161000	6.84
102.4	7000	168000	7.06
102.5	7000	175000	7.27
102.6	7000	182000	7.46
102.7	7000	189000	7.66
102.8	7000	196000	7.86
102.9	7000	203000	8.04
103	7000	210000	8.23
103.1	7000	217000	8.43
103.2	7000	224000	8.6
103.3	7000	231000	8.78
103.4	7000	238000	8.96
103.5	7000	245000	9.13
103.6	7000	252000	9.29
103.7	7000	259000	9.46
103.8	7000	266000	9.63
103.9	7000	273000	9.79
104	7000	280000	9.94
104.1	7000	287000	10.1
104.2	7000	294000	10.26
104.3	7000	301000	11.28

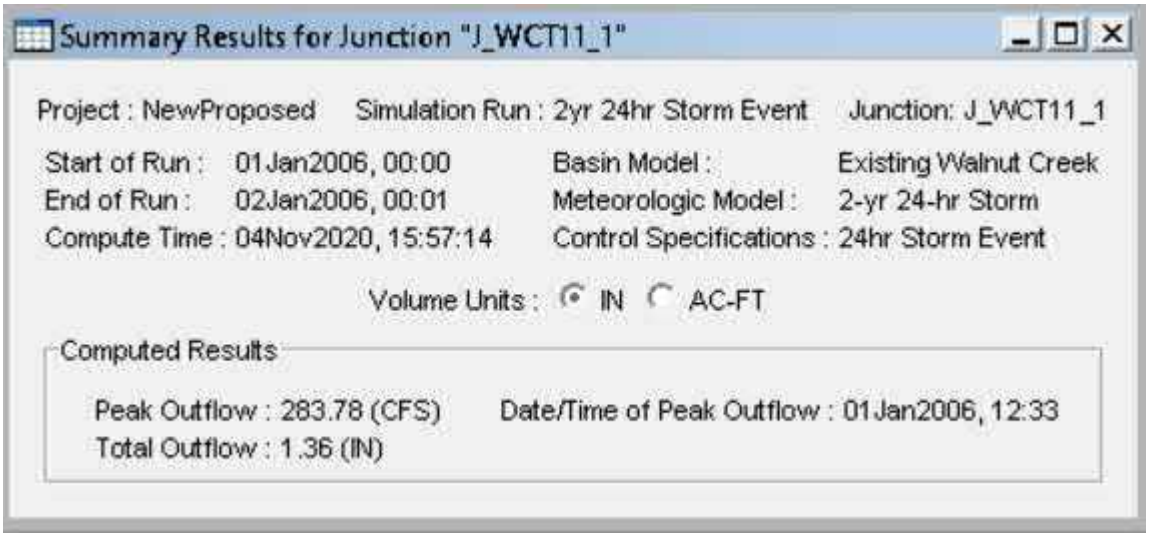
104.4	7000	308000	13.03
104.5	7000	315000	15.25
104.6	7000	322000	17.87
104.7	7000	329000	20.83
104.8	7000	336000	24.09
104.9	7000	343000	27.68
105	7000	350000	31.48
105.1	7000	357000	35.56
105.2	7000	364000	39.88
105.3	7000	371000	44.41
105.4	7000	378000	49.19
105.5	7000	385000	54.13
105.6	7000	392000	59.26
105.7	7000	399000	64.62
105.8	7000	406000	70.12
105.9	7000	413000	75.83
106	7000	420000	81.7
106.1	7000	427000	87.79
106.2	7000	434000	93.98
106.3	7000	441000	100.37
106.4	7000	448000	106.89
106.5	7000	455000	113.55
106.6	7000	462000	119.77
106.7	7000	469000	125.78
106.8	7000	476000	131.71
106.9	7000	483000	137.6
107	7000	490000	143.45
107.1	7000	497000	149.29
107.2	7000	504000	155.12
107.3	7000	511000	160.97
107.4	7000	518000	166.8
107.5	7000	525000	172.64
107.6	7000	532000	178.5
107.7	7000	539000	184.34
107.8	7000	546000	190.22
107.9	7000	553000	196.09
108	7000	560000	201.97

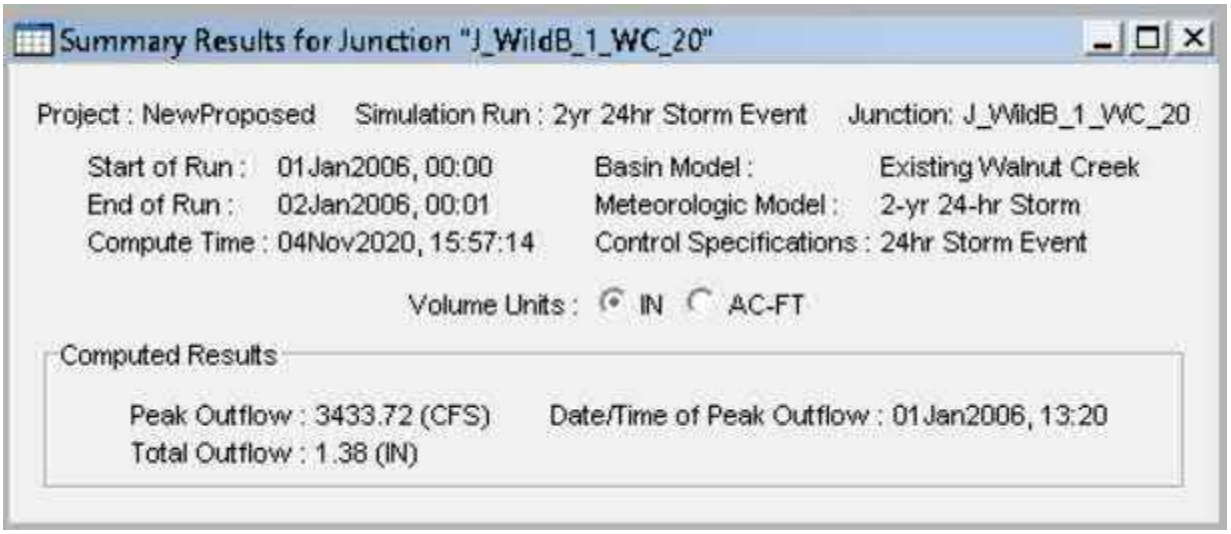
Pond C			
Stage	**Storage (cf)**	**CumStorage (cf)**	**Discharge (cfs)**
100	0	0	0
100.1	13200	13200	0.05
100.2	13200	26400	0.21
100.3	13200	39600	0.48
100.4	13200	52800	0.84
100.5	13200	66000	1.26
100.6	13200	79200	1.73
100.7	13200	92400	2.25
100.8	13200	105600	2.83
100.9	13200	118800	3.46
101	13200	132000	4.14
101.1	13200	145200	4.87
101.2	13200	158400	5.67
101.3	13200	171600	6.52
101.4	13200	184800	7.44
101.5	13200	198000	8.41
101.6	13200	211200	9.47
101.7	13200	224400	10.6
101.8	13200	237600	11.81
101.9	13200	250800	13.11
102	13200	264000	14.32
102.1	13200	277200	15.59
102.2	13200	290400	16.94
102.3	13200	303600	18.36
102.4	13200	316800	19.86
102.5	13200	330000	21.44
102.6	13200	343200	23.17
102.7	13200	356400	24.69
102.8	13200	369600	25.61
102.9	13200	382800	26.51
103	13200	396000	27.39
103.1	13200	409200	28.26
103.2	13200	422400	29.14
103.3	13200	435600	29.97
103.4	13200	448800	30.82
103.5	13200	462000	31.64
103.6	13200	475200	32.46
103.7	13200	488400	33.25
103.8	13200	501600	34.03
103.9	13200	514800	34.81
104	13200	528000	35.56
104.1	13200	541200	36.3
104.2	13200	554400	37.05
104.3	13200	567600	38.51

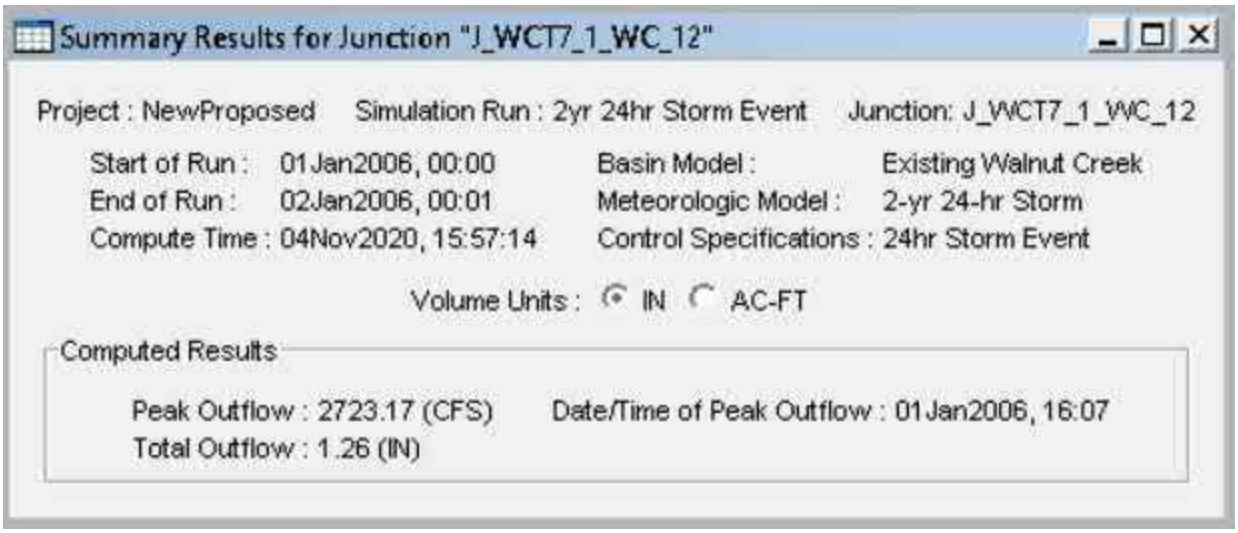
104.4	13200	580800	40.59
104.5	13200	594000	43.07
104.6	13200	607200	45.85
104.7	13200	620400	48.98
104.8	13200	633600	52.37
104.9	13200	646800	55.92
105	13200	660000	59.79
105.1	13200	673200	63.87
105.2	13200	686400	68.17
105.3	13200	699600	72.67
105.4	13200	712800	77.33
105.5	13200	726000	82.22
105.6	13200	739200	87.28
105.7	13200	752400	92.49
105.8	13200	765600	97.91
105.9	13200	778800	103.52
106	13200	792000	109.25
106.1	13200	805200	115.04
106.2	13200	818400	120.52
106.3	13200	831600	125.97
106.4	13200	844800	131.36
106.5	13200	858000	136.75
106.6	13200	871200	142.16
106.7	13200	884400	147.56
106.8	13200	897600	152.98
106.9	13200	910800	158.41
107	13200	924000	163.86
107.1	13200	937200	169.36
107.2	13200	950400	174.83
107.3	13200	963600	180.37
107.4	13200	976800	185.89
107.5	13200	990000	191.45
107.6	13200	1003200	197.04
107.7	13200	1016400	202.63
107.8	13200	1029600	208.22
107.9	13200	1042800	213.87
108	13200	1056000	219.48

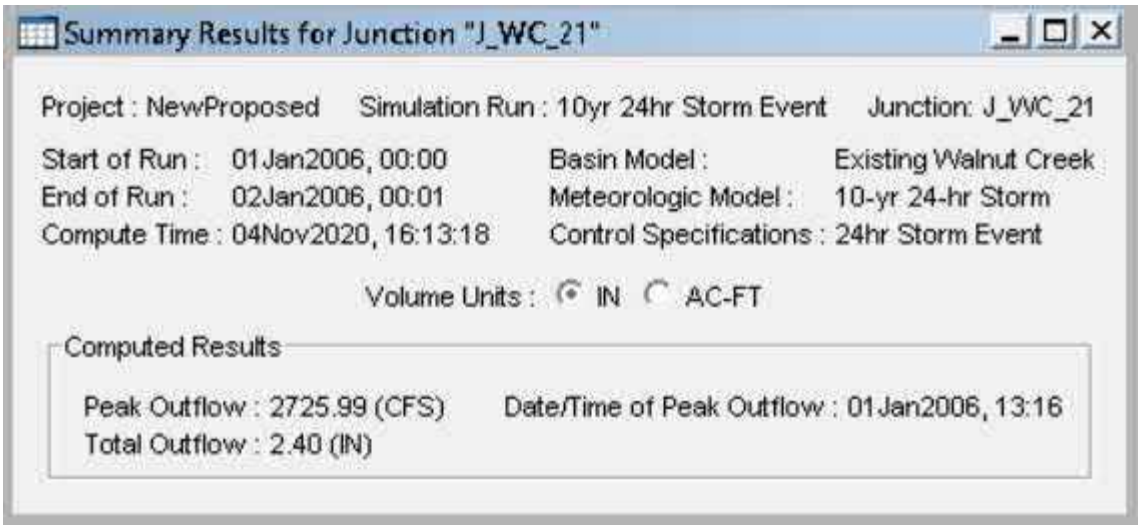

Summary Results for Junction "J_WC_21"
Project : NewProposed
Simulation Run : 2yr 24hr Storm Event
Junction: J_WC_21
Start of Run : 01Jan2006, 00:00
End of Run : 02Jan2006, 00:01
Compute Time : 04Nov2020, 15:57:14
Basin Model : Existing Walnut Creek
Meteorologic Model : 2-yr 24-hr Storm
Control Specifications : 24hr Storm Event
Volume Units : IN AC-FT
Computed Results
Peak Outflow : 1749.22 (CFS)
Date/Time of Peak Outflow : 01Jan2006, 12:52
Total Outflow : 1.24 (IN)

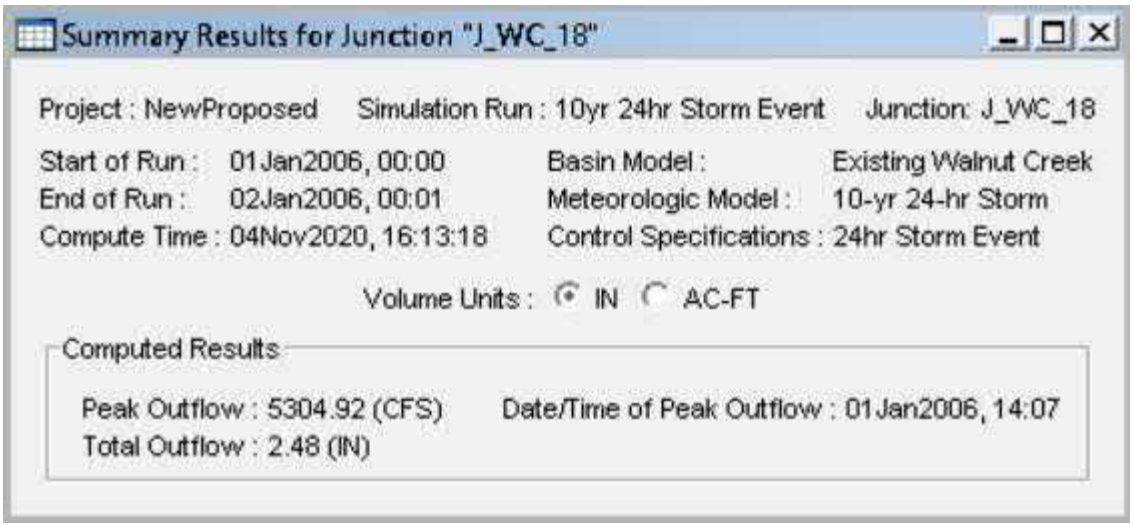

Summary Results for Junction "J_WC_18"
Project : NewProposed
Simulation Run : 2yr 24hr Storm Event
Junction: J_WC_18
Start of Run : 01Jan2006, 00:00
End of Run : 02Jan2006, 00:01
Compute Time : 04Nov2020, 15:57:14
Basin Model : Existing Walnut Creek
Meteorologic Model : 2-yr 24-hr Storm
Control Specifications : 24hr Storm Event
Volume Units : IN AC-FT
Computed Results
Peak Outflow : 3043.36 (CFS)
Date/Time of Peak Outflow : 01Jan2006, 14:05
Total Outflow : 1.32 (IN)


Summary Results for Junction "J_WCT11_1"
Project : NewProposed
Simulation Run : 2yr 24hr Storm Event
Junction: J_WCT11_1
Start of Run : 01Jan2006, 00:00
End of Run : 02Jan2006, 00:01
Compute Time : 04Nov2020, 15:57:14
Basin Model : Existing Walnut Creek
Meteorologic Model : 2-yr 24-hr Storm
Control Specifications : 24hr Storm Event
Volume Units : IN AC-FT
Computed Results
Peak Outflow : 283.78 (CFS)
Date/Time of Peak Outflow : 01Jan2006, 12:33
Total Outflow : 1.36 (IN)


Summary Results for Junction "J_WildB_1_WC_20"
Project : NewProposed
Simulation Run : 2yr 24hr Storm Event
Junction: J_WildB_1_WC_20
Start of Run : 01Jan2006, 00:00
End of Run : 02Jan2006, 00:01
Compute Time : 04Nov2020, 15:57:14
Basin Model : Existing Walnut Creek
Meteorologic Model : 2-yr 24-hr Storm
Control Specifications : 24hr Storm Event
Volume Units : IN AC-FT
Computed Results
Peak Outflow : 3433.72 (CFS)
Date/Time of Peak Outflow : 01Jan2006, 13:20
Total Outflow : 1.38 (IN)

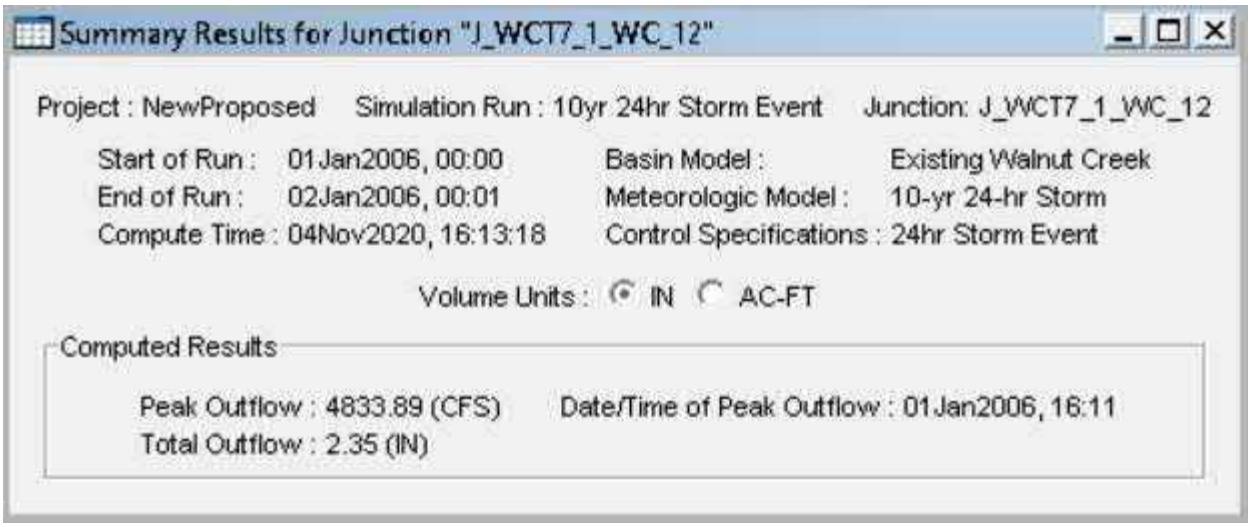

Summary Results for Junction "J_WCT7_1_WC_12"
Project : NewProposed
Simulation Run : 2yr 24hr Storm Event
Junction: J_WCT7_1_WC_12
Start of Run : 01Jan2006, 00:00
End of Run : 02Jan2006, 00:01
Compute Time : 04Nov2020, 15:57:14
Basin Model : Existing Walnut Creek
Meteorologic Model : 2-yr 24-hr Storm
Control Specifications : 24hr Storm Event
Volume Units : IN AC-FT
Computed Results
Peak Outflow : 2723.17 (CFS)
Date/Time of Peak Outflow : 01Jan2006, 16:07
Total Outflow : 1.26 (IN)


Summary Results for Junction "J_WC_21"
Project : NewProposed
Simulation Run : 10yr 24hr Storm Event
Junction: J_WC_21
Start of Run : 01Jan2006, 00:00
End of Run : 02Jan2006, 00:01
Compute Time : 04Nov2020, 16:13:18
Basin Model : Existing Walnut Creek
Meteorologic Model : 10-yr 24-hr Storm
Control Specifications : 24hr Storm Event
Volume Units : IN AC-FT
Computed Results
Peak Outflow : 2725.99 (CFS)
Date/Time of Peak Outflow : 01Jan2006, 13:16
Total Outflow : 2.40 (IN)

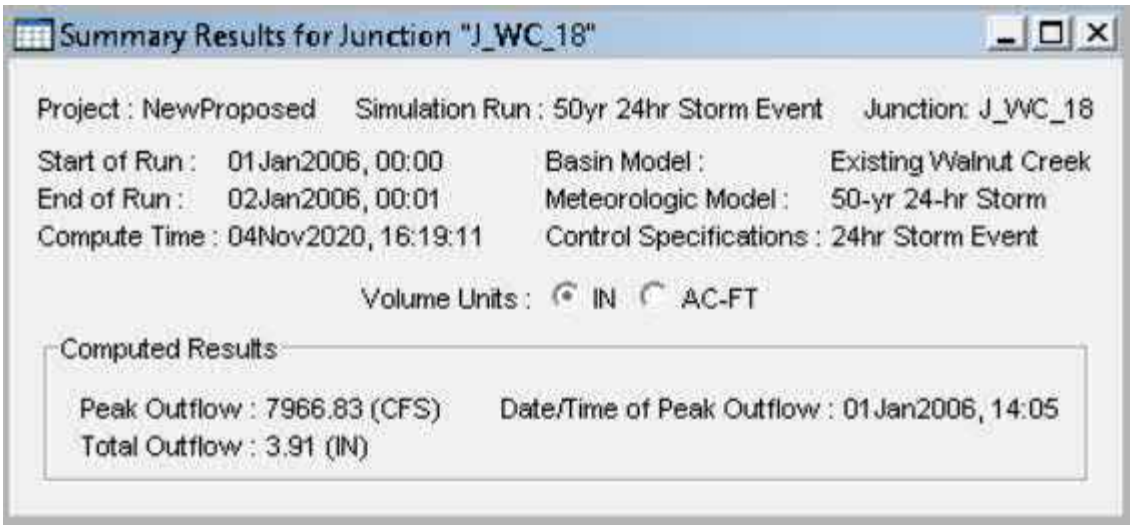

Summary Results for Junction "J_WC_18"
Project : NewProposed
Simulation Run : 10yr 24hr Storm Event
Junction: J_WC_18
Start of Run : 01Jan2006, 00:00
End of Run : 02Jan2006, 00:01
Compute Time : 04Nov2020, 16:13:18
Basin Model : Existing Walnut Creek
Meteorologic Model : 10-yr 24-hr Storm
Control Specifications : 24hr Storm Event
Volume Units : IN AC-FT
Computed Results
Peak Outflow : 5304.92 (CFS)
Date/Time of Peak Outflow : 01Jan2006, 14:07
Total Outflow : 2.48 (IN)


Summary Results for Junction "J_WCT11_1"
Project : NewProposed
Simulation Run : 10yr 24hr Storm Event
Junction: J_WCT11_1
Start of Run : 01Jan2006, 00:00
End of Run : 02Jan2006, 00:01
Compute Time : 04Nov2020, 16:13:18
Basin Model : Existing Walnut Creek
Meteorologic Model : 10-yr 24-hr Storm
Control Specifications : 24hr Storm Event
Volume Units : IN AC-FT
Computed Results
Peak Outflow : 535.55 (CFS)
Date/Time of Peak Outflow : 01Jan2006, 12:37
Total Outflow : 2.63 (IN)


Summary Results for Junction "J_WildB_1_WC_20"
Project : NewProposed Simulation Run : 10yr 24hr Storm Event Junction: J_WildB_1_WC_20
Start of Run : 01Jan2006, 00:00
End of Run : 02Jan2006, 00:01
Compute Time : 04Nov2020, 16:13:18
Basin Model : Existing Walnut Creek
Meteorologic Model : 10-yr 24-hr Storm
Control Specifications : 24hr Storm Event
Volume Units : IN AC-FT
Computed Results
Peak Outflow : 5783.64 (CFS)
Total Outflow : 2.59 (IN)
Date/Time of Peak Outflow : 01Jan2006, 13:30

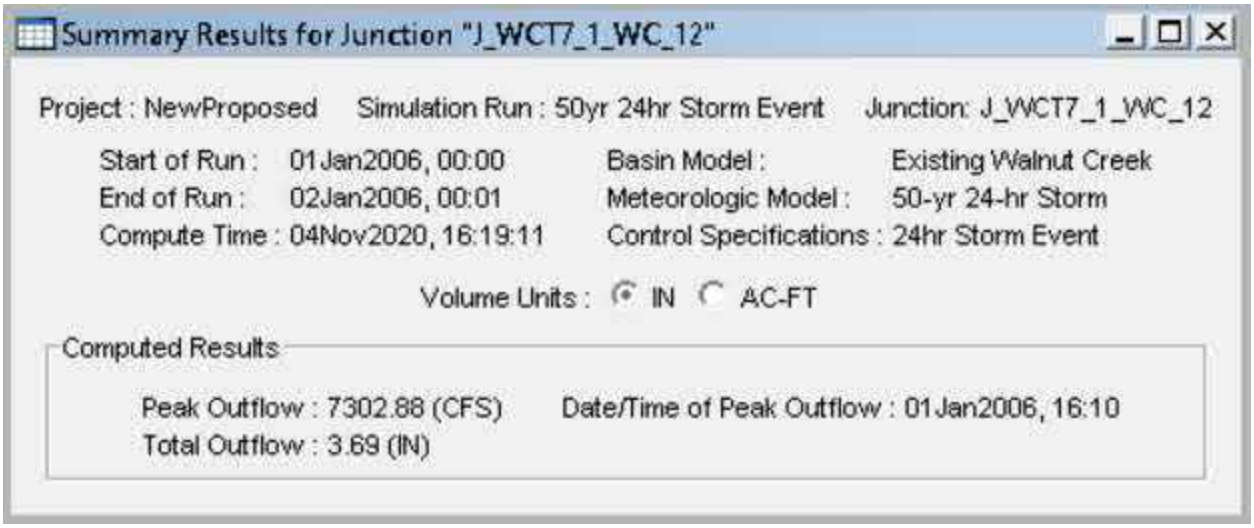

Summary Results for Junction "J_WCT7_1_WC_12"
Project : NewProposed Simulation Run : 10yr 24hr Storm Event Junction: J_WCT7_1_WC_12
Start of Run : 01Jan2006, 00:00
End of Run : 02Jan2006, 00:01
Compute Time : 04Nov2020, 16:13:18
Basin Model : Existing Walnut Creek
Meteorologic Model : 10-yr 24-hr Storm
Control Specifications : 24hr Storm Event
Volume Units : IN AC-FT
Computed Results
Peak Outflow : 4833.89 (CFS)
Total Outflow : 2.35 (IN)
Date/Time of Peak Outflow : 01Jan2006, 16:11

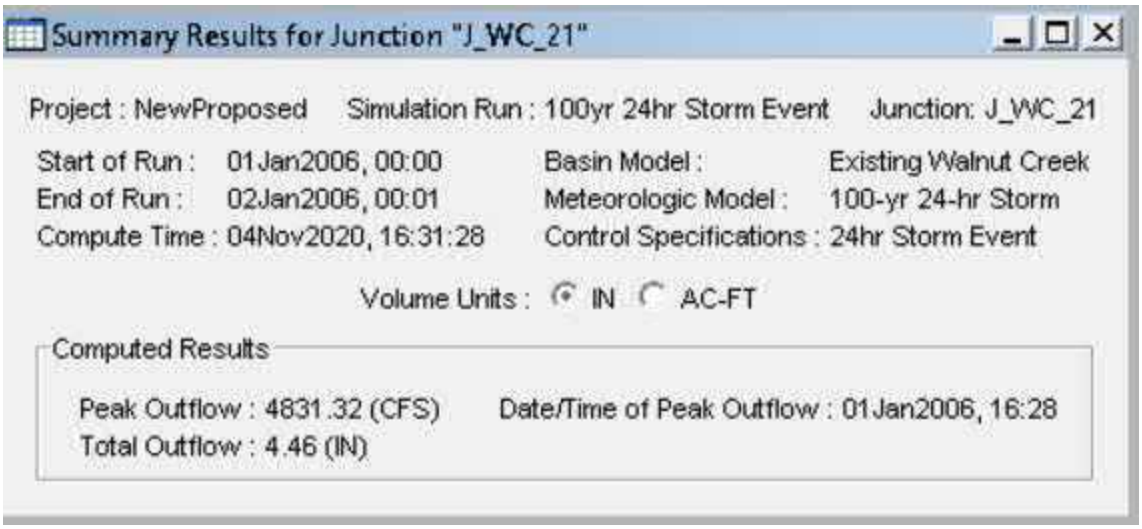

Summary Results for Junction "J_WC_21"
Project : NewProposed
Simulation Run : 50yr 24hr Storm Event
Junction: J_WC_21
Start of Run : 01Jan2006, 00:00
End of Run : 02Jan2006, 00:01
Compute Time : 04Nov2020, 16:19:11
Basin Model : Existing Walnut Creek
Meteorologic Model : 50-yr 24-hr Storm
Control Specifications : 24hr Storm Event
Volume Units : IN AC-FT
Computed Results
Peak Outflow : 4075.65 (CFS)
Date/Time of Peak Outflow : 01Jan2006, 16:15
Total Outflow : 3.83 (IN)

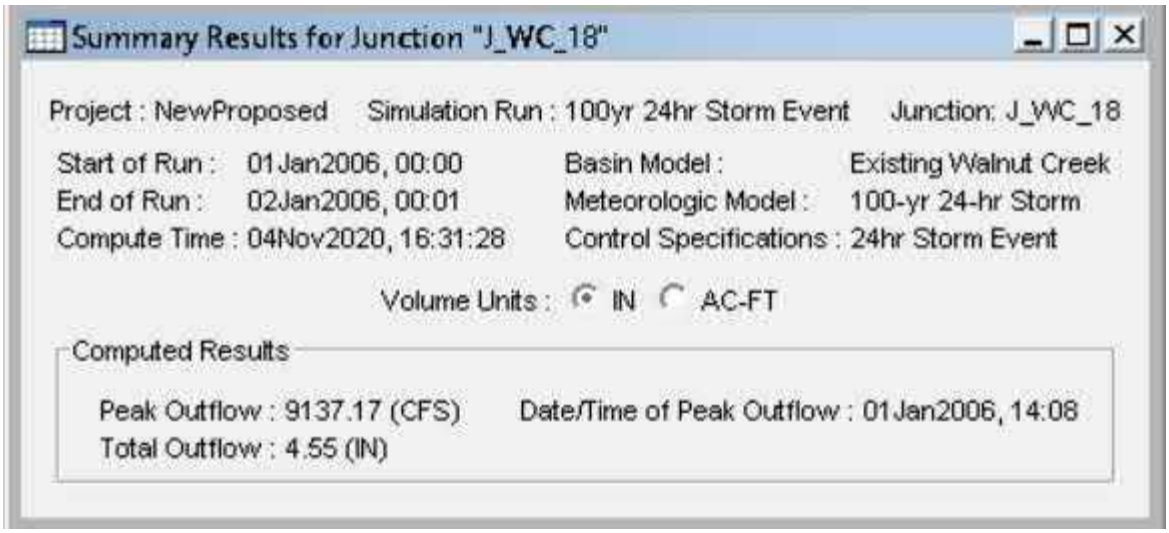

Summary Results for Junction "J_WC_18"
Project : NewProposed
Simulation Run : 50yr 24hr Storm Event
Junction: J_WC_18
Start of Run : 01Jan2006, 00:00
End of Run : 02Jan2006, 00:01
Compute Time : 04Nov2020, 16:19:11
Basin Model : Existing Walnut Creek
Meteorologic Model : 50-yr 24-hr Storm
Control Specifications : 24hr Storm Event
Volume Units : IN AC-FT
Computed Results
Peak Outflow : 7966.83 (CFS)
Date/Time of Peak Outflow : 01Jan2006, 14:05
Total Outflow : 3.91 (IN)


Summary Results for Junction "J_WCT11_1"
Project : NewProposed
Simulation Run : 50yr 24hr Storm Event
Junction: J_WCT11_1
Start of Run : 01Jan2006, 00:00
End of Run : 02Jan2006, 00:01
Compute Time : 04Nov2020, 16:19:11
Basin Model : Existing Walnut Creek
Meteorologic Model : 50-yr 24-hr Storm
Control Specifications : 24hr Storm Event
Volume Units : IN AC-FT
Computed Results
Peak Outflow : 874.19 (CFS)
Date/Time of Peak Outflow : 01Jan2006, 12:37
Total Outflow : 4.24 (IN)


Summary Results for Junction "J_WildB_1_WC_20"
Project : NewProposed Simulation Run : 50yr 24hr Storm Event Junction: J_WildB_1_WC_20
Start of Run : 01Jan2006, 00:00
End of Run : 02Jan2006, 00:01
Compute Time : 04Nov2020, 16:19:11
Basin Model : Existing Walnut Creek
Meteorologic Model : 50-yr 24-hr Storm
Control Specifications : 24hr Storm Event
Volume Units : IN AC-FT
Computed Results
Peak Outflow : 8574.71 (CFS)
Total Outflow : 4.08 (IN)
Date/Time of Peak Outflow : 01Jan2006, 13:33

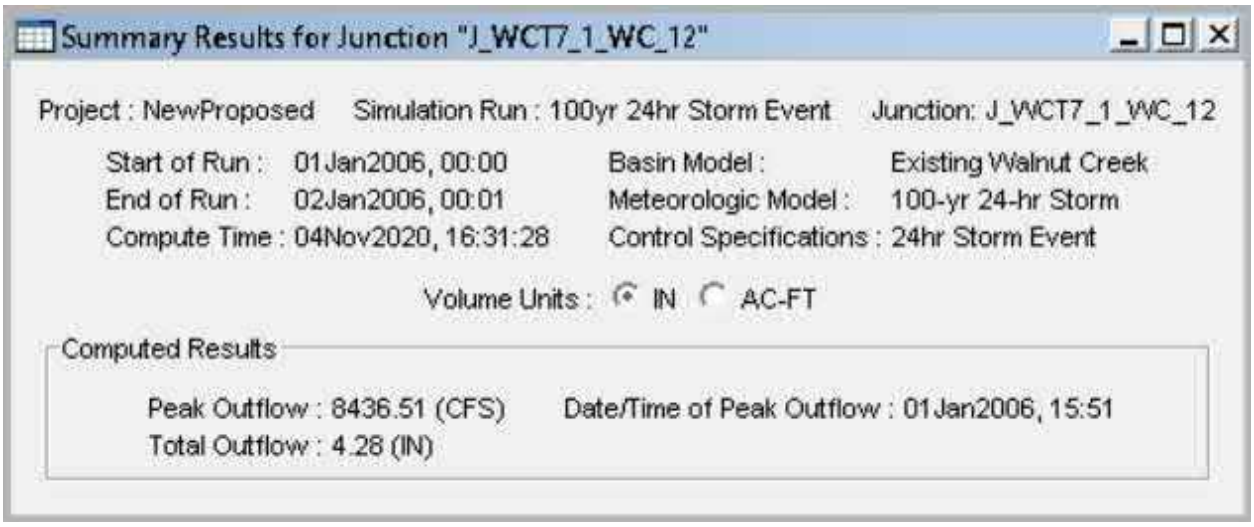

Summary Results for Junction "J_WCT7_1_WC_12"
Project : NewProposed Simulation Run : 50yr 24hr Storm Event Junction: J_WCT7_1_WC_12
Start of Run : 01Jan2006, 00:00
End of Run : 02Jan2006, 00:01
Compute Time : 04Nov2020, 16:19:11
Basin Model : Existing Walnut Creek
Meteorologic Model : 50-yr 24-hr Storm
Control Specifications : 24hr Storm Event
Volume Units : IN AC-FT
Computed Results
Peak Outflow : 7302.88 (CFS)
Total Outflow : 3.69 (IN)
Date/Time of Peak Outflow : 01Jan2006, 16:10

