VARELA
Engineering & Management

City of Tonasket
STORMWATER PLAN

FUNDED BY:
State of Washington Department of Ecology
Agreement No. WQC-2018-Tonask-00124

December 2021

City of Tonasket
STORMWATER PLAN

FUNDED BY:

State of Washington Department of Ecology

Agreement No. WQC-2018-Tonask-00124

December 2021

MAYOR
MARILOU KRINER

CITY CLERK/TREASURER
ALICE ATTWOOD

PUBLIC WORKS SUPERINTENDENT
DARREN JOHNSON

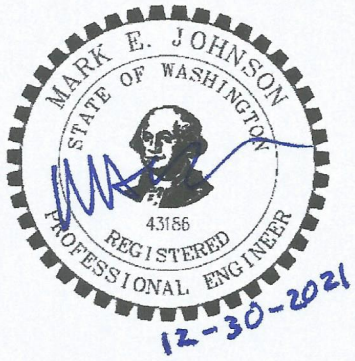
CITY COUNCIL
CHRISTA LEVINE
JEFF MCMILLAN
JILL RITTER
ALISA WEDDLE
MATT ALEXANDER

CITY OF TONASKET

Stormwater Plan

December 2021

The technical material and data contained in this Report were prepared under the supervision and direction of the undersigned whose seal as a professional engineer licensed to practice as such in the State of Washington is affixed below.



Professional Engineer

Varela & Associates, Inc.
601 W. Mallon Avenue, Suite A
Spokane, WA 99201

This project has been funded wholly or in part by the United States Environmental Protection Agency under an assistance agreement to the Washington State Department of Ecology. The contents of this document do not necessarily reflect the views and policies of the Environmental Protection Agency, nor does the mention of trade names or commercial products constitute endorsement or recommendation for use.

City of Tonasket

STORMWATER PLAN

Table of Contents

Table of Contents i

List of Figures iv

Appendices v

Abbreviations and Acronyms vi

References vii

Executive Summary 1

1.0 Introduction and Purpose 4

2.0 Planning Information and Background 5

2.1 Location, Topography, and Soils 5
2.2 Environmental Considerations 5
2.3 Population and Growth 6
2.3.1 Existing Population 6
2.3.2 Future Population Projections 6
2.3.3 Historical Trends 6
2.3.4 Population Projections 7
2.4 History and Planning Documents 8
2.5 Regulatory and Design Criteria Documents 8
2.5.1 Tonasket Municipal Code 8
2.5.2 Storm Water Management Manual for Eastern Washington 9
2.6 Wetlands 9
2.7 Land Use – Existing and Future 9

3.0 Existing Stormwater System Facilities 10

3.1 Drainage Basins/Catchments and Outfalls 10
3.2 Description of Storm Drainage System 10
3.2.1 Drainage Areas/Catchments/Basins 10
3.2.2 Discharge Outfalls 12
3.2.3 Treatment Systems 12
3.3 Condition of System 13
3.3.1 Intersection of Whitcomb Ave. and Third and Fourth Street 13
3.3.2 Erosion of Slope along SR20 at Storm Drain Outlets 13
3.3.3 Ponding on Delicious Street between Whitcomb Ave. and SR97 13
3.3.4 Outfalls 13
3.4 Areas Without Storm Sewer 13

4.0 Design Criteria and Runoff Modeling 15

4.1 Stormwater Design Criteria 15
4.2 Hydrology 15
4.2.1 Design Storm Events 16

4.2.2 Hydrologic Method 16
4.3 Hydraulics 16
4.4 Treatment 16

5.0 Existing Stormwater System Analysis 17

5.1 Stormwater Drainage Basins 17
5.1.1 Basin A 17
5.1.2 Basin B 17
5.1.3 Basin C 18
5.1.4 Basin D 18
5.1.5 Basin E 18
5.1.6 Other Stormwater Basins not Analyzed 18
5.2 Stormwater System Analysis Findings 19
5.3 Analysis Conclusions 21
5.3.1 Intersection of Whitcomb Ave and 3rd/4th Street 21
5.3.2 Ponding on Delicious Street between Whitcomb Ave. and SR97 21
5.3.3 Erosion of slope along SR20 at storm drain outlets 21
5.4 Service Life of Existing Stormwater System 21
5.5 Water Quality Impacts 22
5.6 Additional Stormwater System Observations 22
5.6.1 Inlet/Outlet Combination Culvert Crossings 22
5.6.2 Curb Removal at Third and Whitcomb 22
5.6.3 Discharge to Siwash Creek 22
5.6.4 36” Stormwater Pipe Discharge to Okanogan River 23
5.6.5 Railroad Crossing 23
5.6.6 Treatment 23

6.0 Improvements and Alternatives 24

6.1 Description of Previously Chosen Inlet Capacity and Conveyance Alternatives 24
6.1.1 Third and Fourth Streets from Whitcomb Avenue to Okanogan River 24
6.1.2 Whitcomb Avenue/US 97 from First Street to Sixth Street 25
6.1.3 Ponding on Delicious Street between Whitcomb Ave. and SR97 25
6.1.4 Erosion of Slope along SR20 at Storm Drain Outlets 25
6.2 System Treatment Alternatives 25
6.2.1 Third and Fourth Streets from Whitcomb Avenue to Okanogan River 26
6.2.2 Whitcomb Avenue/US 97 from First Street to Sixth Street 26
6.2.3 Ponding on Delicious Street between Whitcomb Ave. and SR97 (Basin E) 27
6.2.4 Other locations. 28
6.3 Preferred Alternatives 28
6.3.1 Third and Fourth Streets from Whitcomb Avenue to Okanogan River 28
6.3.2 Whitcomb Avenue/US 97 from First Street to Sixth Street 30
6.3.3 Ponding on Delicious Street between Whitcomb Ave. and SR97 30
6.3.4 Erosion of Slope along SR20 at Storm Drain Outlets 31
6.4 Preliminary Costs 32
6.5 Additional Engineering Required 33
6.6 Implementation Issues 33
6.6.1 Stormwater Pipe Replacements 33
6.6.1 Inlet/Catch Basin Replacement/Installation 33
6.6.2 Stormwater Treatment BMP Retrofits 33

7.0 Financing and Schedule 35

7.1 Summary of Projects 35
7.2 Funding for Planned Improvements/Sources 37
7.2.1 Stormwater Utility 38
7.2.2 Washington State Department of Ecology 38
7.2.3 US Department of Agriculture – Rural Development (RD) 39
7.2.4 Community Development Block Grant (CDBG) 40
7.2.5 Other Funding Programs 40
7.3 Stormwater Utility and Rates 41

8.0 Operation and Maintenance 42

8.1 Management and Personnel 42
8.2 Preventive Maintenance Program 42
8.2.1 Existing Stormwater Facilities Not Being Maintained 42
8.3 Monitoring 43
8.4 Emergency Response 43
8.5 Safety Procedures 43
8.5.1 Customer Complaints 45
8.6 Operation and Maintenance Improvements 45

List of Figures

(Located at end of body of Plan)

Figure 2-1 Existing Storm System

Figure 4-1 Basin Map

Figure 6-1 Preferred Alternatives Exhibit

- 6.3-1 Third and Fourth from Whitcomb to River
- 6.3-2 Whitcomb/US97
- 6.3-3 Delicious Street
- 6.3-4 SR 20 Erosion

Appendices

Appendix A Wetlands Inventory Map, Tonasket, WA

NRCS Soils Map for Tonasket, WA

Zoning map, **City of Tonasket** 2020 Comprehensive Plan

Existing Land Use, "Map III-1", **City of Tonasket** 2020 Comprehensive Plan

Land Use Designations, "Map III-2", **City of Tonasket** 2020 Comprehensive Plan

Appendix B NOAA Isopluvial maps

Stormwater Model Input and Output

Hydraulic Calculations for Gutter and Inlet Capacity

Appendix C Copy of SERP Documents

Appendix 6A Copy of Stormwater Utility Ordinance No. 792
Stormwater Utility Rate Table

Appendix 7A Copy of 2020 Department of Ecology funding offer final list

Copy of "Preliminary Stormwater Report for US 97/Whitcomb Avenue Project", October 2019

Abbreviations and Acronyms

ac-ft	acre-feet
bgs	below ground surface
BMP	best management practices
CAD	computer-aided drafting
cfs	cubic feet per second
Council	City Council
CWA	Clean Water Act
DOH	Washington State Department of Health
ECY	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ERU	Equivalent Residential Unit
ft/sec	feet per second
FTE	full-time equivalent
gal	gallon(s)
gpm	gallons per minute
MG	million gallons
mg/L	milligram(s) per liter
msl	mean sea level
MS4	municipal separate storm sewer system
N/A	not applicable
no.	Number
NRCS	USDA Natural Resources Conservation Service
NPDES	National Pollutant Discharge Elimination System
OFM	Washington State Office of Financial Management
O&M	operation and maintenance
PGIS	pollutant generating impervious surface(s)
ppb	parts per billion
ppm	parts per million
psi	pounds per square inch
PVC	polyvinyl chloride
RCW	Revised Code of Washington
RD	USDA – Rural Development
SERP	Washington State Environmental Review Process
SEPA	Washington State Environmental Policy Act
TMDL	total maximum daily loads
UIC	Underground Injection Control
USDA	United States Department of Agriculture
VOC	volatile organic chemical or compound
WAC	Washington Administrative Code
WRIA	Watershed Resource Inventory Area
WSDOT	Washington State Department of Transportation

References

Highland Associates	*City of Tonasket Comprehensive Plan*, December 2020
Washington State Department of Ecology	*Stormwater Management Manual for Eastern Washington*
Okanogan Watershed Planning Unit	2009 Watershed Resource Inventory Area (WRIA) 49 Plan
Washington State Department of Ecology	*Lower Okanogan River Basin DDT and PCBs Total Maximum Daily Load* Submittal Report, October 2004
Varela and Associates	*City of Tonasket Wastewater Facility Plan*, 1998
Varela and Associates	*City of Tonasket Stormwater Infrastructure Inventory, Assessment and Improvements Implementation Plan*, November 2014

,

Executive Summary

Overview

This Stormwater Plan (SWP or Plan) evaluates the City of Tonasket's stormwater system. This Plan was prepared with funding from the State of Washington Department of Ecology (ECY) supplemented by the City's Stormwater Utility funds. The SWP documents the existing storm drainage facilities, identifies problem areas, and evaluates possible solutions and recommendations for improvements.

The City of Tonasket is in north central Washington, 23 miles south of the Canadian border and 24 miles north of Omak on the Okanogan River. The Okanogan River is included in Washington's list of impaired waters compiled under Section 303(d) of the Clean Water Act. Stormwater discharged to the Okanogan River contributes pollutants to the river. This Plan provides an evaluation of possible treatment technologies to clean stormwater runoff before being discharged to the river.

This Plan should be considered as a "living" document: as improvements are made, as the city grows, as water quality requirements change, modeling and maintenance of the system should be updated to identify potential problem areas and to determine future improvements needed to meet City needs and regulatory requirements.

Existing Stormwater Facilities

The City's stormwater system has approximately 7,000 linear feet of pipe, more than 100 inlets, catch basins, and manholes. The stormwater system has one outfall on Siwash Creek, one of Bonaparte Creek and three on the Okanogan River. The stormwater system requires substantial investment by the City for maintenance and improvements. Most of the system was installed in the early 1960s.