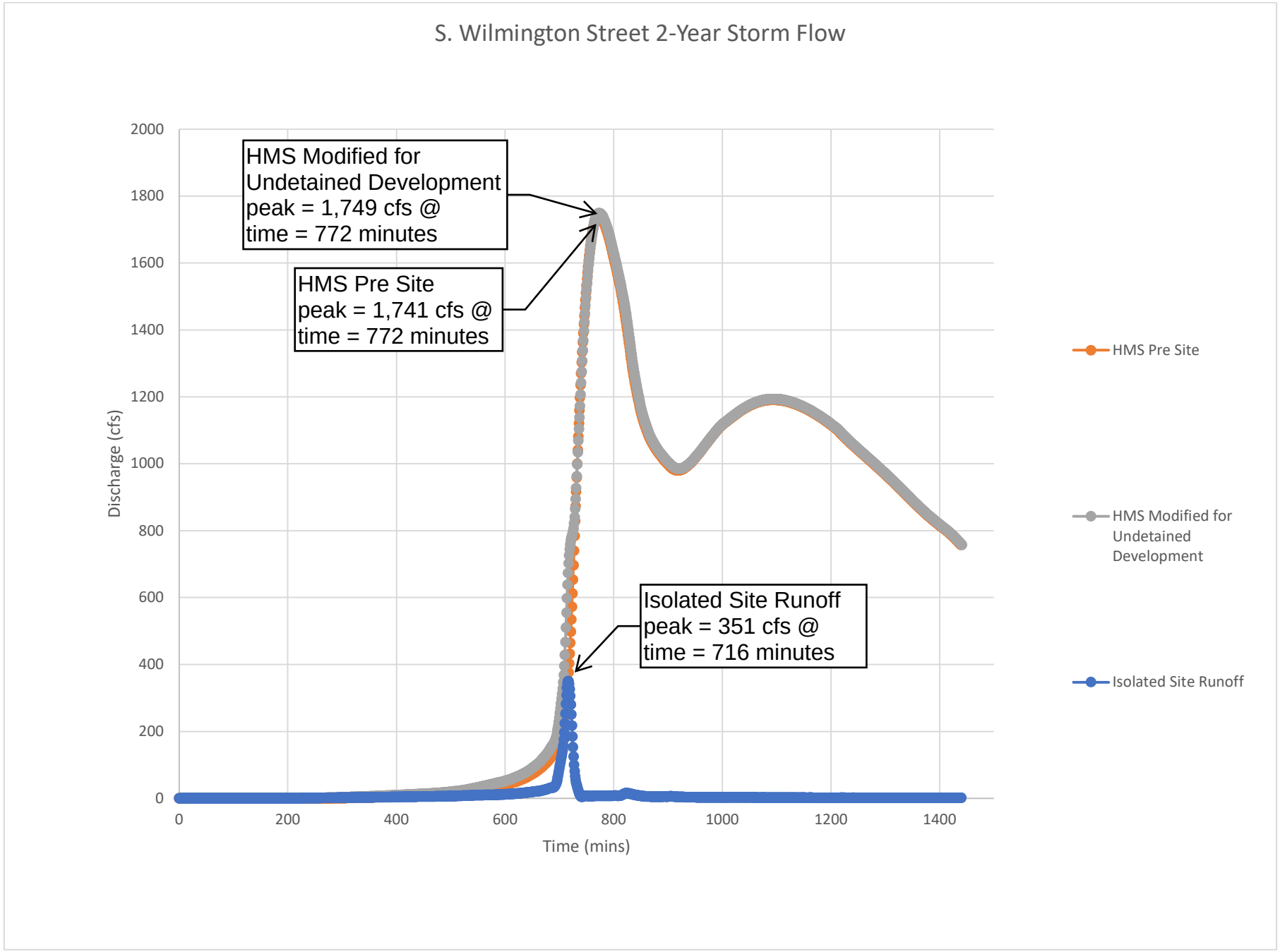

Summary Results for Junction "J_WC_21"
Project : NewProposed Simulation Run : 100yr 24hr Storm Event Junction: J_WC_21
Start of Run : 01Jan2006, 00:00
End of Run : 02Jan2006, 00:01
Compute Time : 04Nov2020, 16:31:28
Basin Model : Existing Walnut Creek
Meteorologic Model : 100-yr 24-hr Storm
Control Specifications : 24hr Storm Event
Volume Units : IN AC-FT
Computed Results
Peak Outflow : 4831.32 (CFS)
Date/Time of Peak Outflow : 01Jan2006, 16:28
Total Outflow : 4.46 (IN)

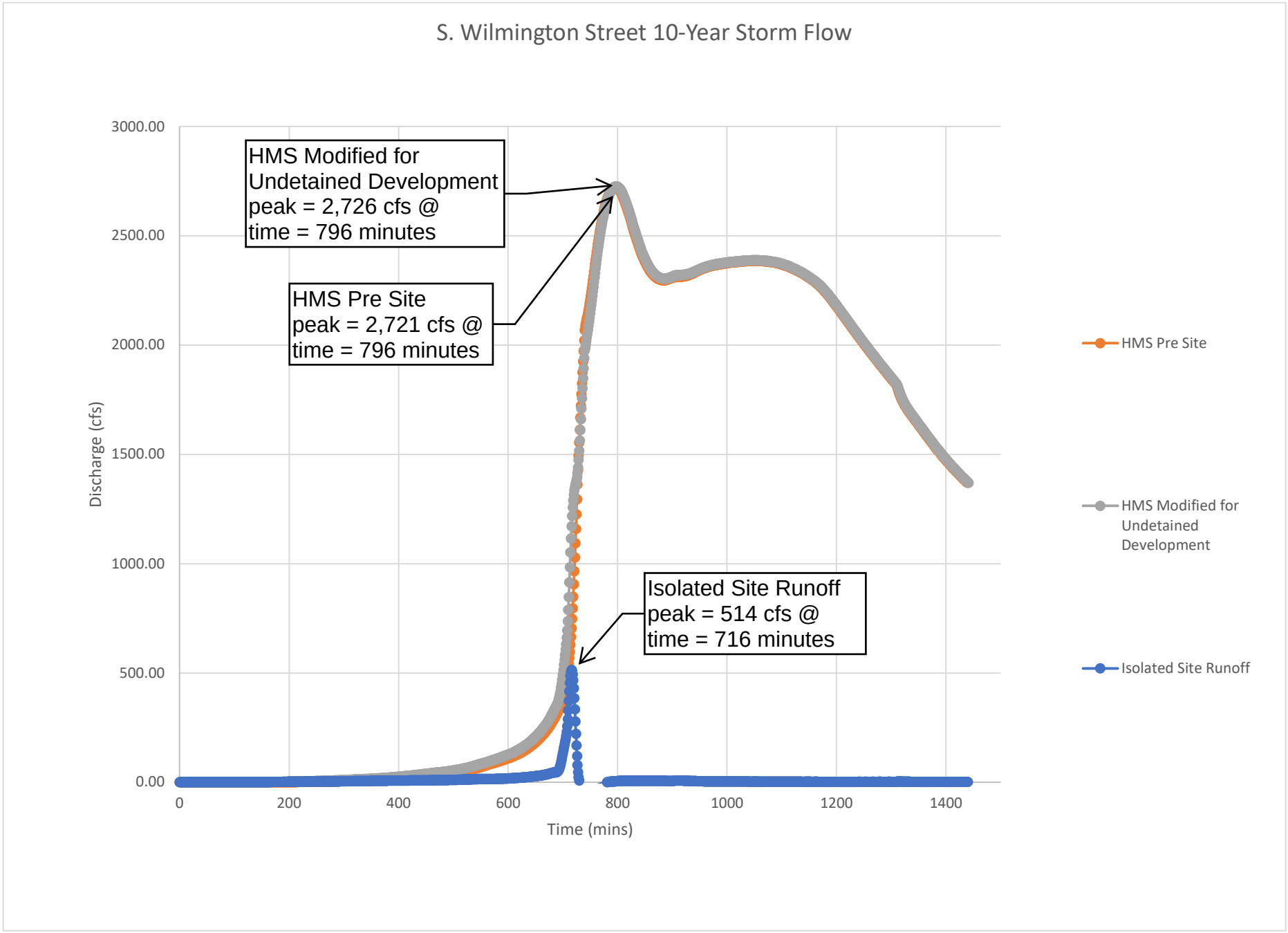

Summary Results for Junction "J_WC_18"
Project : NewProposed Simulation Run : 100yr 24hr Storm Event Junction: J_WC_18
Start of Run : 01Jan2006, 00:00
End of Run : 02Jan2006, 00:01
Compute Time : 04Nov2020, 16:31:28
Basin Model : Existing Walnut Creek
Meteorologic Model : 100-yr 24-hr Storm
Control Specifications : 24hr Storm Event
Volume Units : IN AC-FT
Computed Results
Peak Outflow : 9137.17 (CFS)
Date/Time of Peak Outflow : 01Jan2006, 14:08
Total Outflow : 4.55 (IN)

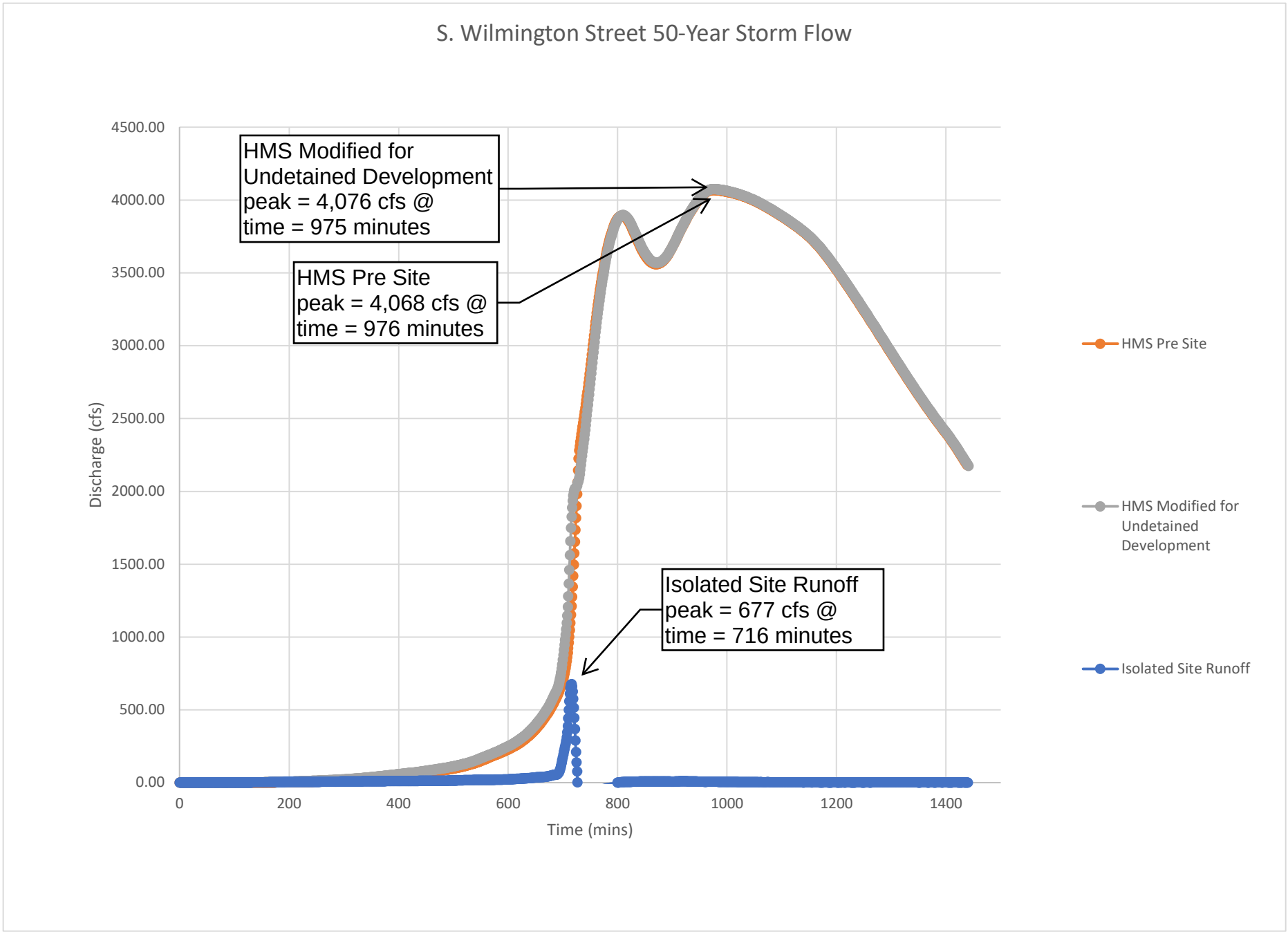

Summary Results for Junction "J_WCT11_1"
Project : NewProposed Simulation Run : 100yr 24hr Storm Event Junction: J_WCT11_1
Start of Run : 01Jan2006, 00:00
End of Run : 02Jan2006, 00:01
Compute Time : 04Nov2020, 16:31:28
Basin Model : Existing Walnut Creek
Meteorologic Model : 100-yr 24-hr Storm
Control Specifications : 24hr Storm Event
Volume Units : IN AC-FT
Computed Results
Peak Outflow : 1009.28 (CFS)
Date/Time of Peak Outflow : 01Jan2006, 12:37
Total Outflow : 4.94 (IN)

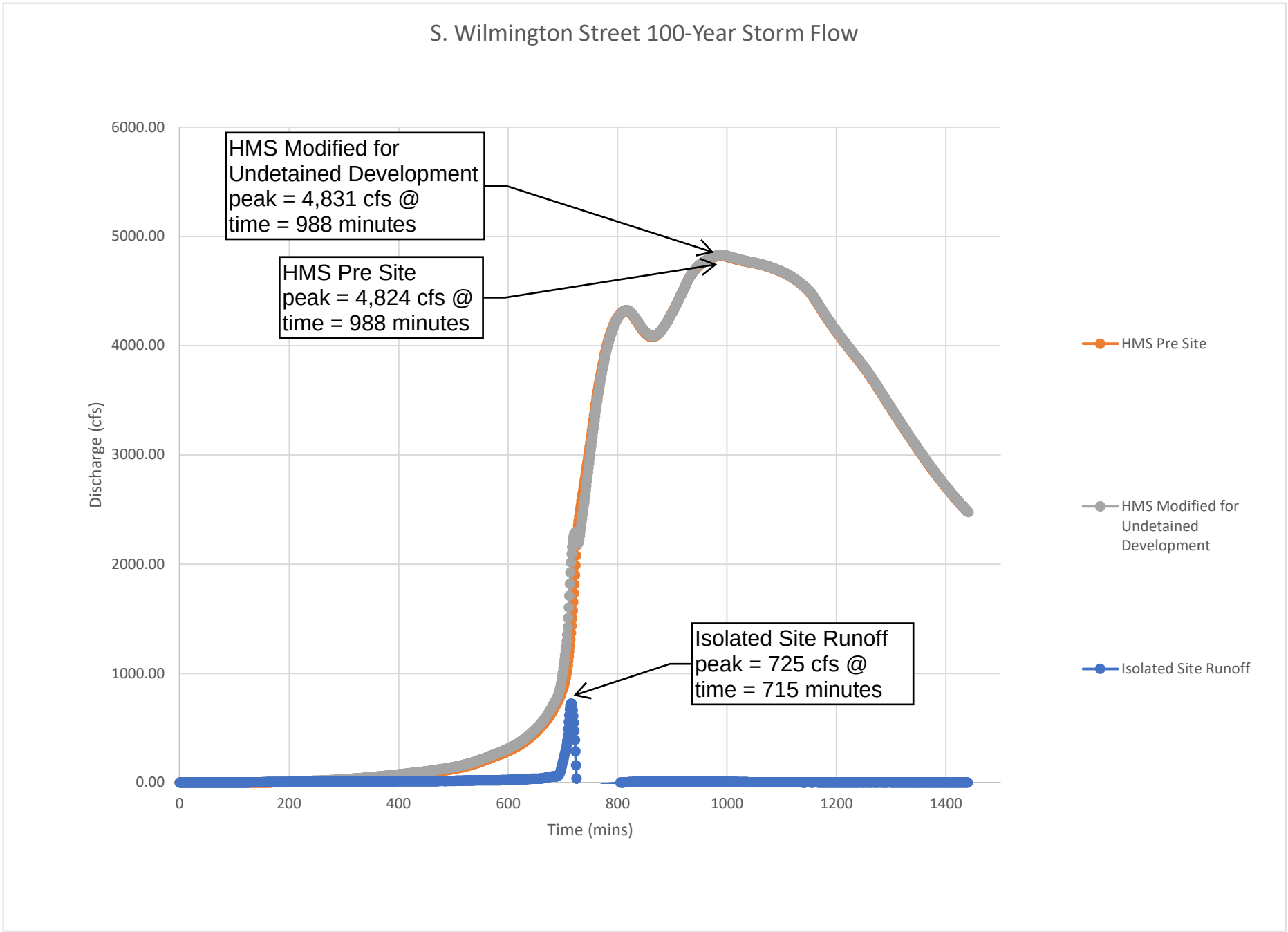

Summary Results for Junction "J_WildB_1_WC_20"
Project : NewProposed
Simulation Run : 100yr 24hr Storm Event
Junction: J_WildB_1_WC_20
Start of Run : 01Jan2006, 00:00
End of Run : 02Jan2006, 00:01
Compute Time : 04Nov2020, 16:31:28
Basin Model : Existing Walnut Creek
Meteorologic Model : 100-yr 24-hr Storm
Control Specifications : 24hr Storm Event
Volume Units : IN AC-FT
Computed Results
Peak Outflow : 9546.63 (CFS)
Date/Time of Peak Outflow : 01Jan2006, 13:38
Total Outflow : 4.73 (IN)

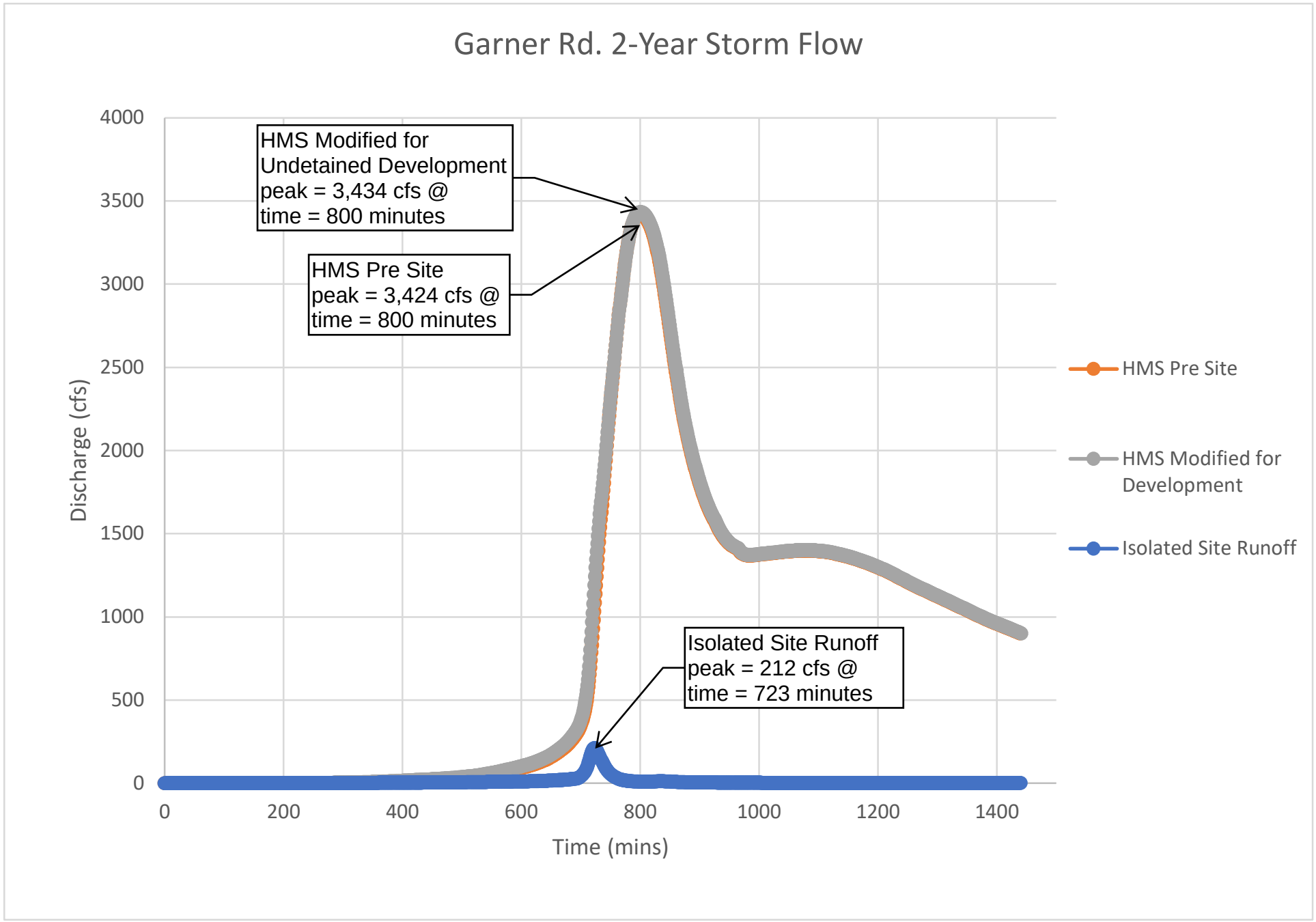

Summary Results for Junction "J_WCT7_1_WC_12"
Project : NewProposed
Simulation Run : 100yr 24hr Storm Event
Junction: J_WCT7_1_WC_12
Start of Run : 01Jan2006, 00:00
End of Run : 02Jan2006, 00:01
Compute Time : 04Nov2020, 16:31:28
Basin Model : Existing Walnut Creek
Meteorologic Model : 100-yr 24-hr Storm
Control Specifications : 24hr Storm Event
Volume Units : IN AC-FT
Computed Results
Peak Outflow : 8436.51 (CFS)
Date/Time of Peak Outflow : 01Jan2006, 15:51
Total Outflow : 4.28 (IN)

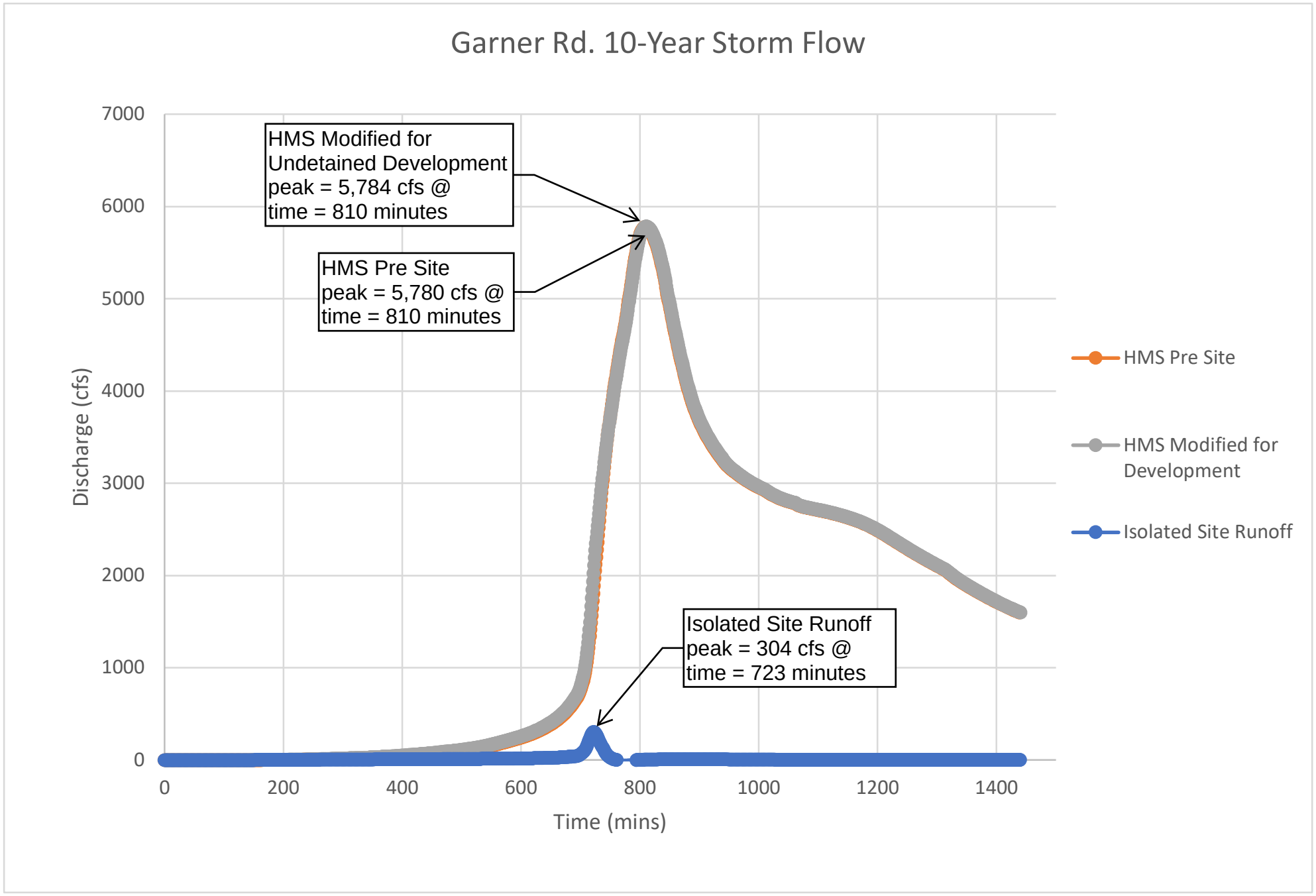

S. Wilmington Street 2-Year Storm Flow
HMS Modified for Undetained Development peak = 1,749 cfs @ time = 772 minutes
HMS Pre Site peak = 1,741 cfs @ time = 772 minutes
Isolated Site Runoff peak = 351 cfs @ time = 716 minutes
Discharge (cfs)
Time (mins)
0
200
400
600
800
1000
1200
1400
1600
1800
2000
HMS Pre Site
HMS Modified for Undetained Development
Isolated Site Runoff

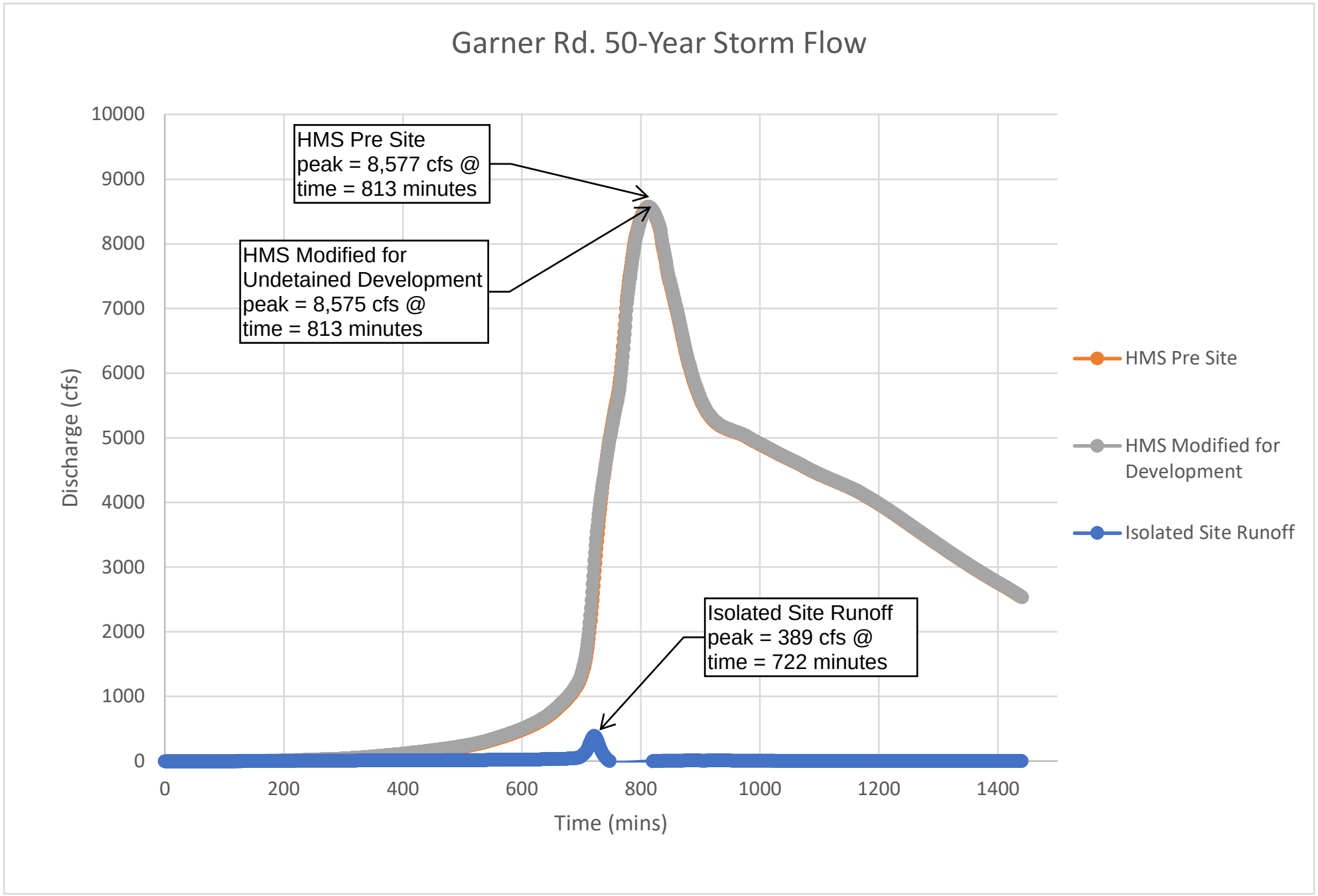

S. Wilmington Street 10-Year Storm Flow
HMS Modified for Undetained Development peak = 2,726 cfs @ time = 796 minutes
HMS Pre Site peak = 2,721 cfs @ time = 796 minutes
Isolated Site Runoff peak = 514 cfs @ time = 716 minutes
Discharge (cfs)
3000.00
2500.00
2000.00
1500.00
1000.00
500.00
0.00
0
200
400
600
800
1000
1200
1400
Time (mins)
HMS Pre Site
HMS Modified for Undetained Development
Isolated Site Runoff

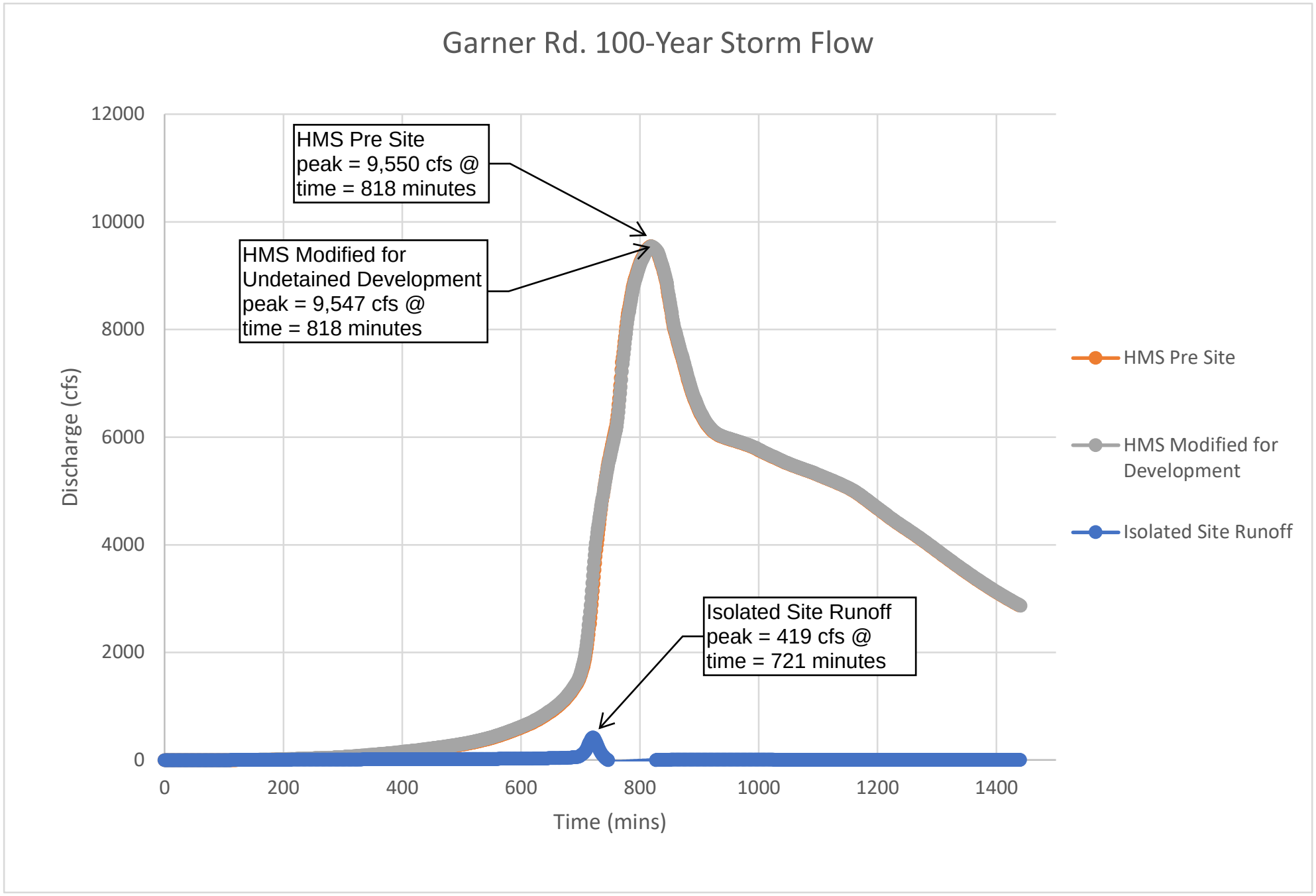

S. Wilmington Street 50-Year Storm Flow
HMS Modified for Undetained Development peak = 4,076 cfs @ time = 975 minutes
HMS Pre Site peak = 4,068 cfs @ time = 976 minutes
Isolated Site Runoff peak = 677 cfs @ time = 716 minutes
Discharge (cfs)
4500.00
4000.00
3500.00
3000.00
2500.00
2000.00
1500.00
1000.00
500.00
0.00
0
200
400
600
800
1000
1200
1400
Time (mins)
HMS Pre Site
HMS Modified for Undetained Development
Isolated Site Runoff

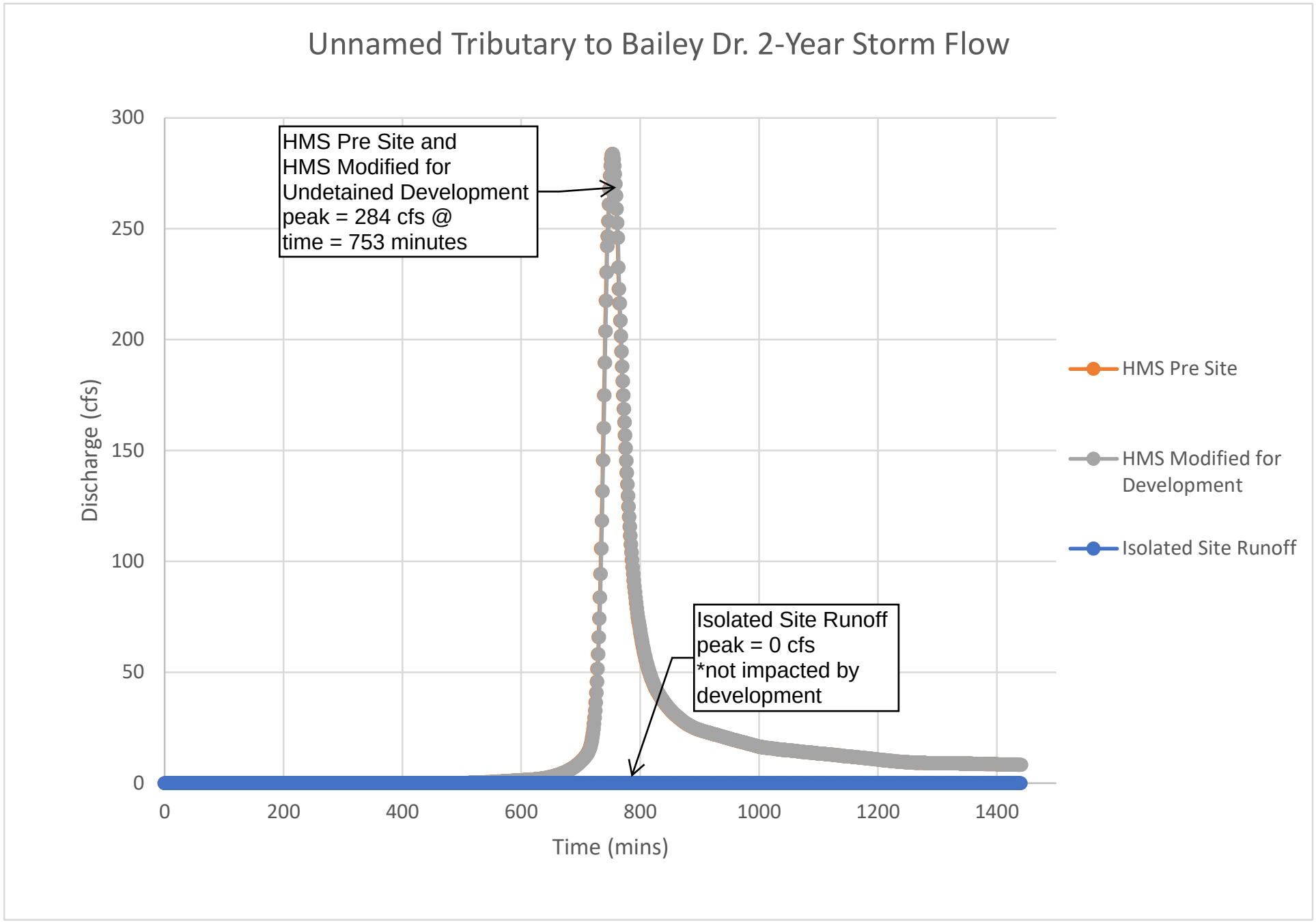

S. Wilmington Street 100-Year Storm Flow
HMS Modified for Undetained Development peak = 4,831 cfs @ time = 988 minutes
HMS Pre Site peak = 4,824 cfs @ time = 988 minutes
Isolated Site Runoff peak = 725 cfs @ time = 715 minutes
Discharge (cfs)
6000.00
5000.00
4000.00
3000.00
2000.00
1000.00
0.00
0
200
400
600
800
1000
1200
1400
Time (mins)
HMS Pre Site
HMS Modified for Undetained Development
Isolated Site Runoff

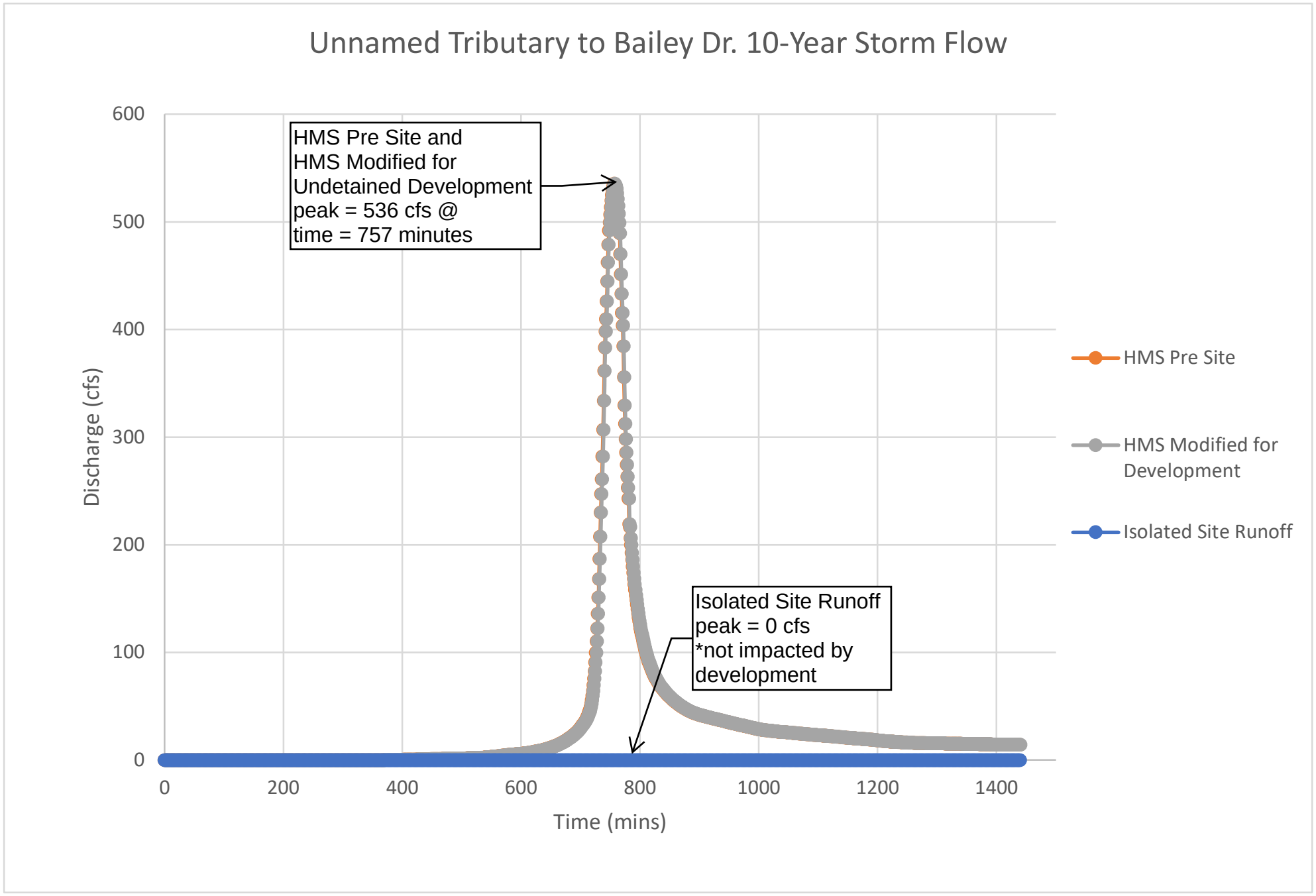

Garner Rd. 2-Year Storm Flow
HMS Modified for Undetained Development peak = 3,434 cfs @ time = 800 minutes
HMS Pre Site peak = 3,424 cfs @ time = 800 minutes
Isolated Site Runoff peak = 212 cfs @ time = 723 minutes
Discharge (cfs)
Time (mins)
0
500
1000
1500
2000
2500
3000
3500
4000
0
200
400
600
800
1000
1200
1400
HMS Pre Site
HMS Modified for Development
Isolated Site Runoff

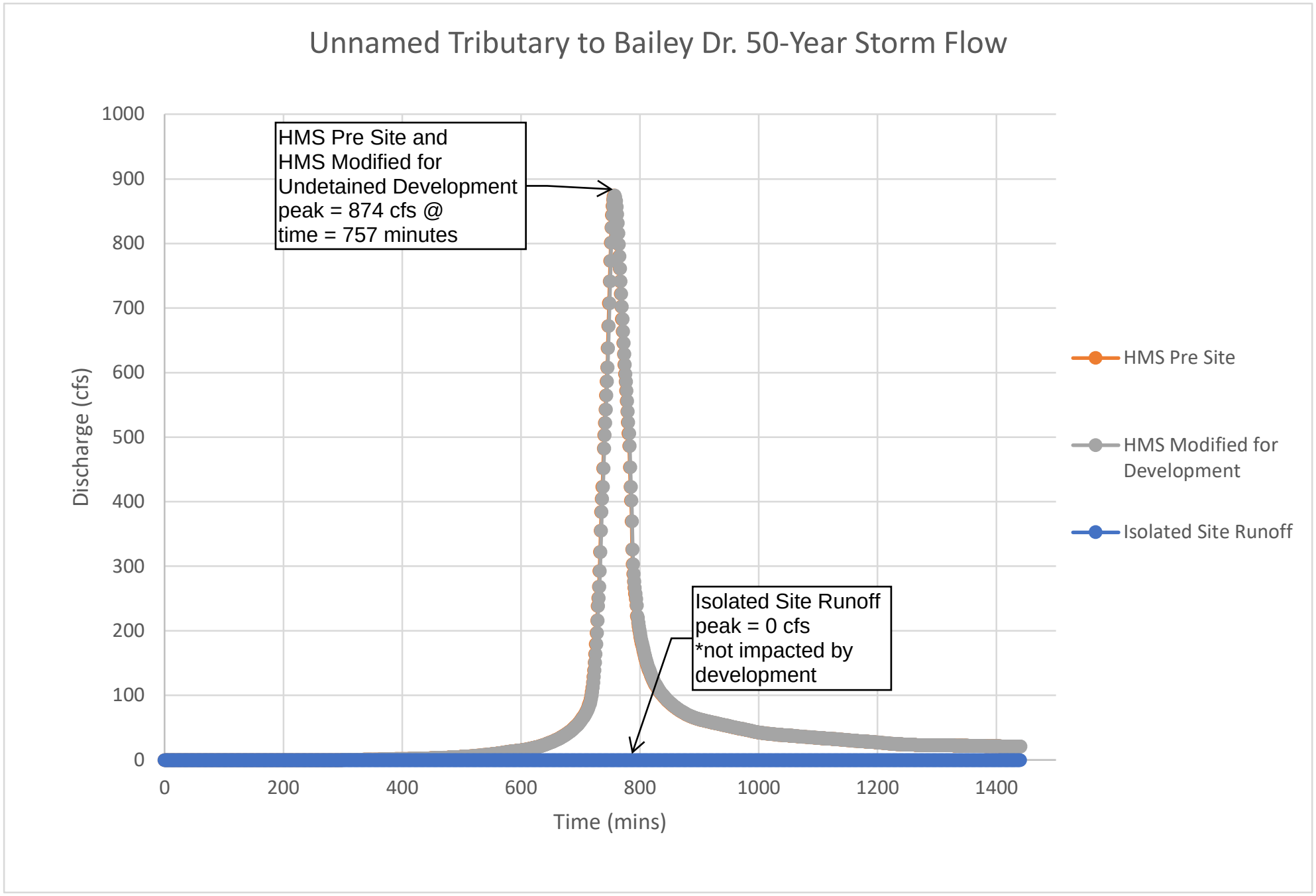

Garner Rd. 10-Year Storm Flow
HMS Modified for Undetained Development peak = 5,784 cfs @ time = 810 minutes
HMS Pre Site peak = 5,780 cfs @ time = 810 minutes
Isolated Site Runoff peak = 304 cfs @ time = 723 minutes
Discharge (cfs)
7000
6000
5000
4000
3000
2000
1000
0
0
200
400
600
800
1000
1200
1400
Time (mins)
HMS Pre Site
HMS Modified for Development
Isolated Site Runoff

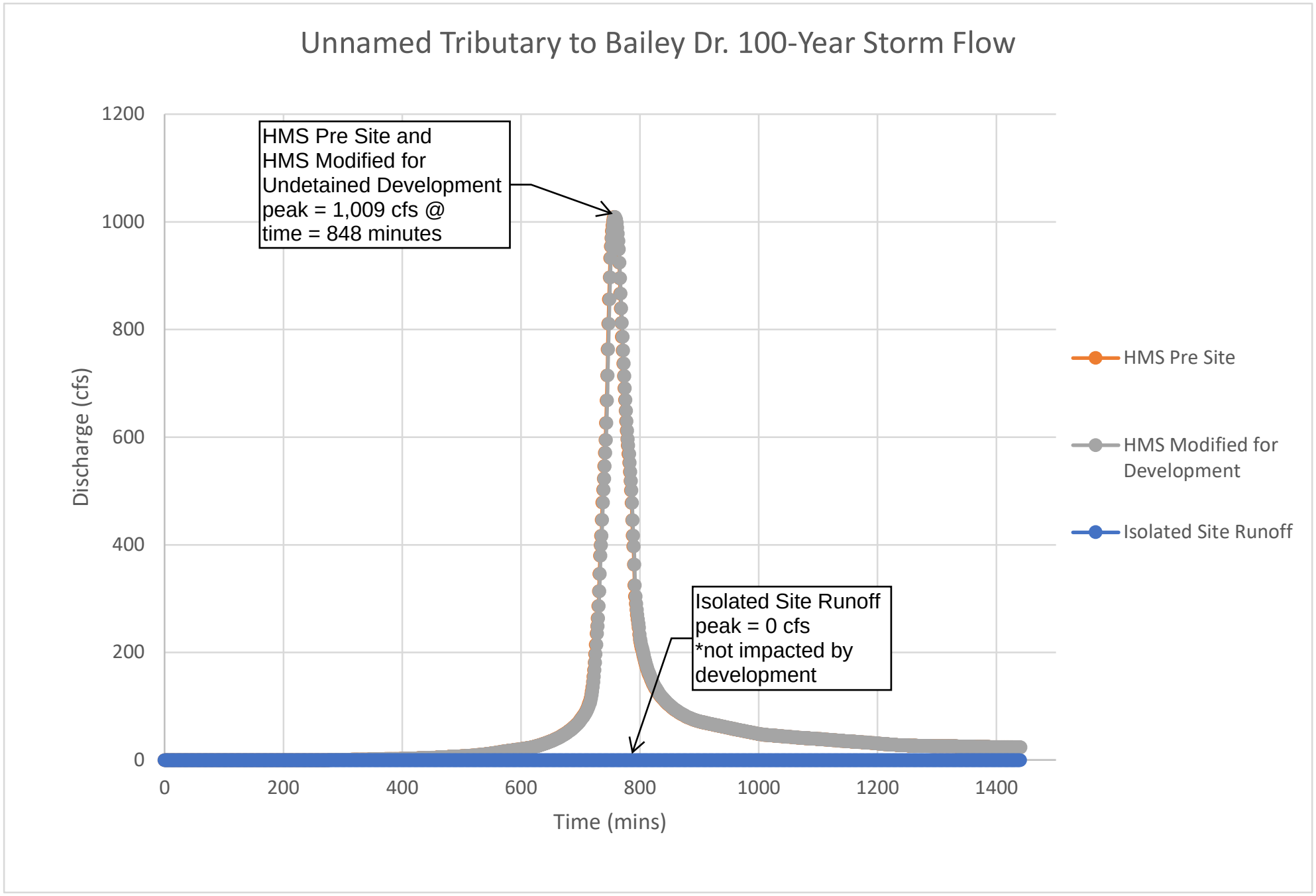

Garner Rd. 50-Year Storm Flow
HMS Pre Site
peak = 8,577 cfs @
time = 813 minutes
HMS Modified for
Undetained Development
peak = 8,575 cfs @
time = 813 minutes
Isolated Site Runoff
peak = 389 cfs @
time = 722 minutes
Discharge (cfs)
Time (mins)
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
0
200
400
600
800
1000
1200
1400
HMS Pre Site
HMS Modified for Development
Isolated Site Runoff

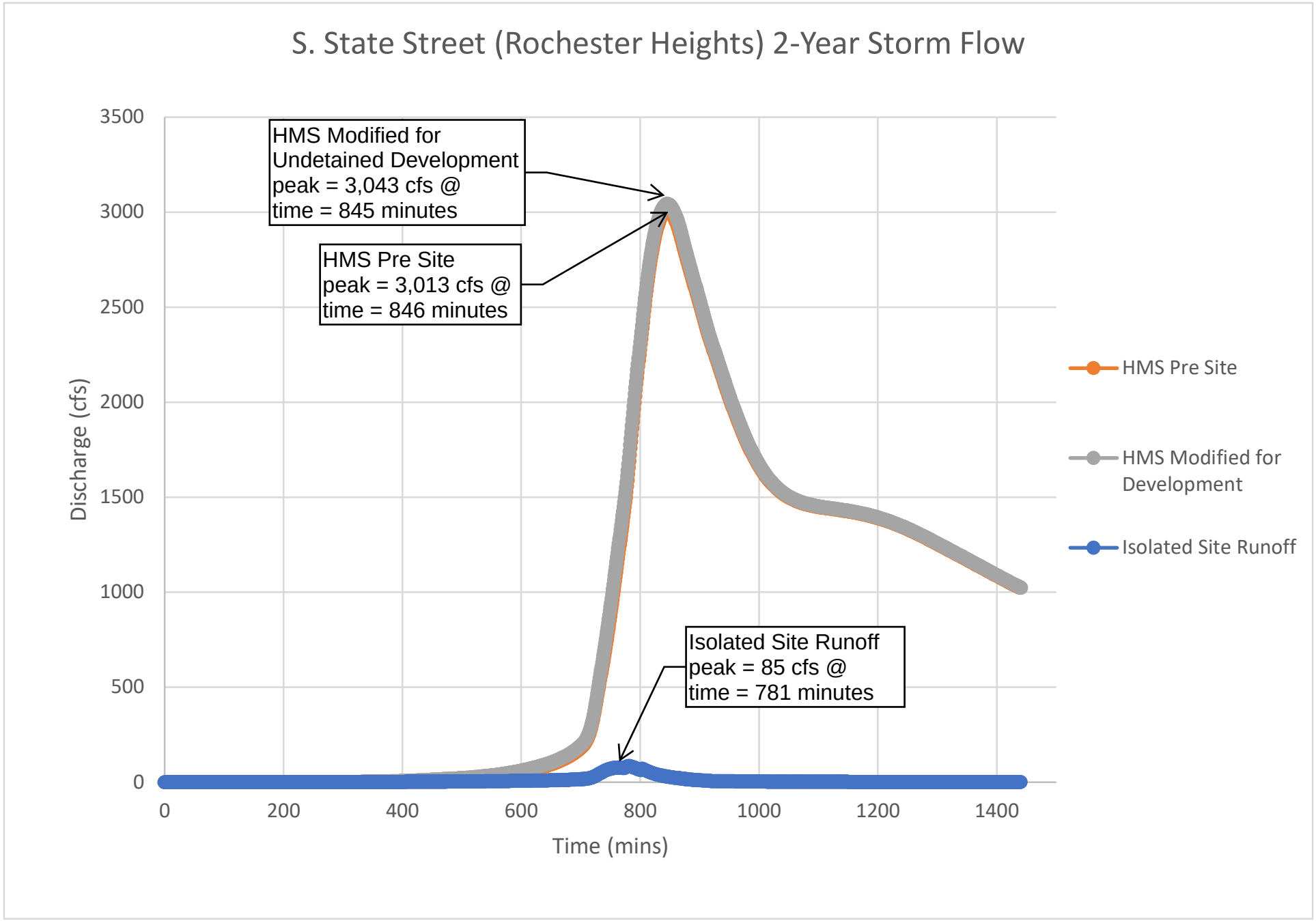

Garner Rd. 100-Year Storm Flow
HMS Pre Site
peak = 9,550 cfs @
time = 818 minutes
HMS Modified for
Undetained Development
peak = 9,547 cfs @
time = 818 minutes
Isolated Site Runoff
peak = 419 cfs @
time = 721 minutes
Discharge (cfs)
Time (mins)
0
2000
4000
6000
8000
10000
12000
0
200
400
600
800
1000
1200
1400
HMS Pre Site
HMS Modified for Development
Isolated Site Runoff

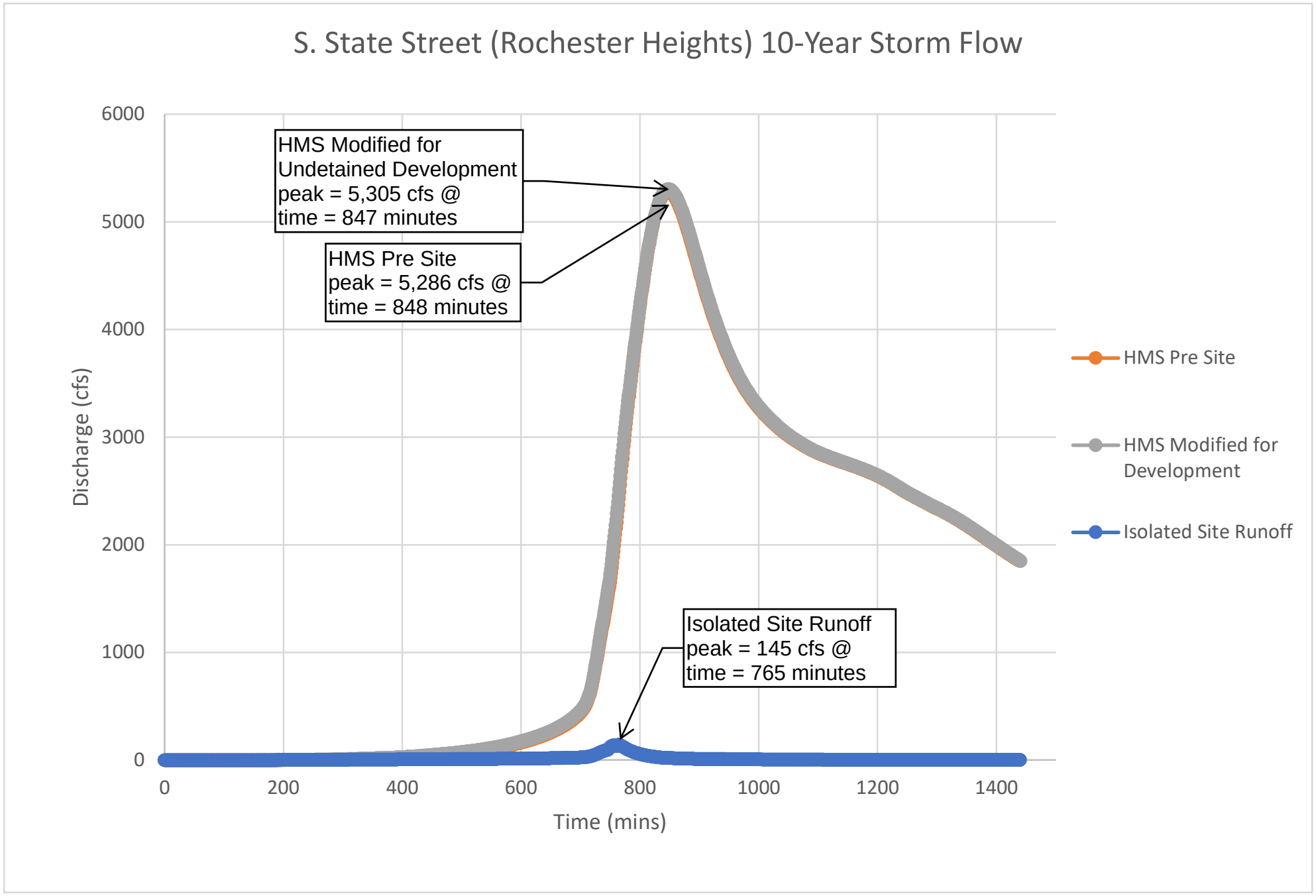

Unnamed Tributary to Bailey Dr. 2-Year Storm Flow
HMS Pre Site and
HMS Modified for
Undetained Development
peak = 284 cfs @
time = 753 minutes
Isolated Site Runoff
peak = 0 cfs
*not impacted by
development
Discharge (cfs)
Time (mins)
0
50
100
150
200
250
300
0
200
400
600
800
1000
1200
1400
HMS Pre Site
HMS Modified for Development
Isolated Site Runoff

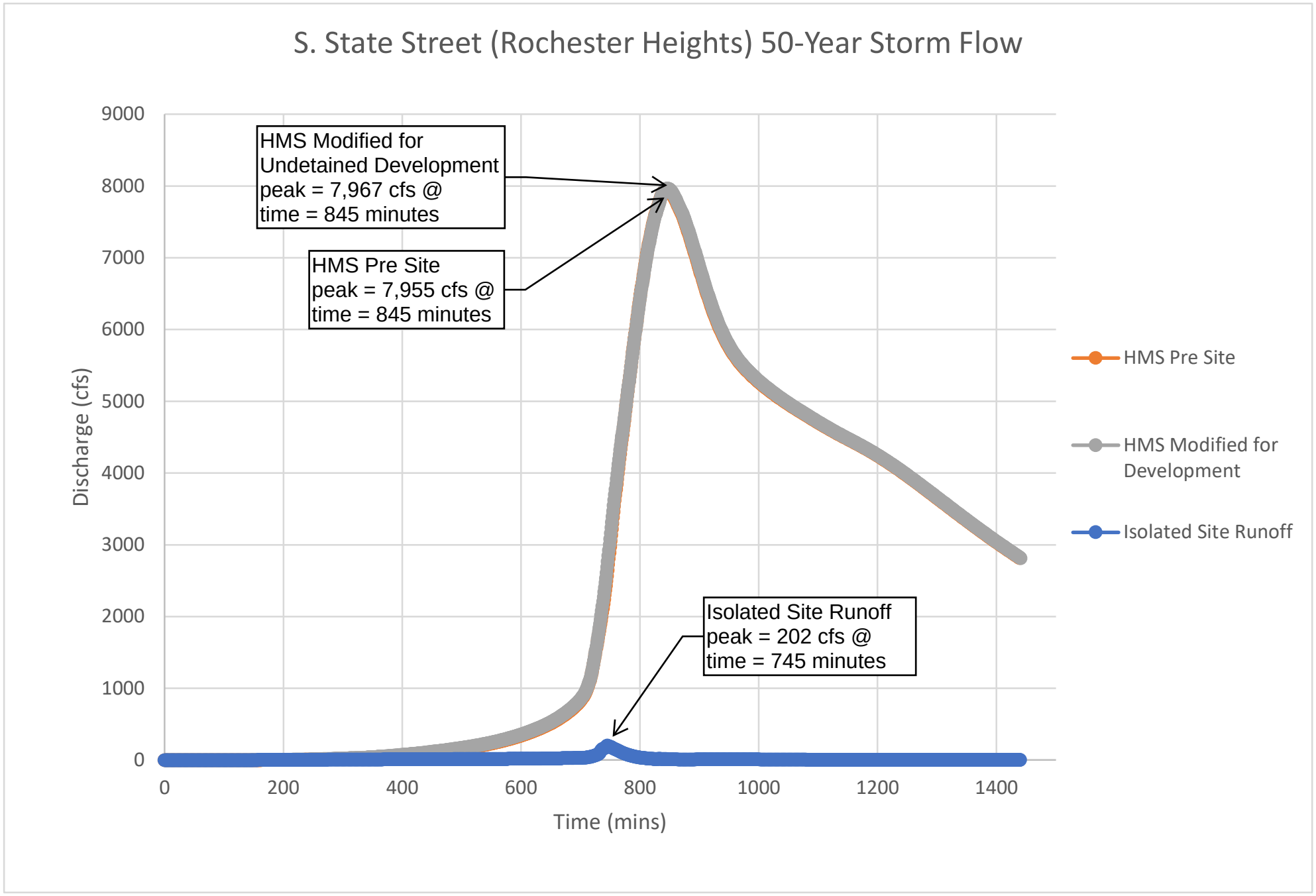

Unnamed Tributary to Bailey Dr. 10-Year Storm Flow
HMS Pre Site and
HMS Modified for
Undetained Development
peak = 536 cfs @
time = 757 minutes
Isolated Site Runoff
peak = 0 cfs
*not impacted by
development
Discharge (cfs)
Time (mins)
0
100
200
300
400
500
600
0
200
400
600
800
1000
1200
1400
HMS Pre Site
HMS Modified for Development
Isolated Site Runoff

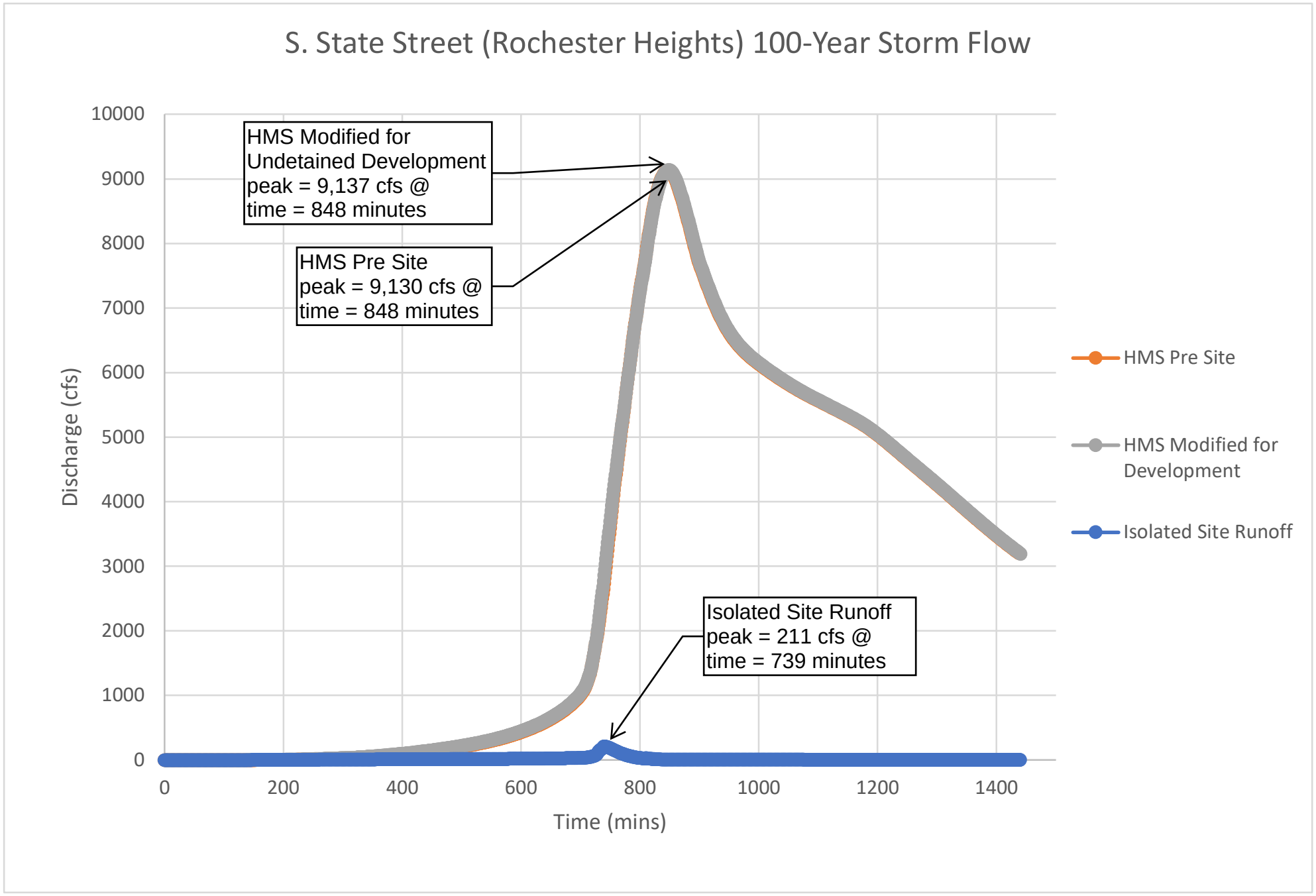

Unnamed Tributary to Bailey Dr. 50-Year Storm Flow
HMS Pre Site and
HMS Modified for
Undetained Development
peak = 874 cfs @
time = 757 minutes
Isolated Site Runoff
peak = 0 cfs
*not impacted by
development
Discharge (cfs)
Time (mins)
0
100
200
300
400
500
600
700
800
900
1000
0
200
400
600
800
1000
1200
1400
HMS Pre Site
HMS Modified for Development
Isolated Site Runoff

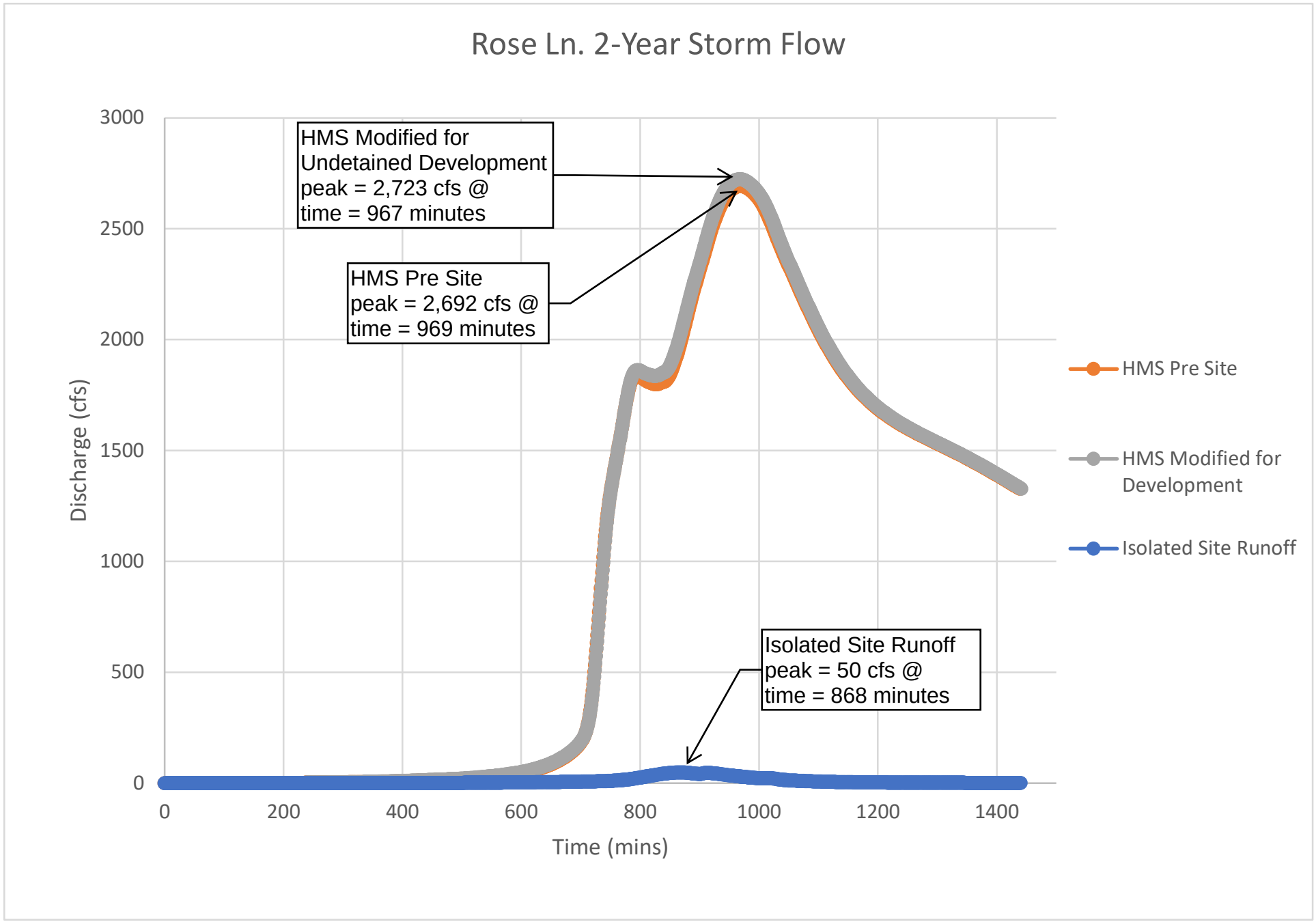

Unnamed Tributary to Bailey Dr. 100-Year Storm Flow
HMS Pre Site and
HMS Modified for
Undetained Development
peak = 1,009 cfs @
time = 848 minutes
Isolated Site Runoff
peak = 0 cfs
*not impacted by
development
Discharge (cfs)
Time (mins)
0
200
400
600
800
1000
1200
1400
HMS Pre Site
HMS Modified for Development
Isolated Site Runoff

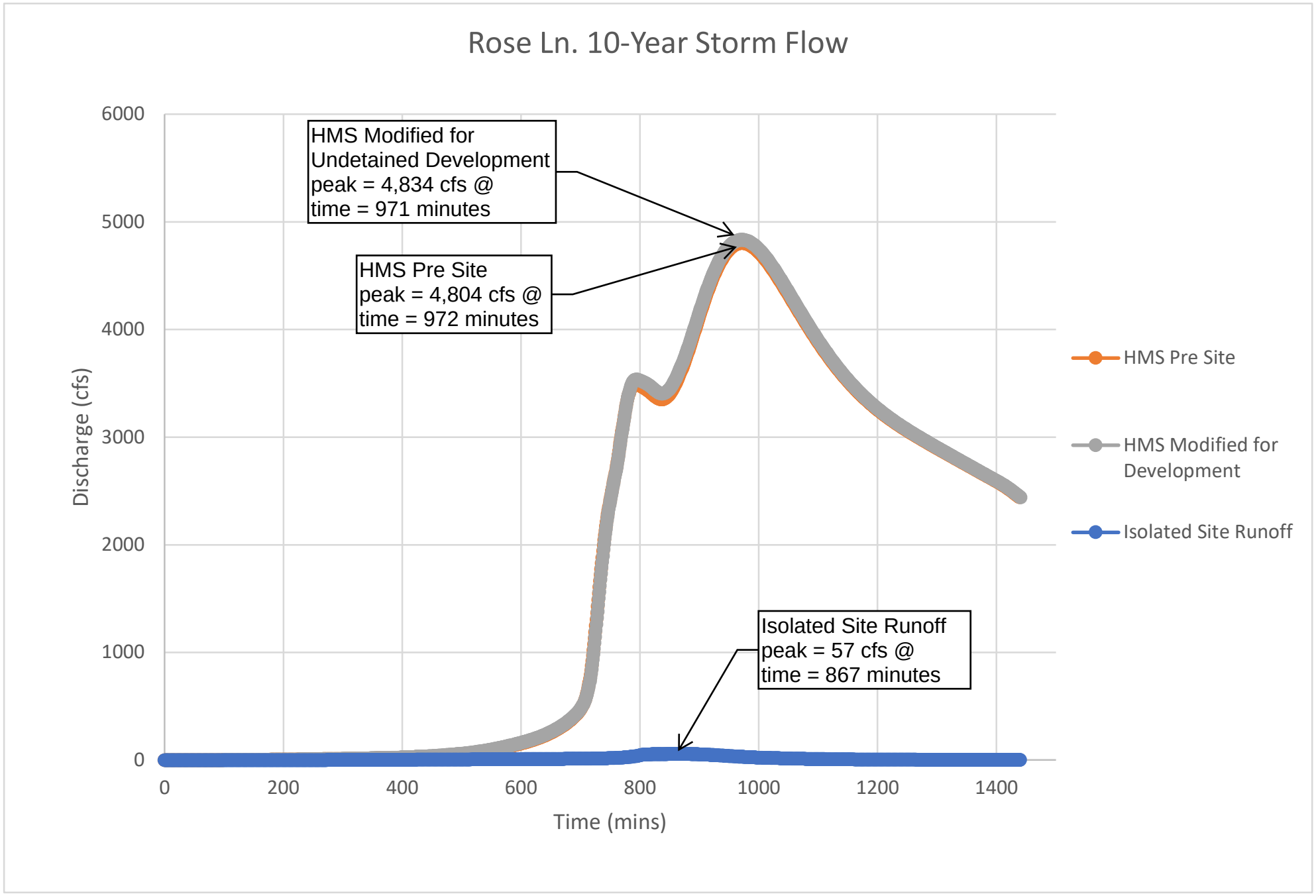

S. State Street (Rochester Heights) 2-Year Storm Flow
HMS Modified for Undetained Development peak = 3,043 cfs @ time = 845 minutes
HMS Pre Site peak = 3,013 cfs @ time = 846 minutes
Isolated Site Runoff peak = 85 cfs @ time = 781 minutes
Discharge (cfs)
Time (mins)
0
500
1000
1500
2000
2500
3000
3500
0
200
400
600
800
1000
1200
1400
HMS Pre Site
HMS Modified for Development
Isolated Site Runoff