Portions of the stormwater system have been upgraded with street improvement projects. In many areas the collection system is undersized and does not provide any stormwater treatment.

Because of inadequate system capacity, flooding, particularly along Whitcomb Avenue, has caused damage and traffic delays, water depth has been over 16 inches on State Highway 97. Flooding impacts include inflow into the wastewater collection system, damage to commercial and residential structures, and scouring of the roadways and neighboring properties resulting in erosion and sediment entering the Okanogan River. Collected sediment also plugs and reduces the capacity of the stormwater pipes, requiring maintenance cleaning

System Analysis

Engineering analysis of the city's existing stormwater system was performed previously in 2014. The report investigated possible causes of incidences, complaints, and property damage due to flooding at different locations in the city. Since flooding occurred during large precipitation events, the 2014 analysis studied a larger design storm (the 50-year design storm) to determine where weaknesses exist in the system. Results of the 2014 Inventory indicated issues with inadequate inlet and pipe network capacity as well as high pavement overlay issues along US 97 that reduced gutter flow and inlet capacity.

This 2021 Plan expands on the work developed in 2014 and evaluates possible stormwater treatment alternatives for the six-month design storm.

Improvement Alternatives

Improvement alternatives for the stormwater system are evaluated for both capacity (mitigation for inlet and conveyance capacity) and stormwater runoff treatment. Capacity alternatives were evaluated in the

2014 Inventory for areas requiring improvement. Treatment alternatives include 1) do nothing, 2) cartridge-style treatment vaults, 3) bio-infiltration swales, and 4) pre-treatment hydrodynamic separators.

Another stormwater BMP used for both treatment and disposal, drywells, was considered, particularly given the hydrologic group A soils that exist in the city. However due to the relative proximity of the river water surface elevation to the ground surface elevation in the city at the locations of existing and proposed stormwater facilities, this option was determined to be impractical for the larger improvements proposed. This should not discourage drywell use at higher elevations in the city and for private projects at higher elevations.

Hydrodynamic separators are selected as a treatment alternative that will improve City stormwater quality discharged to the Okanogan River by removing much of the trash, sediment, and oils from runoff. The separators are considered a pretreatment technology since they are not approved by the State department of Ecology for what is termed "basic treatment". Basic treatment requires at least 80% removal of total suspended solids (TSS). While laboratory testing achieved total removal rates at this level with hydrodynamic separators, smaller grain-size (d_{50} less than 50-picometers) solids may be removed at a lower rate. Given the constraints of land area and funding for treatment improvements, the hydrodynamic separators are considered a reasonable compromise to improve water quality discharged to the river.

The recommended Improvements and capital cost estimates are shown in table ES-1.

Table ES-1 Summary of Recommended Improvements

Description	Estimate
Third and Fourth Streets from Whitcomb Ave. to the Okanogan River. - 1,930 LF of new 12" to 42" pipe, 8 catch basins, manholes	$ 1,272,000
Whitcomb Avenue/US97 from First Street to Sixth Street [2] - 3,300 LF of new 12" to 30" pipe, 65 CBs/MHs, 3 Hydrodynamic Separators	$ 2,283,000[1]
Ponding on Delicious Street between Whitcomb Ave. and SR 97 [2] - 50 LF of new 8" to 12" pipe, 6 CBs/MHs, 1 Hydrodynamic Separator	$ 257,000
Erosion of slope along SR 20 at storm drain outlets - 150 LF of new 12" to 24" culvert, 3 stilling wells	$ 87,000
Total	$ 3,899,000

[1] Currently funded for stormwater ($1.4M). Surface/road restoration assumed funded by other future sources as part of a larger project.

[2] Proposed with treatment improvements

Financing and Schedule

The stormwater utility allows the city to pursue capital improvements to the stormwater system along with funding annual operation and maintenance. The stormwater utility fund is relatively new. It is not sufficient to fund the cost of the improvements identified in this Plan. To implement the recommendations made in this plan, additional funding sources will be needed. Possible funding sources include the Department of Ecology, CDBG, USDA Rural Development, PWTF, and legislative request.

Acquiring sufficient funds for the project may take some time. A proposed schedule is shown in Table ES-2. The schedule may change depending on funding availability.

Table ES-2 Proposed Implementation Schedule

Item	Date	Notes
Plan Approval by City Council and ECY	October 2021	
Apply for Design and Construction Funding (ECY, CDBG, RD, PWTF, Legislature)	October 2021 through October 2022	$1.5M ECY funding offer for Whitcomb/US97 Stormwater Improvements received in 2020
Design and Construction	January 2023 through October 2025	

1.0 Introduction and Purpose

Background

The Stormwater Plan, funded through the Washington State Department of Ecology (ECY) and the City of Tonasket, plans upgrades to the City of Tonasket's stormwater system that will improve water quality by reducing discharge flows and limiting sediment discharge to the Okanogan River and its tributaries. Implementation of this Plan will also control flooding which currently affects health and safety of the residences of Tonasket.

This Plan provides an update to the inventory of the City's stormwater system performed in 2014, *City of Tonasket Stormwater Infrastructure Inventory, Assessment and Improvements Implementation Plan*, November 2014 (2014 Inventory), analyzes hydrologic parameters to determine peak and volume stormwater flow, determines cost feasible stormwater treatment and conveyance alternatives, and identifies possible funding scenarios for the design and construction of the preferred alternatives.

Purpose and Scope

The stormwater system evaluation that is part of this plan determines stormwater system deficiencies, identifies improvement alternatives, and describes preferred project alternatives. This information is to assist the city in its consideration of the needs of the city stormwater system and urgency as it balances funding for other city systems.

The purpose of state funding through ECY is to improve the water quality of the Okanogan River. The specific tasks from the engineering agreement between the City and ECY are:

- Collect and map existing conveyance and treatment facilities (see **Figure 2-1**). There are no existing treatment facilities.
- Identify outfalls and discharge points.
- Research property ownership, land use, existing soils, wetlands, topography, and drainage areas as related to stormwater facilities

The Stormwater Plan (SWP) is to include:

- Determine and evaluate the condition and capacity of existing stormwater system.
- Confirm and identify problem areas based on evaluation and discussions with the City.
- Drainage basins and runoff quantity from contributing basins.
- Establish criteria for the design storm by which the system is to be evaluated and improvements designed.
- Evaluate the existing system.
- Confirm and identify potential stormwater improvements, locations, and alternatives
- Evaluate alternatives for upgrades.
- Develop a prioritized project list to include project costs, life cycle analysis, & funding sources.
- Discuss stormwater utility.
- Prepare a Stormwater Plan summarizing the results of the above.

2.0 Planning Information and Background

2.1 Location, Topography, and Soils

The City of Tonasket is in Okanogan County in north-central Washington. The city is located on a high area between two creek drainages and the east bank of the Okanogan River, with isolated areas within city boundaries across the river. The topography quickly rises east-southeast in the direction of the school campuses and beyond. The land in the city east of Whitcomb/SR 97 rises at about seven to nine percent grade, while west of SR 97 slopes more gradually at about two to three percent to the Okanogan River (**Figure 2-1: Existing Storm System Map and Figure 4-1 Basin Map**). Tonasket is located at the intersection of SR20 and SR97. The city contains five landscaped parks or public spaces, which the two largest are adjacent to the river.

The City's address, phone number, and web page are below:

City of Tonasket
209 South Whitcomb Avenue
Tonasket, WA 98855
(509) 486-2132
www.tonasketcity.org
Mayor: Marilou Kriner
Clerk/Treasurer: Alice Attwood
Public Works Superintendent: Darren Johnson

According to the NRCS, soils within the city and drainage basins consist of different groups of sandy loam. Refer to NRCS soils map in the **appendix**. Soils are primarily hydrologic group "A" soils, which are conducive to drywell construction. There are smaller pockets of hydrologic group "B", "C", and "B/D" soils in the area, which are less suitable for infiltration.

Despite the prevalence of hydrologic group A soils, infiltration and drywell installation in the retrofit of the city's main system, and the new area recently annexed, has a concern due to ground elevations relative to the river water surface elevation. The elevation difference between ground in the primary area of the city's stormwater system , downtown, and the river elevation is only about 20 feet. A drywell or other structure, particularly one that would drain from the system elevation, could be at an elevation that conflicts with the water table. The recently annexed part of the city is also at about the same ground elevation as downtown and so infiltration or drywells installed there could have the same issue. However, infiltration designs, particularly uphill and for aquifer recharge are encouraged.

2.2 Environmental Considerations

The Okanogan River is included in Washington's list of impaired waters compiled under Section 303(d) of the Clean Water act due to some water quality impairments. A total maximum daily load (TMDL) for DDT and PCBs has been completed for the Okanogan River and tributary streams (approved by EPA in February 2005). No enforcement orders are known to exist specifically toward the City of Tonasket.

The Okanogan River begins in Canada and enters Washington through Osoyoos Lake. Its drainage area at the City of Tonasket is approximately 7,300 square miles. Average flows vary from as low as 320 cfs in the summer to an average of 9,000 cfs in the spring and a recorded peak of 44,000 cfs in 1972.

Contributing tributary, Siwash Creek, experiences peak flows from 0 to over 50 cfs (USGS station 12444400). Bonaparte Creek has annual peak flows between 20 cfs and 140 cfs (USGS station 124445500).

The Tonasket SWP is funded in part by a federal loan (CWSRF) and Tonasket is required to perform an environmental review through the State Environmental Review Process (SERP). A copy of the SERP documentation including SEPA checklist, the determination of non-significance (DNS), advertisement, and public meeting minutes are included in **Appendix C**.

Individual projects proposed in this SWP are expected to also require environmental review. Proposed projects would be primarily in existing public right-of-way for public streets and roads and therefore are not expected to affect farmland, range, forest, wetlands, the 100-year floodplain, endangered species, or critical habitats any more than the existing system would be currently.

2.3 Population and Growth

2.3.1 Existing Population

According to the City's 2020 draft Comprehensive Plan the current population for the City of Tonasket is estimated to be 1,115.

2.3.2 Future Population Projections

For the purposes of infrastructure planning, a population at the end of the 20-year planning period is projected. Available data sources include the 2012 Tonasket Water System Plan, Washington State Office of Financial Management (OFM) population projections, known development plans, and the City of Tonasket's draft 2020 Comprehensive Plan. There is no known state or federal agency which makes projections for smaller cities such as Tonasket nor does Okanogan County's comprehensive plan provide projections for Tonasket as a separate incorporated area. Therefore, population projections are developed in the following sections.

2.3.3 Historical Trends

The City of Tonasket's historical population is shown in the following table.

Table 2.3-1 – City of Tonasket Historical Population [1]

Year	Population within City Limits	Percent Increase or (Decrease) per decade[2]
1930	513	-
1940	643	25%
1950	957	49%
1960	958	0%
1970	951	-1%
1980	985	4%
1990	880	-11%
2000	994	13%
2010	1,032	4%
2020	1,115	8%

1. *Figures taken from the City of Tonasket 2020 draft Comprehensive Plan*
2. *Rounded to the nearest whole percent*

The data indicates the population in Tonasket has not fluctuated significantly since 1950. The increase from 2010 to 2020 can be attributed in part to the annexation of the Bonaparte Creek area in 2013. Refer to **Section 2.3.4.1** for discussion on annexation.