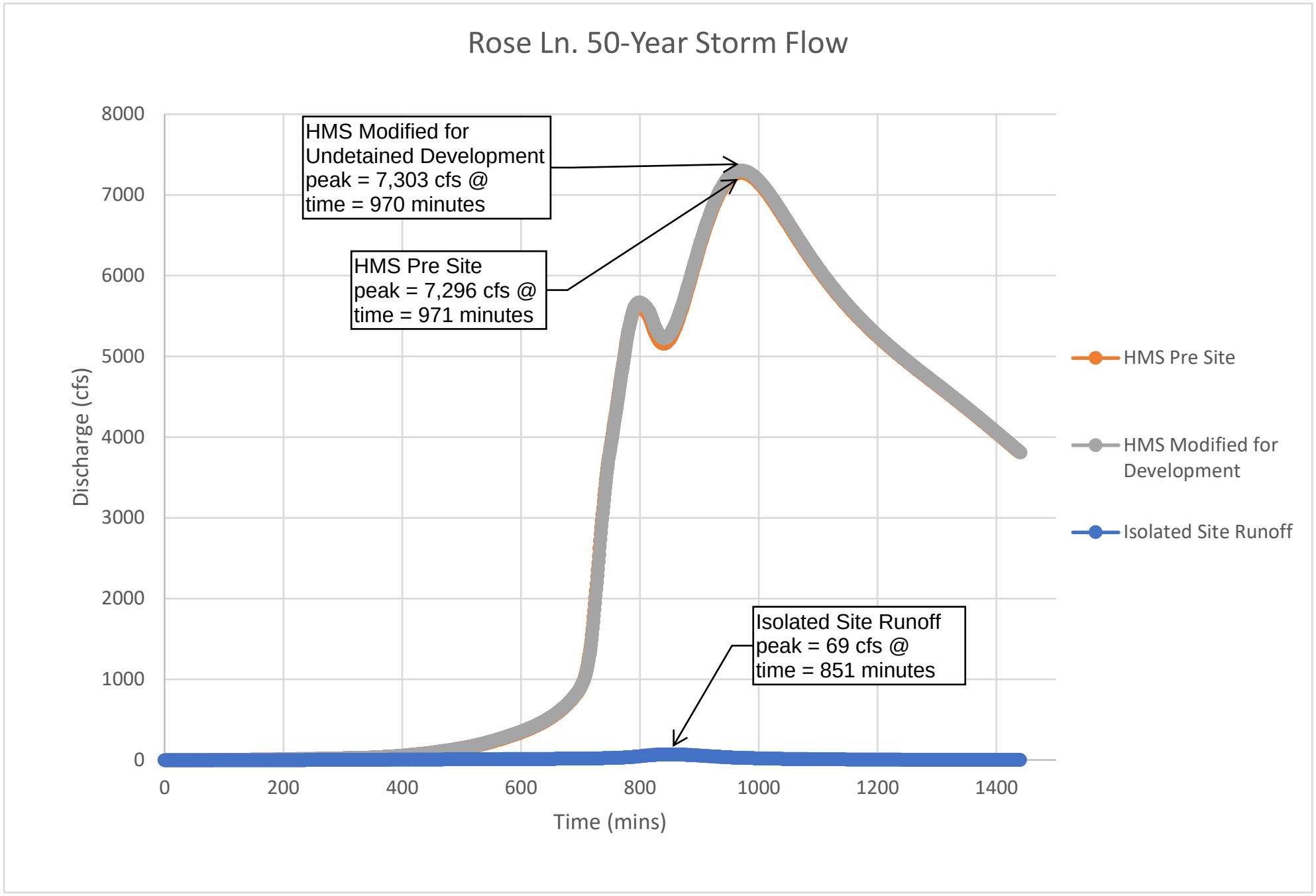

S. State Street (Rochester Heights) 10-Year Storm Flow
HMS Modified for Undetained Development peak = 5,305 cfs @ time = 847 minutes
HMS Pre Site peak = 5,286 cfs @ time = 848 minutes
Isolated Site Runoff peak = 145 cfs @ time = 765 minutes
Discharge (cfs)
Time (mins)
0
1000
2000
3000
4000
5000
6000
0
200
400
600
800
1000
1200
1400
HMS Pre Site
HMS Modified for Development
Isolated Site Runoff

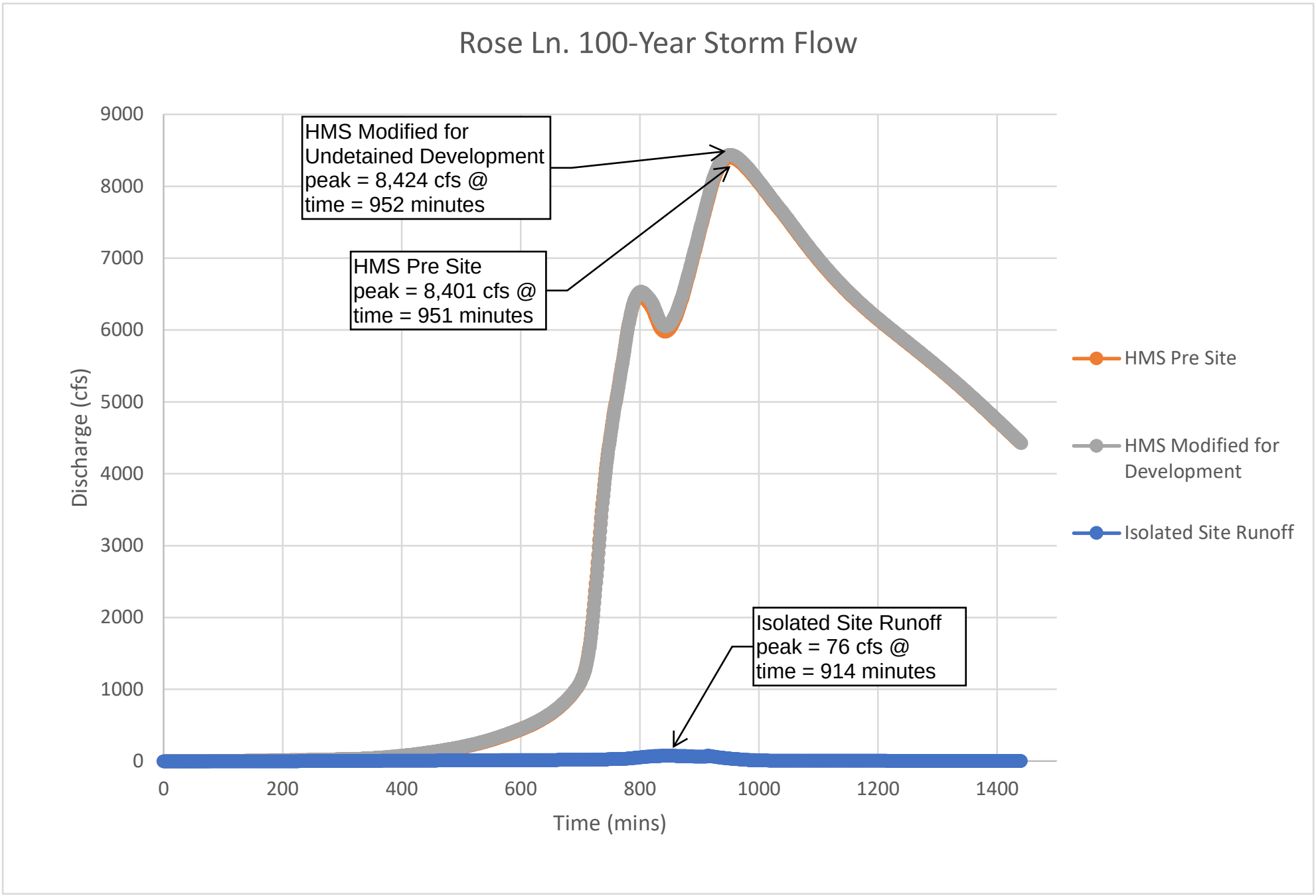

S. State Street (Rochester Heights) 50-Year Storm Flow
HMS Modified for Undetained Development peak = 7,967 cfs @ time = 845 minutes
HMS Pre Site peak = 7,955 cfs @ time = 845 minutes
Isolated Site Runoff peak = 202 cfs @ time = 745 minutes
Discharge (cfs)
Time (mins)
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
0
200
400
600
800
1000
1200
1400
HMS Pre Site
HMS Modified for Development
Isolated Site Runoff


S. State Street (Rochester Heights) 100-Year Storm Flow
HMS Modified for Undetained Development peak = 9,137 cfs @ time = 848 minutes
HMS Pre Site peak = 9,130 cfs @ time = 848 minutes
Isolated Site Runoff peak = 211 cfs @ time = 739 minutes
Discharge (cfs)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
0
200
400
600
800
1000
1200
1400
Time (mins)
HMS Pre Site
HMS Modified for Development
Isolated Site Runoff


Rose Ln. 2-Year Storm Flow
HMS Modified for Undetained Development peak = 2,723 cfs @ time = 967 minutes
HMS Pre Site peak = 2,692 cfs @ time = 969 minutes
Isolated Site Runoff peak = 50 cfs @ time = 868 minutes
Discharge (cfs)
3000
2500
2000
1500
1000
500
0
0
200
400
600
800
1000
1200
1400
Time (mins)
HMS Pre Site
HMS Modified for Development
Isolated Site Runoff


Rose Ln. 10-Year Storm Flow
HMS Modified for Undetained Development peak = 4,834 cfs @ time = 971 minutes
HMS Pre Site peak = 4,804 cfs @ time = 972 minutes
Isolated Site Runoff peak = 57 cfs @ time = 867 minutes
Discharge (cfs)
6000
5000
4000
3000
2000
1000
0
0
200
400
600
800
1000
1200
1400
Time (mins)
HMS Pre Site
HMS Modified for Development
Isolated Site Runoff


Rose Ln. 50-Year Storm Flow
HMS Modified for Undetained Development peak = 7,303 cfs @ time = 970 minutes
HMS Pre Site peak = 7,296 cfs @ time = 971 minutes
Isolated Site Runoff peak = 69 cfs @ time = 851 minutes
Discharge (cfs)
8000
7000
6000
5000
4000
3000
2000
1000
0
0
200
400
600
800
1000
1200
1400
Time (mins)
HMS Pre Site
HMS Modified for Development
Isolated Site Runoff


Rose Ln. 100-Year Storm Flow
HMS Modified for Undetained Development peak = 8,424 cfs @ time = 952 minutes
HMS Pre Site peak = 8,401 cfs @ time = 951 minutes
Isolated Site Runoff peak = 76 cfs @ time = 914 minutes
Discharge (cfs)
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
0
200
400
600
800
1000
1200
1400
Time (mins)
HMS Pre Site
HMS Modified for Development
Isolated Site Runoff

S. Wilmington St. - Pre-Dev 2-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	1,741.67 cfs

Section Definitions

Station (ft)	Elevation (ft)
46+61	250.20
46+71	248.70
46+81	247.80
46+91	247.30
47+01	246.30
47+11	244.60
47+21	243.70
47+31	242.90
47+41	242.30
47+51	241.50
47+61	240.80
47+71	240.20
47+81	239.70
47+91	239.10
48+01	238.70
48+11	238.10
48+21	237.70
48+31	237.20
48+41	236.90
48+51	236.80
48+61	236.50
48+71	236.20
48+81	236.00
48+91	235.90
49+01	235.70
49+21	235.70
49+31	235.50
49+41	235.50
49+51	235.50
49+61	233.80
49+71	228.50
49+85	227.66
49+86	220.44
49+88	218.81
49+94	218.15
49+98	218.22
50+01	219.68
50+05	220.20

S. Wilmington St. - Pre-Dev 2-Year

Section Definitions

Station (ft)	Elevation (ft)
50+08	220.02
50+12	220.26
50+14	220.46
50+18	220.83
50+23	226.16
50+29	229.80
50+39	233.40
50+49	234.90
50+59	235.60
50+69	236.20
50+89	237.10
50+99	237.40
51+09	237.90
51+29	238.90
51+49	239.90
51+59	240.10
51+69	240.10
51+79	240.10
51+89	239.20
51+99	239.60
52+09	239.90
52+19	239.80
52+29	239.90
52+39	240.90
52+49	243.80
52+59	246.00
52+69	246.80
52+79	247.50
52+89	246.80
52+99	247.90
53+09	249.10
53+19	249.60
53+29	250.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(46+61, 250.20)	(49+85, 227.66)	0.100
(49+85, 227.66)	(50+23, 226.16)	0.050
(50+23, 226.16)	(53+29, 250.20)	0.100

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method

S. Wilmington St. - Pre-Dev 2-Year

Options	
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	90.7 in
Elevation Range	218.2 to 250.2 ft
Flow Area	209.1 ft²
Wetted Perimeter	44.6 ft
Hydraulic Radius	56.3 in
Top Width	36.60 ft
Normal Depth	90.7 in
Critical Depth	70.5 in
Critical Slope	0.027 ft/ft
Velocity	8.33 ft/s
Velocity Head	1.08 ft
Specific Energy	8.63 ft
Froude Number	0.614
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	90.7 in
Critical Depth	70.5 in
Channel Slope	0.010 ft/ft
Critical Slope	0.027 ft/ft

S. Wilmington St. - Post-Dev - 2-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	1,761.20 cfs

Section Definitions

Station (ft)	Elevation (ft)
46+61	250.20
46+71	248.70
46+81	247.80
46+91	247.30
47+01	246.30
47+11	244.60
47+21	243.70
47+31	242.90
47+41	242.30
47+51	241.50
47+61	240.80
47+71	240.20
47+81	239.70
47+91	239.10
48+01	238.70
48+11	238.10
48+21	237.70
48+31	237.20
48+41	236.90
48+51	236.80
48+61	236.50
48+71	236.20
48+81	236.00
48+91	235.90
49+01	235.70
49+21	235.70
49+31	235.50
49+41	235.50
49+51	235.50
49+61	233.80
49+71	228.50
49+85	227.66
49+86	220.44
49+88	218.81
49+94	218.15
49+98	218.22
50+01	219.68
50+05	220.20

S. Wilmington St. - Post-Dev - 2-Year

Section Definitions

Station (ft)	Elevation (ft)
50+08	220.02
50+12	220.26
50+14	220.46
50+18	220.83
50+23	226.16
50+29	229.80
50+39	233.40
50+49	234.90
50+59	235.60
50+69	236.20
50+89	237.10
50+99	237.40
51+09	237.90
51+29	238.90
51+49	239.90
51+59	240.10
51+69	240.10
51+79	240.10
51+89	239.20
51+99	239.60
52+09	239.90
52+19	239.80
52+29	239.90
52+39	240.90
52+49	243.80
52+59	246.00
52+69	246.80
52+79	247.50
52+89	246.80
52+99	247.90
53+09	249.10
53+19	249.60
53+29	250.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(46+61, 250.20)	(49+85, 227.66)	0.100
(49+85, 227.66)	(50+23, 226.16)	0.050
(50+23, 226.16)	(53+29, 250.20)	0.100

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method

S. Wilmington St. - Post-Dev - 2-Year

Options	
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	91.2 in
Elevation Range	218.2 to 250.2 ft
Flow Area	210.7 ft²
Wetted Perimeter	44.7 ft
Hydraulic Radius	56.6 in
Top Width	36.64 ft
Normal Depth	91.2 in
Critical Depth	70.9 in
Critical Slope	0.027 ft/ft
Velocity	8.36 ft/s
Velocity Head	1.09 ft
Specific Energy	8.68 ft
Froude Number	0.614
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	91.2 in
Critical Depth	70.9 in
Channel Slope	0.010 ft/ft
Critical Slope	0.027 ft/ft

S. Wilmington St. - Pre-Dev 10-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	2,721.21 cfs

Section Definitions

Station (ft)	Elevation (ft)
46+61	250.20
46+71	248.70
46+81	247.80
46+91	247.30
47+01	246.30
47+11	244.60
47+21	243.70
47+31	242.90
47+41	242.30
47+51	241.50
47+61	240.80
47+71	240.20
47+81	239.70
47+91	239.10
48+01	238.70
48+11	238.10
48+21	237.70
48+31	237.20
48+41	236.90
48+51	236.80
48+61	236.50
48+71	236.20
48+81	236.00
48+91	235.90
49+01	235.70
49+21	235.70
49+31	235.50
49+41	235.50
49+51	235.50
49+61	233.80
49+71	228.50
49+85	227.66
49+86	220.44
49+88	218.81
49+94	218.15
49+98	218.22
50+01	219.68
50+05	220.20

S. Wilmington St. - Pre-Dev 10-Year

Section Definitions

Station (ft)	Elevation (ft)
50+08	220.02
50+12	220.26
50+14	220.46
50+18	220.83
50+23	226.16
50+29	229.80
50+39	233.40
50+49	234.90
50+59	235.60
50+69	236.20
50+89	237.10
50+99	237.40
51+09	237.90
51+29	238.90
51+49	239.90
51+59	240.10
51+69	240.10
51+79	240.10
51+89	239.20
51+99	239.60
52+09	239.90
52+19	239.80
52+29	239.90
52+39	240.90
52+49	243.80
52+59	246.00
52+69	246.80
52+79	247.50
52+89	246.80
52+99	247.90
53+09	249.10
53+19	249.60
53+29	250.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(46+61, 250.20)	(49+85, 227.66)	0.100
(49+85, 227.66)	(50+23, 226.16)	0.050
(50+23, 226.16)	(53+29, 250.20)	0.100

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method

S. Wilmington St. - Pre-Dev 10-Year

Options	
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	142.6 in
Elevation Range	218.2 to 250.2 ft
Flow Area	413.0 ft²
Wetted Perimeter	72.8 ft
Hydraulic Radius	68.1 in
Top Width	61.43 ft
Normal Depth	142.6 in
Critical Depth	88.7 in
Critical Slope	0.055 ft/ft
Velocity	6.59 ft/s
Velocity Head	0.67 ft
Specific Energy	12.56 ft
Froude Number	0.448
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	142.6 in
Critical Depth	88.7 in
Channel Slope	0.010 ft/ft
Critical Slope	0.055 ft/ft

S. Wilmington St. - Post-Dev - 10-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	2,760.60 cfs

Section Definitions

Station (ft)	Elevation (ft)
46+61	250.20
46+71	248.70
46+81	247.80
46+91	247.30
47+01	246.30
47+11	244.60
47+21	243.70
47+31	242.90
47+41	242.30
47+51	241.50
47+61	240.80
47+71	240.20
47+81	239.70
47+91	239.10
48+01	238.70
48+11	238.10
48+21	237.70
48+31	237.20
48+41	236.90
48+51	236.80
48+61	236.50
48+71	236.20
48+81	236.00
48+91	235.90
49+01	235.70
49+21	235.70
49+31	235.50
49+41	235.50
49+51	235.50
49+61	233.80
49+71	228.50
49+85	227.66
49+86	220.44
49+88	218.81
49+94	218.15
49+98	218.22
50+01	219.68
50+05	220.20

S. Wilmington St. - Post-Dev - 10-Year

Section Definitions

Station (ft)	Elevation (ft)
50+08	220.02
50+12	220.26
50+14	220.46
50+18	220.83
50+23	226.16
50+29	229.80
50+39	233.40
50+49	234.90
50+59	235.60
50+69	236.20
50+89	237.10
50+99	237.40
51+09	237.90
51+29	238.90
51+49	239.90
51+59	240.10
51+69	240.10
51+79	240.10
51+89	239.20
51+99	239.60
52+09	239.90
52+19	239.80
52+29	239.90
52+39	240.90
52+49	243.80
52+59	246.00
52+69	246.80
52+79	247.50
52+89	246.80
52+99	247.90
53+09	249.10
53+19	249.60
53+29	250.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(46+61, 250.20)	(49+85, 227.66)	0.100
(49+85, 227.66)	(50+23, 226.16)	0.050
(50+23, 226.16)	(53+29, 250.20)	0.100

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method

S. Wilmington St. - Post-Dev - 10-Year

Options	
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	143.6 in
Elevation Range	218.2 to 250.2 ft
Flow Area	418.3 ft²
Wetted Perimeter	73.3 ft
Hydraulic Radius	68.5 in
Top Width	61.83 ft
Normal Depth	143.6 in
Critical Depth	89.4 in
Critical Slope	0.055 ft/ft
Velocity	6.60 ft/s
Velocity Head	0.68 ft
Specific Energy	12.64 ft
Froude Number	0.447
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	143.6 in
Critical Depth	89.4 in
Channel Slope	0.010 ft/ft
Critical Slope	0.055 ft/ft

S. Wilmington St. - Pre-Dev 50-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	4,067.81 cfs

Section Definitions

Station (ft)	Elevation (ft)
46+61	250.20
46+71	248.70
46+81	247.80
46+91	247.30
47+01	246.30
47+11	244.60
47+21	243.70
47+31	242.90
47+41	242.30
47+51	241.50
47+61	240.80
47+71	240.20
47+81	239.70
47+91	239.10
48+01	238.70
48+11	238.10
48+21	237.70
48+31	237.20
48+41	236.90
48+51	236.80
48+61	236.50
48+71	236.20
48+81	236.00
48+91	235.90
49+01	235.70
49+21	235.70
49+31	235.50
49+41	235.50
49+51	235.50
49+61	233.80
49+71	228.50
49+85	227.66
49+86	220.44
49+88	218.81
49+94	218.15
49+98	218.22
50+01	219.68
50+05	220.20

S. Wilmington St. - Pre-Dev 50-Year

Section Definitions

Station (ft)	Elevation (ft)
50+08	220.02
50+12	220.26
50+14	220.46
50+18	220.83
50+23	226.16
50+29	229.80
50+39	233.40
50+49	234.90
50+59	235.60
50+69	236.20
50+89	237.10
50+99	237.40
51+09	237.90
51+29	238.90
51+49	239.90
51+59	240.10
51+69	240.10
51+79	240.10
51+89	239.20
51+99	239.60
52+09	239.90
52+19	239.80
52+29	239.90
52+39	240.90
52+49	243.80
52+59	246.00
52+69	246.80
52+79	247.50
52+89	246.80
52+99	247.90
53+09	249.10
53+19	249.60
53+29	250.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(46+61, 250.20)	(49+85, 227.66)	0.100
(49+85, 227.66)	(50+23, 226.16)	0.050
(50+23, 226.16)	(53+29, 250.20)	0.100

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method

S. Wilmington St. - Pre-Dev 50-Year

Options	
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	173.0 in
Elevation Range	218.2 to 250.2 ft
Flow Area	584.0 ft²
Wetted Perimeter	85.7 ft
Hydraulic Radius	81.7 in
Top Width	73.27 ft
Normal Depth	173.0 in
Critical Depth	110.7 in
Critical Slope	0.061 ft/ft
Velocity	6.97 ft/s
Velocity Head	0.75 ft
Specific Energy	15.17 ft
Froude Number	0.435
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	173.0 in
Critical Depth	110.7 in
Channel Slope	0.010 ft/ft
Critical Slope	0.061 ft/ft

S. Wilmington St. - Post-Dev - 50-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	4,109.60 cfs

Section Definitions

Station (ft)	Elevation (ft)
46+61	250.20
46+71	248.70
46+81	247.80
46+91	247.30
47+01	246.30
47+11	244.60
47+21	243.70
47+31	242.90
47+41	242.30
47+51	241.50
47+61	240.80
47+71	240.20
47+81	239.70
47+91	239.10
48+01	238.70
48+11	238.10
48+21	237.70
48+31	237.20
48+41	236.90
48+51	236.80
48+61	236.50
48+71	236.20
48+81	236.00
48+91	235.90
49+01	235.70
49+21	235.70
49+31	235.50
49+41	235.50
49+51	235.50
49+61	233.80
49+71	228.50
49+85	227.66
49+86	220.44
49+88	218.81
49+94	218.15
49+98	218.22
50+01	219.68
50+05	220.20

S. Wilmington St. - Post-Dev - 50-Year

Section Definitions

Station (ft)	Elevation (ft)
50+08	220.02
50+12	220.26
50+14	220.46
50+18	220.83
50+23	226.16
50+29	229.80
50+39	233.40
50+49	234.90
50+59	235.60
50+69	236.20
50+89	237.10
50+99	237.40
51+09	237.90
51+29	238.90
51+49	239.90
51+59	240.10
51+69	240.10
51+79	240.10
51+89	239.20
51+99	239.60
52+09	239.90
52+19	239.80
52+29	239.90
52+39	240.90
52+49	243.80
52+59	246.00
52+69	246.80
52+79	247.50
52+89	246.80
52+99	247.90
53+09	249.10
53+19	249.60
53+29	250.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(46+61, 250.20)	(49+85, 227.66)	0.100
(49+85, 227.66)	(50+23, 226.16)	0.050
(50+23, 226.16)	(53+29, 250.20)	0.100

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method

S. Wilmington St. - Post-Dev - 50-Year

Options	
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	173.9 in
Elevation Range	218.2 to 250.2 ft
Flow Area	589.0 ft²
Wetted Perimeter	86.1 ft
Hydraulic Radius	82.1 in
Top Width	73.59 ft
Normal Depth	173.9 in
Critical Depth	111.3 in
Critical Slope	0.061 ft/ft
Velocity	6.98 ft/s
Velocity Head	0.76 ft
Specific Energy	15.25 ft
Froude Number	0.435
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	173.9 in
Critical Depth	111.3 in
Channel Slope	0.010 ft/ft
Critical Slope	0.061 ft/ft

S. Wilmington St. - Pre-Dev - 100-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	4,824.35 cfs

Section Definitions

Station (ft)	Elevation (ft)
46+61	250.20
46+71	248.70
46+81	247.80
46+91	247.30
47+01	246.30
47+11	244.60
47+21	243.70
47+31	242.90
47+41	242.30
47+51	241.50
47+61	240.80
47+71	240.20
47+81	239.70
47+91	239.10
48+01	238.70
48+11	238.10
48+21	237.70
48+31	237.20
48+41	236.90
48+51	236.80
48+61	236.50
48+71	236.20
48+81	236.00
48+91	235.90
49+01	235.70
49+21	235.70
49+31	235.50
49+41	235.50
49+51	235.50
49+61	233.80
49+71	228.50
49+85	227.66
49+86	220.44
49+88	218.81
49+94	218.15
49+98	218.22
50+01	219.68
50+05	220.20

S. Wilmington St. - Pre-Dev - 100-Year

Section Definitions

Station (ft)	Elevation (ft)
50+08	220.02
50+12	220.26
50+14	220.46
50+18	220.83
50+23	226.16
50+29	229.80
50+39	233.40
50+49	234.90
50+59	235.60
50+69	236.20
50+89	237.10
50+99	237.40
51+09	237.90
51+29	238.90
51+49	239.90
51+59	240.10
51+69	240.10
51+79	240.10
51+89	239.20
51+99	239.60
52+09	239.90
52+19	239.80
52+29	239.90
52+39	240.90
52+49	243.80
52+59	246.00
52+69	246.80
52+79	247.50
52+89	246.80
52+99	247.90
53+09	249.10
53+19	249.60
53+29	250.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(46+61, 250.20)	(49+85, 227.66)	0.100
(49+85, 227.66)	(50+23, 226.16)	0.050
(50+23, 226.16)	(53+29, 250.20)	0.100

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method

S. Wilmington St. - Pre-Dev - 100-Year

Options	
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	189.2 in
Elevation Range	218.2 to 250.2 ft
Flow Area	687.6 ft²
Wetted Perimeter	95.0 ft
Hydraulic Radius	86.8 in
Top Width	82.06 ft
Normal Depth	189.2 in
Critical Depth	128.9 in
Critical Slope	0.063 ft/ft
Velocity	7.02 ft/s
Velocity Head	0.76 ft
Specific Energy	16.53 ft
Froude Number	0.427
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	189.2 in
Critical Depth	128.9 in
Channel Slope	0.010 ft/ft
Critical Slope	0.063 ft/ft

S. Wilmington St. - Post-Dev - 100-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	4,862.10 cfs

Section Definitions

Station (ft)	Elevation (ft)
46+61	250.20
46+71	248.70
46+81	247.80
46+91	247.30
47+01	246.30
47+11	244.60
47+21	243.70
47+31	242.90
47+41	242.30
47+51	241.50
47+61	240.80
47+71	240.20
47+81	239.70
47+91	239.10
48+01	238.70
48+11	238.10
48+21	237.70
48+31	237.20
48+41	236.90
48+51	236.80
48+61	236.50
48+71	236.20
48+81	236.00
48+91	235.90
49+01	235.70
49+21	235.70
49+31	235.50
49+41	235.50
49+51	235.50
49+61	233.80
49+71	228.50
49+85	227.66
49+86	220.44
49+88	218.81
49+94	218.15
49+98	218.22
50+01	219.68
50+05	220.20

S. Wilmington St. - Post-Dev - 100-Year

Section Definitions

Station (ft)	Elevation (ft)
50+08	220.02
50+12	220.26
50+14	220.46
50+18	220.83
50+23	226.16
50+29	229.80
50+39	233.40
50+49	234.90
50+59	235.60
50+69	236.20
50+89	237.10
50+99	237.40
51+09	237.90
51+29	238.90
51+49	239.90
51+59	240.10
51+69	240.10
51+79	240.10
51+89	239.20
51+99	239.60
52+09	239.90
52+19	239.80
52+29	239.90
52+39	240.90
52+49	243.80
52+59	246.00
52+69	246.80
52+79	247.50
52+89	246.80
52+99	247.90
53+09	249.10
53+19	249.60
53+29	250.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(46+61, 250.20)	(49+85, 227.66)	0.100
(49+85, 227.66)	(50+23, 226.16)	0.050
(50+23, 226.16)	(53+29, 250.20)	0.100

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method

S. Wilmington St. - Post-Dev - 100-Year

Options	
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	190.5 in
Elevation Range	218.2 to 250.2 ft
Flow Area	696.6 ft²
Wetted Perimeter	96.4 ft
Hydraulic Radius	86.7 in
Top Width	83.42 ft
Normal Depth	190.5 in
Critical Depth	129.4 in
Critical Slope	0.064 ft/ft
Velocity	6.98 ft/s
Velocity Head	0.76 ft
Specific Energy	16.63 ft
Froude Number	0.426
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	190.5 in
Critical Depth	129.4 in
Channel Slope	0.010 ft/ft
Critical Slope	0.064 ft/ft

Garner Rd. - Pre-Dev 2-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	3,424.08 cfs

Section Definitions

Station (ft)	Elevation (ft)
38+10	242.34
38+30	241.44
38+50	240.94
38+60	240.84
38+70	240.54
38+80	239.54
38+90	238.14
39+00	237.64
39+06	237.58
39+10	237.54
39+16	237.48
39+20	237.44
39+26	237.52
39+36	237.67
39+40	237.74
39+46	237.68
39+50	237.64
39+56	237.58
39+70	237.44
39+76	237.38
39+80	237.34
39+86	237.26
39+96	237.11
40+00	237.04
40+06	236.79
40+16	236.34
40+20	236.14
40+36	235.28
40+46	234.73
40+60	233.94
40+70	233.64
40+76	233.58
40+80	233.54
40+90	233.54
40+96	233.54
41+00	233.54
41+06	233.82
41+10	234.04

Garner Rd. - Pre-Dev 2-Year

Section Definitions

Station (ft)	Elevation (ft)
41+16	234.26
41+20	234.44
41+26	234.33
41+30	234.24
41+36	233.62
41+40	233.14
41+43	233.11
41+46	233.08
41+46	233.08
41+50	233.04
41+56	232.65
41+60	232.34
41+66	231.72
41+70	231.24
41+76	230.74
41+80	230.34
41+86	230.06
41+90	229.84
41+96	229.84
42+00	229.84
42+06	230.06
42+10	230.24
42+20	230.24
42+26	230.07
42+30	229.94
42+36	230.05
42+40	230.14
42+46	230.20
42+50	230.24
42+56	230.41
42+60	230.54
42+66	230.43
42+70	230.34
42+76	230.06
42+80	229.84
43+00	230.24
43+20	230.44
43+26	230.44
43+30	230.44
43+50	229.84
43+56	229.78
43+60	229.74
43+66	229.57
43+70	229.44
43+76	229.19
43+86	228.74
43+90	228.54

Garner Rd. - Pre-Dev 2-Year

Section Definitions

Station (ft)	Elevation (ft)
44+00	227.14
44+10	225.04
44+20	224.84
44+30	224.94
44+40	224.44
44+50	223.64
44+60	223.34
44+70	223.04
44+76	222.70
44+80	222.44
44+90	222.64
45+00	222.54
45+10	222.24
45+20	221.84
45+30	222.34
45+40	222.44
45+50	221.84
45+60	221.24
45+62	221.21
45+70	221.04
45+72	221.02
45+90	220.84
46+00	220.74
46+10	220.84
46+12	220.84
46+20	220.84
46+40	220.54
46+50	220.54
46+60	220.24
46+62	220.22
46+70	220.14
46+72	220.07
46+80	219.74
46+90	219.54
47+00	220.04
47+02	220.09
47+10	220.34
47+12	220.32
47+20	220.24
47+32	220.28
47+39	220.30
47+39	220.30
47+39	220.30
47+41	220.31
47+50	220.34
47+53	219.59
47+91	219.74

Garner Rd. - Pre-Dev 2-Year

Section Definitions

Station (ft)	Elevation (ft)
48+03	219.79
48+42	219.60
48+56	219.53
48+80	219.82
48+93	219.86
49+43	220.02
49+46	220.03
49+47	219.91
49+47	219.89
49+47	219.87
49+47	219.85
49+52	219.03
49+64	219.73
49+69	220.03
49+74	216.24
49+77	214.81
49+81	213.92
49+85	212.77
49+89	212.42
49+94	213.15
49+99	214.79
50+02	215.50
50+12	215.66
50+16	215.58
50+17	215.48
50+21	215.95
50+25	215.13
50+26	216.26
50+28	219.51
50+47	219.81
50+48	219.74
50+48	219.73
50+49	219.73
50+49	219.72
50+50	219.63
50+58	219.70
50+94	219.98
50+98	220.00
51+16	219.87
51+16	219.87
51+16	219.87
51+45	219.67
51+47	219.68
51+97	220.06
52+01	220.06
52+31	220.05
52+41	220.84

Garner Rd. - Pre-Dev 2-Year

Section Definitions

Station (ft)	Elevation (ft)
52+51	220.04
52+54	220.01
52+61	219.94
52+71	219.24
52+81	219.54
52+91	219.74
53+01	220.02
53+01	220.04
53+21	221.10
53+21	221.14
53+31	221.51
53+31	221.54
53+41	221.74
53+71	221.45
53+71	221.44
53+81	221.64
53+91	221.64
54+11	222.04
54+21	222.14
54+31	222.24
54+41	222.54
54+71	222.84
54+91	222.94
55+01	223.03
55+11	223.14
55+21	223.14
55+31	223.14
55+71	223.64
55+81	223.94
56+01	224.26
56+11	224.43
56+11	224.44
56+31	224.97
56+41	225.25
56+51	225.52
56+51	225.54
56+61	225.73
56+61	225.74
56+71	225.94
57+01	226.92
57+01	226.94
57+11	227.41
57+21	227.91
57+21	227.94
57+31	228.31
57+31	228.34
57+51	229.40

Garner Rd. - Pre-Dev 2-Year

Section Definitions

Station (ft)	Elevation (ft)
57+51	229.44
57+61	229.81
57+61	229.84
57+71	230.64
57+81	231.24
57+91	231.43
57+91	231.44
58+01	231.94
58+11	232.13
58+11	232.14
58+21	232.79
58+31	233.49
58+51	234.89
58+51	234.94
58+61	235.04
58+71	236.04
58+81	241.34
58+91	246.34

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(38+10, 242.34)	(41+43, 233.11)	0.100
(41+43, 233.11)	(41+46, 233.08)	0.120
(41+46, 233.08)	(49+64, 219.73)	0.150
(49+64, 219.73)	(49+69, 220.03)	0.100
(49+69, 220.03)	(50+28, 219.51)	0.046
(50+28, 219.51)	(58+91, 246.34)	0.100

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	114.0 in
Elevation Range	212.4 to 246.3 ft
Flow Area	1,775.8 ft²
Wetted Perimeter	865.7 ft
Hydraulic Radius	24.6 in
Top Width	860.08 ft
Normal Depth	114.0 in
Critical Depth	95.4 in

Garner Rd. - Pre-Dev 2-Year

Results	
Critical Slope	0.231 ft/ft
Velocity	1.93 ft/s
Velocity Head	0.06 ft
Specific Energy	9.56 ft
Froude Number	0.237
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	114.0 in
Critical Depth	95.4 in
Channel Slope	0.010 ft/ft
Critical Slope	0.231 ft/ft

Messages	
Messages	Flow is divided.

Garner Rd. - Post-Dev - 2-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	3,448.60 cfs

Section Definitions

Station (ft)	Elevation (ft)
38+10	242.34
38+30	241.44
38+50	240.94
38+60	240.84
38+70	240.54
38+80	239.54
38+90	238.14
39+00	237.64
39+06	237.58
39+10	237.54
39+16	237.48
39+20	237.44
39+26	237.52
39+36	237.67
39+40	237.74
39+46	237.68
39+50	237.64
39+56	237.58
39+70	237.44
39+76	237.38
39+80	237.34
39+86	237.26
39+96	237.11
40+00	237.04
40+06	236.79
40+16	236.34
40+20	236.14
40+36	235.28
40+46	234.73
40+60	233.94
40+70	233.64
40+76	233.58
40+80	233.54
40+90	233.54
40+96	233.54
41+00	233.54
41+06	233.82
41+10	234.04

Garner Rd. - Post-Dev - 2-Year

Section Definitions

Station (ft)	Elevation (ft)
41+16	234.26
41+20	234.44
41+26	234.33
41+30	234.24
41+36	233.62
41+40	233.14
41+43	233.11
41+46	233.08
41+46	233.08
41+50	233.04
41+56	232.65
41+60	232.34
41+66	231.72
41+70	231.24
41+76	230.74
41+80	230.34
41+86	230.06
41+90	229.84
41+96	229.84
42+00	229.84
42+06	230.06
42+10	230.24
42+20	230.24
42+26	230.07
42+30	229.94
42+36	230.05
42+40	230.14
42+46	230.20
42+50	230.24
42+56	230.41
42+60	230.54
42+66	230.43
42+70	230.34
42+76	230.06
42+80	229.84
43+00	230.24
43+20	230.44
43+26	230.44
43+30	230.44
43+50	229.84
43+56	229.78
43+60	229.74
43+66	229.57
43+70	229.44
43+76	229.19
43+86	228.74
43+90	228.54

Garner Rd. - Post-Dev - 2-Year

Section Definitions

Station (ft)	Elevation (ft)
44+00	227.14
44+10	225.04
44+20	224.84
44+30	224.94
44+40	224.44
44+50	223.64
44+60	223.34
44+70	223.04
44+76	222.70
44+80	222.44
44+90	222.64
45+00	222.54
45+10	222.24
45+20	221.84
45+30	222.34
45+40	222.44
45+50	221.84
45+60	221.24
45+62	221.21
45+70	221.04
45+72	221.02
45+90	220.84
46+00	220.74
46+10	220.84
46+12	220.84
46+20	220.84
46+40	220.54
46+50	220.54
46+60	220.24
46+62	220.22
46+70	220.14
46+72	220.07
46+80	219.74
46+90	219.54
47+00	220.04
47+02	220.09
47+10	220.34
47+12	220.32
47+20	220.24
47+32	220.28
47+39	220.30
47+39	220.30
47+39	220.30
47+41	220.31
47+50	220.34
47+53	219.59
47+91	219.74

Garner Rd. - Post-Dev - 2-Year

Section Definitions

Station (ft)	Elevation (ft)
48+03	219.79
48+42	219.60
48+56	219.53
48+80	219.82
48+93	219.86
49+43	220.02
49+46	220.03
49+47	219.91
49+47	219.89
49+47	219.87
49+47	219.85
49+52	219.03
49+64	219.73
49+69	220.03
49+74	216.24
49+77	214.81
49+81	213.92
49+85	212.77
49+89	212.42
49+94	213.15
49+99	214.79
50+02	215.50
50+12	215.66
50+16	215.58
50+17	215.48
50+21	215.95
50+25	215.13
50+26	216.26
50+28	219.51
50+47	219.81
50+48	219.74
50+48	219.73
50+49	219.73
50+49	219.72
50+50	219.63
50+58	219.70
50+94	219.98
50+98	220.00
51+16	219.87
51+16	219.87
51+16	219.87
51+45	219.67
51+47	219.68
51+97	220.06
52+01	220.06
52+31	220.05
52+41	220.84

Garner Rd. - Post-Dev - 2-Year

Section Definitions

Station (ft)	Elevation (ft)
52+51	220.04
52+54	220.01
52+61	219.94
52+71	219.24
52+81	219.54
52+91	219.74
53+01	220.02
53+01	220.04
53+21	221.10
53+21	221.14
53+31	221.51
53+31	221.54
53+41	221.74
53+71	221.45
53+71	221.44
53+81	221.64
53+91	221.64
54+11	222.04
54+21	222.14
54+31	222.24
54+41	222.54
54+71	222.84
54+91	222.94
55+01	223.03
55+11	223.14
55+21	223.14
55+31	223.14
55+71	223.64
55+81	223.94
56+01	224.26
56+11	224.43
56+11	224.44
56+31	224.97
56+41	225.25
56+51	225.52
56+51	225.54
56+61	225.73
56+61	225.74
56+71	225.94
57+01	226.92
57+01	226.94
57+11	227.41
57+21	227.91
57+21	227.94
57+31	228.31
57+31	228.34
57+51	229.40

Garner Rd. - Post-Dev - 2-Year

Section Definitions

Station (ft)	Elevation (ft)
57+51	229.44
57+61	229.81
57+61	229.84
57+71	230.64
57+81	231.24
57+91	231.43
57+91	231.44
58+01	231.94
58+11	232.13
58+11	232.14
58+21	232.79
58+31	233.49
58+51	234.89
58+51	234.94
58+61	235.04
58+71	236.04
58+81	241.34
58+91	246.34

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(38+10, 242.34)	(41+43, 233.11)	0.100
(41+43, 233.11)	(41+46, 233.08)	0.120
(41+46, 233.08)	(49+64, 219.73)	0.150
(49+64, 219.73)	(49+69, 220.03)	0.100
(49+69, 220.03)	(50+28, 219.51)	0.046
(50+28, 219.51)	(58+91, 246.34)	0.100

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	114.1 in
Elevation Range	212.4 to 246.3 ft
Flow Area	1,784.4 ft²
Wetted Perimeter	866.8 ft
Hydraulic Radius	24.7 in
Top Width	861.20 ft
Normal Depth	114.1 in
Critical Depth	95.5 in

Garner Rd. - Post-Dev - 2-Year

Results	
Critical Slope	0.231 ft/ft
Velocity	1.93 ft/s
Velocity Head	0.06 ft
Specific Energy	9.57 ft
Froude Number	0.237
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	114.1 in
Critical Depth	95.5 in
Channel Slope	0.010 ft/ft
Critical Slope	0.231 ft/ft

Messages	
Messages	Flow is divided.

Garner Rd. Pre-Dev 10-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	5,779.62 cfs

Section Definitions

Station (ft)	Elevation (ft)
38+10	242.34
38+30	241.44
38+50	240.94
38+60	240.84
38+70	240.54
38+80	239.54
38+90	238.14
39+00	237.64
39+06	237.58
39+10	237.54
39+16	237.48
39+20	237.44
39+26	237.52
39+36	237.67
39+40	237.74
39+46	237.68
39+50	237.64
39+56	237.58
39+70	237.44
39+76	237.38
39+80	237.34
39+86	237.26
39+96	237.11
40+00	237.04
40+06	236.79
40+16	236.34
40+20	236.14
40+36	235.28
40+46	234.73
40+60	233.94
40+70	233.64
40+76	233.58
40+80	233.54
40+90	233.54
40+96	233.54
41+00	233.54
41+06	233.82
41+10	234.04

Garner Rd. Pre-Dev 10-Year

Section Definitions

Station (ft)	Elevation (ft)
41+16	234.26
41+20	234.44
41+26	234.33
41+30	234.24
41+36	233.62
41+40	233.14
41+43	233.11
41+46	233.08
41+46	233.08
41+50	233.04
41+56	232.65
41+60	232.34
41+66	231.72
41+70	231.24
41+76	230.74
41+80	230.34
41+86	230.06
41+90	229.84
41+96	229.84
42+00	229.84
42+06	230.06
42+10	230.24
42+20	230.24
42+26	230.07
42+30	229.94
42+36	230.05
42+40	230.14
42+46	230.20
42+50	230.24
42+56	230.41
42+60	230.54
42+66	230.43
42+70	230.34
42+76	230.06
42+80	229.84
43+00	230.24
43+20	230.44
43+26	230.44
43+30	230.44
43+50	229.84
43+56	229.78
43+60	229.74
43+66	229.57
43+70	229.44
43+76	229.19
43+86	228.74
43+90	228.54

Garner Rd. Pre-Dev 10-Year

Section Definitions

Station (ft)	Elevation (ft)
44+00	227.14
44+10	225.04
44+20	224.84
44+30	224.94
44+40	224.44
44+50	223.64
44+60	223.34
44+70	223.04
44+76	222.70
44+80	222.44
44+90	222.64
45+00	222.54
45+10	222.24
45+20	221.84
45+30	222.34
45+40	222.44
45+50	221.84
45+60	221.24
45+62	221.21
45+70	221.04
45+72	221.02
45+90	220.84
46+00	220.74
46+10	220.84
46+12	220.84
46+20	220.84
46+40	220.54
46+50	220.54
46+60	220.24
46+62	220.22
46+70	220.14
46+72	220.07
46+80	219.74
46+90	219.54
47+00	220.04
47+02	220.09
47+10	220.34
47+12	220.32
47+20	220.24
47+32	220.28
47+39	220.30
47+39	220.30
47+39	220.30
47+41	220.31
47+50	220.34
47+53	219.59
47+91	219.74

Garner Rd. Pre-Dev 10-Year

Section Definitions

Station (ft)	Elevation (ft)
48+03	219.79
48+42	219.60
48+56	219.53
48+80	219.82
48+93	219.86
49+43	220.02
49+46	220.03
49+47	219.91
49+47	219.89
49+47	219.87
49+47	219.85
49+52	219.03
49+64	219.73
49+69	220.03
49+74	216.24
49+77	214.81
49+81	213.92
49+85	212.77
49+89	212.42
49+94	213.15
49+99	214.79
50+02	215.50
50+12	215.66
50+16	215.58
50+17	215.48
50+21	215.95
50+25	215.13
50+26	216.26
50+28	219.51
50+47	219.81
50+48	219.74
50+48	219.73
50+49	219.73
50+49	219.72
50+50	219.63
50+58	219.70
50+94	219.98
50+98	220.00
51+16	219.87
51+16	219.87
51+16	219.87
51+45	219.67
51+47	219.68
51+97	220.06
52+01	220.06
52+31	220.05
52+41	220.84

Garner Rd. Pre-Dev 10-Year

Section Definitions

Station (ft)	Elevation (ft)
52+51	220.04
52+54	220.01
52+61	219.94
52+71	219.24
52+81	219.54
52+91	219.74
53+01	220.02
53+01	220.04
53+21	221.10
53+21	221.14
53+31	221.51
53+31	221.54
53+41	221.74
53+71	221.45
53+71	221.44
53+81	221.64
53+91	221.64
54+11	222.04
54+21	222.14
54+31	222.24
54+41	222.54
54+71	222.84
54+91	222.94
55+01	223.03
55+11	223.14
55+21	223.14
55+31	223.14
55+71	223.64
55+81	223.94
56+01	224.26
56+11	224.43
56+11	224.44
56+31	224.97
56+41	225.25
56+51	225.52
56+51	225.54
56+61	225.73
56+61	225.74
56+71	225.94
57+01	226.92
57+01	226.94
57+11	227.41
57+21	227.91
57+21	227.94
57+31	228.31
57+31	228.34
57+51	229.40

Garner Rd. Pre-Dev 10-Year

Section Definitions

Station (ft)	Elevation (ft)
57+51	229.44
57+61	229.81
57+61	229.84
57+71	230.64
57+81	231.24
57+91	231.43
57+91	231.44
58+01	231.94
58+11	232.13
58+11	232.14
58+21	232.79
58+31	233.49
58+51	234.89
58+51	234.94
58+61	235.04
58+71	236.04
58+81	241.34
58+91	246.34

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(38+10, 242.34)	(41+43, 233.11)	0.100
(41+43, 233.11)	(41+46, 233.08)	0.120
(41+46, 233.08)	(49+64, 219.73)	0.150
(49+64, 219.73)	(49+69, 220.03)	0.100
(49+69, 220.03)	(50+28, 219.51)	0.046
(50+28, 219.51)	(58+91, 246.34)	0.100

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	124.5 in
Elevation Range	212.4 to 246.3 ft
Flow Area	2,581.6 ft²
Wetted Perimeter	998.0 ft
Hydraulic Radius	31.0 in
Top Width	992.33 ft
Normal Depth	124.5 in
Critical Depth	100.5 in

Garner Rd. Pre-Dev 10-Year

Results	
Critical Slope	0.212 ft/ft
Velocity	2.24 ft/s
Velocity Head	0.08 ft
Specific Energy	10.45 ft
Froude Number	0.245
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	124.5 in
Critical Depth	100.5 in
Channel Slope	0.010 ft/ft
Critical Slope	0.212 ft/ft

Garner Rd. - Post-Dev - 10-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	5,812.70 cfs

Section Definitions

Station (ft)	Elevation (ft)
38+10	242.34
38+30	241.44
38+50	240.94
38+60	240.84
38+70	240.54
38+80	239.54
38+90	238.14
39+00	237.64
39+06	237.58
39+10	237.54
39+16	237.48
39+20	237.44
39+26	237.52
39+36	237.67
39+40	237.74
39+46	237.68
39+50	237.64
39+56	237.58
39+70	237.44
39+76	237.38
39+80	237.34
39+86	237.26
39+96	237.11
40+00	237.04
40+06	236.79
40+16	236.34
40+20	236.14
40+36	235.28
40+46	234.73
40+60	233.94
40+70	233.64
40+76	233.58
40+80	233.54
40+90	233.54
40+96	233.54
41+00	233.54
41+06	233.82
41+10	234.04

Garner Rd. - Post-Dev - 10-Year

Section Definitions

Station (ft)	Elevation (ft)
41+16	234.26
41+20	234.44
41+26	234.33
41+30	234.24
41+36	233.62
41+40	233.14
41+43	233.11
41+46	233.08
41+46	233.08
41+50	233.04
41+56	232.65
41+60	232.34
41+66	231.72
41+70	231.24
41+76	230.74
41+80	230.34
41+86	230.06
41+90	229.84
41+96	229.84
42+00	229.84
42+06	230.06
42+10	230.24
42+20	230.24
42+26	230.07
42+30	229.94
42+36	230.05
42+40	230.14
42+46	230.20
42+50	230.24
42+56	230.41
42+60	230.54
42+66	230.43
42+70	230.34
42+76	230.06
42+80	229.84
43+00	230.24
43+20	230.44
43+26	230.44
43+30	230.44
43+50	229.84
43+56	229.78
43+60	229.74
43+66	229.57
43+70	229.44
43+76	229.19
43+86	228.74
43+90	228.54

Garner Rd. - Post-Dev - 10-Year

Section Definitions

Station (ft)	Elevation (ft)
44+00	227.14
44+10	225.04
44+20	224.84
44+30	224.94
44+40	224.44
44+50	223.64
44+60	223.34
44+70	223.04
44+76	222.70
44+80	222.44
44+90	222.64
45+00	222.54
45+10	222.24
45+20	221.84
45+30	222.34
45+40	222.44
45+50	221.84
45+60	221.24
45+62	221.21
45+70	221.04
45+72	221.02
45+90	220.84
46+00	220.74
46+10	220.84
46+12	220.84
46+20	220.84
46+40	220.54
46+50	220.54
46+60	220.24
46+62	220.22
46+70	220.14
46+72	220.07
46+80	219.74
46+90	219.54
47+00	220.04
47+02	220.09
47+10	220.34
47+12	220.32
47+20	220.24
47+32	220.28
47+39	220.30
47+39	220.30
47+39	220.30
47+41	220.31
47+50	220.34
47+53	219.59
47+91	219.74

Garner Rd. - Post-Dev - 10-Year

Section Definitions

Station (ft)	Elevation (ft)
48+03	219.79
48+42	219.60
48+56	219.53
48+80	219.82
48+93	219.86
49+43	220.02
49+46	220.03
49+47	219.91
49+47	219.89
49+47	219.87
49+47	219.85
49+52	219.03
49+64	219.73
49+69	220.03
49+74	216.24
49+77	214.81
49+81	213.92
49+85	212.77
49+89	212.42
49+94	213.15
49+99	214.79
50+02	215.50
50+12	215.66
50+16	215.58
50+17	215.48
50+21	215.95
50+25	215.13
50+26	216.26
50+28	219.51
50+47	219.81
50+48	219.74
50+48	219.73
50+49	219.73
50+49	219.72
50+50	219.63
50+58	219.70
50+94	219.98
50+98	220.00
51+16	219.87
51+16	219.87
51+16	219.87
51+45	219.67
51+47	219.68
51+97	220.06
52+01	220.06
52+31	220.05
52+41	220.84

Garner Rd. - Post-Dev - 10-Year

Section Definitions

Station (ft)	Elevation (ft)
52+51	220.04
52+54	220.01
52+61	219.94
52+71	219.24
52+81	219.54
52+91	219.74
53+01	220.02
53+01	220.04
53+21	221.10
53+21	221.14
53+31	221.51
53+31	221.54
53+41	221.74
53+71	221.45
53+71	221.44
53+81	221.64
53+91	221.64
54+11	222.04
54+21	222.14
54+31	222.24
54+41	222.54
54+71	222.84
54+91	222.94
55+01	223.03
55+11	223.14
55+21	223.14
55+31	223.14
55+71	223.64
55+81	223.94
56+01	224.26
56+11	224.43
56+11	224.44
56+31	224.97
56+41	225.25
56+51	225.52
56+51	225.54
56+61	225.73
56+61	225.74
56+71	225.94
57+01	226.92
57+01	226.94
57+11	227.41
57+21	227.91
57+21	227.94
57+31	228.31
57+31	228.34
57+51	229.40

Garner Rd. - Post-Dev - 10-Year

Section Definitions

Station (ft)	Elevation (ft)
57+51	229.44
57+61	229.81
57+61	229.84
57+71	230.64
57+81	231.24
57+91	231.43
57+91	231.44
58+01	231.94
58+11	232.13
58+11	232.14
58+21	232.79
58+31	233.49
58+51	234.89
58+51	234.94
58+61	235.04
58+71	236.04
58+81	241.34
58+91	246.34

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(38+10, 242.34)	(41+43, 233.11)	0.100
(41+43, 233.11)	(41+46, 233.08)	0.120
(41+46, 233.08)	(49+64, 219.73)	0.150
(49+64, 219.73)	(49+69, 220.03)	0.100
(49+69, 220.03)	(50+28, 219.51)	0.046
(50+28, 219.51)	(58+91, 246.34)	0.100

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	124.6 in
Elevation Range	212.4 to 246.3 ft
Flow Area	2,591.4 ft²
Wetted Perimeter	999.1 ft
Hydraulic Radius	31.1 in
Top Width	993.48 ft
Normal Depth	124.6 in
Critical Depth	100.6 in

Garner Rd. - Post-Dev - 10-Year

Results	
Critical Slope	0.212 ft/ft
Velocity	2.24 ft/s
Velocity Head	0.08 ft
Specific Energy	10.46 ft
Froude Number	0.245
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	124.6 in
Critical Depth	100.6 in
Channel Slope	0.010 ft/ft
Critical Slope	0.212 ft/ft

Garner Rd. Pre-Dev - 50-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	8,577.30 cfs

Section Definitions

Station (ft)	Elevation (ft)
38+10	242.34
38+30	241.44
38+50	240.94
38+60	240.84
38+70	240.54
38+80	239.54
38+90	238.14
39+00	237.64
39+06	237.58
39+10	237.54
39+16	237.48
39+20	237.44
39+26	237.52
39+36	237.67
39+40	237.74
39+46	237.68
39+50	237.64
39+56	237.58
39+70	237.44
39+76	237.38
39+80	237.34
39+86	237.26
39+96	237.11
40+00	237.04
40+06	236.79
40+16	236.34
40+20	236.14
40+36	235.28
40+46	234.73
40+60	233.94
40+70	233.64
40+76	233.58
40+80	233.54
40+90	233.54
40+96	233.54
41+00	233.54
41+06	233.82
41+10	234.04

Garner Rd. Pre-Dev - 50-Year

Section Definitions

Station (ft)	Elevation (ft)
41+16	234.26
41+20	234.44
41+26	234.33
41+30	234.24
41+36	233.62
41+40	233.14
41+43	233.11
41+46	233.08
41+46	233.08
41+50	233.04
41+56	232.65
41+60	232.34
41+66	231.72
41+70	231.24
41+76	230.74
41+80	230.34
41+86	230.06
41+90	229.84
41+96	229.84
42+00	229.84
42+06	230.06
42+10	230.24
42+20	230.24
42+26	230.07
42+30	229.94
42+36	230.05
42+40	230.14
42+46	230.20
42+50	230.24
42+56	230.41
42+60	230.54
42+66	230.43
42+70	230.34
42+76	230.06
42+80	229.84
43+00	230.24
43+20	230.44
43+26	230.44
43+30	230.44
43+50	229.84
43+56	229.78
43+60	229.74
43+66	229.57
43+70	229.44
43+76	229.19
43+86	228.74
43+90	228.54

Garner Rd. Pre-Dev - 50-Year

Section Definitions

Station (ft)	Elevation (ft)
44+00	227.14
44+10	225.04
44+20	224.84
44+30	224.94
44+40	224.44
44+50	223.64
44+60	223.34
44+70	223.04
44+76	222.70
44+80	222.44
44+90	222.64
45+00	222.54
45+10	222.24
45+20	221.84
45+30	222.34
45+40	222.44
45+50	221.84
45+60	221.24
45+62	221.21
45+70	221.04
45+72	221.02
45+90	220.84
46+00	220.74
46+10	220.84
46+12	220.84
46+20	220.84
46+40	220.54
46+50	220.54
46+60	220.24
46+62	220.22
46+70	220.14
46+72	220.07
46+80	219.74
46+90	219.54
47+00	220.04
47+02	220.09
47+10	220.34
47+12	220.32
47+20	220.24
47+32	220.28
47+39	220.30
47+39	220.30
47+39	220.30
47+41	220.31
47+50	220.34
47+53	219.59
47+91	219.74

Garner Rd. Pre-Dev - 50-Year

Section Definitions

Station (ft)	Elevation (ft)
48+03	219.79
48+42	219.60
48+56	219.53
48+80	219.82
48+93	219.86
49+43	220.02
49+46	220.03
49+47	219.91
49+47	219.89
49+47	219.87
49+47	219.85
49+52	219.03
49+64	219.73
49+69	220.03
49+74	216.24
49+77	214.81
49+81	213.92
49+85	212.77
49+89	212.42
49+94	213.15
49+99	214.79
50+02	215.50
50+12	215.66
50+16	215.58
50+17	215.48
50+21	215.95
50+25	215.13
50+26	216.26
50+28	219.51
50+47	219.81
50+48	219.74
50+48	219.73
50+49	219.73
50+49	219.72
50+50	219.63
50+58	219.70
50+94	219.98
50+98	220.00
51+16	219.87
51+16	219.87
51+16	219.87
51+45	219.67
51+47	219.68
51+97	220.06
52+01	220.06
52+31	220.05
52+41	220.84

Garner Rd. Pre-Dev - 50-Year

Section Definitions

Station (ft)	Elevation (ft)
52+51	220.04
52+54	220.01
52+61	219.94
52+71	219.24
52+81	219.54
52+91	219.74
53+01	220.02
53+01	220.04
53+21	221.10
53+21	221.14
53+31	221.51
53+31	221.54
53+41	221.74
53+71	221.45
53+71	221.44
53+81	221.64
53+91	221.64
54+11	222.04
54+21	222.14
54+31	222.24
54+41	222.54
54+71	222.84
54+91	222.94
55+01	223.03
55+11	223.14
55+21	223.14
55+31	223.14
55+71	223.64
55+81	223.94
56+01	224.26
56+11	224.43
56+11	224.44
56+31	224.97
56+41	225.25
56+51	225.52
56+51	225.54
56+61	225.73
56+61	225.74
56+71	225.94
57+01	226.92
57+01	226.94
57+11	227.41
57+21	227.91
57+21	227.94
57+31	228.31
57+31	228.34
57+51	229.40

Garner Rd. Pre-Dev - 50-Year

Section Definitions

Station (ft)	Elevation (ft)
57+51	229.44
57+61	229.81
57+61	229.84
57+71	230.64
57+81	231.24
57+91	231.43
57+91	231.44
58+01	231.94
58+11	232.13
58+11	232.14
58+21	232.79
58+31	233.49
58+51	234.89
58+51	234.94
58+61	235.04
58+71	236.04
58+81	241.34
58+91	246.34

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(38+10, 242.34)	(41+43, 233.11)	0.100
(41+43, 233.11)	(41+46, 233.08)	0.120
(41+46, 233.08)	(49+64, 219.73)	0.150
(49+64, 219.73)	(49+69, 220.03)	0.100
(49+69, 220.03)	(50+28, 219.51)	0.046
(50+28, 219.51)	(58+91, 246.34)	0.100

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	133.7 in
Elevation Range	212.4 to 246.3 ft
Flow Area	3,399.9 ft²
Wetted Perimeter	1,118.4 ft
Hydraulic Radius	36.5 in
Top Width	1,112.78 ft
Normal Depth	133.7 in
Critical Depth	105.4 in

Garner Rd. Pre-Dev - 50-Year

Results	
Critical Slope	0.193 ft/ft
Velocity	2.52 ft/s
Velocity Head	0.10 ft
Specific Energy	11.24 ft
Froude Number	0.254
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	133.7 in
Critical Depth	105.4 in
Channel Slope	0.010 ft/ft
Critical Slope	0.193 ft/ft

Garner Rd. - Post-Dev - 50-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	8,618.24 cfs

Section Definitions

Station (ft)	Elevation (ft)
38+10	242.34
38+30	241.44
38+50	240.94
38+60	240.84
38+70	240.54
38+80	239.54
38+90	238.14
39+00	237.64
39+06	237.58
39+10	237.54
39+16	237.48
39+20	237.44
39+26	237.52
39+36	237.67
39+40	237.74
39+46	237.68
39+50	237.64
39+56	237.58
39+70	237.44
39+76	237.38
39+80	237.34
39+86	237.26
39+96	237.11
40+00	237.04
40+06	236.79
40+16	236.34
40+20	236.14
40+36	235.28
40+46	234.73
40+60	233.94
40+70	233.64
40+76	233.58
40+80	233.54
40+90	233.54
40+96	233.54
41+00	233.54
41+06	233.82
41+10	234.04

Garner Rd. - Post-Dev - 50-Year

Section Definitions

Station (ft)	Elevation (ft)
41+16	234.26
41+20	234.44
41+26	234.33
41+30	234.24
41+36	233.62
41+40	233.14
41+43	233.11
41+46	233.08
41+46	233.08
41+50	233.04
41+56	232.65
41+60	232.34
41+66	231.72
41+70	231.24
41+76	230.74
41+80	230.34
41+86	230.06
41+90	229.84
41+96	229.84
42+00	229.84
42+06	230.06
42+10	230.24
42+20	230.24
42+26	230.07
42+30	229.94
42+36	230.05
42+40	230.14
42+46	230.20
42+50	230.24
42+56	230.41
42+60	230.54
42+66	230.43
42+70	230.34
42+76	230.06
42+80	229.84
43+00	230.24
43+20	230.44
43+26	230.44
43+30	230.44
43+50	229.84
43+56	229.78
43+60	229.74
43+66	229.57
43+70	229.44
43+76	229.19
43+86	228.74
43+90	228.54

Garner Rd. - Post-Dev - 50-Year

Section Definitions

Station (ft)	Elevation (ft)
44+00	227.14
44+10	225.04
44+20	224.84
44+30	224.94
44+40	224.44
44+50	223.64
44+60	223.34
44+70	223.04
44+76	222.70
44+80	222.44
44+90	222.64
45+00	222.54
45+10	222.24
45+20	221.84
45+30	222.34
45+40	222.44
45+50	221.84
45+60	221.24
45+62	221.21
45+70	221.04
45+72	221.02
45+90	220.84
46+00	220.74
46+10	220.84
46+12	220.84
46+20	220.84
46+40	220.54
46+50	220.54
46+60	220.24
46+62	220.22
46+70	220.14
46+72	220.07
46+80	219.74
46+90	219.54
47+00	220.04
47+02	220.09
47+10	220.34
47+12	220.32
47+20	220.24
47+32	220.28
47+39	220.30
47+39	220.30
47+39	220.30
47+41	220.31
47+50	220.34
47+53	219.59
47+91	219.74

Garner Rd. - Post-Dev - 50-Year

Section Definitions

Station (ft)	Elevation (ft)
48+03	219.79
48+42	219.60
48+56	219.53
48+80	219.82
48+93	219.86
49+43	220.02
49+46	220.03
49+47	219.91
49+47	219.89
49+47	219.87
49+47	219.85
49+52	219.03
49+64	219.73
49+69	220.03
49+74	216.24
49+77	214.81
49+81	213.92
49+85	212.77
49+89	212.42
49+94	213.15
49+99	214.79
50+02	215.50
50+12	215.66
50+16	215.58
50+17	215.48
50+21	215.95
50+25	215.13
50+26	216.26
50+28	219.51
50+47	219.81
50+48	219.74
50+48	219.73
50+49	219.73
50+49	219.72
50+50	219.63
50+58	219.70
50+94	219.98
50+98	220.00
51+16	219.87
51+16	219.87
51+16	219.87
51+45	219.67
51+47	219.68
51+97	220.06
52+01	220.06
52+31	220.05
52+41	220.84

Garner Rd. - Post-Dev - 50-Year

Section Definitions

Station (ft)	Elevation (ft)
52+51	220.04
52+54	220.01
52+61	219.94
52+71	219.24
52+81	219.54
52+91	219.74
53+01	220.02
53+01	220.04
53+21	221.10
53+21	221.14
53+31	221.51
53+31	221.54
53+41	221.74
53+71	221.45
53+71	221.44
53+81	221.64
53+91	221.64
54+11	222.04
54+21	222.14
54+31	222.24
54+41	222.54
54+71	222.84
54+91	222.94
55+01	223.03
55+11	223.14
55+21	223.14
55+31	223.14
55+71	223.64
55+81	223.94
56+01	224.26
56+11	224.43
56+11	224.44
56+31	224.97
56+41	225.25
56+51	225.52
56+51	225.54
56+61	225.73
56+61	225.74
56+71	225.94
57+01	226.92
57+01	226.94
57+11	227.41
57+21	227.91
57+21	227.94
57+31	228.31
57+31	228.34
57+51	229.40

Garner Rd. - Post-Dev - 50-Year

Section Definitions

Station (ft)	Elevation (ft)
57+51	229.44
57+61	229.81
57+61	229.84
57+71	230.64
57+81	231.24
57+91	231.43
57+91	231.44
58+01	231.94
58+11	232.13
58+11	232.14
58+21	232.79
58+31	233.49
58+51	234.89
58+51	234.94
58+61	235.04
58+71	236.04
58+81	241.34
58+91	246.34

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(38+10, 242.34)	(41+43, 233.11)	0.100
(41+43, 233.11)	(41+46, 233.08)	0.120
(41+46, 233.08)	(49+64, 219.73)	0.150
(49+64, 219.73)	(49+69, 220.03)	0.100
(49+69, 220.03)	(50+28, 219.51)	0.046
(50+28, 219.51)	(58+91, 246.34)	0.100

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	133.9 in
Elevation Range	212.4 to 246.3 ft
Flow Area	3,410.9 ft²
Wetted Perimeter	1,119.6 ft
Hydraulic Radius	36.6 in
Top Width	1,113.90 ft
Normal Depth	133.9 in
Critical Depth	105.5 in

Garner Rd. - Post-Dev - 50-Year

Results	
Critical Slope	0.193 ft/ft
Velocity	2.53 ft/s
Velocity Head	0.10 ft
Specific Energy	11.25 ft
Froude Number	0.255
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	133.9 in
Critical Depth	105.5 in
Channel Slope	0.010 ft/ft
Critical Slope	0.193 ft/ft

Garner Rd. - Pre-Dev - 100-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	9,549.54 cfs

Section Definitions

Station (ft)	Elevation (ft)
38+10	242.34
38+30	241.44
38+50	240.94
38+60	240.84
38+70	240.54
38+80	239.54
38+90	238.14
39+00	237.64
39+06	237.58
39+10	237.54
39+16	237.48
39+20	237.44
39+26	237.52
39+36	237.67
39+40	237.74
39+46	237.68
39+50	237.64
39+56	237.58
39+70	237.44
39+76	237.38
39+80	237.34
39+86	237.26
39+96	237.11
40+00	237.04
40+06	236.79
40+16	236.34
40+20	236.14
40+36	235.28
40+46	234.73
40+60	233.94
40+70	233.64
40+76	233.58
40+80	233.54
40+90	233.54
40+96	233.54
41+00	233.54
41+06	233.82
41+10	234.04

Garner Rd. - Pre-Dev - 100-Year

Section Definitions

Station (ft)	Elevation (ft)
41+16	234.26
41+20	234.44
41+26	234.33
41+30	234.24
41+36	233.62
41+40	233.14
41+43	233.11
41+46	233.08
41+46	233.08
41+50	233.04
41+56	232.65
41+60	232.34
41+66	231.72
41+70	231.24
41+76	230.74
41+80	230.34
41+86	230.06
41+90	229.84
41+96	229.84
42+00	229.84
42+06	230.06
42+10	230.24
42+20	230.24
42+26	230.07
42+30	229.94
42+36	230.05
42+40	230.14
42+46	230.20
42+50	230.24
42+56	230.41
42+60	230.54
42+66	230.43
42+70	230.34
42+76	230.06
42+80	229.84
43+00	230.24
43+20	230.44
43+26	230.44
43+30	230.44
43+50	229.84
43+56	229.78
43+60	229.74
43+66	229.57
43+70	229.44
43+76	229.19
43+86	228.74
43+90	228.54

Garner Rd. - Pre-Dev - 100-Year

Section Definitions

Station (ft)	Elevation (ft)
44+00	227.14
44+10	225.04
44+20	224.84
44+30	224.94
44+40	224.44
44+50	223.64
44+60	223.34
44+70	223.04
44+76	222.70
44+80	222.44
44+90	222.64
45+00	222.54
45+10	222.24
45+20	221.84
45+30	222.34
45+40	222.44
45+50	221.84
45+60	221.24
45+62	221.21
45+70	221.04
45+72	221.02
45+90	220.84
46+00	220.74
46+10	220.84
46+12	220.84
46+20	220.84
46+40	220.54
46+50	220.54
46+60	220.24
46+62	220.22
46+70	220.14
46+72	220.07
46+80	219.74
46+90	219.54
47+00	220.04
47+02	220.09
47+10	220.34
47+12	220.32
47+20	220.24
47+32	220.28
47+39	220.30
47+39	220.30
47+39	220.30
47+41	220.31
47+50	220.34
47+53	219.59
47+91	219.74

Garner Rd. - Pre-Dev - 100-Year

Section Definitions

Station (ft)	Elevation (ft)
48+03	219.79
48+42	219.60
48+56	219.53
48+80	219.82
48+93	219.86
49+43	220.02
49+46	220.03
49+47	219.91
49+47	219.89
49+47	219.87
49+47	219.85
49+52	219.03
49+64	219.73
49+69	220.03
49+74	216.24
49+77	214.81
49+81	213.92
49+85	212.77
49+89	212.42
49+94	213.15
49+99	214.79
50+02	215.50
50+12	215.66
50+16	215.58
50+17	215.48
50+21	215.95
50+25	215.13
50+26	216.26
50+28	219.51
50+47	219.81
50+48	219.74
50+48	219.73
50+49	219.73
50+49	219.72
50+50	219.63
50+58	219.70
50+94	219.98
50+98	220.00
51+16	219.87
51+16	219.87
51+16	219.87
51+45	219.67
51+47	219.68
51+97	220.06
52+01	220.06
52+31	220.05
52+41	220.84

Garner Rd. - Pre-Dev - 100-Year

Section Definitions

Station (ft)	Elevation (ft)
52+51	220.04
52+54	220.01
52+61	219.94
52+71	219.24
52+81	219.54
52+91	219.74
53+01	220.02
53+01	220.04
53+21	221.10
53+21	221.14
53+31	221.51
53+31	221.54
53+41	221.74
53+71	221.45
53+71	221.44
53+81	221.64
53+91	221.64
54+11	222.04
54+21	222.14
54+31	222.24
54+41	222.54
54+71	222.84
54+91	222.94
55+01	223.03
55+11	223.14
55+21	223.14
55+31	223.14
55+71	223.64
55+81	223.94
56+01	224.26
56+11	224.43
56+11	224.44
56+31	224.97
56+41	225.25
56+51	225.52
56+51	225.54
56+61	225.73
56+61	225.74
56+71	225.94
57+01	226.92
57+01	226.94
57+11	227.41
57+21	227.91
57+21	227.94
57+31	228.31
57+31	228.34
57+51	229.40

Garner Rd. - Pre-Dev - 100-Year

Section Definitions

Station (ft)	Elevation (ft)
57+51	229.44
57+61	229.81
57+61	229.84
57+71	230.64
57+81	231.24
57+91	231.43
57+91	231.44
58+01	231.94
58+11	232.13
58+11	232.14
58+21	232.79
58+31	233.49
58+51	234.89
58+51	234.94
58+61	235.04
58+71	236.04
58+81	241.34
58+91	246.34