2.3.4 Population Projections

2.3.4.1 City of Tonasket 2020 draft Comprehensive Plan

The City's 2020 draft Comprehensive Plan indicates that population growth is expected to occur predominantly through annexation. To quote the Comprehensive Plan, "Based on the U.S. Census figures provided, population over the past decade indicates a significant decline. It is assumed that some of this growth is occurring outside of the Tonasket incorporated boundaries and will be annexed in the future". The following table shows population projections based on growth projections in the City's 2020 draft Comprehensive Plan.

Table 2.3-2 – Population Projections

Projection Series	2020 Population [1]	2030 Population (10-yr)	2040 Population (20-yr)	Average Annual Growth Rate [2]
Low	1,115	1,142	1,170	0.24%
Medium	1,115	1,155	1,195	0.35%
High	1,115	1,170	1,307	0.48% (10-yr) 0.80% (20-yr)

1. *Existing population. Refer to* ***Section 2.3.1***
2. *Calculated based on growth projections in the City of Tonasket 2020 draft Comprehensive Plan. In general, annual growth rates are expected to remain constant throughout the 10-year and 20-year planning period within each projection series. A higher growth rate is calculated for the 20-year high series to account for growth outside the Tonasket incorporated boundaries that may be annexed in the future.*

The City of Tonasket does not have large open areas available for new development. Infill of undeveloped or partially developed parcels is very limited. As discussed in the Comprehensive Plan, population growth in the city is expected to occur primarily through annexation. The most recent annexation was finalized in 2013 for an area on south side of the city in the Bonaparte Creek area. The annexation included approximately 48 acres of partially developed Residential Two (R-2) and Rural Residential (R-R) zoned land.

Annexations have a corresponding increase in land area to the city that may increase stormwater runoff contribution and responsibility. The city plans to also annex and extend utilities to an area consisting of approximately 78 acres south of the city and east of US 97. This area includes the City Shop, WSDOT Shop, rodeo facility, and several other commercial enterprises, but is otherwise underdeveloped. The land also includes ample vacant areas suitable to fully develop commercial, light industrial, residential, and recreational development potential. This annexation also provides new and improved access to the city athletic parks.

The annexation area does not currently have stormwater facilities, or at least none connected to the existing system. Future development of this area may require implementation stormwater facilities however, the area is hydraulically separated and any stormwater facilities would be separate from the existing system. Any future development is to follow the SWMMEW and the city code for stormwater improvements.

2.4 History and Planning Documents

The 2014 *City of Tonasket Stormwater Infrastructure Inventory, Assessment and Improvements Implementation Plan* (2014 Inventory) was developed to begin to address incidents of flooding that have occurred in the city of Tonasket. The 2014 Inventory produced several recommendations for improving collection and conveyance of stormwater facilities within the city to mitigate flooding in the city.

The 2020 Comprehensive Plan for the City of Tonasket plan reviews current land use in the City and future land use within the city and the Urban Growth Boundary (UGA). Copies of land use planning exhibits and figures are in the **appendix**.

Plans and reports related to stormwater facilities or improvements built or prepared prior to 2014 are not available. Multiple site visits and discussions with city staff informed development of this Plan.

2.5 Regulatory and Design Criteria Documents

Though currently not subject to NPDES discharge permit requirements, the city's storm system discharges to the Okanogan River which is included in Washington's list of impaired waters. Total maximum daily loads (TMDL's) have been completed for the Okanogan River and tributary streams, for protecting and restoring water quality. The City of Tonasket has typically followed design criteria that adhere to the 2019 Stormwater Management Manual for Easter Washington (SWMMEW) to meet the minimum standards set by ECY for stormwater design.

2.5.1 Tonasket Municipal Code

The City of Tonasket has codified requirements for stormwater mitigation for new development and land actions. Also in 2018, the City of Tonasket passed Ordinance No. 792, adopting a Storm Drainage and Surface Water Utility and created new Chapter 12.30 to the Tonasket Municipal code. Refer to **Appendix 6A** for copy of ordinance.

2.5.2 Storm Water Management Manual for Eastern Washington

The Storm Water Management Manual for Eastern Washington (SWMMEW) provides guidance for the measures necessary to control the quantity and quality of stormwater in eastern Washington. Local jurisdictions use this manual to set stormwater requirements for new development and redevelopment projects. Land developers and engineers use this manual to design permanent stormwater control plans, develop construction stormwater pollution prevention plans, and determine stormwater infrastructure. Businesses use this manual to help design their stormwater pollution prevention plans.

2.6 Wetlands

Freshwater emergent wetlands and freshwater ponds have been mapped previously according to the United States Fish and Wildlife Service. Refer to wetland inventory map located in the **appendix** for locations of wetlands. The mapped wetland areas are not connected to the city's stormwater system. Stormwater BMPs are not allowed within the wetlands.

2.7 Land Use – Existing and Future

Land use determines the locations and densities at which growth can occur in a given area. Planned land use is used to predict where future growth and development will occur. The City of Tonasket Comprehensive Plan maps out land use within city limits and the UGA. Copies of maps representing current zoning in the city and future land use are included in **Appendix 2A**.

The largest zone within the drainage catchments or basins for the municipal storm drainage system is single and multi-family residential, with a mix of public and retail/service commercial zones along the downtown corridor. The area between Locust Way and Western Avenue is zoned as industrial and there are some rural residential and mixed-use zones on the outer edges of the city.

The established commercial areas exist along Whitcomb Avenue. The general industrial area west of Whitcomb Avenue along the Western Avenue area includes railroad access. The fruit processing industry, which was strong at one time, is essentially shut down and the city is looking to replace that industrial use.

There is no agricultural or forest resource land within the city limits.

Annexation is identified as the driver of future growth in the city of Tonasket and so land use designations cannot be predicted as accurately since annexation can change land use and designations through the annexation process and depend on the often-unpredictable nature and need for annexations. Land use designations and uses through annexation can change more rapidly than Comprehensive Plan changes. It is expected however that future annexations will be primarily residential uses and zones with minor areas of commercial properties.

3.0 Existing Stormwater System Facilities

3.1 Drainage Basins/Catchments and Outfalls

Stormwater runoff within the city of Tonasket would generally drain downhill from east to west in the direction of Siwash Creek, Bonaparte Creek, and the Okanogan River. There are five pipe outfalls that outlet from the municipal stormwater system to the creeks and river. The largest outfall is a 36" pipe that discharges to the Okanogan River. Runoff that is not collected by the municipal system is assumed to naturally disperse or travel overland into the creeks and river. Hydrologic Group A soils are prevalent around the city and significant infiltration is expected to be occurring of stormwater runoff that falls or reaches pervious vegetated areas and runoff that collects in earthen ditches. Pervious areas, such as lawns and landscaped areas that are not hardscaped, in the city are not expected to produce runoff due to the type of soils.

3.2 Description of Storm Drainage System

An overall map of the city of Tonasket's municipal stormwater system is **Figure 2-1**. Tonasket's stormwater system was constructed in 1963. Paved roadways with curbs, inlets, catch basins, pipe networks, unconnected inlets ("bubblers"), and drywells make up the system. Portions of the system have been upgraded as a part of street improvement projects. In general, the storm system ultimately discharges directly to area surface waters Okanogan River, Bonaparte Creek, and Siwash Creek from five existing discharge outlets. The upper part of the city, downhill from the high school and grade school campuses, contains "bubblers"—inlets or catch basins not connected by piping and without a discharge—at a few intersections throughout the neighborhood. The bubblers are not currently maintained and could be considered not functional. Semi-annual stormwater flooding events have ben reported with depth as much as 16 inches on State Highway 97. Flooding impacts include inflow to the wastewater system, commercial and residential structures, and curb to curb scouring of the roadways and neighboring properties resulting in erosion and sediment migration to the Okanogan River as well as conveyance system plugging and outfall piping failures.

There are no known connections to the sanitary sewer system. Sanitary sewer connections to the stormwater system are not allowed.

The majority of the City's storm drain system is located in the downtown area, which is also the area with the most impervious surfaces. Refer to **Figure 2-1** at the back of this document. The existing system is further described in Table 2-1 in following section.

3.2.1 Drainage Areas/Catchments/Basins

The following table contains a summary of Tonasket's existing stormwater basins throughout the city.

Table 3-1 Description of Drainage Basins and Facilities

Basin	Catchment/Basin Area Description	Description of Collection System	Description of Outlet
Basin A	Approximately 100 acres and consists of a mixture of residential, commercial, and rural land uses. Runoff is collected by catch basins in the downtown area after flowing from the open areas on the east side of town, through the residential neighborhoods and into the downtown corridor/US97.	The collection system of this area is primarily located in the downtown area at Whitcomb Avenue and Western Avenue between Third and Fourth Streets. The pipe ranges from 12”-36” concrete with some PVC and PE pipe in Sixth Street.	Flow from Basin A travels through Basin D (Third Street) by pipe then discharging to the Okanogan River.
Basin B	Approximately 10 acres of residential area along Seventh Street. Catch basins collect runoff along Seventh Street and Whitcomb Avenue.	There is a small section of piping running along Whitcomb Avenue towards Bonaparte Creek that consists of 12”-18” PVC.	Flow discharges to Bonaparte Creek.
Basin C	12 acres of industrial area between Fourth and Sixth Streets and the Okanogan River and Western Avenue. Catch basins collect runoff along Fourth Street.	The drainage system runs through Fourth Street from Western Avenue to the discharge point and consists of 12”-22” concrete pipe.	Flow discharges to the Okanogan River just south of the Fourth Street bridge.
Basin D	10 acres of industrial area along the railroad tracks between Fourth Street and Jonathan Street.	The collection system for Basin D is located along Third Street and along First Street. The pipe consists of 14”-36” concrete.	Flow discharges to the Okanogan River through two separate outlets (at Third Street and First Street).
Basin E	20 acres of rural residential area north of Jonathan Street and east of Western Avenue.	A mixture of 8”-12” concrete, PVC, and corrugated piping is located on Delicious Street between Whitcomb Avenue and Western Avenue before flowing North towards Siwash Creek.	Flow discharges to Siwash Creek where US97 crosses.
School Basin	15 acres at the school. City personnel report that runoff is contained by a series of flow control facilities and a stormwater piping network that eventually drains to a concrete lined open channel located south of SR20 that discharges to Bonaparte Creek.	The collection system for this area consists of flow control facilities, a stormwater piping network, and a concrete lined open channel. The condition of the existing concrete lined open channel is poor and contains many cracks and fractures, with several locations of collapsed side walls.	Flow discharges to Bonaparte Creek.

Play Fields Basin	30 acres of rural area that borders the north side of the school basin containing the baseball, softball, and soccer fields.	The collection system for this basin, if runoff travels that far, is the three inlets and connected drywells that are located along the south side of Jonathan Street.	Runoff does not have a concentrated discharge point but rather a localized low area between Jonathan/Havillah Rd. and Division St. that stores, infiltrates stormwater runoff.

3.2.2 Discharge Outfalls

The city has five outfalls. Figure 4-1 shows the locations of the outfalls and contributing drainage basins.