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(38+10, 242.34)	(41+43, 233.11)	0.100
(41+43, 233.11)	(41+46, 233.08)	0.120
(41+46, 233.08)	(49+64, 219.73)	0.150
(49+64, 219.73)	(49+69, 220.03)	0.100
(49+69, 220.03)	(50+28, 219.51)	0.046
(50+28, 219.51)	(58+91, 246.34)	0.100

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	136.3 in
Elevation Range	212.4 to 246.3 ft
Flow Area	3,643.8 ft²
Wetted Perimeter	1,133.5 ft
Hydraulic Radius	38.6 in
Top Width	1,127.82 ft
Normal Depth	136.3 in
Critical Depth	106.9 in

Garner Rd. - Pre-Dev - 100-Year

Results	
Critical Slope	0.188 ft/ft
Velocity	2.62 ft/s
Velocity Head	0.11 ft
Specific Energy	11.47 ft
Froude Number	0.257
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	136.3 in
Critical Depth	106.9 in
Channel Slope	0.010 ft/ft
Critical Slope	0.188 ft/ft

Garner Rd. - Post-Dev - 100-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	9,594.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
38+10	242.34
38+30	241.44
38+50	240.94
38+60	240.84
38+70	240.54
38+80	239.54
38+90	238.14
39+00	237.64
39+06	237.58
39+10	237.54
39+16	237.48
39+20	237.44
39+26	237.52
39+36	237.67
39+40	237.74
39+46	237.68
39+50	237.64
39+56	237.58
39+70	237.44
39+76	237.38
39+80	237.34
39+86	237.26
39+96	237.11
40+00	237.04
40+06	236.79
40+16	236.34
40+20	236.14
40+36	235.28
40+46	234.73
40+60	233.94
40+70	233.64
40+76	233.58
40+80	233.54
40+90	233.54
40+96	233.54
41+00	233.54
41+06	233.82
41+10	234.04

Garner Rd. - Post-Dev - 100-Year

Section Definitions

Station (ft)	Elevation (ft)
41+16	234.26
41+20	234.44
41+26	234.33
41+30	234.24
41+36	233.62
41+40	233.14
41+43	233.11
41+46	233.08
41+46	233.08
41+50	233.04
41+56	232.65
41+60	232.34
41+66	231.72
41+70	231.24
41+76	230.74
41+80	230.34
41+86	230.06
41+90	229.84
41+96	229.84
42+00	229.84
42+06	230.06
42+10	230.24
42+20	230.24
42+26	230.07
42+30	229.94
42+36	230.05
42+40	230.14
42+46	230.20
42+50	230.24
42+56	230.41
42+60	230.54
42+66	230.43
42+70	230.34
42+76	230.06
42+80	229.84
43+00	230.24
43+20	230.44
43+26	230.44
43+30	230.44
43+50	229.84
43+56	229.78
43+60	229.74
43+66	229.57
43+70	229.44
43+76	229.19
43+86	228.74
43+90	228.54

Garner Rd. - Post-Dev - 100-Year

Section Definitions

Station (ft)	Elevation (ft)
44+00	227.14
44+10	225.04
44+20	224.84
44+30	224.94
44+40	224.44
44+50	223.64
44+60	223.34
44+70	223.04
44+76	222.70
44+80	222.44
44+90	222.64
45+00	222.54
45+10	222.24
45+20	221.84
45+30	222.34
45+40	222.44
45+50	221.84
45+60	221.24
45+62	221.21
45+70	221.04
45+72	221.02
45+90	220.84
46+00	220.74
46+10	220.84
46+12	220.84
46+20	220.84
46+40	220.54
46+50	220.54
46+60	220.24
46+62	220.22
46+70	220.14
46+72	220.07
46+80	219.74
46+90	219.54
47+00	220.04
47+02	220.09
47+10	220.34
47+12	220.32
47+20	220.24
47+32	220.28
47+39	220.30
47+39	220.30
47+39	220.30
47+41	220.31
47+50	220.34
47+53	219.59
47+91	219.74

Garner Rd. - Post-Dev - 100-Year

Section Definitions

Station (ft)	Elevation (ft)
48+03	219.79
48+42	219.60
48+56	219.53
48+80	219.82
48+93	219.86
49+43	220.02
49+46	220.03
49+47	219.91
49+47	219.89
49+47	219.87
49+47	219.85
49+52	219.03
49+64	219.73
49+69	220.03
49+74	216.24
49+77	214.81
49+81	213.92
49+85	212.77
49+89	212.42
49+94	213.15
49+99	214.79
50+02	215.50
50+12	215.66
50+16	215.58
50+17	215.48
50+21	215.95
50+25	215.13
50+26	216.26
50+28	219.51
50+47	219.81
50+48	219.74
50+48	219.73
50+49	219.73
50+49	219.72
50+50	219.63
50+58	219.70
50+94	219.98
50+98	220.00
51+16	219.87
51+16	219.87
51+16	219.87
51+45	219.67
51+47	219.68
51+97	220.06
52+01	220.06
52+31	220.05
52+41	220.84

Garner Rd. - Post-Dev - 100-Year

Section Definitions

Station (ft)	Elevation (ft)
52+51	220.04
52+54	220.01
52+61	219.94
52+71	219.24
52+81	219.54
52+91	219.74
53+01	220.02
53+01	220.04
53+21	221.10
53+21	221.14
53+31	221.51
53+31	221.54
53+41	221.74
53+71	221.45
53+71	221.44
53+81	221.64
53+91	221.64
54+11	222.04
54+21	222.14
54+31	222.24
54+41	222.54
54+71	222.84
54+91	222.94
55+01	223.03
55+11	223.14
55+21	223.14
55+31	223.14
55+71	223.64
55+81	223.94
56+01	224.26
56+11	224.43
56+11	224.44
56+31	224.97
56+41	225.25
56+51	225.52
56+51	225.54
56+61	225.73
56+61	225.74
56+71	225.94
57+01	226.92
57+01	226.94
57+11	227.41
57+21	227.91
57+21	227.94
57+31	228.31
57+31	228.34
57+51	229.40

Garner Rd. - Post-Dev - 100-Year

Section Definitions

Station (ft)	Elevation (ft)
57+51	229.44
57+61	229.81
57+61	229.84
57+71	230.64
57+81	231.24
57+91	231.43
57+91	231.44
58+01	231.94
58+11	232.13
58+11	232.14
58+21	232.79
58+31	233.49
58+51	234.89
58+51	234.94
58+61	235.04
58+71	236.04
58+81	241.34
58+91	246.34

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(38+10, 242.34)	(41+43, 233.11)	0.100
(41+43, 233.11)	(41+46, 233.08)	0.120
(41+46, 233.08)	(49+64, 219.73)	0.150
(49+64, 219.73)	(49+69, 220.03)	0.100
(49+69, 220.03)	(50+28, 219.51)	0.046
(50+28, 219.51)	(58+91, 246.34)	0.100

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	136.5 in
Elevation Range	212.4 to 246.3 ft
Flow Area	3,654.6 ft²
Wetted Perimeter	1,133.9 ft
Hydraulic Radius	38.7 in
Top Width	1,128.26 ft
Normal Depth	136.5 in
Critical Depth	107.0 in

Garner Rd. - Post-Dev - 100-Year

Results	
Critical Slope	0.188 ft/ft
Velocity	2.63 ft/s
Velocity Head	0.11 ft
Specific Energy	11.48 ft
Froude Number	0.257
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	136.5 in
Critical Depth	107.0 in
Channel Slope	0.010 ft/ft
Critical Slope	0.188 ft/ft

S. State St. Pre-Dev 2-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	3,013.07 cfs

Section Definitions

Station (ft)	Elevation (ft)
34+29	237.80
34+39	233.20
34+49	232.70
34+59	232.30
34+79	231.90
34+89	231.80
34+99	231.70
35+09	231.50
35+19	231.00
35+29	230.90
35+39	231.00
35+49	231.10
35+59	230.80
35+69	230.70
35+79	230.70
35+89	230.90
35+99	230.90
36+09	230.50
36+19	230.20
36+39	229.90
36+49	229.50
36+59	229.90
36+69	230.00
36+89	229.90
37+19	228.60
37+29	228.30
37+39	228.30
37+79	227.70
37+89	227.50
38+09	227.10
38+19	226.80
38+39	226.60
38+49	226.40
38+69	225.50
38+89	224.50
39+09	223.10
39+19	223.00
39+29	223.20

S. State St. Pre-Dev 2-Year

Section Definitions

Station (ft)	Elevation (ft)
39+39	223.00
39+49	223.70
39+56	222.72
39+59	222.20
39+69	220.20
39+79	219.40
39+89	219.10
39+99	219.30
40+09	219.30
40+19	219.20
40+29	219.40
40+79	219.40
40+89	218.80
41+09	218.90
41+19	219.10
41+29	219.30
41+39	219.30
41+69	218.80
41+79	218.40
41+89	218.20
41+99	218.40
42+09	218.30
42+19	218.10
42+29	218.10
42+39	218.20
42+49	218.50
42+59	218.50
42+79	218.80
42+89	218.80
42+99	218.90
43+09	218.50
43+19	218.70
43+29	218.60
43+59	217.80
43+69	217.70
43+99	217.80
44+29	217.50
44+39	217.40
44+49	217.10
44+69	217.10
44+89	216.80
44+99	216.80
45+09	216.80
45+29	216.80
45+39	216.70
45+49	216.60
45+59	216.40

S. State St. Pre-Dev 2-Year

Section Definitions

Station (ft)	Elevation (ft)
45+79	215.80
45+89	215.70
46+09	215.70
46+19	215.80
46+39	216.30
46+49	216.20
46+59	215.70
46+79	216.00
46+99	216.00
47+09	215.80
47+19	216.00
47+29	216.40
47+39	216.10
47+49	215.80
47+59	215.80
47+69	215.90
47+79	216.20
47+89	216.20
47+99	216.10
48+29	215.90
48+39	216.00
48+59	216.40
48+79	216.60
48+89	216.50
48+99	216.20
49+09	216.50
49+19	216.90
49+29	217.20
49+39	218.30
49+49	219.10
49+59	217.00
49+69	214.80
49+72	214.70
49+76	212.52
49+82	211.50
49+88	211.83
49+99	211.56
50+11	212.08
50+18	211.69
50+24	212.49
50+25	214.38
50+30	218.50
50+40	219.10
50+50	218.60
50+70	217.20
50+80	216.90
50+90	217.00

S. State St. Pre-Dev 2-Year

Section Definitions

Station (ft)	Elevation (ft)
51+00	217.90
51+10	217.40
51+20	217.20
51+40	217.30
51+50	217.00
51+60	217.30
51+70	216.90
51+80	216.50
52+00	216.70
52+10	216.60
52+20	216.50
52+30	216.30
52+40	216.00
52+50	216.00
52+60	215.60
52+70	215.60
52+90	216.10
53+00	216.50
53+10	217.10
53+20	218.10
53+30	218.50
53+40	220.00
53+50	221.50
53+60	221.30
53+70	222.00
53+90	224.60
54+00	224.30
54+20	224.40
54+30	225.40
54+31	225.44
54+50	226.20
54+60	226.40
55+10	227.70
55+20	227.80
55+30	228.40
55+40	229.20
55+50	230.00
55+80	232.00
56+00	234.30

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(34+29, 237.80)	(39+56, 222.72)	0.100
(39+56, 222.72)	(49+72, 214.70)	0.155
(49+72, 214.70)	(50+25, 214.38)	0.046
(50+25, 214.38)	(54+31, 225.44)	0.150

S. State St. Pre-Dev 2-Year

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(54+31, 225.44)	(56+00, 234.30)	0.100

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	83.2 in
Elevation Range	211.5 to 237.8 ft
Flow Area	1,971.8 ft²
Wetted Perimeter	1,031.2 ft
Hydraulic Radius	22.9 in
Top Width	1,027.28 ft
Normal Depth	83.2 in
Critical Depth	62.1 in
Critical Slope	0.333 ft/ft
Velocity	1.53 ft/s
Velocity Head	0.04 ft
Specific Energy	6.97 ft
Froude Number	0.194
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	83.2 in
Critical Depth	62.1 in
Channel Slope	0.010 ft/ft
Critical Slope	0.333 ft/ft

Messages	
Messages	Flow is divided.

S. State St. - Post-Dev - 2-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	3,034.20 cfs

Section Definitions

Station (ft)	Elevation (ft)
34+29	237.80
34+39	233.20
34+49	232.70
34+59	232.30
34+79	231.90
34+89	231.80
34+99	231.70
35+09	231.50
35+19	231.00
35+29	230.90
35+39	231.00
35+49	231.10
35+59	230.80
35+69	230.70
35+79	230.70
35+89	230.90
35+99	230.90
36+09	230.50
36+19	230.20
36+39	229.90
36+49	229.50
36+59	229.90
36+69	230.00
36+89	229.90
37+19	228.60
37+29	228.30
37+39	228.30
37+79	227.70
37+89	227.50
38+09	227.10
38+19	226.80
38+39	226.60
38+49	226.40
38+69	225.50
38+89	224.50
39+09	223.10
39+19	223.00
39+29	223.20

S. State St. - Post-Dev - 2-Year

Section Definitions

Station (ft)	Elevation (ft)
39+39	223.00
39+49	223.70
39+56	222.72
39+59	222.20
39+69	220.20
39+79	219.40
39+89	219.10
39+99	219.30
40+09	219.30
40+19	219.20
40+29	219.40
40+79	219.40
40+89	218.80
41+09	218.90
41+19	219.10
41+29	219.30
41+39	219.30
41+69	218.80
41+79	218.40
41+89	218.20
41+99	218.40
42+09	218.30
42+19	218.10
42+29	218.10
42+39	218.20
42+49	218.50
42+59	218.50
42+79	218.80
42+89	218.80
42+99	218.90
43+09	218.50
43+19	218.70
43+29	218.60
43+59	217.80
43+69	217.70
43+99	217.80
44+29	217.50
44+39	217.40
44+49	217.10
44+69	217.10
44+89	216.80
44+99	216.80
45+09	216.80
45+29	216.80
45+39	216.70
45+49	216.60
45+59	216.40

S. State St. - Post-Dev - 2-Year

Section Definitions

Station (ft)	Elevation (ft)
45+79	215.80
45+89	215.70
46+09	215.70
46+19	215.80
46+39	216.30
46+49	216.20
46+59	215.70
46+79	216.00
46+99	216.00
47+09	215.80
47+19	216.00
47+29	216.40
47+39	216.10
47+49	215.80
47+59	215.80
47+69	215.90
47+79	216.20
47+89	216.20
47+99	216.10
48+29	215.90
48+39	216.00
48+59	216.40
48+79	216.60
48+89	216.50
48+99	216.20
49+09	216.50
49+19	216.90
49+29	217.20
49+39	218.30
49+49	219.10
49+59	217.00
49+69	214.80
49+72	214.70
49+76	212.52
49+82	211.50
49+88	211.83
49+99	211.56
50+11	212.08
50+18	211.69
50+24	212.49
50+25	214.38
50+30	218.50
50+40	219.10
50+50	218.60
50+70	217.20
50+80	216.90
50+90	217.00

S. State St. - Post-Dev - 2-Year

Section Definitions

Station (ft)	Elevation (ft)
51+00	217.90
51+10	217.40
51+20	217.20
51+40	217.30
51+50	217.00
51+60	217.30
51+70	216.90
51+80	216.50
52+00	216.70
52+10	216.60
52+20	216.50
52+30	216.30
52+40	216.00
52+50	216.00
52+60	215.60
52+70	215.60
52+90	216.10
53+00	216.50
53+10	217.10
53+20	218.10
53+30	218.50
53+40	220.00
53+50	221.50
53+60	221.30
53+70	222.00
53+90	224.60
54+00	224.30
54+20	224.40
54+30	225.40
54+31	225.44
54+50	226.20
54+60	226.40
55+10	227.70
55+20	227.80
55+30	228.40
55+40	229.20
55+50	230.00
55+80	232.00
56+00	234.30

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(34+29, 237.80)	(39+56, 222.72)	0.100
(39+56, 222.72)	(49+72, 214.70)	0.155
(49+72, 214.70)	(50+25, 214.38)	0.046
(50+25, 214.38)	(54+31, 225.44)	0.150

S. State St. - Post-Dev - 2-Year

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(54+31, 225.44)	(56+00, 234.30)	0.100

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	83.3 in
Elevation Range	211.5 to 237.8 ft
Flow Area	1,981.2 ft²
Wetted Perimeter	1,032.6 ft
Hydraulic Radius	23.0 in
Top Width	1,028.68 ft
Normal Depth	83.3 in
Critical Depth	62.1 in
Critical Slope	0.333 ft/ft
Velocity	1.53 ft/s
Velocity Head	0.04 ft
Specific Energy	6.98 ft
Froude Number	0.195
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	83.3 in
Critical Depth	62.1 in
Channel Slope	0.010 ft/ft
Critical Slope	0.333 ft/ft

Messages	
Messages	Flow is divided.

S. State St. - Pre-Dev 10-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	5,285.86 cfs

Section Definitions

Station (ft)	Elevation (ft)
34+29	237.80
34+39	233.20
34+49	232.70
34+59	232.30
34+79	231.90
34+89	231.80
34+99	231.70
35+09	231.50
35+19	231.00
35+29	230.90
35+39	231.00
35+49	231.10
35+59	230.80
35+69	230.70
35+79	230.70
35+89	230.90
35+99	230.90
36+09	230.50
36+19	230.20
36+39	229.90
36+49	229.50
36+59	229.90
36+69	230.00
36+89	229.90
37+19	228.60
37+29	228.30
37+39	228.30
37+79	227.70
37+89	227.50
38+09	227.10
38+19	226.80
38+39	226.60
38+49	226.40
38+69	225.50
38+89	224.50
39+09	223.10
39+19	223.00
39+29	223.20

S. State St. - Pre-Dev 10-Year

Section Definitions

Station (ft)	Elevation (ft)
39+39	223.00
39+49	223.70
39+56	222.72
39+59	222.20
39+69	220.20
39+79	219.40
39+89	219.10
39+99	219.30
40+09	219.30
40+19	219.20
40+29	219.40
40+79	219.40
40+89	218.80
41+09	218.90
41+19	219.10
41+29	219.30
41+39	219.30
41+69	218.80
41+79	218.40
41+89	218.20
41+99	218.40
42+09	218.30
42+19	218.10
42+29	218.10
42+39	218.20
42+49	218.50
42+59	218.50
42+79	218.80
42+89	218.80
42+99	218.90
43+09	218.50
43+19	218.70
43+29	218.60
43+59	217.80
43+69	217.70
43+99	217.80
44+29	217.50
44+39	217.40
44+49	217.10
44+69	217.10
44+89	216.80
44+99	216.80
45+09	216.80
45+29	216.80
45+39	216.70
45+49	216.60
45+59	216.40

S. State St. - Pre-Dev 10-Year

Section Definitions

Station (ft)	Elevation (ft)
45+79	215.80
45+89	215.70
46+09	215.70
46+19	215.80
46+39	216.30
46+49	216.20
46+59	215.70
46+79	216.00
46+99	216.00
47+09	215.80
47+19	216.00
47+29	216.40
47+39	216.10
47+49	215.80
47+59	215.80
47+69	215.90
47+79	216.20
47+89	216.20
47+99	216.10
48+29	215.90
48+39	216.00
48+59	216.40
48+79	216.60
48+89	216.50
48+99	216.20
49+09	216.50
49+19	216.90
49+29	217.20
49+39	218.30
49+49	219.10
49+59	217.00
49+69	214.80
49+72	214.70
49+76	212.52
49+82	211.50
49+88	211.83
49+99	211.56
50+11	212.08
50+18	211.69
50+24	212.49
50+25	214.38
50+30	218.50
50+40	219.10
50+50	218.60
50+70	217.20
50+80	216.90
50+90	217.00

S. State St. - Pre-Dev 10-Year

Section Definitions

Station (ft)	Elevation (ft)
51+00	217.90
51+10	217.40
51+20	217.20
51+40	217.30
51+50	217.00
51+60	217.30
51+70	216.90
51+80	216.50
52+00	216.70
52+10	216.60
52+20	216.50
52+30	216.30
52+40	216.00
52+50	216.00
52+60	215.60
52+70	215.60
52+90	216.10
53+00	216.50
53+10	217.10
53+20	218.10
53+30	218.50
53+40	220.00
53+50	221.50
53+60	221.30
53+70	222.00
53+90	224.60
54+00	224.30
54+20	224.40
54+30	225.40
54+31	225.44
54+50	226.20
54+60	226.40
55+10	227.70
55+20	227.80
55+30	228.40
55+40	229.20
55+50	230.00
55+80	232.00
56+00	234.30

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(34+29, 237.80)	(39+56, 222.72)	0.100
(39+56, 222.72)	(49+72, 214.70)	0.155
(49+72, 214.70)	(50+25, 214.38)	0.046
(50+25, 214.38)	(54+31, 225.44)	0.150

S. State St. - Pre-Dev 10-Year

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(54+31, 225.44)	(56+00, 234.30)	0.100

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	94.3 in
Elevation Range	211.5 to 237.8 ft
Flow Area	3,048.9 ft²
Wetted Perimeter	1,306.6 ft
Hydraulic Radius	28.0 in
Top Width	1,302.39 ft
Normal Depth	94.3 in
Critical Depth	68.0 in
Critical Slope	0.316 ft/ft
Velocity	1.73 ft/s
Velocity Head	0.05 ft
Specific Energy	7.90 ft
Froude Number	0.200
Flow Type	Subcritical

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	94.3 in
Critical Depth	68.0 in
Channel Slope	0.010 ft/ft
Critical Slope	0.316 ft/ft

Messages

Messages	Flow is divided.

S. State St. - Post-Dev - 10-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	5,306.30 cfs

Section Definitions

Station (ft)	Elevation (ft)
34+29	237.80
34+39	233.20
34+49	232.70
34+59	232.30
34+79	231.90
34+89	231.80
34+99	231.70
35+09	231.50
35+19	231.00
35+29	230.90
35+39	231.00
35+49	231.10
35+59	230.80
35+69	230.70
35+79	230.70
35+89	230.90
35+99	230.90
36+09	230.50
36+19	230.20
36+39	229.90
36+49	229.50
36+59	229.90
36+69	230.00
36+89	229.90
37+19	228.60
37+29	228.30
37+39	228.30
37+79	227.70
37+89	227.50
38+09	227.10
38+19	226.80
38+39	226.60
38+49	226.40
38+69	225.50
38+89	224.50
39+09	223.10
39+19	223.00
39+29	223.20

S. State St. - Post-Dev - 10-Year

Section Definitions

Station (ft)	Elevation (ft)
39+39	223.00
39+49	223.70
39+56	222.72
39+59	222.20
39+69	220.20
39+79	219.40
39+89	219.10
39+99	219.30
40+09	219.30
40+19	219.20
40+29	219.40
40+79	219.40
40+89	218.80
41+09	218.90
41+19	219.10
41+29	219.30
41+39	219.30
41+69	218.80
41+79	218.40
41+89	218.20
41+99	218.40
42+09	218.30
42+19	218.10
42+29	218.10
42+39	218.20
42+49	218.50
42+59	218.50
42+79	218.80
42+89	218.80
42+99	218.90
43+09	218.50
43+19	218.70
43+29	218.60
43+59	217.80
43+69	217.70
43+99	217.80
44+29	217.50
44+39	217.40
44+49	217.10
44+69	217.10
44+89	216.80
44+99	216.80
45+09	216.80
45+29	216.80
45+39	216.70
45+49	216.60
45+59	216.40

S. State St. - Post-Dev - 10-Year

Section Definitions

Station (ft)	Elevation (ft)
45+79	215.80
45+89	215.70
46+09	215.70
46+19	215.80
46+39	216.30
46+49	216.20
46+59	215.70
46+79	216.00
46+99	216.00
47+09	215.80
47+19	216.00
47+29	216.40
47+39	216.10
47+49	215.80
47+59	215.80
47+69	215.90
47+79	216.20
47+89	216.20
47+99	216.10
48+29	215.90
48+39	216.00
48+59	216.40
48+79	216.60
48+89	216.50
48+99	216.20
49+09	216.50
49+19	216.90
49+29	217.20
49+39	218.30
49+49	219.10
49+59	217.00
49+69	214.80
49+72	214.70
49+76	212.52
49+82	211.50
49+88	211.83
49+99	211.56
50+11	212.08
50+18	211.69
50+24	212.49
50+25	214.38
50+30	218.50
50+40	219.10
50+50	218.60
50+70	217.20
50+80	216.90
50+90	217.00

S. State St. - Post-Dev - 10-Year

Section Definitions

Station (ft)	Elevation (ft)
51+00	217.90
51+10	217.40
51+20	217.20
51+40	217.30
51+50	217.00
51+60	217.30
51+70	216.90
51+80	216.50
52+00	216.70
52+10	216.60
52+20	216.50
52+30	216.30
52+40	216.00
52+50	216.00
52+60	215.60
52+70	215.60
52+90	216.10
53+00	216.50
53+10	217.10
53+20	218.10
53+30	218.50
53+40	220.00
53+50	221.50
53+60	221.30
53+70	222.00
53+90	224.60
54+00	224.30
54+20	224.40
54+30	225.40
54+31	225.44
54+50	226.20
54+60	226.40
55+10	227.70
55+20	227.80
55+30	228.40
55+40	229.20
55+50	230.00
55+80	232.00
56+00	234.30

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(34+29, 237.80)	(39+56, 222.72)	0.100
(39+56, 222.72)	(49+72, 214.70)	0.155
(49+72, 214.70)	(50+25, 214.38)	0.046
(50+25, 214.38)	(54+31, 225.44)	0.150

S. State St. - Post-Dev - 10-Year

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(54+31, 225.44)	(56+00, 234.30)	0.100

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	94.4 in
Elevation Range	211.5 to 237.8 ft
Flow Area	3,056.5 ft²
Wetted Perimeter	1,307.3 ft
Hydraulic Radius	28.1 in
Top Width	1,303.02 ft
Normal Depth	94.4 in
Critical Depth	68.0 in
Critical Slope	0.315 ft/ft
Velocity	1.74 ft/s
Velocity Head	0.05 ft
Specific Energy	7.91 ft
Froude Number	0.200
Flow Type	Subcritical

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	94.4 in
Critical Depth	68.0 in
Channel Slope	0.010 ft/ft
Critical Slope	0.315 ft/ft

Messages

Messages	Flow is divided.

S. State St. - Pre-Dev - 50-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	7,954.63 cfs

Section Definitions

Station (ft)	Elevation (ft)
34+29	237.80
34+39	233.20
34+49	232.70
34+59	232.30
34+79	231.90
34+89	231.80
34+99	231.70
35+09	231.50
35+19	231.00
35+29	230.90
35+39	231.00
35+49	231.10
35+59	230.80
35+69	230.70
35+79	230.70
35+89	230.90
35+99	230.90
36+09	230.50
36+19	230.20
36+39	229.90
36+49	229.50
36+59	229.90
36+69	230.00
36+89	229.90
37+19	228.60
37+29	228.30
37+39	228.30
37+79	227.70
37+89	227.50
38+09	227.10
38+19	226.80
38+39	226.60
38+49	226.40
38+69	225.50
38+89	224.50
39+09	223.10
39+19	223.00
39+29	223.20

S. State St. - Pre-Dev - 50-Year

Section Definitions

Station (ft)	Elevation (ft)
39+39	223.00
39+49	223.70
39+56	222.72
39+59	222.20
39+69	220.20
39+79	219.40
39+89	219.10
39+99	219.30
40+09	219.30
40+19	219.20
40+29	219.40
40+79	219.40
40+89	218.80
41+09	218.90
41+19	219.10
41+29	219.30
41+39	219.30
41+69	218.80
41+79	218.40
41+89	218.20
41+99	218.40
42+09	218.30
42+19	218.10
42+29	218.10
42+39	218.20
42+49	218.50
42+59	218.50
42+79	218.80
42+89	218.80
42+99	218.90
43+09	218.50
43+19	218.70
43+29	218.60
43+59	217.80
43+69	217.70
43+99	217.80
44+29	217.50
44+39	217.40
44+49	217.10
44+69	217.10
44+89	216.80
44+99	216.80
45+09	216.80
45+29	216.80
45+39	216.70
45+49	216.60
45+59	216.40

S. State St. - Pre-Dev - 50-Year

Section Definitions

Station (ft)	Elevation (ft)
45+79	215.80
45+89	215.70
46+09	215.70
46+19	215.80
46+39	216.30
46+49	216.20
46+59	215.70
46+79	216.00
46+99	216.00
47+09	215.80
47+19	216.00
47+29	216.40
47+39	216.10
47+49	215.80
47+59	215.80
47+69	215.90
47+79	216.20
47+89	216.20
47+99	216.10
48+29	215.90
48+39	216.00
48+59	216.40
48+79	216.60
48+89	216.50
48+99	216.20
49+09	216.50
49+19	216.90
49+29	217.20
49+39	218.30
49+49	219.10
49+59	217.00
49+69	214.80
49+72	214.70
49+76	212.52
49+82	211.50
49+88	211.83
49+99	211.56
50+11	212.08
50+18	211.69
50+24	212.49
50+25	214.38
50+30	218.50
50+40	219.10
50+50	218.60
50+70	217.20
50+80	216.90
50+90	217.00

S. State St. - Pre-Dev - 50-Year

Section Definitions

Station (ft)	Elevation (ft)
51+00	217.90
51+10	217.40
51+20	217.20
51+40	217.30
51+50	217.00
51+60	217.30
51+70	216.90
51+80	216.50
52+00	216.70
52+10	216.60
52+20	216.50
52+30	216.30
52+40	216.00
52+50	216.00
52+60	215.60
52+70	215.60
52+90	216.10
53+00	216.50
53+10	217.10
53+20	218.10
53+30	218.50
53+40	220.00
53+50	221.50
53+60	221.30
53+70	222.00
53+90	224.60
54+00	224.30
54+20	224.40
54+30	225.40
54+31	225.44
54+50	226.20
54+60	226.40
55+10	227.70
55+20	227.80
55+30	228.40
55+40	229.20
55+50	230.00
55+80	232.00
56+00	234.30

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(34+29, 237.80)	(39+56, 222.72)	0.100
(39+56, 222.72)	(49+72, 214.70)	0.155
(49+72, 214.70)	(50+25, 214.38)	0.046
(50+25, 214.38)	(54+31, 225.44)	0.150

S. State St. - Pre-Dev - 50-Year

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(54+31, 225.44)	(56+00, 234.30)	0.100

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	102.5 in
Elevation Range	211.5 to 237.8 ft
Flow Area	3,977.8 ft²
Wetted Perimeter	1,373.5 ft
Hydraulic Radius	34.8 in
Top Width	1,369.19 ft
Normal Depth	102.5 in
Critical Depth	72.8 in
Critical Slope	0.297 ft/ft
Velocity	2.00 ft/s
Velocity Head	0.06 ft
Specific Energy	8.60 ft
Froude Number	0.207
Flow Type	Subcritical

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	102.5 in
Critical Depth	72.8 in
Channel Slope	0.010 ft/ft
Critical Slope	0.297 ft/ft

S. State St. - Post-Dev - 50-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	7,985.49 cfs

Section Definitions

Station (ft)	Elevation (ft)
34+29	237.80
34+39	233.20
34+49	232.70
34+59	232.30
34+79	231.90
34+89	231.80
34+99	231.70
35+09	231.50
35+19	231.00
35+29	230.90
35+39	231.00
35+49	231.10
35+59	230.80
35+69	230.70
35+79	230.70
35+89	230.90
35+99	230.90
36+09	230.50
36+19	230.20
36+39	229.90
36+49	229.50
36+59	229.90
36+69	230.00
36+89	229.90
37+19	228.60
37+29	228.30
37+39	228.30
37+79	227.70
37+89	227.50
38+09	227.10
38+19	226.80
38+39	226.60
38+49	226.40
38+69	225.50
38+89	224.50
39+09	223.10
39+19	223.00
39+29	223.20

S. State St. - Post-Dev - 50-Year

Section Definitions

Station (ft)	Elevation (ft)
39+39	223.00
39+49	223.70
39+56	222.72
39+59	222.20
39+69	220.20
39+79	219.40
39+89	219.10
39+99	219.30
40+09	219.30
40+19	219.20
40+29	219.40
40+79	219.40
40+89	218.80
41+09	218.90
41+19	219.10
41+29	219.30
41+39	219.30
41+69	218.80
41+79	218.40
41+89	218.20
41+99	218.40
42+09	218.30
42+19	218.10
42+29	218.10
42+39	218.20
42+49	218.50
42+59	218.50
42+79	218.80
42+89	218.80
42+99	218.90
43+09	218.50
43+19	218.70
43+29	218.60
43+59	217.80
43+69	217.70
43+99	217.80
44+29	217.50
44+39	217.40
44+49	217.10
44+69	217.10
44+89	216.80
44+99	216.80
45+09	216.80
45+29	216.80
45+39	216.70
45+49	216.60
45+59	216.40

S. State St. - Post-Dev - 50-Year

Section Definitions

Station (ft)	Elevation (ft)
45+79	215.80
45+89	215.70
46+09	215.70
46+19	215.80
46+39	216.30
46+49	216.20
46+59	215.70
46+79	216.00
46+99	216.00
47+09	215.80
47+19	216.00
47+29	216.40
47+39	216.10
47+49	215.80
47+59	215.80
47+69	215.90
47+79	216.20
47+89	216.20
47+99	216.10
48+29	215.90
48+39	216.00
48+59	216.40
48+79	216.60
48+89	216.50
48+99	216.20
49+09	216.50
49+19	216.90
49+29	217.20
49+39	218.30
49+49	219.10
49+59	217.00
49+69	214.80
49+72	214.70
49+76	212.52
49+82	211.50
49+88	211.83
49+99	211.56
50+11	212.08
50+18	211.69
50+24	212.49
50+25	214.38
50+30	218.50
50+40	219.10
50+50	218.60
50+70	217.20
50+80	216.90
50+90	217.00

S. State St. - Post-Dev - 50-Year

Section Definitions

Station (ft)	Elevation (ft)
51+00	217.90
51+10	217.40
51+20	217.20
51+40	217.30
51+50	217.00
51+60	217.30
51+70	216.90
51+80	216.50
52+00	216.70
52+10	216.60
52+20	216.50
52+30	216.30
52+40	216.00
52+50	216.00
52+60	215.60
52+70	215.60
52+90	216.10
53+00	216.50
53+10	217.10
53+20	218.10
53+30	218.50
53+40	220.00
53+50	221.50
53+60	221.30
53+70	222.00
53+90	224.60
54+00	224.30
54+20	224.40
54+30	225.40
54+31	225.44
54+50	226.20
54+60	226.40
55+10	227.70
55+20	227.80
55+30	228.40
55+40	229.20
55+50	230.00
55+80	232.00
56+00	234.30

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(34+29, 237.80)	(39+56, 222.72)	0.100
(39+56, 222.72)	(49+72, 214.70)	0.155
(49+72, 214.70)	(50+25, 214.38)	0.046
(50+25, 214.38)	(54+31, 225.44)	0.150

S. State St. - Post-Dev - 50-Year

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(54+31, 225.44)	(56+00, 234.30)	0.100

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	102.6 in
Elevation Range	211.5 to 237.8 ft
Flow Area	3,987.2 ft²
Wetted Perimeter	1,373.6 ft
Hydraulic Radius	34.8 in
Top Width	1,369.32 ft
Normal Depth	102.6 in
Critical Depth	72.8 in
Critical Slope	0.296 ft/ft
Velocity	2.00 ft/s
Velocity Head	0.06 ft
Specific Energy	8.61 ft
Froude Number	0.207
Flow Type	Subcritical

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	102.6 in
Critical Depth	72.8 in
Channel Slope	0.010 ft/ft
Critical Slope	0.296 ft/ft

S. State St. - Pre-Dev - 100-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	9,130.46 cfs

Section Definitions

Station (ft)	Elevation (ft)
34+29	237.80
34+39	233.20
34+49	232.70
34+59	232.30
34+79	231.90
34+89	231.80
34+99	231.70
35+09	231.50
35+19	231.00
35+29	230.90
35+39	231.00
35+49	231.10
35+59	230.80
35+69	230.70
35+79	230.70
35+89	230.90
35+99	230.90
36+09	230.50
36+19	230.20
36+39	229.90
36+49	229.50
36+59	229.90
36+69	230.00
36+89	229.90
37+19	228.60
37+29	228.30
37+39	228.30
37+79	227.70
37+89	227.50
38+09	227.10
38+19	226.80
38+39	226.60
38+49	226.40
38+69	225.50
38+89	224.50
39+09	223.10
39+19	223.00
39+29	223.20

S. State St. - Pre-Dev - 100-Year

Section Definitions

Station (ft)	Elevation (ft)
39+39	223.00
39+49	223.70
39+56	222.72
39+59	222.20
39+69	220.20
39+79	219.40
39+89	219.10
39+99	219.30
40+09	219.30
40+19	219.20
40+29	219.40
40+79	219.40
40+89	218.80
41+09	218.90
41+19	219.10
41+29	219.30
41+39	219.30
41+69	218.80
41+79	218.40
41+89	218.20
41+99	218.40
42+09	218.30
42+19	218.10
42+29	218.10
42+39	218.20
42+49	218.50
42+59	218.50
42+79	218.80
42+89	218.80
42+99	218.90
43+09	218.50
43+19	218.70
43+29	218.60
43+59	217.80
43+69	217.70
43+99	217.80
44+29	217.50
44+39	217.40
44+49	217.10
44+69	217.10
44+89	216.80
44+99	216.80
45+09	216.80
45+29	216.80
45+39	216.70
45+49	216.60
45+59	216.40

S. State St. - Pre-Dev - 100-Year

Section Definitions

Station (ft)	Elevation (ft)
45+79	215.80
45+89	215.70
46+09	215.70
46+19	215.80
46+39	216.30
46+49	216.20
46+59	215.70
46+79	216.00
46+99	216.00
47+09	215.80
47+19	216.00
47+29	216.40
47+39	216.10
47+49	215.80
47+59	215.80
47+69	215.90
47+79	216.20
47+89	216.20
47+99	216.10
48+29	215.90
48+39	216.00
48+59	216.40
48+79	216.60
48+89	216.50
48+99	216.20
49+09	216.50
49+19	216.90
49+29	217.20
49+39	218.30
49+49	219.10
49+59	217.00
49+69	214.80
49+72	214.70
49+76	212.52
49+82	211.50
49+88	211.83
49+99	211.56
50+11	212.08
50+18	211.69
50+24	212.49
50+25	214.38
50+30	218.50
50+40	219.10
50+50	218.60
50+70	217.20
50+80	216.90
50+90	217.00

S. State St. - Pre-Dev - 100-Year

Section Definitions

Station (ft)	Elevation (ft)
51+00	217.90
51+10	217.40
51+20	217.20
51+40	217.30
51+50	217.00
51+60	217.30
51+70	216.90
51+80	216.50
52+00	216.70
52+10	216.60
52+20	216.50
52+30	216.30
52+40	216.00
52+50	216.00
52+60	215.60
52+70	215.60
52+90	216.10
53+00	216.50
53+10	217.10
53+20	218.10
53+30	218.50
53+40	220.00
53+50	221.50
53+60	221.30
53+70	222.00
53+90	224.60
54+00	224.30
54+20	224.40
54+30	225.40
54+31	225.44
54+50	226.20
54+60	226.40
55+10	227.70
55+20	227.80
55+30	228.40
55+40	229.20
55+50	230.00
55+80	232.00
56+00	234.30

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(34+29, 237.80)	(39+56, 222.72)	0.100
(39+56, 222.72)	(49+72, 214.70)	0.155
(49+72, 214.70)	(50+25, 214.38)	0.046
(50+25, 214.38)	(54+31, 225.44)	0.150

S. State St. - Pre-Dev - 100-Year

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(54+31, 225.44)	(56+00, 234.30)	0.100

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	105.5 in
Elevation Range	211.5 to 237.8 ft
Flow Area	4,326.1 ft²
Wetted Perimeter	1,377.7 ft
Hydraulic Radius	37.7 in
Top Width	1,373.34 ft
Normal Depth	105.5 in
Critical Depth	74.7 in
Critical Slope	0.290 ft/ft
Velocity	2.11 ft/s
Velocity Head	0.07 ft
Specific Energy	8.86 ft
Froude Number	0.210
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	105.5 in
Critical Depth	74.7 in
Channel Slope	0.010 ft/ft
Critical Slope	0.290 ft/ft

S. State St. - Post-Dev - 100-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	9,163.30 cfs

Section Definitions

Station (ft)	Elevation (ft)
34+29	237.80
34+39	233.20
34+49	232.70
34+59	232.30
34+79	231.90
34+89	231.80
34+99	231.70
35+09	231.50
35+19	231.00
35+29	230.90
35+39	231.00
35+49	231.10
35+59	230.80
35+69	230.70
35+79	230.70
35+89	230.90
35+99	230.90
36+09	230.50
36+19	230.20
36+39	229.90
36+49	229.50
36+59	229.90
36+69	230.00
36+89	229.90
37+19	228.60
37+29	228.30
37+39	228.30
37+79	227.70
37+89	227.50
38+09	227.10
38+19	226.80
38+39	226.60
38+49	226.40
38+69	225.50
38+89	224.50
39+09	223.10
39+19	223.00
39+29	223.20

S. State St. - Post-Dev - 100-Year

Section Definitions

Station (ft)	Elevation (ft)
39+39	223.00
39+49	223.70
39+56	222.72
39+59	222.20
39+69	220.20
39+79	219.40
39+89	219.10
39+99	219.30
40+09	219.30
40+19	219.20
40+29	219.40
40+79	219.40
40+89	218.80
41+09	218.90
41+19	219.10
41+29	219.30
41+39	219.30
41+69	218.80
41+79	218.40
41+89	218.20
41+99	218.40
42+09	218.30
42+19	218.10
42+29	218.10
42+39	218.20
42+49	218.50
42+59	218.50
42+79	218.80
42+89	218.80
42+99	218.90
43+09	218.50
43+19	218.70
43+29	218.60
43+59	217.80
43+69	217.70
43+99	217.80
44+29	217.50
44+39	217.40
44+49	217.10
44+69	217.10
44+89	216.80
44+99	216.80
45+09	216.80
45+29	216.80
45+39	216.70
45+49	216.60
45+59	216.40

S. State St. - Post-Dev - 100-Year

Section Definitions

Station (ft)	Elevation (ft)
45+79	215.80
45+89	215.70
46+09	215.70
46+19	215.80
46+39	216.30
46+49	216.20
46+59	215.70
46+79	216.00
46+99	216.00
47+09	215.80
47+19	216.00
47+29	216.40
47+39	216.10
47+49	215.80
47+59	215.80
47+69	215.90
47+79	216.20
47+89	216.20
47+99	216.10
48+29	215.90
48+39	216.00
48+59	216.40
48+79	216.60
48+89	216.50
48+99	216.20
49+09	216.50
49+19	216.90
49+29	217.20
49+39	218.30
49+49	219.10
49+59	217.00
49+69	214.80
49+72	214.70
49+76	212.52
49+82	211.50
49+88	211.83
49+99	211.56
50+11	212.08
50+18	211.69
50+24	212.49
50+25	214.38
50+30	218.50
50+40	219.10
50+50	218.60
50+70	217.20
50+80	216.90
50+90	217.00

S. State St. - Post-Dev - 100-Year

Section Definitions

Station (ft)	Elevation (ft)
51+00	217.90
51+10	217.40
51+20	217.20
51+40	217.30
51+50	217.00
51+60	217.30
51+70	216.90
51+80	216.50
52+00	216.70
52+10	216.60
52+20	216.50
52+30	216.30
52+40	216.00
52+50	216.00
52+60	215.60
52+70	215.60
52+90	216.10
53+00	216.50
53+10	217.10
53+20	218.10
53+30	218.50
53+40	220.00
53+50	221.50
53+60	221.30
53+70	222.00
53+90	224.60
54+00	224.30
54+20	224.40
54+30	225.40
54+31	225.44
54+50	226.20
54+60	226.40
55+10	227.70
55+20	227.80
55+30	228.40
55+40	229.20
55+50	230.00
55+80	232.00
56+00	234.30

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(34+29, 237.80)	(39+56, 222.72)	0.100
(39+56, 222.72)	(49+72, 214.70)	0.155
(49+72, 214.70)	(50+25, 214.38)	0.046
(50+25, 214.38)	(54+31, 225.44)	0.150

S. State St. - Post-Dev - 100-Year

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(54+31, 225.44)	(56+00, 234.30)	0.100

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	105.6 in
Elevation Range	211.5 to 237.8 ft
Flow Area	4,335.6 ft²
Wetted Perimeter	1,377.8 ft
Hydraulic Radius	37.8 in
Top Width	1,373.42 ft
Normal Depth	105.6 in
Critical Depth	74.8 in
Critical Slope	0.290 ft/ft
Velocity	2.11 ft/s
Velocity Head	0.07 ft
Specific Energy	8.87 ft
Froude Number	0.210
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	105.6 in
Critical Depth	74.8 in
Channel Slope	0.010 ft/ft
Critical Slope	0.290 ft/ft

Rose Ln Pre-Dev - 2-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	2,692.30 cfs

Section Definitions

Station (ft)	Elevation (ft)
42+63	218.00
42+66	217.90
42+69	217.66
42+74	217.30
42+76	217.30
42+89	217.40
42+99	216.80
43+32	216.80
43+33	216.80
43+34	216.80
43+35	216.80
43+43	216.60
43+52	216.70
43+64	216.20
43+81	213.70
44+08	213.50
44+13	214.40
44+29	215.60
44+29	215.50
44+30	215.50
44+33	214.70
44+41	211.40
44+71	210.80
44+93	212.20
45+09	211.20
45+11	211.20
45+19	212.00
45+22	211.70
45+30	212.80
45+37	212.80
45+40	213.10
45+57	212.30
45+62	211.80
45+81	211.70
45+96	212.10
46+16	210.40
46+27	210.30
46+44	212.00

Rose Ln Pre-Dev - 2-Year

Section Definitions

Station (ft)	Elevation (ft)
46+45	212.00
46+57	211.00
46+67	210.50
46+75	210.80
46+76	210.70
46+78	210.50
46+88	208.60
47+16	203.80
47+27	202.40
47+35	202.50
47+52	202.40
47+72	203.30
47+83	202.40
48+09	202.30
48+09	202.30
48+10	202.30
48+28	202.20
48+34	202.70
48+40	202.70
48+44	202.40
48+51	202.60
48+67	202.50
48+68	202.50
48+68	202.50
48+77	202.10
48+91	202.20
48+93	202.30
48+97	202.30
49+07	202.10
49+23	202.50
49+25	202.10
49+29	202.60
49+36	202.90
49+44	202.70
49+47	202.80
49+59	203.10
49+76	201.01
49+79	199.50
49+87	198.77
49+95	197.94
50+01	198.25
50+07	196.41
50+14	196.12
50+20	198.08
50+21	199.43
50+26	199.22
50+26	199.70

Rose Ln Pre-Dev - 2-Year

Section Definitions

Station (ft)	Elevation (ft)
50+48	202.20
50+62	201.80
50+81	201.80
50+99	200.70
51+08	200.70
51+16	200.90
51+46	200.70
51+52	200.50
51+67	200.70
51+75	201.20
51+77	201.20
51+87	200.60
52+09	200.70
52+10	200.60
52+48	200.40
52+71	200.90
52+76	200.90
53+02	201.30
53+22	200.80
53+34	200.90
53+43	201.60
53+55	200.90
53+63	200.60
53+82	200.60
53+97	200.00
53+97	200.00
53+97	200.00
54+43	201.80
54+57	201.90
54+73	201.40
54+84	200.70
54+88	200.90
54+90	200.90
55+14	201.00
55+18	201.20
55+28	201.50
55+29	201.50
55+48	201.60
55+54	201.00
55+63	201.20
55+78	201.10
55+86	201.30
55+92	201.90
56+22	201.10
56+26	201.20
56+32	201.00
56+35	200.80

Rose Ln Pre-Dev - 2-Year

Section Definitions

Station (ft)	Elevation (ft)
56+54	200.30
56+76	200.80
56+88	202.00
57+19	201.60
57+22	201.40
57+51	201.60
57+74	203.00
57+90	203.60
58+12	206.60
58+18	208.20
58+19	208.30
58+20	208.50
58+48	214.50
58+57	217.00
58+74	220.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(42+63, 218.00)	(42+69, 217.66)	0.200
(42+69, 217.66)	(49+76, 201.01)	0.155
(49+76, 201.01)	(50+26, 199.70)	0.042
(50+26, 199.70)	(58+74, 220.00)	0.155

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	83.3 in
Elevation Range	196.1 to 220.0 ft
Flow Area	1,865.6 ft²
Wetted Perimeter	1,046.5 ft
Hydraulic Radius	21.4 in
Top Width	1,043.43 ft
Normal Depth	83.3 in
Critical Depth	64.3 in
Critical Slope	0.354 ft/ft
Velocity	1.44 ft/s
Velocity Head	0.03 ft
Specific Energy	6.98 ft
Froude Number	0.190

Rose Ln Pre-Dev - 2-Year

Results	
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	83.3 in
Critical Depth	64.3 in
Channel Slope	0.010 ft/ft
Critical Slope	0.354 ft/ft

Messages	
Messages	Flow is divided.

Rose Ln. - Post-Dev - 2-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	2,705.30 cfs

Section Definitions

Station (ft)	Elevation (ft)
42+63	218.00
42+66	217.90
42+69	217.66
42+74	217.30
42+76	217.30
42+89	217.40
42+99	216.80
43+32	216.80
43+33	216.80
43+34	216.80
43+35	216.80
43+43	216.60
43+52	216.70
43+64	216.20
43+81	213.70
44+08	213.50
44+13	214.40
44+29	215.60
44+29	215.50
44+30	215.50
44+33	214.70
44+41	211.40
44+71	210.80
44+93	212.20
45+09	211.20
45+11	211.20
45+19	212.00
45+22	211.70
45+30	212.80
45+37	212.80
45+40	213.10
45+57	212.30
45+62	211.80
45+81	211.70
45+96	212.10
46+16	210.40
46+27	210.30
46+44	212.00

Rose Ln. - Post-Dev - 2-Year

Section Definitions

Station (ft)	Elevation (ft)
46+45	212.00
46+57	211.00
46+67	210.50
46+75	210.80
46+76	210.70
46+78	210.50
46+88	208.60
47+16	203.80
47+27	202.40
47+35	202.50
47+52	202.40
47+72	203.30
47+83	202.40
48+09	202.30
48+09	202.30
48+10	202.30
48+28	202.20
48+34	202.70
48+40	202.70
48+44	202.40
48+51	202.60
48+67	202.50
48+68	202.50
48+68	202.50
48+77	202.10
48+91	202.20
48+93	202.30
48+97	202.30
49+07	202.10
49+23	202.50
49+25	202.10
49+29	202.60
49+36	202.90
49+44	202.70
49+47	202.80
49+59	203.10
49+76	201.01
49+79	199.50
49+87	198.77
49+95	197.94
50+01	198.25
50+07	196.41
50+14	196.12
50+20	198.08
50+21	199.43
50+26	199.22
50+26	199.70

Rose Ln. - Post-Dev - 2-Year

Section Definitions

Station (ft)	Elevation (ft)
50+48	202.20
50+62	201.80
50+81	201.80
50+99	200.70
51+08	200.70
51+16	200.90
51+46	200.70
51+52	200.50
51+67	200.70
51+75	201.20
51+77	201.20
51+87	200.60
52+09	200.70
52+10	200.60
52+48	200.40
52+71	200.90
52+76	200.90
53+02	201.30
53+22	200.80
53+34	200.90
53+43	201.60
53+55	200.90
53+63	200.60
53+82	200.60
53+97	200.00
53+97	200.00
53+97	200.00
54+43	201.80
54+57	201.90
54+73	201.40
54+84	200.70
54+88	200.90
54+90	200.90
55+14	201.00
55+18	201.20
55+28	201.50
55+29	201.50
55+48	201.60
55+54	201.00
55+63	201.20
55+78	201.10
55+86	201.30
55+92	201.90
56+22	201.10
56+26	201.20
56+32	201.00
56+35	200.80

Rose Ln. - Post-Dev - 2-Year

Section Definitions

Station (ft)	Elevation (ft)
56+54	200.30
56+76	200.80
56+88	202.00
57+19	201.60
57+22	201.40
57+51	201.60
57+74	203.00
57+90	203.60
58+12	206.60
58+18	208.20
58+19	208.30
58+20	208.50
58+48	214.50
58+57	217.00
58+74	220.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(42+63, 218.00)	(42+69, 217.66)	0.200
(42+69, 217.66)	(49+76, 201.01)	0.155
(49+76, 201.01)	(50+26, 199.70)	0.042
(50+26, 199.70)	(58+74, 220.00)	0.155

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	83.4 in
Elevation Range	196.1 to 220.0 ft
Flow Area	1,871.5 ft²
Wetted Perimeter	1,047.2 ft
Hydraulic Radius	21.4 in
Top Width	1,044.10 ft
Normal Depth	83.4 in
Critical Depth	64.3 in
Critical Slope	0.353 ft/ft
Velocity	1.45 ft/s
Velocity Head	0.03 ft
Specific Energy	6.98 ft
Froude Number	0.190

Rose Ln. - Post-Dev - 2-Year

Results	
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	83.4 in
Critical Depth	64.3 in
Channel Slope	0.010 ft/ft
Critical Slope	0.353 ft/ft

Messages	
Messages	Flow is divided.

Rose Ln. Pre-Dev 10-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	4,803.74 cfs

Section Definitions

Station (ft)	Elevation (ft)
42+63	218.00
42+66	217.90
42+69	217.66
42+74	217.30
42+76	217.30
42+89	217.40
42+99	216.80
43+32	216.80
43+33	216.80
43+34	216.80
43+35	216.80
43+43	216.60
43+52	216.70
43+64	216.20
43+81	213.70
44+08	213.50
44+13	214.40
44+29	215.60
44+29	215.50
44+30	215.50
44+33	214.70
44+41	211.40
44+71	210.80
44+93	212.20
45+09	211.20
45+11	211.20
45+19	212.00
45+22	211.70
45+30	212.80
45+37	212.80
45+40	213.10
45+57	212.30
45+62	211.80
45+81	211.70
45+96	212.10
46+16	210.40
46+27	210.30
46+44	212.00

Rose Ln. Pre-Dev 10-Year

Section Definitions

Station (ft)	Elevation (ft)
46+45	212.00
46+57	211.00
46+67	210.50
46+75	210.80
46+76	210.70
46+78	210.50
46+88	208.60
47+16	203.80
47+27	202.40
47+35	202.50
47+52	202.40
47+72	203.30
47+83	202.40
48+09	202.30
48+09	202.30
48+10	202.30
48+28	202.20
48+34	202.70
48+40	202.70
48+44	202.40
48+51	202.60
48+67	202.50
48+68	202.50
48+68	202.50
48+77	202.10
48+91	202.20
48+93	202.30
48+97	202.30
49+07	202.10
49+23	202.50
49+25	202.10
49+29	202.60
49+36	202.90
49+44	202.70
49+47	202.80
49+59	203.10
49+76	201.01
49+79	199.50
49+87	198.77
49+95	197.94
50+01	198.25
50+07	196.41
50+14	196.12
50+20	198.08
50+21	199.43
50+26	199.22
50+26	199.70

Rose Ln. Pre-Dev 10-Year

Section Definitions

Station (ft)	Elevation (ft)
50+48	202.20
50+62	201.80
50+81	201.80
50+99	200.70
51+08	200.70
51+16	200.90
51+46	200.70
51+52	200.50
51+67	200.70
51+75	201.20
51+77	201.20
51+87	200.60
52+09	200.70
52+10	200.60
52+48	200.40
52+71	200.90
52+76	200.90
53+02	201.30
53+22	200.80
53+34	200.90
53+43	201.60
53+55	200.90
53+63	200.60
53+82	200.60
53+97	200.00
53+97	200.00
53+97	200.00
54+43	201.80
54+57	201.90
54+73	201.40
54+84	200.70
54+88	200.90
54+90	200.90
55+14	201.00
55+18	201.20
55+28	201.50
55+29	201.50
55+48	201.60
55+54	201.00
55+63	201.20
55+78	201.10
55+86	201.30
55+92	201.90
56+22	201.10
56+26	201.20
56+32	201.00
56+35	200.80

Rose Ln. Pre-Dev 10-Year

Section Definitions

Station (ft)	Elevation (ft)
56+54	200.30
56+76	200.80
56+88	202.00
57+19	201.60
57+22	201.40
57+51	201.60
57+74	203.00
57+90	203.60
58+12	206.60
58+18	208.20
58+19	208.30
58+20	208.50
58+48	214.50
58+57	217.00
58+74	220.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(42+63, 218.00)	(42+69, 217.66)	0.200
(42+69, 217.66)	(49+76, 201.01)	0.155
(49+76, 201.01)	(50+26, 199.70)	0.042
(50+26, 199.70)	(58+74, 220.00)	0.155

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	92.4 in
Elevation Range	196.1 to 220.0 ft
Flow Area	2,673.9 ft²
Wetted Perimeter	1,078.7 ft
Hydraulic Radius	29.7 in
Top Width	1,075.54 ft
Normal Depth	92.4 in
Critical Depth	69.7 in
Critical Slope	0.329 ft/ft
Velocity	1.80 ft/s
Velocity Head	0.05 ft
Specific Energy	7.75 ft
Froude Number	0.201

Rose Ln. Pre-Dev 10-Year

Results	
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	92.4 in
Critical Depth	69.7 in
Channel Slope	0.010 ft/ft
Critical Slope	0.329 ft/ft

Rose Ln. - Post-Dev - 10-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	4,818.58 cfs

Section Definitions

Station (ft)	Elevation (ft)
42+63	218.00
42+66	217.90
42+69	217.66
42+74	217.30
42+76	217.30
42+89	217.40
42+99	216.80
43+32	216.80
43+33	216.80
43+34	216.80
43+35	216.80
43+43	216.60
43+52	216.70
43+64	216.20
43+81	213.70
44+08	213.50
44+13	214.40
44+29	215.60
44+29	215.50
44+30	215.50
44+33	214.70
44+41	211.40
44+71	210.80
44+93	212.20
45+09	211.20
45+11	211.20
45+19	212.00
45+22	211.70
45+30	212.80
45+37	212.80
45+40	213.10
45+57	212.30
45+62	211.80
45+81	211.70
45+96	212.10
46+16	210.40
46+27	210.30
46+44	212.00

Rose Ln. - Post-Dev - 10-Year

Section Definitions

Station (ft)	Elevation (ft)
46+45	212.00
46+57	211.00
46+67	210.50
46+75	210.80
46+76	210.70
46+78	210.50
46+88	208.60
47+16	203.80
47+27	202.40
47+35	202.50
47+52	202.40
47+72	203.30
47+83	202.40
48+09	202.30
48+09	202.30
48+10	202.30
48+28	202.20
48+34	202.70
48+40	202.70
48+44	202.40
48+51	202.60
48+67	202.50
48+68	202.50
48+68	202.50
48+77	202.10
48+91	202.20
48+93	202.30
48+97	202.30
49+07	202.10
49+23	202.50
49+25	202.10
49+29	202.60
49+36	202.90
49+44	202.70
49+47	202.80
49+59	203.10
49+76	201.01
49+79	199.50
49+87	198.77
49+95	197.94
50+01	198.25
50+07	196.41
50+14	196.12
50+20	198.08
50+21	199.43
50+26	199.22
50+26	199.70

Rose Ln. - Post-Dev - 10-Year

Section Definitions

Station (ft)	Elevation (ft)
50+48	202.20
50+62	201.80
50+81	201.80
50+99	200.70
51+08	200.70
51+16	200.90
51+46	200.70
51+52	200.50
51+67	200.70
51+75	201.20
51+77	201.20
51+87	200.60
52+09	200.70
52+10	200.60
52+48	200.40
52+71	200.90
52+76	200.90
53+02	201.30
53+22	200.80
53+34	200.90
53+43	201.60
53+55	200.90
53+63	200.60
53+82	200.60
53+97	200.00
53+97	200.00
53+97	200.00
54+43	201.80
54+57	201.90
54+73	201.40
54+84	200.70
54+88	200.90
54+90	200.90
55+14	201.00
55+18	201.20
55+28	201.50
55+29	201.50
55+48	201.60
55+54	201.00
55+63	201.20
55+78	201.10
55+86	201.30
55+92	201.90
56+22	201.10
56+26	201.20
56+32	201.00
56+35	200.80

Rose Ln. - Post-Dev - 10-Year

Section Definitions

Station (ft)	Elevation (ft)
56+54	200.30
56+76	200.80
56+88	202.00
57+19	201.60
57+22	201.40
57+51	201.60
57+74	203.00
57+90	203.60
58+12	206.60
58+18	208.20
58+19	208.30
58+20	208.50
58+48	214.50
58+57	217.00
58+74	220.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(42+63, 218.00)	(42+69, 217.66)	0.200
(42+69, 217.66)	(49+76, 201.01)	0.155
(49+76, 201.01)	(50+26, 199.70)	0.042
(50+26, 199.70)	(58+74, 220.00)	0.155

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	92.5 in
Elevation Range	196.1 to 220.0 ft
Flow Area	2,678.9 ft²
Wetted Perimeter	1,078.8 ft
Hydraulic Radius	29.8 in
Top Width	1,075.60 ft
Normal Depth	92.5 in
Critical Depth	69.7 in
Critical Slope	0.329 ft/ft
Velocity	1.80 ft/s
Velocity Head	0.05 ft
Specific Energy	7.76 ft
Froude Number	0.201

Rose Ln. - Post-Dev - 10-Year

Results	
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	92.5 in
Critical Depth	69.7 in
Channel Slope	0.010 ft/ft
Critical Slope	0.329 ft/ft

Rose Ln. - Pre-Dev - 50-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	7,275.95 cfs

Section Definitions

Station (ft)	Elevation (ft)
42+63	218.00
42+66	217.90
42+69	217.66
42+74	217.30
42+76	217.30
42+89	217.40
42+99	216.80
43+32	216.80
43+33	216.80
43+34	216.80
43+35	216.80
43+43	216.60
43+52	216.70
43+64	216.20
43+81	213.70
44+08	213.50
44+13	214.40
44+29	215.60
44+29	215.50
44+30	215.50
44+33	214.70
44+41	211.40
44+71	210.80
44+93	212.20
45+09	211.20
45+11	211.20
45+19	212.00
45+22	211.70
45+30	212.80
45+37	212.80
45+40	213.10
45+57	212.30
45+62	211.80
45+81	211.70
45+96	212.10
46+16	210.40
46+27	210.30
46+44	212.00

Rose Ln. - Pre-Dev - 50-Year

Section Definitions

Station (ft)	Elevation (ft)
46+45	212.00
46+57	211.00
46+67	210.50
46+75	210.80
46+76	210.70
46+78	210.50
46+88	208.60
47+16	203.80
47+27	202.40
47+35	202.50
47+52	202.40
47+72	203.30
47+83	202.40
48+09	202.30
48+09	202.30
48+10	202.30
48+28	202.20
48+34	202.70
48+40	202.70
48+44	202.40
48+51	202.60
48+67	202.50
48+68	202.50
48+68	202.50
48+77	202.10
48+91	202.20
48+93	202.30
48+97	202.30
49+07	202.10
49+23	202.50
49+25	202.10
49+29	202.60
49+36	202.90
49+44	202.70
49+47	202.80
49+59	203.10
49+76	201.01
49+79	199.50
49+87	198.77
49+95	197.94
50+01	198.25
50+07	196.41
50+14	196.12
50+20	198.08
50+21	199.43
50+26	199.22
50+26	199.70

Rose Ln. - Pre-Dev - 50-Year

Section Definitions

Station (ft)	Elevation (ft)
50+48	202.20
50+62	201.80
50+81	201.80
50+99	200.70
51+08	200.70
51+16	200.90
51+46	200.70
51+52	200.50
51+67	200.70
51+75	201.20
51+77	201.20
51+87	200.60
52+09	200.70
52+10	200.60
52+48	200.40
52+71	200.90
52+76	200.90
53+02	201.30
53+22	200.80
53+34	200.90
53+43	201.60
53+55	200.90
53+63	200.60
53+82	200.60
53+97	200.00
53+97	200.00
53+97	200.00
54+43	201.80
54+57	201.90
54+73	201.40
54+84	200.70
54+88	200.90
54+90	200.90
55+14	201.00
55+18	201.20
55+28	201.50
55+29	201.50
55+48	201.60
55+54	201.00
55+63	201.20
55+78	201.10
55+86	201.30
55+92	201.90
56+22	201.10
56+26	201.20
56+32	201.00
56+35	200.80

Rose Ln. - Pre-Dev - 50-Year

Section Definitions

Station (ft)	Elevation (ft)
56+54	200.30
56+76	200.80
56+88	202.00
57+19	201.60
57+22	201.40
57+51	201.60
57+74	203.00
57+90	203.60
58+12	206.60
58+18	208.20
58+19	208.30
58+20	208.50
58+48	214.50
58+57	217.00
58+74	220.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(42+63, 218.00)	(42+69, 217.66)	0.200
(42+69, 217.66)	(49+76, 201.01)	0.155
(49+76, 201.01)	(50+26, 199.70)	0.042
(50+26, 199.70)	(58+74, 220.00)	0.155

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	101.0 in
Elevation Range	196.1 to 220.0 ft
Flow Area	3,442.8 ft²
Wetted Perimeter	1,088.2 ft
Hydraulic Radius	38.0 in
Top Width	1,084.88 ft
Normal Depth	101.0 in
Critical Depth	74.2 in
Critical Slope	0.308 ft/ft
Velocity	2.11 ft/s
Velocity Head	0.07 ft
Specific Energy	8.48 ft
Froude Number	0.209

Rose Ln. - Pre-Dev - 50-Year

Results	
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	101.0 in
Critical Depth	74.2 in
Channel Slope	0.010 ft/ft
Critical Slope	0.308 ft/ft

Rose Ln. - Post-Dev - 50-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	7,293.24 cfs

Section Definitions

Station (ft)	Elevation (ft)
42+63	218.00
42+66	217.90
42+69	217.66
42+74	217.30
42+76	217.30
42+89	217.40
42+99	216.80
43+32	216.80
43+33	216.80
43+34	216.80
43+35	216.80
43+43	216.60
43+52	216.70
43+64	216.20
43+81	213.70
44+08	213.50
44+13	214.40
44+29	215.60
44+29	215.50
44+30	215.50
44+33	214.70
44+41	211.40
44+71	210.80
44+93	212.20
45+09	211.20
45+11	211.20
45+19	212.00
45+22	211.70
45+30	212.80
45+37	212.80
45+40	213.10
45+57	212.30
45+62	211.80
45+81	211.70
45+96	212.10
46+16	210.40
46+27	210.30
46+44	212.00

Rose Ln. - Post-Dev - 50-Year

Section Definitions

Station (ft)	Elevation (ft)
46+45	212.00
46+57	211.00
46+67	210.50
46+75	210.80
46+76	210.70
46+78	210.50
46+88	208.60
47+16	203.80
47+27	202.40
47+35	202.50
47+52	202.40
47+72	203.30
47+83	202.40
48+09	202.30
48+09	202.30
48+10	202.30
48+28	202.20
48+34	202.70
48+40	202.70
48+44	202.40
48+51	202.60
48+67	202.50
48+68	202.50
48+68	202.50
48+77	202.10
48+91	202.20
48+93	202.30
48+97	202.30
49+07	202.10
49+23	202.50
49+25	202.10
49+29	202.60
49+36	202.90
49+44	202.70
49+47	202.80
49+59	203.10
49+76	201.01
49+79	199.50
49+87	198.77
49+95	197.94
50+01	198.25
50+07	196.41
50+14	196.12
50+20	198.08
50+21	199.43
50+26	199.22
50+26	199.70

Rose Ln. - Post-Dev - 50-Year

Section Definitions

Station (ft)	Elevation (ft)
50+48	202.20
50+62	201.80
50+81	201.80
50+99	200.70
51+08	200.70
51+16	200.90
51+46	200.70
51+52	200.50
51+67	200.70
51+75	201.20
51+77	201.20
51+87	200.60
52+09	200.70
52+10	200.60
52+48	200.40
52+71	200.90
52+76	200.90
53+02	201.30
53+22	200.80
53+34	200.90
53+43	201.60
53+55	200.90
53+63	200.60
53+82	200.60
53+97	200.00
53+97	200.00
53+97	200.00
54+43	201.80
54+57	201.90
54+73	201.40
54+84	200.70
54+88	200.90
54+90	200.90
55+14	201.00
55+18	201.20
55+28	201.50
55+29	201.50
55+48	201.60
55+54	201.00
55+63	201.20
55+78	201.10
55+86	201.30
55+92	201.90
56+22	201.10
56+26	201.20
56+32	201.00
56+35	200.80

Rose Ln. - Post-Dev - 50-Year

Section Definitions

Station (ft)	Elevation (ft)
56+54	200.30
56+76	200.80
56+88	202.00
57+19	201.60
57+22	201.40
57+51	201.60
57+74	203.00
57+90	203.60
58+12	206.60
58+18	208.20
58+19	208.30
58+20	208.50
58+48	214.50
58+57	217.00
58+74	220.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(42+63, 218.00)	(42+69, 217.66)	0.200
(42+69, 217.66)	(49+76, 201.01)	0.155
(49+76, 201.01)	(50+26, 199.70)	0.042
(50+26, 199.70)	(58+74, 220.00)	0.155

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	101.0 in
Elevation Range	196.1 to 220.0 ft
Flow Area	3,447.8 ft²
Wetted Perimeter	1,088.3 ft
Hydraulic Radius	38.0 in
Top Width	1,084.94 ft
Normal Depth	101.0 in
Critical Depth	74.2 in
Critical Slope	0.308 ft/ft
Velocity	2.12 ft/s
Velocity Head	0.07 ft
Specific Energy	8.49 ft
Froude Number	0.209

Rose Ln. - Post-Dev - 50-Year

Results	
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	101.0 in
Critical Depth	74.2 in
Channel Slope	0.010 ft/ft
Critical Slope	0.308 ft/ft

Rose Ln. - Pre-Dev - 100-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	8,401.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
42+63	218.00
42+66	217.90
42+69	217.66
42+74	217.30
42+76	217.30
42+89	217.40
42+99	216.80
43+32	216.80
43+33	216.80
43+34	216.80
43+35	216.80
43+43	216.60
43+52	216.70
43+64	216.20
43+81	213.70
44+08	213.50
44+13	214.40
44+29	215.60
44+29	215.50
44+30	215.50
44+33	214.70
44+41	211.40
44+71	210.80
44+93	212.20
45+09	211.20
45+11	211.20
45+19	212.00
45+22	211.70
45+30	212.80
45+37	212.80
45+40	213.10
45+57	212.30
45+62	211.80
45+81	211.70
45+96	212.10
46+16	210.40
46+27	210.30
46+44	212.00

Rose Ln. - Pre-Dev - 100-Year

Section Definitions

Station (ft)	Elevation (ft)
46+45	212.00
46+57	211.00
46+67	210.50
46+75	210.80
46+76	210.70
46+78	210.50
46+88	208.60
47+16	203.80
47+27	202.40
47+35	202.50
47+52	202.40
47+72	203.30
47+83	202.40
48+09	202.30
48+09	202.30
48+10	202.30
48+28	202.20
48+34	202.70
48+40	202.70
48+44	202.40
48+51	202.60
48+67	202.50
48+68	202.50
48+68	202.50
48+77	202.10
48+91	202.20
48+93	202.30
48+97	202.30
49+07	202.10
49+23	202.50
49+25	202.10
49+29	202.60
49+36	202.90
49+44	202.70
49+47	202.80
49+59	203.10
49+76	201.01
49+79	199.50
49+87	198.77
49+95	197.94
50+01	198.25
50+07	196.41
50+14	196.12
50+20	198.08
50+21	199.43
50+26	199.22
50+26	199.70

Rose Ln. - Pre-Dev - 100-Year

Section Definitions

Station (ft)	Elevation (ft)
50+48	202.20
50+62	201.80
50+81	201.80
50+99	200.70
51+08	200.70
51+16	200.90
51+46	200.70
51+52	200.50
51+67	200.70
51+75	201.20
51+77	201.20
51+87	200.60
52+09	200.70
52+10	200.60
52+48	200.40
52+71	200.90
52+76	200.90
53+02	201.30
53+22	200.80
53+34	200.90
53+43	201.60
53+55	200.90
53+63	200.60
53+82	200.60
53+97	200.00
53+97	200.00
53+97	200.00
54+43	201.80
54+57	201.90
54+73	201.40
54+84	200.70
54+88	200.90
54+90	200.90
55+14	201.00
55+18	201.20
55+28	201.50
55+29	201.50
55+48	201.60
55+54	201.00
55+63	201.20
55+78	201.10
55+86	201.30
55+92	201.90
56+22	201.10
56+26	201.20
56+32	201.00
56+35	200.80

Rose Ln. - Pre-Dev - 100-Year

Section Definitions

Station (ft)	Elevation (ft)
56+54	200.30
56+76	200.80
56+88	202.00
57+19	201.60
57+22	201.40
57+51	201.60
57+74	203.00
57+90	203.60
58+12	206.60
58+18	208.20
58+19	208.30
58+20	208.50
58+48	214.50
58+57	217.00
58+74	220.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(42+63, 218.00)	(42+69, 217.66)	0.200
(42+69, 217.66)	(49+76, 201.01)	0.155
(49+76, 201.01)	(50+26, 199.70)	0.042
(50+26, 199.70)	(58+74, 220.00)	0.155

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	104.4 in
Elevation Range	196.1 to 220.0 ft
Flow Area	3,758.4 ft²
Wetted Perimeter	1,092.0 ft
Hydraulic Radius	41.3 in
Top Width	1,088.69 ft
Normal Depth	104.4 in
Critical Depth	76.1 in
Critical Slope	0.303 ft/ft
Velocity	2.24 ft/s
Velocity Head	0.08 ft
Specific Energy	8.78 ft
Froude Number	0.212

Rose Ln. - Pre-Dev - 100-Year

Results	
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	104.4 in
Critical Depth	76.1 in
Channel Slope	0.010 ft/ft
Critical Slope	0.303 ft/ft