Table 3-2 Discharge Outfalls

Drainage Basin	Existing Basin 50-year Peak Flow from *2014 Inventory* (cfs)	Outfall Size	Material	Location
Basin A	91	36”	Concrete Pipe	Third Street and Okanogan River
Basin B	8	12”	CPE	Whitcomb/US97 and Bonaparte Creek
Basin C	18	22”	Concrete Pipe	Fourth St. and Okanogan River
Basin D	9	14”	Concrete Pipe	First St. and Okanogan River
Basin E	8	12”	CMP	Whitcomb/US97 and Siwash Creek

3.2.3 Treatment Systems

Stormwater treatment is not currently part of the stormwater system in Tonasket. The stormwater system has outfalls that discharge directly to Siwash and Bonaparte Creeks and the Okanogan River. Tonasket is located in a Critical Aquifer Recharge Area (Map III-4 “Critical Aquifer Recharge Areas”, prepared by Highlands Associates, 8/25/20, City of Tonasket 2020 Comprehensive Plan). Stormwater treatment could have a more direct benefit in this system than those with more indirect discharge or dispersal of stormwater and do not discharge directly to a surface water. While not included in this Plan, infiltration designs that provide both stormwater disposal and treatment at locations above Highway 97 and the Okanogan River elevations are encouraged in the future to promote aquifer recharge.

3.3 Condition of System

The stormwater collection system is nearly 60 years old. Most of the piping is concrete, which is prone to cracking and leaking at joints. Inlet grates are surface mounted in asphalt and typically do not include better-performing combination inlets with openings in the curb at sump locations. There appears to be overlays in the areas of the grates along Whitcomb/US97 that may have altered drainage patterns and grades in the areas of the grates. The city has identified several locations which experience flooding during large stormwater events. Reports and photographs of flooding erosion are in the 2014 Inventory report.

Specific problem areas are described in the following sections:

3.3.1 Intersection of Whitcomb Ave. and Third and Fourth Street

Seasonal flooding occurs at the intersections of Whitcomb Avenue and Third Street and Fourth Street. These two intersections are sump locations on the east side of Whitcomb. Only one inlet is at each corner of each intersection. A trench drain was installed just uphill on each of Third and Fourth streets, but based on conversations with city staff and the photographs the trench drains are ineffectual at providing relief to the single inlets at the sump locations at these intersections. City staff currently removes the sump grates at these locations upon receiving report or notification of storm events to increase flow capacity of the individual inlets in an effort to prevent overflow to the other side of Whitcombe and properties.

3.3.2 Erosion of Slope along SR20 at Storm Drain Outlets

The slopes along SR20 at the existing storm drain outlets are experiencing erosion caused by stormwater flow exiting the culvert outlets at a velocity which exceeds the slope's ability to remain stable.

3.3.3 Ponding on Delicious Street between Whitcomb Ave. and SR97

Stormwater runoff ponds in Delicious Street between Whitcomb Avenue and SR97. There is a series of inlets/catch basins in Delicious Street, Whitcomb Avenue, and SR97 connected to a pipe network that discharges to Siwash Creek. The location at which the ponding occurs is at the entrance to a local grocery store, which creates access problems when flooding occurs.

3.3.4 Outfalls

As mentioned previously, the city has five discharge outfalls to surface waters at various locations. The city's primary 36" concrete stormwater discharge piping to the Okanogan River has a steel screen attached at the outlet. During a storm even in the spring of 2014, the screen at the outlet was blocked with debris that the last length of concrete pipe detached from the upstream joint. While this 36" discharge outfall sees highest flows and is in a visible location, the rest of the discharge outfalls are believed to be at no less risk of this type of failure.

3.4 Areas Without Storm Sewer

As can be seen from the basin map (Figure 4-1) there are areas of the city where the municipal stormwater system does not collect runoff and runoff is dispersed, infiltrated, or runs off downhill or into one of the surface waters. This is the case with the smaller, more dispersed parts of the city of Tonasket on the west side of the Okanogan River, including the airport, cemetery, and neighborhood southwest of town. This is

also the case with the annexed area south of Bonaparte Creek. No reports of flooding or erosion issues related to stormwater in these areas are known to exist at this time. This may change with development of these areas, and there is city policy and code for development to address stormwater. Some of these areas of the city may have an advantage for stormwater mitigation in that some are adjacent to city parks or open space that can disperse or even treat stormwater before it reaches one of the surface waters. As these areas currently contain significant majority pervious land covers and have natural stormwater mitigation in the form of dispersion in pervious areas with hydrologic group A soils, stormwater mitigation for these areas is not proposed to be changed in this Plan. If future development of these areas proposes to increase impervious and pollution generating surfaces, review of any development to the recommendations in the SWMMEW will be required.

4.0 Design Criteria and Runoff Modeling

Tonasket is not currently subject to stormwater discharge permit requirements under the National Pollutant Discharge Elimination System (NPDES), and so is not yet required to provide mitigation for stormwater runoff nor stormwater treatment prior to discharge. The exceptions to regulation would be registration of drywells and other underground infiltration structures through the state UIC program, and NPDES discharge permits for construction activities over one acre in size. The City's development ordinance (16.32.050) requires design of stormwater facilities for new developments. The city's stormwater utility ordinance (No. 792) provides additional guidelines for allowable discharges to the stormwater system and means to finance improvements.

The City's stormwater system discharges to the Okanogan River, Siwash Creek and Bonaparte Creek which are included in Washington's list of impaired waters. Total maximum daily loads (TMDLs) have been completed for the Okanogan River and tributary streams to protect and restore water quality. The City of Tonasket has typically followed design criteria that adhere to the Stormwater Management Manual for Easter Washington (SMMEW) to meet the minimum standards set by ECY for stormwater design. This section describes the criteria for evaluating the adequacy of the existing system and for design of future facilities.

4.1 Stormwater Design Criteria

Stormwater system evaluation is based on theoretical storms with estimated return periods. The return period is the probability of the storm occurring in any given year. For example, the 5-year storm will statistically occur on the average of once every 5 years; the 100-year storm once every 100 years; etc. However, there is no guarantee a high precipitation storm will not occur more frequently (e.g. a 100-year storm could occur two years in a row). Design of storm drainage facilities is a balance between flood risk protection and costs of drainage improvements, including operation and maintenance.

The City's ordinance (16.32.050) for new development requires stormwater facilities for new developments be designed for a 10-year storm event. Proposed conveyance improvements are generally sized for the 10-year NRCS Type II 24-hour rainfall event (design storm). The overall pipe conveyance capacity of the Tonasket's stormwater system was evaluated in 2014 due to the city's existing flooding issues, and resulting property damage. A more conservative storm event was chosen for evaluation in the 2014 Inventory, the 50-year design storm, which produces larger flows than the city-required 10-year storm. The results of pipe flow analysis from the 2014 Inventory using the 50-year design storm is reprinted in this Plan with minor updates. Calculations analyzing the pipe network using the city-standard 10-year design storm, for proposed improvements, are included in the appendix of this Plan.

This report was prepared in accordance with the Stormwater Management Manual for Eastern Washington.

4.2 Hydrology

Volume and rate of stormwater runoff for a given drainage area is determined by hydrologic analysis. There are several accepted hydrologic analysis methods outlined/summarized in the SMMEW. Hydrologic analysis and design of the City of Tonasket Stormwater systems and best management practices (BMPs), discussed in this report, is in accordance with the guidelines of the SMMEW and City code.

The total depth of rainfall for storm recurrence intervals and 24-hour duration are published by NOAA in the form of isopluvial maps (**Appendix B**).

Offsite basins can contribute flow through the city as "pass-through" and contributing flow. The offsite basins are currently undeveloped and not expected to develop as they are outside the Urban Growth Boundary. The city's system is technically a combined system, so flows are generally routed through facilities within the city rather than passing separately. Peak flows are expected to occur later for undeveloped land cover than for developed and as such, peak flow analysis will show highest peak for the initial peak for runoff from developed basins and the offsite is ignored for peak flow analysis and the calculated flow rates do not include the "pass through" flows from the offsite basins.

4.2.1 Design Storm Events

The SCS Type II 24-hr 6-month and 10-year design storms are utilized to evaluate the existing facilities and proposed improvements for each basin. The 6-month storm is utilized to analyze treatment requirements, and the 10-year design storm is used to analyze conveyance and storage requirements. The 100-year design storm is used in the model to understand potential flooding impacts.

4.2.2 Hydrologic Method

The SCS / TR-55 method is used model the stormwater system. Calculations are preformed using Autodesk Storm and Sanitary Analysis software (SSA). The software contains a built-in rainfall designer with standard storm time series data for different regions, including standard storms for Okanogan County.

The time of concentrations and runoff coefficients (CNs) for each basin or sub-basin are per Technical Release 55. Runoff coefficients representing individual basin characteristics are determined based on hydrologic soil group, land use, and cover type classification.

The city of Tonasket Municipal code states that stormwater peak flow analysis is to be completed using the Rational Method. Storage volume analysis is to be completed using the "Rational-Stored Rate Method". The rational method produces acceptable results for small uniform drainage basins, but for this size of analysis a more robust method is needed for this city-wide evaluation. Acceptable methods within the SMMEW are used (SCS/TR55) for storm routing to determine peak flow rates and volumes.

4.3 Hydraulics

The SCS / TR-55 method (using SSA software) is used to determine peak flows for pipe designs and pipe networks analyzed using open-channel flow methods. The Rational Method is used to determine flows for inlet capacity analysis. Pipe and inlet design is completed per the methods outlined in the WSDOT Hydraulics Manual.

4.4 Treatment

Proposed water quality facilities are evaluated for flow or rate based BMPs using the 6-month design storm. In some cases, the volume method of treating the first ½-inch of runoff is used to preliminarily determine swale sizing and land impact of treatment alternatives. Stormwater treatment would be a retrofit within the existing system and so treatment is to be proposed to the maximum extent possible within the existing system for the improvements proposed.

5.0 Existing Stormwater System Analysis

Significant portions of this chapter 5 narrative, below, is taken from the *City of Tonasket Stormwater Infrastructure Inventory, Assessment and Improvements Implementation Plan*, prepared by Varela & Associates, Inc., dated November 2014 (2014 Inventory). The narrative of this chapter includes revisions/updates to the 2014 Inventory to incorporate new information.

5.1 Stormwater Drainage Basins

Existing stormwater drainage basins are defined by locating and then tracing the stormwater outfalls from their point of discharge to the upper basin boundary. Drainage basins were delineated in a manner that would result in runoff characteristics that are as homogeneous as practicable. Based on the characteristics, some basins were divided into sub-basins to more accurately represent the behavior of stormwater through a basin. The primary hydrologic parameters analyzed within a basin or sub-basin was land use, hydrologic soil type, ground cover and slope.

5.1.1 Basin A

Basin A is the major city watershed contributing stormwater to the City's primary stormwater system eventually discharging to the Okanogan River on Third Street (See **Figure 4-1**). Basin A includes approximately 100 acres of residential and commercial developed land. Stormwater runoff is directed to drainage structures via overland flow, where it enters the collection system that discharges to the Okanogan River at Third Street. The collection system includes catch basins and storm piping (12"-36" concrete, PVC, and PE pipes) that collect and route the runoff through Basin D. Basin A is separated into seven different sub-basins, A1-A7. Each sub-basin is analyzed separately by characterizing specific parameters that affect run-off.

Many of the up-gradient catch basins within Basin A are not connected to the main storm piping system and are intended to act as bubblers, overflowing back into the roadway and routing to connected down-gradient catch basins. Many of these bubblers are currently not functioning as intended due to accumulation of sediment and debris and need to be cleaned.