Rose Ln. - Post-Dev - 100-Year

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	8,426.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
42+63	218.00
42+66	217.90
42+69	217.66
42+74	217.30
42+76	217.30
42+89	217.40
42+99	216.80
43+32	216.80
43+33	216.80
43+34	216.80
43+35	216.80
43+43	216.60
43+52	216.70
43+64	216.20
43+81	213.70
44+08	213.50
44+13	214.40
44+29	215.60
44+29	215.50
44+30	215.50
44+33	214.70
44+41	211.40
44+71	210.80
44+93	212.20
45+09	211.20
45+11	211.20
45+19	212.00
45+22	211.70
45+30	212.80
45+37	212.80
45+40	213.10
45+57	212.30
45+62	211.80
45+81	211.70
45+96	212.10
46+16	210.40
46+27	210.30
46+44	212.00

Rose Ln. - Post-Dev - 100-Year

Section Definitions

Station (ft)	Elevation (ft)
46+45	212.00
46+57	211.00
46+67	210.50
46+75	210.80
46+76	210.70
46+78	210.50
46+88	208.60
47+16	203.80
47+27	202.40
47+35	202.50
47+52	202.40
47+72	203.30
47+83	202.40
48+09	202.30
48+09	202.30
48+10	202.30
48+28	202.20
48+34	202.70
48+40	202.70
48+44	202.40
48+51	202.60
48+67	202.50
48+68	202.50
48+68	202.50
48+77	202.10
48+91	202.20
48+93	202.30
48+97	202.30
49+07	202.10
49+23	202.50
49+25	202.10
49+29	202.60
49+36	202.90
49+44	202.70
49+47	202.80
49+59	203.10
49+76	201.01
49+79	199.50
49+87	198.77
49+95	197.94
50+01	198.25
50+07	196.41
50+14	196.12
50+20	198.08
50+21	199.43
50+26	199.22
50+26	199.70

Rose Ln. - Post-Dev - 100-Year

Section Definitions

Station (ft)	Elevation (ft)
50+48	202.20
50+62	201.80
50+81	201.80
50+99	200.70
51+08	200.70
51+16	200.90
51+46	200.70
51+52	200.50
51+67	200.70
51+75	201.20
51+77	201.20
51+87	200.60
52+09	200.70
52+10	200.60
52+48	200.40
52+71	200.90
52+76	200.90
53+02	201.30
53+22	200.80
53+34	200.90
53+43	201.60
53+55	200.90
53+63	200.60
53+82	200.60
53+97	200.00
53+97	200.00
53+97	200.00
54+43	201.80
54+57	201.90
54+73	201.40
54+84	200.70
54+88	200.90
54+90	200.90
55+14	201.00
55+18	201.20
55+28	201.50
55+29	201.50
55+48	201.60
55+54	201.00
55+63	201.20
55+78	201.10
55+86	201.30
55+92	201.90
56+22	201.10
56+26	201.20
56+32	201.00
56+35	200.80

Rose Ln. - Post-Dev - 100-Year

Section Definitions

Station (ft)	Elevation (ft)
56+54	200.30
56+76	200.80
56+88	202.00
57+19	201.60
57+22	201.40
57+51	201.60
57+74	203.00
57+90	203.60
58+12	206.60
58+18	208.20
58+19	208.30
58+20	208.50
58+48	214.50
58+57	217.00
58+74	220.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(42+63, 218.00)	(42+69, 217.66)	0.200
(42+69, 217.66)	(49+76, 201.01)	0.155
(49+76, 201.01)	(50+26, 199.70)	0.042
(50+26, 199.70)	(58+74, 220.00)	0.155

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	104.5 in
Elevation Range	196.1 to 220.0 ft
Flow Area	3,765.3 ft²
Wetted Perimeter	1,092.1 ft
Hydraulic Radius	41.4 in
Top Width	1,088.77 ft
Normal Depth	104.5 in
Critical Depth	76.2 in
Critical Slope	0.303 ft/ft
Velocity	2.24 ft/s
Velocity Head	0.08 ft
Specific Energy	8.79 ft
Froude Number	0.212

Rose Ln. - Post-Dev - 100-Year

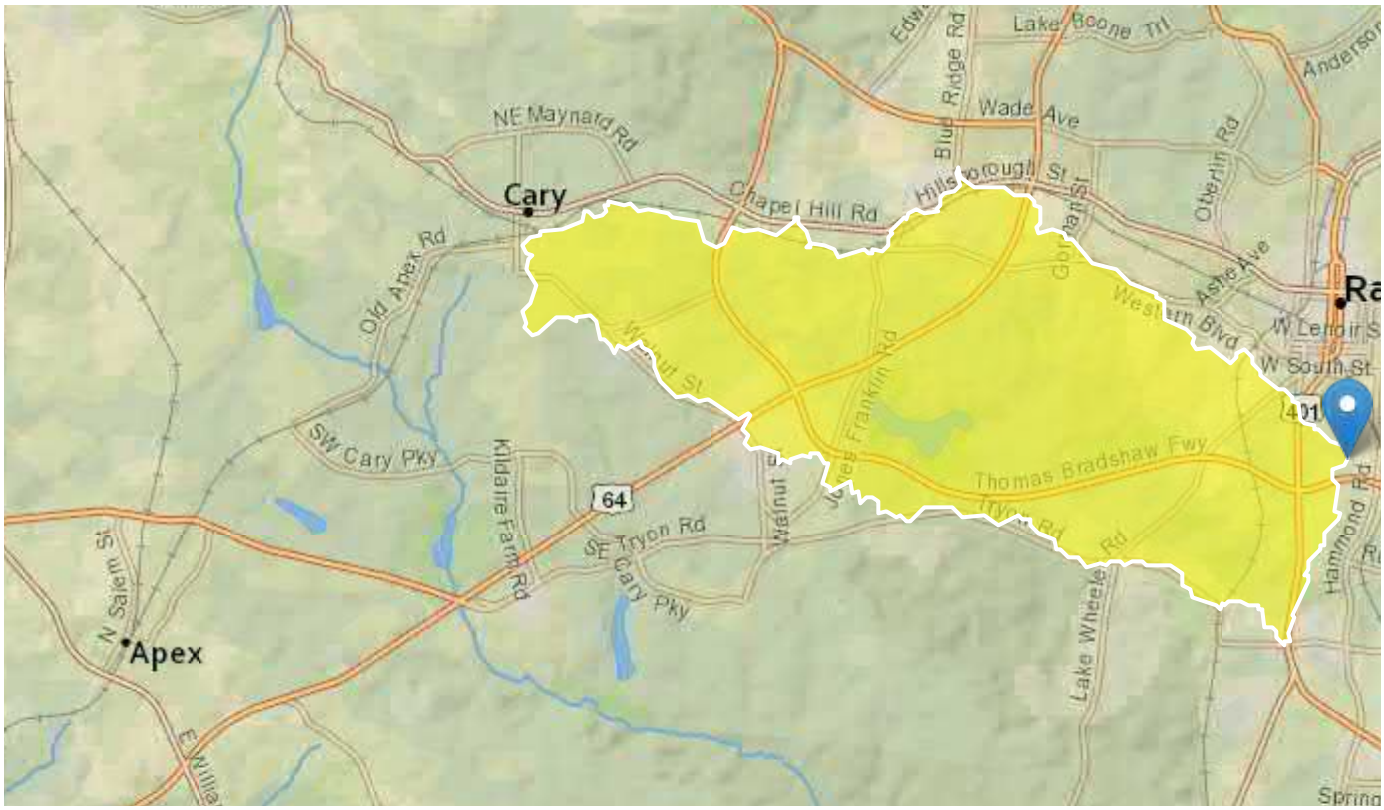
Results	
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	104.5 in
Critical Depth	76.2 in
Channel Slope	0.010 ft/ft
Critical Slope	0.303 ft/ft

StreamStats Report - Walnut Creek at S. Wilmington St.

Region ID: NC
Workspace ID: NC20201026140147216000
Clicked Point (Latitude, Longitude): 35.75706, -78.64089
Time: 2020-10-26 10:02:04 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	17.2	square miles
LC06IMP	Percentage of impervious area determined from NLCD 2006 impervious dataset	20.6	percent
BASINPERIM	Perimeter of the drainage basin as defined in SIR 2004-5262	33.4	miles
BSLDEM30FT	Mean basin slope, based on slope percent grid	7.29	percent

Parameter Code	Parameter Description	Value	Unit
CSL10_85fm	Change in elevation between points 10 and 85 percent of length along main channel to basin divide divided by length between points ft per mi	21.95	feet per mi
ELEV	Mean Basin Elevation	389	feet
ELEVMAX	Maximum basin elevation	521	feet
I24H50Y	Maximum 24-hour precipitation that occurs on average once in 50 years	6.77	inches
LC01BARE	Percentage of area barren land, NLCD 2001 category 31	0.16	percent
LC01CRPHAY	Percentage of cultivated crops and hay, classes 81 and 82, from NLCD 2001	1.574	percent
LC01DEV	Percentage of land-use from NLCD 2001 classes 21-24	77.218	percent
LC01FOREST	Percentage of forest from NLCD 2001 classes 41-43	17.565	percent
LC01HERB	Percentage of herbaceous upland from NLCD 2001 class 71	0.594	percent
LC01IMP	Percent imperviousness of basin area 2001 NLCD	19.37	percent
LC01SHRUB	Percent of area covered by shrubland using 2001 NLCD	0.149	percent
LC01WATER	Percentage of open water, class 11, from NLCD 2001	2.059	percent
LC01WETLND	Percentage of wetlands, classes 90 and 95, from NLCD 2001	0.68	percent
LC06BARE	Percent of area covered by barren rock using 2006 NLCD	0.075	percent
LC06DEV	Percentage of land-use from NLCD 2006 classes 21-24	78.398	percent
LC06FOREST	Percentage of forest from NLCD 2006 classes 41-43	16.189	percent
LC06GRASS	Percent of area covered by grassland/herbaceous using 2006 NLCD	1.186	percent
LC06PLANT	Percent of area in cultivation using 2006 NLCD	1.301	percent
LC06SHRUB	Percent of area covered by shrubland using 2006 NLCD	0.112	percent
LC06WATER	Percent of open water, class 11, from NLCD 2006	2.059	percent
LC06WETLND	Percent of area covered by wetland using 2006 NLCD	0.68	percent
LC11BARE	Percentage of barren from NLCD 2011 class 31	0.097	percent
LC11CRPHAY	Percentage of cultivated crops and hay, classes 81 and 82, from NLCD 2011	1.254	percent
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	80.2	percent

Parameter Code	Parameter Description	Value	Unit
LC11FOREST	Percentage of forest from NLCD 2011 classes 41-43	14.792	percent
LC11GRASS	Percent of area covered by grassland/herbaceous using 2011 NLCD	0.85	percent
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	21.8	percent
LC11SHRUB	Percent of area covered by shrubland using 2011 NLCD	0.153	percent
LC11WATER	Percent of open water, class 11, from NLCD 2011	2.054	percent
LC11WETLND	Percentage of wetlands, classes 90 and 95, from NLCD 2011	0.634	percent
LC92FOREST	Percentage of forest from NLCD 1992 classes 41-43	31.781	percent
LFPLENGTH	Length of longest flow path	11.591	miles
LU92BARE	Percent of area covered by barren rock using 1992 NLCD	6.218	percent
LU92DEV	Percent of area covered by all densities of developed land using 1992 NLCD	55.99	percent
LU92PLANT	Percent of area in cultivation using 1992 NLCD	2.65	percent
LU92WATER	Percent of area covered by water using 1992 NLCD	2.379	percent
LU92WETLN	Percent of area covered by wetland using 1992 NLCD	0.982	percent
MINBELEV	Minimum basin elevation	224	feet
OUTLETELEV	Elevation of the stream outlet in feet above NAVD88	232	feet
PCTREG1	Percentage of drainage area located in Region 1	100	percent
PCTREG2	Percentage of drainage area located in Region 2	0	percent
PCTREG3	Percentage of drainage area located in Region 3	0	percent
PCTREG4	Percentage of drainage area located in Region 4	0	percent
PCTREG5	Percentage of drainage area located in Region 5	0	percent
PRECIP	Mean Annual Precipitation	46.8	inches
PROTECTED	Percent of area of protected Federal and State owned land	0	percent
SSURGOA	Percentage of area of Hydrologic Soil Type A from SSURGO	0	percent
SSURGOB	Percentage of area of Hydrologic Soil Type B from SSURGO	86.1	percent
SSURGOC	Percentage of area of Hydrologic Soil Type C from SSURGO	6.88	percent
SSURGOD	Percentage of area of Hydrologic Soil Type D from SSURGO	4.61	percent

Urban Peak-Flow Statistics Parameters[Region 1 Piedmont Urban over 3 sqmi 2014 5030]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	17.2	square miles	3	436
LC06IMP	Percent Impervious NLCD2006	20.6	percent	0	47.9

Urban Peak-Flow Statistics Flow Report[Region 1 Piedmont Urban over 3 sqmi 2014 5030]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	PIu	SEp
Urban 2 Year Peak Flood	1630	ft^3/s	851	3120	34.4
Urban 5 Year Peak Flood	2510	ft^3/s	1380	4580	31.4
Urban 10 Year Peak Flood	3110	ft^3/s	1730	5580	30.7
Urban 25 Year Peak Flood	3870	ft^3/s	2120	7080	31.4
Urban 50 Year Peak Flood	4430	ft^3/s	2380	8250	32.4
Urban 100 Year Peak Flood	4970	ft^3/s	2580	9580	34.2
Urban 200 Year Peak Flood	5550	ft^3/s	2790	11000	35.8
Urban 500 Year Peak Flood	6290	ft^3/s	3020	13100	38.7

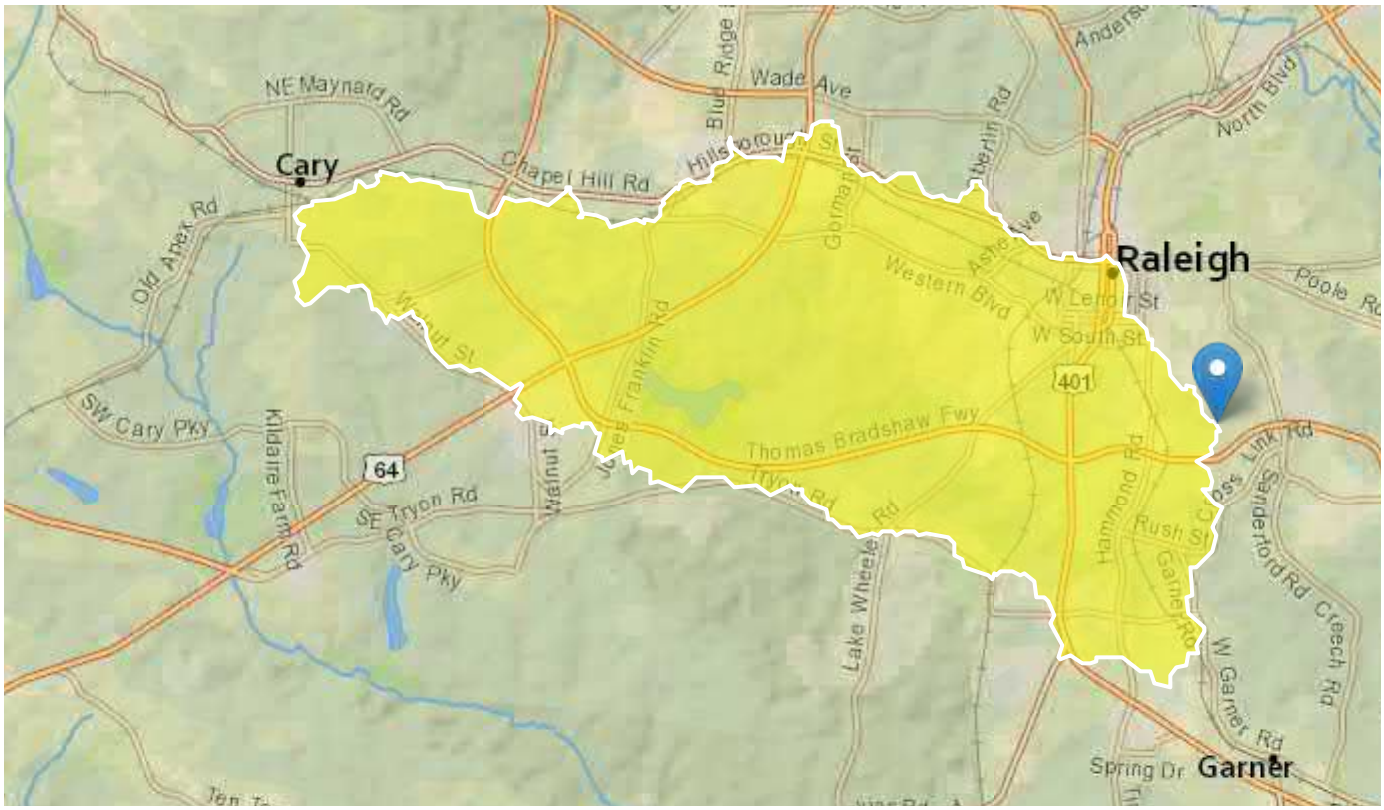
Urban Peak-Flow Statistics Citations

Feaster, T.D., Gotvald, A.J., and Weaver, J.C.,2014, Methods for estimating the magnitude and frequency of floods for urban and small, rural streams in Georgia, South Carolina, and North Carolina, 2011 (ver. 1.1, March 2014): U.S. Geological Survey Scientific Investigations Report 2014–5030, 104 p. (http://pubs.usgs.gov/sir/2014/5030/)

Application Version: 4.4.0

Walnut Creek Drainage to Rochester Heights Subdivision

Region ID: NC
Workspace ID: NC20201027120008825000
Clicked Point (Latitude, Longitude): 35.75781, -78.62413
Time: 2020-10-27 08:00:28 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	23.4	square miles
LC06IMP	Percentage of impervious area determined from NLCD 2006 impervious dataset	23.28	percent
BASINPERIM	Perimeter of the drainage basin as defined in SIR 2004-5262	39.8	miles
BSLDEM30FT	Mean basin slope, based on slope percent grid	7.1	percent

Parameter Code	Parameter Description	Value	Unit
CSL10_85fm	Change in elevation between points 10 and 85 percent of length along main channel to basin divide divided by length between points ft per mi	21.11	feet per mi
ELEV	Mean Basin Elevation	372	feet
ELEVMAX	Maximum basin elevation	521	feet
I24H50Y	Maximum 24-hour precipitation that occurs on average once in 50 years	6.78	inches
LC01BARE	Percentage of area barren land, NLCD 2001 category 31	0.118	percent
LC01CRPHAY	Percentage of cultivated crops and hay, classes 81 and 82, from NLCD 2001	1.768	percent
LC01DEV	Percentage of land-use from NLCD 2001 classes 21-24	80.105	percent
LC01FOREST	Percentage of forest from NLCD 2001 classes 41-43	14.938	percent
LC01HERB	Percentage of herbaceous upland from NLCD 2001 class 71	0.605	percent
LC01IMP	Percent imperviousness of basin area 2001 NLCD	21.91	percent
LC01SHRUB	Percent of area covered by shrubland using 2001 NLCD	0.119	percent
LC01WATER	Percentage of open water, class 11, from NLCD 2001	1.554	percent
LC01WETLND	Percentage of wetlands, classes 90 and 95, from NLCD 2001	0.793	percent
LC06BARE	Percent of area covered by barren rock using 2006 NLCD	0.155	percent
LC06DEV	Percentage of land-use from NLCD 2006 classes 21-24	81.051	percent
LC06FOREST	Percentage of forest from NLCD 2006 classes 41-43	13.806	percent
LC06GRASS	Percent of area covered by grassland/herbaceous using 2006 NLCD	0.994	percent
LC06PLANT	Percent of area in cultivation using 2006 NLCD	1.566	percent
LC06SHRUB	Percent of area covered by shrubland using 2006 NLCD	0.091	percent
LC06WATER	Percent of open water, class 11, from NLCD 2006	1.554	percent
LC06WETLND	Percent of area covered by wetland using 2006 NLCD	0.783	percent
LC11BARE	Percentage of barren from NLCD 2011 class 31	0.087	percent
LC11CRPHAY	Percentage of cultivated crops and hay, classes 81 and 82, from NLCD 2011	1.514	percent
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	82.6	percent

Parameter Code	Parameter Description	Value	Unit
LC11FOREST	Percentage of forest from NLCD 2011 classes 41-43	12.601	percent
LC11GRASS	Percent of area covered by grassland/herbaceous using 2011 NLCD	0.742	percent
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	24.6	percent
LC11SHRUB	Percent of area covered by shrubland using 2011 NLCD	0.122	percent
LC11WATER	Percent of open water, class 11, from NLCD 2011	1.549	percent
LC11WETLND	Percentage of wetlands, classes 90 and 95, from NLCD 2011	0.747	percent
LC92FOREST	Percentage of forest from NLCD 1992 classes 41-43	27.936	percent
LFPLENGTH	Length of longest flow path	12.672	miles
LU92BARE	Percent of area covered by barren rock using 1992 NLCD	7.105	percent
LU92DEV	Percent of area covered by all densities of developed land using 1992 NLCD	59.108	percent
LU92PLANT	Percent of area in cultivation using 1992 NLCD	2.747	percent
LU92WATER	Percent of area covered by water using 1992 NLCD	1.814	percent
LU92WETLN	Percent of area covered by wetland using 1992 NLCD	1.29	percent
MINBELEV	Minimum basin elevation	213	feet
OUTLETELEV	Elevation of the stream outlet in feet above NAVD88	213	feet
PCTREG1	Percentage of drainage area located in Region 1	100	percent
PCTREG2	Percentage of drainage area located in Region 2	0	percent
PCTREG3	Percentage of drainage area located in Region 3	0	percent
PCTREG4	Percentage of drainage area located in Region 4	0	percent
PCTREG5	Percentage of drainage area located in Region 5	0	percent
PRECIP	Mean Annual Precipitation	46.8	inches
PROTECTED	Percent of area of protected Federal and State owned land	0	percent
SSURGOA	Percentage of area of Hydrologic Soil Type A from SSURGO	0	percent
SSURGOB	Percentage of area of Hydrologic Soil Type B from SSURGO	86.5	percent
SSURGOC	Percentage of area of Hydrologic Soil Type C from SSURGO	6.72	percent
SSURGOD	Percentage of area of Hydrologic Soil Type D from SSURGO	4.86	percent

Urban Peak-Flow Statistics Parameters[Region 1 Piedmont Urban over 3 sqmi 2014 5030]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	23.4	square miles	3	436
LC06IMP	Percent Impervious NLCD2006	23.28	percent	0	47.9

Urban Peak-Flow Statistics Flow Report[Region 1 Piedmont Urban over 3 sqmi 2014 5030]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

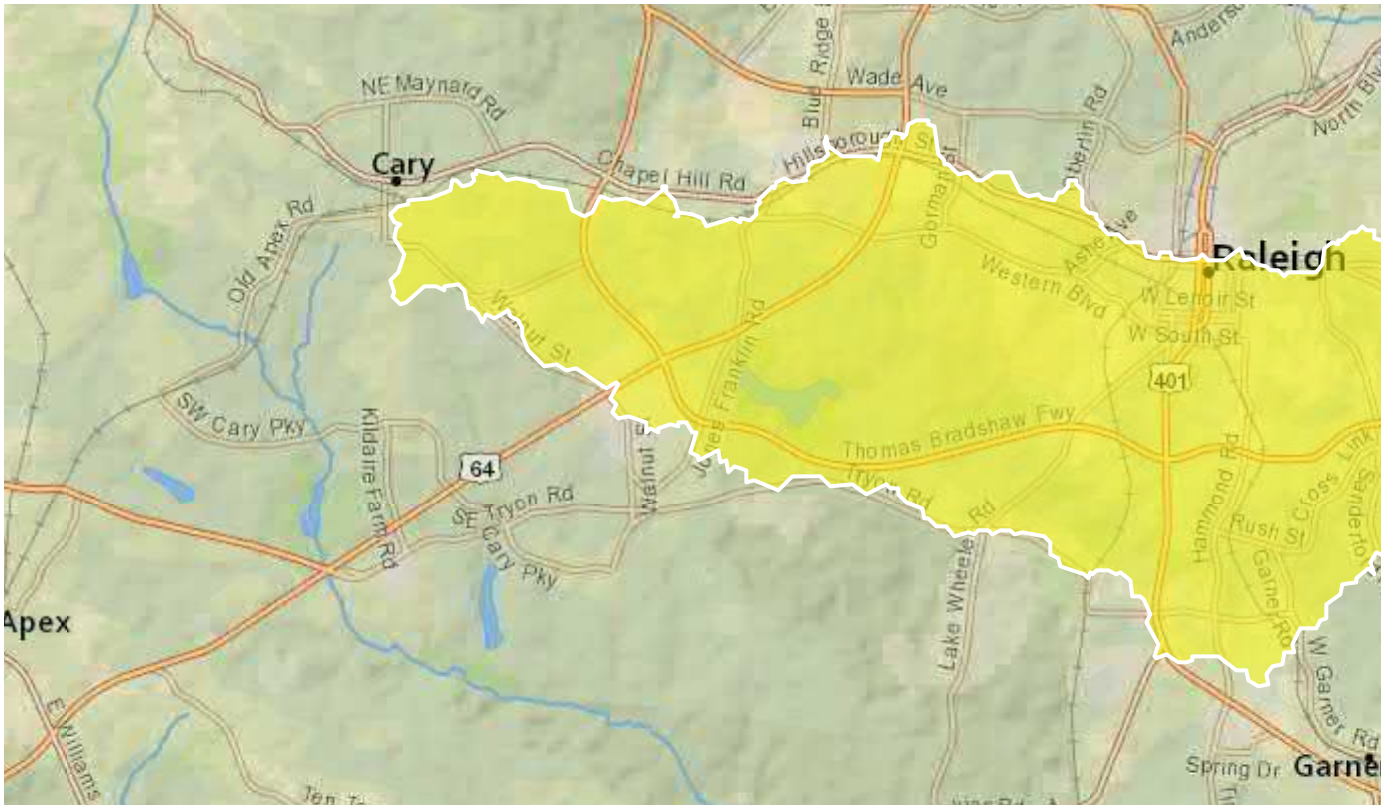
Statistic	Value	Unit	PII	PIu	SEp
Urban 2 Year Peak Flood	2080	ft^3/s	1080	3990	34.4
Urban 5 Year Peak Flood	3120	ft^3/s	1710	5700	31.4
Urban 10 Year Peak Flood	3830	ft^3/s	2130	6880	30.7
Urban 25 Year Peak Flood	4720	ft^3/s	2580	8640	31.4
Urban 50 Year Peak Flood	5360	ft^3/s	2870	NaN	32.4
Urban 100 Year Peak Flood	5970	ft^3/s	3090	11500	34.2
Urban 200 Year Peak Flood	6630	ft^3/s	3330	13200	35.8
Urban 500 Year Peak Flood	7450	ft^3/s	3570	15500	38.7

Urban Peak-Flow Statistics Citations

Application Version: 4.4.0

StreamStats Report - Walnut Creek at Rose Ln.

Region ID: NC
Workspace ID: NC20201111201403322000
Clicked Point (Latitude, Longitude): 35.76022, -78.60025
Time: 2020-11-11 15:14:22 -0500



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	28.2	square miles
LC06IMP	Percentage of impervious area determined from NLCD 2006 impervious dataset	22.79	percent
BASINPERIM	Perimeter of the drainage basin as defined in SIR 2004-5262	44.4	miles
BSLDEM30FT	Mean basin slope, based on slope percent grid	6.93	percent

Parameter Code	Parameter Description	Value	Unit
CSL10_85fm	Change in elevation between points 10 and 85 percent of length along main channel to basin divide divided by length between points ft per mi	19.24	feet per mi
ELEV	Mean Basin Elevation	356	feet
ELEVMAX	Maximum basin elevation	521	feet
I24H50Y	Maximum 24-hour precipitation that occurs on average once in 50 years	6.8	inches
LC01BARE	Percentage of area barren land, NLCD 2001 category 31	0.135	percent
LC01CRPHAY	Percentage of cultivated crops and hay, classes 81 and 82, from NLCD 2001	1.66	percent
LC01DEV	Percentage of land-use from NLCD 2001 classes 21-24	80.615	percent
LC01FOREST	Percentage of forest from NLCD 2001 classes 41-43	14.167	percent
LC01HERB	Percentage of herbaceous upland from NLCD 2001 class 71	0.671	percent
LC01IMP	Percent imperviousness of basin area 2001 NLCD	21.39	percent
LC01SHRUB	Percent of area covered by shrubland using 2001 NLCD	0.099	percent
LC01WATER	Percentage of open water, class 11, from NLCD 2001	1.345	percent
LC01WETLND	Percentage of wetlands, classes 90 and 95, from NLCD 2001	1.307	percent
LC06BARE	Percent of area covered by barren rock using 2006 NLCD	0.128	percent
LC06DEV	Percentage of land-use from NLCD 2006 classes 21-24	81.781	percent
LC06FOREST	Percentage of forest from NLCD 2006 classes 41-43	13.035	percent
LC06GRASS	Percent of area covered by grassland/herbaceous using 2006 NLCD	0.941	percent
LC06PLANT	Percent of area in cultivation using 2006 NLCD	1.395	percent
LC06SHRUB	Percent of area covered by shrubland using 2006 NLCD	0.076	percent
LC06WATER	Percent of open water, class 11, from NLCD 2006	1.345	percent
LC06WETLND	Percent of area covered by wetland using 2006 NLCD	1.299	percent
LC11BARE	Percentage of barren from NLCD 2011 class 31	0.09	percent
LC11CRPHAY	Percentage of cultivated crops and hay, classes 81 and 82, from NLCD 2011	1.31	percent
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	83.2	percent

Parameter Code	Parameter Description	Value	Unit
LC11FOREST	Percentage of forest from NLCD 2011 classes 41-43	11.857	percent
LC11GRASS	Percent of area covered by grassland/herbaceous using 2011 NLCD	0.833	percent
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	24.1	percent
LC11SHRUB	Percent of area covered by shrubland using 2011 NLCD	0.101	percent
LC11WATER	Percent of open water, class 11, from NLCD 2011	1.342	percent
LC11WETLND	Percentage of wetlands, classes 90 and 95, from NLCD 2011	1.268	percent
LC92FOREST	Percentage of forest from NLCD 1992 classes 41-43	27.363	percent
LFPLENGTH	Length of longest flow path	14.489	miles
LU92BARE	Percent of area covered by barren rock using 1992 NLCD	5.887	percent
LU92DEV	Percent of area covered by all densities of developed land using 1992 NLCD	60.367	percent
LU92PLANT	Percent of area in cultivation using 1992 NLCD	2.903	percent
LU92WATER	Percent of area covered by water using 1992 NLCD	1.532	percent
LU92WETLN	Percent of area covered by wetland using 1992 NLCD	1.948	percent
MINBELEV	Minimum basin elevation	199	feet
OUTLETELEV	Elevation of the stream outlet in feet above NAVD88	200	feet
PCTREG1	Percentage of drainage area located in Region 1	100	percent
PCTREG2	Percentage of drainage area located in Region 2	0	percent
PCTREG3	Percentage of drainage area located in Region 3	0	percent
PCTREG4	Percentage of drainage area located in Region 4	0	percent
PCTREG5	Percentage of drainage area located in Region 5	0	percent
PRECIP	Mean Annual Precipitation	46.8	inches
PROTECTED	Percent of area of protected Federal and State owned land	0	percent
SSURGOA	Percentage of area of Hydrologic Soil Type A from SSURGO	0	percent
SSURGOB	Percentage of area of Hydrologic Soil Type B from SSURGO	86.1	percent
SSURGOC	Percentage of area of Hydrologic Soil Type C from SSURGO	6.94	percent
SSURGOD	Percentage of area of Hydrologic Soil Type D from SSURGO	5.3	percent

Urban Peak-Flow Statistics Parameters[Region 1 Piedmont Urban over 3 sqmi 2014 5030]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	28.2	square miles	3	436
LC06IMP	Percent Impervious NLCD2006	22.79	percent	0	47.9

Urban Peak-Flow Statistics Flow Report[Region 1 Piedmont Urban over 3 sqmi 2014 5030]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	PIu	SEp
Urban 2 Year Peak Flood	2280	ft^3/s	1190	4370	34.4
Urban 5 Year Peak Flood	3440	ft^3/s	1880	6280	31.4
Urban 10 Year Peak Flood	4220	ft^3/s	2350	7580	30.7
Urban 25 Year Peak Flood	5200	ft^3/s	2840	9520	31.4
Urban 50 Year Peak Flood	5910	ft^3/s	3170	11000	32.4
Urban 100 Year Peak Flood	6580	ft^3/s	3410	12700	34.2
Urban 200 Year Peak Flood	7310	ft^3/s	3670	14600	35.8
Urban 500 Year Peak Flood	8220	ft^3/s	3940	17100	38.7

Urban Peak-Flow Statistics Citations

Feaster, T.D., Gotvald, A.J., and Weaver, J.C.,2014, Methods for estimating the magnitude and frequency of floods for urban and small, rural streams in Georgia, South Carolina, and North Carolina, 2011 (ver. 1.1, March 2014): U.S. Geological Survey Scientific Investigations Report 2014–5030, 104 p. (http://pubs.usgs.gov/sir/2014/5030/)

Application Version: 4.4.0

Wilmington Street

Time of Concentration for Walnut Creek at S. Wilmington St.

Flow Length	11.591	miles
	61200.5	feet
Upstream Elevation	521	feet
Downstream Elevation	224	feet
Elev Change	297	feet
Slope	0.00485	ft/ft
Kirpich Tc	294	minutes
	4.9	hours
Total Drainage Area	**17.2**	sq mi

Time of Concentration for Downtown South Site to S. Wilmington St.

Time	39	minutes

FEMA Preliminary FIS Data: (Q100 = 4,835 cfs)

Summary of Discharges

Flooding Source		Discharges (cfs)			
Location	Drainage Area (square miles)	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Rocky Branch (Basin 30, Stream 5)					
Hydrologic node located at 35.7574, -78.6384	3.15	2017	2883	3206	3971
Hydrologic node located at 35.7584, -78.6396	3.10	2008	2871	3193	3956
Walnut Creek (Basin 30, Stream 1)					
Hydrologic node located at 35.7566, -78.6351	20.50	4665	6682	7443	8855
Hydrologic node located at 35.7572, -78.6383	17.32	3753	4079	4835	6285
Hydrologic node located at 35.7544, -78.6448	16.01	2466	3867	4580	6077
Wildcat Branch (Basin 30, Stream 4)					

Rochester Heights

Time of Concentration for Walnut Creek at Rochester Subdivision		
Flow Length	12.672	miles
	66908.2	feet
Upstream Elevation	521	feet
Downstream Elevation	213	feet
Elev Change	308	feet
Slope	0.0046	ft/ft
Kirpich Tc	322	minutes
	5.4	hours
Total Drainage Area	**23.4**	sq mi

Time of Concentration for Downtown South Site to Rochester Heights subdivision		
Time	67	minutes

FEMA Preliminary FIS Data: (Q100 = 9,159 cfs)

Summary of Discharges

Flooding Source		Discharges (cfs)			
Location	Drainage Area (square miles)	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
− Rocky Branch (Basin 30, Stream 5)					
Hydrologic node located at 35.7574, -78.6384	3.15	2017	2883	3206	3971
Hydrologic node located at 35.7584, -78.6396	3.10	2008	2871	3193	3956
− Unnamed Stream					
Hydrologic node located at 35.7579, -78.6242	1.02	1356	1969	2226	2704
Hydrologic node located at 35.7574, -78.6296	0.45	536	874	1009	1273
Hydrologic node located at 35.7635, -78.613	0.33	460	660	727	826
− Walnut Creek (Basin 30, Stream 1)					
Hydrologic node located at 35.763, -78.6131	25.19	4673	7077	8290	11019
Hydrologic node located at 35.7622, -78.6137	25.16	4672	7076	8294	11034
Hydrologic node located at 35.7594, -78.6179	24.63	4893	7398	8704	11150
Hydrologic node located at 35.7578, -78.6239	23.49	5307	7985	9159	11158

Time of Concentration for Walnut Creek at Rose Ln

Flow Length	14.489	miles
	76501.9	feet
Upstream Elevation	521	feet
Downstream Elevation	199	feet
Elev Change	322	feet
Slope	0.00421	ft/ft
Kirpich Tc	369	minutes
	6.2	hours
Total Drainage Area	**23.4**	sq mi

Time of Concentration for Downtown South Site to Rose Ln.

Time	114	minutes

FEMA Preliminary FIS Data: (Q100 = 8,376 cfs)

Summary of Discharges

Flooding Source		Discharges (cfs)			
Location	Drainage Area (square miles)	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
− Unnamed Stream					
Hydrologic node located at 35.7608, -78.6041	1.58	1300	1925	2215	2584
Hydrologic node located at 35.7627, -78.6029	0.37	479	763	882	1104
− Walnut Creek (Basin 30, Stream 1)					
Hydrologic node located at 35.7626, -78.6026	27.89	4791	7253	8376	10938
Hydrologic node located at 35.7628, -78.6048	26.31	4671	7075	8161	10644