The city currently experiences substantial flooding during storm events at the intersections of 3rd and 4th Street with SR 97 (Whitcomb Avenue). Citizens and property owners have expressed significant concern regarding this flooding. Improvements to the existing collection system are proposed, including new storm piping and catch basins/inlets, adequately sized to convey runoff from the design storm. See **Chapter 6** for more information regarding proposed improvements.

5.1.2 Basin B

Basin B is the watershed that contributes stormwater to Bonaparte Creek discharging near the corner of US97 and Seventh Street (See **Figure 4-1**). Basin B includes approximately 10 acres of residential area. Stormwater runoff is directed to drainage structures via overland flow, where it enters the collection system and is routed/discharged to Bonaparte Creek. The collection system consists of catch basins and storm piping that collect and route runoff to the point of discharge.

Basin B also contains bubbler inlets/catch basins up-gradient that are not connected to the main storm piping system, overflowing back into the roadway and routing to connected down-gradient catch basins.

Many of these bubblers are currently not functioning as intended due to accumulation of sediment and debris and need to be cleaned.

5.1.3 Basin C

Basin C is the watershed that contributes stormwater to the City's piping infrastructure on Fourth Street that discharges to the Okanogan River (See **Figure 4-1**) on the south side of the Fourth Street bridge. Basin C includes approximately 12 acres of industrial area. Stormwater runoff is directed to drainage structures via overland flow, where it enters the collection system and is routed/discharged to the river. The collection system consists of catch basins and storm piping (12"-22" concrete pipes) that collect and route runoff to the point of discharge.

The City did not identify flooding or express any concerns or capacity issues with this basin.

5.1.4 Basin D

Basin D is the watershed that contributes stormwater to the City's stormwater piping infrastructure on First Street that discharges to the Okanogan River (See **Figure 4-1**). Basin D includes approximately 10 acres of industrial area. Stormwater runoff is directed to drainage structures via overland flow, where it enters the collection system and is routed/discharged to the Okanogan River at two separate points of discharge. The collection system consists of catch basins and storm piping (14"-36" concrete pipes) that collect and route runoff to the points of discharge. The system is split into two sections with one running along and discharging to the Okanogan River near/at First Street and the other running along and discharging to the Okanogan River near/at Third Street.

The City did not identify flooding or express any concerns or capacity issues with this basin.

5.1.5 Basin E

Basin E is the watershed that contributes stormwater to the City's stormwater piping infrastructure near the intersection of Western Ave. and US97 that discharges to Siwash Creek (See **Figure 4-1**). Basin E includes approximately 20 acres of residential and rural developed land. Stormwater runoff is directed to drainage structures via overland flow, where it enters the collection system and is routed/discharged to the Siwash Creek. The collection system consists of catch basins and storm piping (8"-12" concrete, PVC, and corrugated pipes) that collect and route the runoff to the point of discharge. Basin E is separated into two different sub-basins that were analyzed separately by characterizing specific parameters that affect run-off.

The City expressed concern regarding localized flooding issues near the intersection of SR 97 and Delicious Street. Improvements proposed in this basin could include stormwater treatment.

5.1.6 Other Stormwater Basins not Analyzed

This evaluation focused on basins identified as problem areas. Areas in the City not identified as problem areas were not analyzed and includes the areas noted as follows.

5.1.6.1 School Drainage Basin

City personnel report that the drainage basin that encompasses the watershed surrounding the school (approximately 15 acres) contains a series of flow control facilities and a stormwater piping network that eventually drains to a concrete lined open channel located to the South of HWY 20 that discharges to Bonaparte Creek (See **Figure 4-1**).

The City has not observed any capacity issues within this watershed. One issue that was communicated and confirmed during a site visit was the poor condition of the existing concrete lined open channel. The concrete channel contains many cracks and fractures that in several locations have even caused collapse of the side walls. The poor condition of the existing channel is currently obstructing stormwater conveyance and affects capacity though no flooding issues have been reported.

5.1.6.2 School Play Fields Drainage Basin

This drainage basin borders the north side of the school basin and generally encompasses the watershed surrounding the baseball, softball, and soccer fields (See **Figure 4-1**), including approximately 30 acres of non-developed area or fields. This basin does not appear to have a concentrated discharge point but rather a localized low area between Havillah Road and Division Street that provides storage/infiltration/dispersion for stormwater runoff.

The City did not express any concerns or reported flooding issues with this basin.

5.1.6.3 HWY 20 Culverts

Due to storm events during the spring of 2014, the city discovered three culvert locations within city limits that were installed by WSDOT and discharge to the southern slope of HWY 20. Refer to **Figure 2-1** for the locations of these culverts. Stormwater discharge from each culvert has caused erosion to the southern embankment of HWY 20.

The City has communicated concern regarding the erosion created by stormwater discharge from there.

5.2 Stormwater System Analysis Findings

This Section 4.2 is taken from Section 3.3 of the "City of Tonasket Stormwater Infrastructure Inventory, Assessment and Improvements Implementation Plan", prepared by Varela & Associates, Inc., dated November 2014 (2014 Inventory). **Table 5-1** below is copied from the Table 3-1 of the *2014 Inventory* and includes revisions/updates to address current conditions and currently available information.

In the 2014 Inventory the 50-year storm event was modeled and routed through each existing basin. Results were used to calculate the conveyance capacity of the existing stormwater collection system trunk mains. The following table, reprinted from the 2014 Inventory with minor updates, compares existing stormwater capacity with the estimated 50-year storm event flow rate; and shows percent of calculated capacity for each reach of the system. Percentages over 100% indicate the storm event exceeds the current capacity of the reach. The more conservative 50-year storm event was chosen for the 2014 Inventory report rather than the City-standard 10-year event so as to address flooding concerns in the downtown area.

Results of calculated hydraulic profiles along pipe runs using the basin information from the 2014 Inventory are included in Appendix B. These profiles show locations that are expected to surcharge the existing stormwater pipe system at the 50-year storm event.

Table 5-1 Existing Stormwater Piping Capacity VS Estimated 50-yr Storm Event Flows (reprinted)

Basin	Conduit Number [1]	Description	Existing		Est. 50-Year Storm Event (CFS)	Percent of Calculated Capacity [6][7]
			Pipe Dia. (IN)	Pipe Capacity (CFS)		
A3	1	HWY 20 Between Antwine and Tonasket Avenue	8	3.2	0.3	9%
A4	2	HWY 20 between Tonasket Avenue and SR 97	12	6.4	5	70%
A5	3	SR 97 between HWY 20 and Fifth Street	18	13.4	12	87%
	4	SR 97 between Fifth and Fourth Street	20	9.5	11	120%
A2	5	SR 97 between Fourth and Third Street	24	28.8	32	111%
A1	6	Third Street between SR 97 and Western Avenue	30	50.3	50[2]	99%
	7	Third Street between SR 97 and Western Avenue	24	33.5	7[2]	22%
A6	8	Western Avenue between Fourth and Third Street	12	1.7	12	684%
A7	9	From 3rd & Western to unknown location likely NW of Railroad Tracks	30	39.5[3]	92	233%
	10	From unknown above to corner of Locust Avenue and Third Street	36	64.2[3]	92	143%
	11	From corner of Locust Avenue and Third Street to Okanogan River	36	50.7	91	179%
B	12	Corner of Seventh Street and SR 97 to Bonaparte Creek	12	1.6	7	463%
	13	Corner of Seventh Street and SR 97 to Bonaparte Creek	12	2.9	8	259%
C	14	On Fourth Street between Locust Avenue and the Okanogan River	20	17.1	18	104%
	15	On Fourth Street between Locust Avenue and the Okanogan River	22	Unknown [4]	18	N/A
D	16	Corner of Locust Avenue & First Street toward the Okanogan River	14	12.4	9	73%
	17	First Street toward the Okanogan River	14	7.5	9	120%
	18	First Street toward the Okanogan River	14	8.2	9	110%
E	19	Corner of SR 97 and Delicious Street to Siwash Creek	12	Unknown [5]	10	N/A

1. *See **Figure 2-1** for existing stormwater system inventory and conduit numbering.*
2. *There is an existing stormwater inlet grate that crosses 3rd Street to the East of SR95. Per conversation with City personnel, during storm events, some stormwater bypasses this grate to the next downstream catch basin. Both inlets contribute to different parallel stormwater pipes, therefore, an assumption was made that during a storm event 30% of the stormwater from the contributing basin bypasses this grate. The stormwater analysis model reflects this assumption.*
3. *The manhole location that connects conduit #9 and #10 is unknown. The slope of the conduit #9 and #10 was assumed based upon the known elevations of the manhole upstream and downstream of the one between the two.*
4. *The slope of the 22" storm pipe discharging to the river is unknown. If the slope is less than 8.5%, the estimated 50-yr storm event exceeds that capacity of the pipe. Further investigation is recommended to locate discharge location.*
5. *The slope of the 12" storm pipe discharging to creek is unknown. If the slope is less than 7%, the estimated 50-yr storm event exceeds that capacity of the pipe. Further investigation is recommended to locate discharge location.*
6. *This table calculates the capacity of the pipes under 50-year storm events. Where the table indicates many pipes are undersized in areas without reported problems this is believed to be due to the infrequency of the 50-year storm events and the subsequent lack of reported problems.*

5.3 Analysis Conclusions

5.3.1 Intersection of Whitcomb Ave and 3rd/4th Street

The cause of the seasonal flooding at this location is due to both inadequate inlet structures and inadequate capacity of the downstream stormwater piping network (see **Table 4-1**).

To correct this problem, it is recommended the City add catch basins along the curbs on both sides of Third and Fourth Streets and in Whitcomb Avenue/US97 to capture the stormwater flow and increase conveyance capacity of the downstream stormwater mains (See **Figures 6.3-1 and 6.3-2**). This part of the system is a candidate for retrofitting stormwater treatment BMP(s).

5.3.2 Ponding on Delicious Street between Whitcomb Ave. and SR97

The ponding of stormwater at this location is due to both inadequate inlet structures and inadequate capacity of the downstream stormwater piping network.

To correct this problem, it is recommended the City install catch basins at the low spots with an overflow pipe connected to the existing stormwater system (See **Figure 6.3-3**). This is part of the system is also a candidate to retrofit a stormwater treatment BMP.

5.3.3 Erosion of slope along SR20 at storm drain outlets

The erosion is caused by stormwater flow exiting the culvert outlets at a velocity which exceeds the slope's ability to remain stable.

To correct this problem it is recommended the existing culverts be extended and add energy/velocity dissipation structures to these areas (See **Figure 6.3-4**). This improvement may involve participation from WSDOT.

5.4 Service Life of Existing Stormwater System

A significant portion of the City's stormwater system infrastructure appears to be either approaching, currently at, or exceeding its service life. The improvements proposed within this report include cleaning and/or replacement of many of these components.

5.5 Water Quality Impacts

Tonasket's existing stormwater system (2020) does not provide stormwater treatment. Stormwater is collected and discharged directly to the Okanogan River, Siwash Creek, and Bonaparte Creek without treatment. This Stormwater Plan includes evaluation of improvement alternatives that address treatment and sediment control.

5.6 Additional Stormwater System Observations

During the multiple site visits conducted during preparation of the 2014 Inventory, the City reported additional stormwater system characteristics that are included in this SWP to document system functionality and condition.

5.6.1 Inlet/Outlet Combination Culvert Crossings

The 1963 "Water and Street Improvement Project, Schedules II & III" by Gray & Osborne, indicated many intersections in the area east of Whitcomb Ave, between Division St. and Fifth St. were [bubblers]. Many of these catch basins were not found during field visits.

City staff reported these types of [inlets and pipes] have been abandoned over time primarily by asphalt overlayment. Abandonment of these crossings has created stormwater ponding problems. During a storm event ponding water will accumulate until water crests the crown of the road and continues downstream. Although these abandoned [bubblers] impact the behavior of stormwater runoff they have little practical effect on the analysis.

These inlet systems or bubblers are to be replaced with proposed improvements and connection to the pipe network that has a discharge. See **Figure 6.3-1**.

5.6.2 Curb Removal at Third and Whitcomb

The City indicated an issue on the Southeast corner of US97 and Third Street where a section of curb was removed to accommodate a vehicle approach to a local business. This approach is the location where the largest stormwater gutter flows are observed. Currently, stormwater flows into the approach to the adjacent property causing significant erosion to the existing gravel surfacing. This re-direction of stormwater prevents runoff from flowing to the catch basin the stormwater was intended to flow into in the intersection.

A solution to this problem is included as part of the improvements provided in **Figure 6.3-1**.

5.6.3 Discharge to Siwash Creek

The City upsized the stormwater discharge piping from the manhole located near the intersection of Western Avenue and SR 97 to Siwash Creek. Given the elevation constraints of the existing upstream stormwater system, the outlet invert elevation of the new pipe was installed approximately 1.5' above the inlet invert elevation. Hydraulically this creates surcharging in the manhole prior to stormwater discharge. It is recommended the city continue to monitor this part of the system.

5.6.4 36" Stormwater Pipe Discharge to Okanogan River

The City's primary 36" concrete stormwater discharge piping to the Okanogan has a steel screen attached at the outlet. During a storm event in the spring of 2014, the screen at the outlet was blocked with enough debris that the last length of concrete pipe detached from the upstream joint (see photographs in 2014 Inventory). This damaged system has since been repaired and is currently in operation.

5.6.5 Railroad Crossing

The existing stormwater system in Fourth and Third Streets between Whitcomb Avenue/US97 and the Okanogan River includes a crossing of the railroad lines that parallel US97. A turning structure is assumed to exist at some point in the railroad right-of-way since connecting pipes on either side of the rail lines do not align. A connecting structure was not found during site visits and its location is not known. It is expected that permitting through the railroad will be necessary to upgrade this section of the stormwater system.

5.6.6 Treatment

The City's existing storm water system does not currently include stormwater treatment.

6.0 Improvements and Alternatives

This section identifies a system improvement or range of system improvement alternatives for each deficiency identified in Section 5. Where applicable, **Figure 6-1** and **Figures 6.3** show the location of proposed system improvements within Tonasket's system.

Stormwater treatment alternatives are discussed in this chapter. Alternatives for stormwater inlet capacity and conveyance are not reexamined in this Plan as options for those issues were previously evaluated in the 2014 Inventory and before.

The estimated cost of improvements in this section represents a planning level estimate based on preliminary evaluations and assumptions; the estimates are for comparison of alternatives and to approximate financing needs. Estimated costs for both conveyance and treatment are derived from other similar projects in central/eastern Washington in the past 5-10 years and will vary depending on actual project design specifics as well as the cost of labor, materials and market conditions at the time of project implementation.

6.1 Description of Previously Chosen Inlet Capacity and Conveyance Alternatives

The stormwater system improvements described in the following sections address the specific stormwater issues identified previously and in the 2014 Assessment and re-described in this Plan. Following are descriptions of improvements with updated opinions of probable construction costs (estimates) for:

- Third and Fourth Streets from Whitcomb Avenue to Okanogan River (See **Figure 6.3-1**)
- Whitcomb Avenue/US97 from First Street to Sixth Street (See **Figure 6.3-2**)
- Ponding on Delicious Street between Whitcomb Avenue and SR 97 (See **Figure 6.3-3**)
- Erosion of the slope along SR 20 at the Storm Drain Outlets (See **Figure 6.3-4**)

6.1.1 Third and Fourth Streets from Whitcomb Avenue to Okanogan River

The existing storm pipes along Whitcomb Avenue/US 97 and from Whitcomb Avenue to the outlet at the Okanogan River are undersized contributing to resulting annual flooding. The most effective solution to the flooding is to increase the size of the storm piping in this area to better handle the current runoff as well as provide additional infrastructure for the growth of the City. By supplementing the replacements with the additional stormwater infrastructure proposed to continue north along Whitcomb Avenue/US 97, a reduction in flooding and thereby improved quality of discharge to the Okanogan River is to be achieved. The proposed improvements are shown in **Figure 6.3-1** and include:

- Addition of catch basins on both sides of Third and Fourth Streets at Western Avenue
- Addition of piping/manholes to route the flow from the catch basins into the storm system
- Replace the existing stormwater mains with larger stormwater mains:
    - Fourth from Whitcomb to Western (new 36" connecting to system in Whitcomb)
    - Western from Fourth to Third (12" to 36")
    - Third from Western to Outfall (36" to 42")

6.1.2 Whitcomb Avenue/US 97 from First Street to Sixth Street

The improvements recommended improve collection of the surface stormwater and increase capacity of the conveyance system to reduce seasonal flooding at these locations. The proposed improvements are shown in **Figure 6.3-2** and include:

- Addition of catch basins along the gutters on both sides of Whitcomb Avenue and uphill on First, Second, Third, Fourth, Fifth, and Sixth at these intersections with Whitcomb
- Addition of piping/manholes to route the flow from these catch basins into the storm system
- Replace the existing stormwater mains with larger stormwater mains:
    - Whitcomb from Fifth to Fourth (20" to 24")

6.1.3 Ponding on Delicious Street between Whitcomb Ave. and SR97

To reduce the ponding on Delicious Street it is recommended the City install catch basins at the low spots with an overflow pipe connected to the existing stormwater system. Refer to **Figure 6.3-3** for the proposed improvement layout.

6.1.4 Erosion of Slope along SR20 at Storm Drain Outlets

To mitigate erosion at these locations, it is recommended the City extend the existing culverts and add energy dissipation structures at these locations. Refer to **Figure 6.3-4** for the proposed improvement layout.

6.2 System Treatment Alternatives

Four treatment method alternatives are considered for retrofitting the Tonasket stormwater system to address the untreated discharge to the Okanogan River and tributary creeks: the "Do-Nothing" alternative, treatment through bio-infiltration swales, basic treatment through stormwater filtration with pollutant absorbing media filled cartridges, and treatment utilizing hydrodynamic separators.

The "Do-Nothing" alternative would continue use of the existing stormwater facilities in their existing condition. In the short term, the "Do-Nothing" alternative has the least financial impact on the community. The undersized storm pipe network in US 97 is not able to adequately convey stormwater to the outfalls and discharges untreated stormwater into the Okanogan River. The result is annual flooding in the downtown corridor and discharging of untreated stormwater to the river. Flooding in the downtown corridor damages the buildings and businesses in the area, resulting in costs for repairs. The other drainage basins in the system discharge directly to Bonaparte and Siwash Creeks, which discharge to the Okanogan River. Water quality is expected to continue to diminish and O&M costs are expected to increase if the "Do-Nothing" alternative is selected.

The second alternative for basic treatment considered is to construct bio-infiltration swales. Along US 97/Whitcomb Avenue, the largest basin, basic treatment through swales is not feasible due to a lack of land in the project area available to construct swales. The surface features in the vicinity of US 97 in the project area are connected road to sidewalk to building. The other basins have the same problem of available land or are lacking in existing catchment facilities to produce a benefit. There are however localized areas in sub-basins that could take advantage of this form of BMP, just not significant enough of a benefit to warrant a stand-alone project for the cost.

The third alternative considered was to use stormwater filters with pollutant absorbing media filled cartridges coupled with the replacement of existing stormwater pipes, primarily in US 97/Whitcomb Avenue. The storm filters provide basic treatment by removing particulates as the stormwater passes through filters. The filters, and vaults that house them, in cost estimations are 8 feet wide by 18 feet long each. This alternative includes the replacement of existing storm pipes in US 97 with larger sized piping. Based on a previous project that utilized a vault and cartridge setup for basic treatment, the cost per 8'x18' vault is approximately $51,000. An analysis was done using a treatment design flow of 29 cubic feet per second, a maximum cartridge flow rate of 15 gallons per minute, and a maximum number of cartridges per vault of 44. The analysis shows that a total of 20 vaults would be required, so the capital cost for the vaults and cartridges alone is approximately $1,000,000. On top of the capital cost are the O&M costs to replace media and cartridges as they begin to degrade.

The fourth, and selected, alternative is to utilize hydrodynamic separators to provide stormwater treatment. Hydrodynamic separators use swirl concentration and continuous separation to screen, separate and trap trash, debris, sediment, and hydrocarbons from stormwater runoff. To prevent flooding and ensure the stormwater enters the collection system for pretreatment by hydrodynamic separator, collection system improvements are needed.

6.2.1 Third and Fourth Streets from Whitcomb Avenue to Okanogan River

Flow quantities are highest in the system in this area. Increases in pipe diameter to sizes would reduce the frequency of flooding and flows that pass over PGIS (streets and parking lots) areas directly into the river and streams. Treatment BMPs are not proposed for this area in this Plan to allow evaluation of the proposed upstream treatment BMPs described in the next section. However retrofitting treatment BMPs to this area of the stormwater system should be investigated in the future to more completely provide treatment and contaminant removal from runoff. Higher flows may make offline setups necessary in this area.

6.2.2 Whitcomb Avenue/US 97 from First Street to Sixth Street

The proposed improvements in this area are to retrofit primary stormwater treatment by means of hydrodynamic separators. Improvements will also improve collection of the surface stormwater and increase capacity of the conveyance system to properly capture runoff for treatment. The proposed treatment improvements are shown in **Figure 6.3-2** and include:

- Addition of larger hydrodynamic separator manholes in place of proposed standard manholes at the locations:
    - Whitcomb from Fifth for a water quality flow (6-month storm) of approximately 5.0 cfs
    - Just upstream (north) from the intersection at third and Whitcomb for 5 cfs
    - Whitcomb and Fourth for a water quality flow of approximately 6.6 cfs

The overall basin runoff flow for Basin A is estimated at 29 cubic feet per second using a 6-month storm for water quality design. This design flow is used when sizing hydrodynamic separators. This flow was split up into several sub-basins. The resulting stormwater flow to be treated by all three separators is approximately 20 cfs. Figure 6.2-1 below shows design flow rates of the separators.

Figure 6.2-1

	CDS MODEL	Treatment Flow Rates[1] 75 microns (cfs)/(L/s)	125 microns[2] (cfs)/(L/s)	Trash & Debris (cfs)/(L/s)	Estimated Maximum Peak Conveyance Flow[3] (cfs)/(L/s)	Minimum Sump Storage Capacity[4] (yd^3)/(m^3)	Minimum Oil Storage Capacity[4] (gal)/(L)
PRECAST	CDS2015-4	0.5 (14.2)	0.7 (19.8)	1.0 (28.3)	10 (283)	0.9 (0.7)	61 (232)
	CDS2015-5	0.5 (14.2)	0.7(19.8)	1.0 (28.3)	10 (283)	1.5 (1.1)	83 (313)
	CDS2020-5	0.7 (19.8)	1.1 (31.2)	1.5 (42.5)	14 (396)	1.5 (1.1)	99 (376)
	CDS2025-5	1.1 (31.2)	1.6 (45.3)	2.2 (62.3)	14 (396)	1.5 (1.1)	116 (439)
	CDS3020-6	1.4 (39.6)	2.0 (56.6)	2.8 (79.3)	20 (566)	2.1 (1.6)	184 (696)
	CDS3025-6	1.7 (48.1)	2.5 (70.8)	3.5 (99.2)	20 (566)	2.1 (1.6)	210 (795)
	CDS3030-6	2.0 (56.6)	3.0 (85.0)	4.2 (118.9)	20 (566)	2.1 (1.6)	236 (895)
	CDS3035-6	2.6 (73.6)	3.8 (106.2)	5.3 (150.0)	20 (566)	2.1 (1.6)	263 (994)
	CDS4030-8	3.1 (87.7)	4.5 (127.4)	6.3 (178.3)	30 (850)	5.6 (4.3)	426 (1612)
	CDS4040-8	4.1 (116.1)	6.0 (169.9)	8.4 (237.8)	30 (850)	5.6 (4.3)	520 (1970)
	CDS4045-8	5.1 (144.4)	7.5 (212.4)	10.5 (297.2)	30 (850)	5.6 (4.3)	568 (2149)
	CDS5640-10	6.1 (172.7)	9.0 (254.9)	12.6 (356.7)	50 (1416)	8.7 (6.7)	758 (2869)
	CDS5653-10	9.5 (268.9)	14.0 (396.5)	19.6 (554.8)	50 (1416)	8.7 (6.7)	965 (3652)
	CDS5668-10	12.9 (365.1)	19.0 (538.1)	26.6 (752.9)	50 (1416)	8.7 (6.7)	1172 (4435)
	CDS5678-10	17.0 (481.2)	25.0 (708.0)	35.0 (990.7)	50 (1416)	8.7 (6.7)	1309 (4956)
	CDS9280-12	27.2 (770.2)	40.0 (1132.7)	56.0 (1585.7)	Offline	16.8 (12.8)	N/A
	CDS9290-12	35.4 (1002.4)	52.0 (1472.5)	72 (2038.8)		16.8 (12.8)	
	CDS92100-12	42.8 (1212.0)	63.0 (1783.9)	88 (2491.9)		16.8 (12.8)	
CAST-IN-PLACE	CDS150134-22	100.7 (2851.5)	148.0 (4190.9)	270 (7645.6)		56.3 (43.0)	
	CDS200164-26	183.6 (5199.0)	270.0 (7645.6)	378.0 (10703.8)		78.7 (60.2)	
	CDS240160-32	204 (5776.6)	300.0 (8495.1)	420.0 (11893.0)		119.1 (91.1)	
	Additional Cast-in-Place models available upon request.						

1. Alternative PSD/D_{50} sizing is available upon request.
2. 125 micron flows are based on the CDS Washington State Department of Ecology approval for 80% removal of a particle size distribution (PSD) having a mean particle size (D_{50}) of 125 microns.
3. Estimated maximum peak conveyance flow is calculated using conservative values and may be exceeded on sites with lower inflow velocities and sufficient head over the weir.
4. Sump and oil capacities can be customized to meet site needs.

Provided by Contech Engineered Solutions, LLC

The treatment ratio of the pretreatment units is estimated at approximately 60 to 70% of the total 6-month storm runoff (20 cfs/29 cfs), if there were a water quality requirement in the City for improvements in the public rights-of-way. Following phases increases the capability of the stormwater collection system to collect the runoff from the US-97 drainage basin. By improving the collection system, the proposed improvements will prevent the annual flooding which results in untreated flow over the ground, and discharge into the Okanogan River and the Bonaparte and Siwash Creeks.

6.2.3 *Ponding on Delicious Street between Whitcomb Ave. and SR97 (Basin E)*

Catch basins at the low spots connected to storm manholes with an overflow pipe connected to the existing stormwater system are proposed with this improvement. One of the manholes can be a hydrodynamic separator for primary stormwater treatment as a retrofit. Refer to **Figure 6.3-3** for the proposed improvement layout. Treatment improvements include:

- Addition of a hydrodynamic separator manhole in place of a standard manhole at the location of the downstream added manhole. Calculated stormwater runoff flow for treatment (6-month storm) is 5.0 cfs.

Other treatment alternatives considered are as discussed above. Introduction of treatment swales would be more than twice the cost of hydrodynamic separators with associated right-of-way concerns, and approximately quadruple to use filter cartridge-style treatment at this location

6.2.4 Other locations.

There are other discharge locations in the city that could benefit from stormwater treatment such as Basin B (Seventh Street) to Bonaparte Creek and Basin D (First Street to the River). However, these locations are not currently recommended for stormwater improvements directly. The runoff volume from these basins is much smaller than from Basin B and the water quality benefit would be much smaller at this time than in Basin B for similar cost.

6.3 Preferred Alternatives

The selected alternative for treatment in the Whitcomb Avenue/SR20 area includes comprehensive stormwater facility improvements that may be constructed in multiple phases. The stormwater improvements for Whitcomb Avenue/SR20 includes approximately 1,900 linear feet of storm piping and 3 hydrodynamic separators for treatment. The replacement of storm facilities between Fourth Street and Sixth Street total another 1,200 linear feet of replacement storm sewer piping, and the construction of new stormwater facilities along US-97 extending just past 1st Street towards Division Street. The proposed improvements result in a stormwater system that provides treatment of the 6-month design storm.

The ability to retrofit stormwater treatment in the system in Delicious Street drove the decision to choose hydrodynamic separator at that location in addition to lower cost.

The stormwater system improvements recommended herein address the specific stormwater issues identified previously and in the 2014 Assessment. Following are opinions of probable construction costs (estimates) for:

- Third and Fourth Streets from Whitcomb Ave. to Okanogan River (See **Figure 6.3-1**)
- Whitcomb Avenue/US97 from First Street to Sixth Street (See **Figure 6.3-2**)
- Ponding on Delicious Street between Whitcomb Avenue and SR 97 (See **Figure 6.3-3**)
- Erosion of the slope along SR 20 at the Storm Drain Outlets (See **Figure 6.3-4**)

6.3.1 Third and Fourth Streets from Whitcomb Avenue to Okanogan River

The improvements for this area are to replace undersized stormwater piping along Third Avenue and Fourth Avenue to the Okanogan River. The improvements are to better handle the current runoff as well as provide additional infrastructure for the growth of the city. By supplementing the replacements with additional stormwater infrastructure continuing north along US 97, a reduction in flooding and improved quality of discharge to the Okanogan River is to be achieved. Stormwater treatment facilities are not proposed within this section of infrastructure improvements due to size of flows and treatment is proposed upstream from these proposed improvements (see next section). The proposed improvements are shown in **Figure 5.3-1**. A preliminary Engineer's Estimate (OPC) for these improvements is in Table 5-2:

Table 6-1 Third and Fourth Streets from Whitcomb Ave. to Okanogan River Improvements

Description	Estimated Unit Price	Estimated Quantity		Amount
Special Requirements/Bid Items				
Temporary Traffic Control	$ 20,000	1	LS	$ 20,000
SWPPP	$ 5,000	1	LS	$ 5,000
Pavement Marking	$ 10,000	1	LS	$ 10,000
Railroad Crossing	$ 100,000	1	EA	$ 100,000
Mobilization and Administration				
Mobilization and Administration (Maximum 8%)	$ 80,000	1	LS	$ 60,000
Trench Excavation, Backfill and Compaction				
Furnish Imported 12"-24" Pipe Bedding	$ 10	130	LF	$ 1,300
Furnish Imported 36"-48" Pipe Bedding	$ 20	1,800	LF	$ 36,000
Trench Excavation Safety System	$ 5,000	1	LS	$ 5,000
Rock Excavation	$ 115	100	CY	$ 11,500
Storm Drains				
High Density Polyethylene (HDPE) Pipe - 12 Inch	$ 35	130	LF	$ 4,600
High Density Polyethylene (HDPE) Pipe - 36 Inch	$ 130	800	LF	$ 104,000
Conc. Storm Pipe - 42 inch	$ 200	1,000	LF	$ 200,000
Catch Basin Type 1	$ 2,500	4	EA	$ 10,000
Storm Manhole 60 In. Diam. Type 2	$ 7,500	2	EA	$ 15,000
Storm Manhole 72 In. Diam. Type 2	$ 10,000	2	EA	$ 20,000
Surface Improvements and Restoration				
AC Pavement Removal	$ 4	3,000	SY	$ 12,000
Concrete Curb and Gutter Removal	$ 6	200	LF	$ 1,200
Concrete Flatwork Removal	$ 10	120	SY	$ 1,200
Gravel Surface Placement	$ 6	100	SY	$ 600
Pavement Placement HMA CL. 1/2" PG 64-28, 4"/12" CSBC	$ 58	3,000	SY	$ 174,000
4" Concrete Flatwork	$ 65	50	SY	$ 3,300
6" Concrete Flatwork	$ 80	70	SY	$ 5,600
Cement Concrete Traffic Curb	$ 45	200	LF	$ 9,000
Cement Concrete Pedestrian Ramp	$ 1,500	3	EA	$ 4,500
Cement Concrete Pedestrian Curb	$ 30	60	LF	$ 1,800
			Subtotal	$ 816,000
			Contingency (20%)	$ 163,000
			Estimated Construction Cost	$ 979,000

Environmental, cultural and historical permits/approvals (3%)	$ 29,000
Engineering including Design, Construction Management and Inspection (27%)	$ 264,000
Estimated Total Project Cost (rounded to nearest $1K)	$ 1,272,000

6.3.2 Whitcomb Avenue/US 97 from First Street to Sixth Street

The improvements recommended for this location are to improve collection of the surface stormwater, increase capacity of the conveyance system, and add primary treatment of stormwater. Table 6-2 below summarizes Engineer's Estimates (OPCs) for phases of the proposed project as if surface restoration is funded separately. More detailed OPCs are in the copy of the Preliminary Stormwater Report for US97/Whitcomb Avenue Project in **Appendix 7A**.

Table 6-2 Whitcomb Avenue/US97 Improvements (Summary)

Description	Est. Quant.	Units	Unit Price	Amount
Phase 1				
Stormwater Facilities Construction	-	See SS[1]	-	$608,000
Phase 2				
Stormwater Facilities Construction	-	See SS[1]	-	$273,000
Phase 3				
Stormwater Facilities Construction	-	See SS[1]	-	$40,000
Stormwater Imp. without Surface Restoration or Demo. Construction Subtotal				$921,000
One Phase Road Repair[2]				
Mobilization (8% of Total Project Construction)	-	LS	-	$55,000
AC Removal and Replace, incl. Gravel	4,838	SY	$68	$329,000
Curb Removal and Replace	3,225	LF	$51	$165,000
Flatwork and Ped. Ramps Remove and Replace	1	LS	$45,000	$45,000
Surface Restoration and Demo. Construction Subtotal				$594,000
Construction Subtotal				$1,515,000
Contingency 15%				$227,000
Subtotal				$1,742,000
Eng, Inspection, Admin (30%)				$523,000
Environmental, Cultural and Historical Approval Allowance				$9,000
ECY Admin				$9,000
ESTIMATED PROJECT COST (rounded to nearest $1K)				$2,283,000

(1) See Detailed Engineers Estimates by Phase.
(2) May be reduced or eliminated if funded separately as part of other improvements

6.3.3 Ponding on Delicious Street between Whitcomb Ave. and SR97

Catch basins at the low spots with an overflow pipe connected to the existing stormwater system are proposed with this improvement. Two storm manholes are to be part of the improvements—one of which is to be a hydrodynamic separator for primary stormwater treatment as shown in **Figure 6.3-3**.

The proposed improvement is estimated to be:

Table 6-3 Ponding at Delicious St. between Whitcomb Ave. and SR 97

Description	Estimated Unit Price	Estimated Quantity		Amount
Mobilization and Administration				
Mobilization and Administration (Maximum 8%)	$ 21,000	1	LS	$ 11,000
Erosion Control/ Inlet Protection	$ 1,500	1	LS	$ 1,500
Storm Drains				
PVC Storm Drain Pipe - 8 inch	$ 50	100	LF	$ 5,000
Catch Basin Type 1	$ 2,500	4	EA	$ 10,000
Storm Manhole 48 In. Diam. Type 2	$ 7,500	2	EA	$ 15,000
Hydrodynamic Sep. Storm Manhole CDS 4045-8	$ 98,000	1	EA	$ 98,000
Surface Improvements and Restoration				
AC Pavement Removal	$ 8	300	SY	$ 2,400
Concrete Curb and Gutter Removal	$ 10	100	LF	$ 1,000
Gravel Surface Placement	$ 20	50	SY	$ 1,000
Pavement Placement HMA CL. 1/2" PG 64-28, 3"/8" CSBC	$ 60	300	SY	$ 18,000
Cement Concrete Traffic Curb	$ 45	100	LF	$ 4,500
			Subtotal	$ 158,000
			Contingency (25%)	$ 40,000
			Estimated Construction Cost	$ 198,000
			Environmental, cultural and historical permits/approvals (3%)	$ 6,000
			Engineering including Design, Construction Management and Inspection (27%)	$ 53,000
			Estimated Total Project Cost (rounded to nearest $1K)	$ 257,000

6.3.4 Erosion of Slope along SR20 at Storm Drain Outlets

To mitigate erosion, it is recommended the City extend the existing culverts and add energy dissipation structures to these areas. Refer to **Figure 6.3-4** for the proposed improvement layout. Following is an estimate for the proposed improvements (updated from 2014 Inventory):

Table 6-4 SR 20 Slope Erosion

Description	Estimated Unit Price	Estimated Quantity		Amount
Special Requirements/Bid Items				
Slope Anchors	$ 800	9	EA	$ 7,200
Mobilization and Administration				
Mobilization and Administration (Maximum 8%)	$ 21,000	1	LS	$ 3,500
Storm Drains				
Corrugated Steel Culvert Pipe - 12 Inch	$ 80	100	LF	$ 8,000
Corrugated Steel Culvert Pipe - 24 Inch	$ 120	50	LF	$ 6,000
Velocity Dissipation Structure	$ 7,500	3	EA	$ 22,500
			Subtotal	$ 47,000
			Contingency (25%)	$ 12,000
			Estimated Construction Cost	$ 59,000
			Allowance for stormwater easements including: legal fees, surveying, engineering, title company/recording fees, etc.	$ 10,000
			Environmental, cultural and historical permits/approvals (3%)	$ 2,000
			Engineering including Design, Construction Management and Inspection (27%)	$ 16,000
			Estimated Total Project Cost (rounded to nearest $1K)	$ 87,000

6.4 Preliminary Costs

The Table 6-6 below summarize the proposed improvements for the various improvement locations including those areas with chosen treatment alternatives and each associated preliminary opinions of probable construction costs (“engineer’s estimates”).

Table 6-6 Summary of Recommended Improvements

Description	Estimate
Third and Fourth Streets from Whitcomb Ave. to the Okanogan River.	$ 1,272,000
Whitcomb Avenue/US97 from First Street to Sixth Street[2]	$ 2,283,000[1]
Ponding on Delicious Street between Whitcomb Ave. and US97[2]	$ 257,000
Erosion of slope along SR20 at storm drain outlets	$ 87,000
Total	$ 3,899,000

1. *Currently funded for stormwater ($1.4M). Surface/road restoration assumed funded by other future sources as part of a larger project.*
2. *Proposed with treatment improvements*

6.5 Additional Engineering Required

Existing stormwater system information is developed from multiple site visits and investigations, city staff discussions, and informed by experience with the city and its infrastructure. However, there are areas of infrastructure that are decades-old, and the level of functionality and connectivity are not known without excavation. The scope of this Plan is also not to the level of detail of a final design for construction for any part or proposal. Additional engineering will be required as the projects are advanced.

6.6 Implementation Issues

6.6.1 Stormwater Pipe Replacements

Stormwater pipe additions/replacements require foresight in providing temporary traffic access while new mains are installed. Stormwater mains are typically larger than other wet utility main lines and can have larger trench widths and be in locations that would not be a simple “pavement cut”. The city would plan to make traffic interruptions as brief as possible.

The city can save considerably on the cost of surface restoration by coordinating stormwater main and collection system replacements with street and other utility projects. The city will plan stormwater projects to coincide with street and other utility projects as much as possible.

6.6.1 Inlet/Catch Basin Replacement/Installation

Stormwater inlets and catch basins are typically located in curb lines in developed parts of the municipalities with possible connected sidewalk or other impacted infrastructure that requires replacement when the collection devices are replaced or installed. This makes this type of work more expensive than other work that does not affect as much infrastructure surrounding it.

6.6.2 Stormwater Treatment BMP Retrofits

Stormwater treatment structures such as the hydrodynamic separator manholes evaluated in this Plan are typically larger in diameter than the stormwater manhole they would replace. Planning and design shall take into account placing these structures in right-of-way to avoid conflicts to other utilities and encroachments into private property.

7.0 Financing and Schedule

The financing section identifies revenue needs and potential funding sources for capital improvements

Tonasket was offered funding in 2020 through the Department of Ecology (ECY) to make improvements to its stormwater facilities and to add primary treatment to the stormwater system for the Whitcomb Avenue/US97 (see **Figure 6.3-2**) location identified in this Plan. The funding was intended to be for stormwater improvements that would be part of a larger project in the city along Whitcomb Avenue/US97 and other funding would be used for surface and other facilities improvements and repair, thereby allowing more of the stormwater funding for stormwater improvements rather than also road and street repair for installation of stormwater improvements. However, the other forms of funding are not secured at the time of this Plan and the descriptions and opinions of costs at this location in the previous chapter include surface repair, as if no other funding would be available at the time of the project. It is expected that project limits will be reevaluated as other funding offers to become available to share in project costs.

7.1 Summary of Projects

Costs are estimated in the preceding sections for project elements. **Table 7-1** provides a summary of costs used to develop funding scenarios in this section for design and construction of improvements.

Table 7-1 Estimated Project Costs

Description	Estimated Costs	Estimated Addt'l Annual O&M
Stormwater Facility Projects		
Third and Fourth Streets from Whitcomb Ave. to Okanogan River	$1,272,000	
Whitcomb Ave./US97 from First Street to Sixth Street	$2,283,000	$5,500
Delicious Street between Whitcomb Ave. and US97	$ 257,000	$2,500
Erosion along SR20 at Storm Drain Outlets	$ 87,000	
Total	$3,889,000	$ 8,000

The estimated improvements costs are based on 2021 dollars. **Table 7-2** estimates the project costs at the time of the anticipated construction (i.e. 2025) and is used for funding budgeting and planning purposes.

Table 7-2: Estimated Project Budget for Funding

Description	Estimated Cost	Estimated Addt'l Annual O&M
Estimated Capital Cost [1]	$3,889,000	$ 8,000
Estimated Rate of Annual Inflation	3.5%	3.5%
Years of Inflation[2]	4	4
Total Inflation Contingency	14.8%	14.8%
Total Estimated Cost For Funding Purposes [2]	$4,465,000	$ 9,200

(1) *Estimated in 2021 dollars per earlier sections of Plan.*
(2) *Assumed 2025.*

There may be opportunity for the city to coordinate funding for stormwater system improvements with street funding via the Transportation Improvement Board (TIB). Funding for the stormwater system improvements is likely to be financed through Ecology and/or Rural Development funding and CDBG funding.

Table 7-2 estimates the project costs at an anticipated future construction start (i.e. 2024) and is used for funding discussions and planning purposes. For project funding and estimated inflation purposes, an estimated timeline is shown in Table 7-3.

Table 7-3 Implementation Timeline Scenarios

Task/Description	Estimated Timeline
Submit Stormwater Plan to ECY	July 2021
Stormwater Plan review and ECY approval	Sep – Dec 2021
Potential Timeline with ECY Funding:	
ECY funding application for design phase ***Note: if project < $5 million, a combined design + construction project project application can be submitted and results in a shorter timeline***	October 2021 through October 2022
Design Phase	
ECY Funding available (July 2022) / ECY & City contract / proceed	Oct 2022
Design phase / ECY approval	Nov 2022 – Apr 2023
Construction Funding Procurement	
ECY funding application for construction	Oct 2023
ECY funding available	Jul 2024
Construction Phase	
Commence construction	Late summer 2024 or spring 2025

Construction completion	2025
All improvements operational	Summer/fall 2025
Potential Timeline with RD Funding (ECY for design phase only):	
ECY funding application for design phase	Oct 2021
Design Phase (same as above scenarios with ECY funding)	
ECY Funding available (July 2022) / ECY & City contract / proceed	Oct 2022
Design phase/ ECY approval	Nov 2022 – Apr 2023
Construction Funding Procurement	
Initiate RD funding application process	May - Dec 2022
Potential CDBG grant application	May – Jun 2022
RD funding approved	Mar 2023
Construction Phase	
Commence construction	Jun 2023
Construction completion	Late 2023 or spring/summer 2024
All improvements operational	Fall 2024

7.2 Funding for Planned Improvements/Sources

The city of Tonasket plans to fund stormwater capital improvements through Stormwater Utility revenue, interest income, and the use of reserve funds, but primarily through other funding sources. As of June 30, 2021, Tonasket's Stormwater Utility Fund had a balance of $25,115; this fund covers capital improvements for stormwater utilities. Tonasket plans to pay for stormwater capital improvements from other sources rather than relying on available cash-in-hand.

There are several funding sources available to municipalities for financing public works projects (some specifically directed at wastewater improvements) through grants and low interest loans (and forgivable loans – equivalent to grant). The favorability of each program varies from community to community, and project to project depending on several factors (e.g., $ size of project; need; potential health and safety threat; impacts to water quality; anticipated sewer rate impacts to customers; and other funding criteria).

Three potential funding agencies with likely the most favorable funding packages for Tonasket are:

- WA Department of Ecology
  - Centennial Clean Water Program (CCWP),
  - Clean Water State Revolving Fund Loan Program (CWSRF), and
  - Ecology Stormwater Financial Assistance Program (SFAP)
- US Department of Agriculture – Rural Development (RD)
  - Water and Waste Disposal Loan and Grant Program

- WA Department of Commerce
  - Community Development Block Grant (CDBG) Program
- Other Sources
  - Public Works Board (PWB)
  - Line Item—State Budget
  - Revenue Bonds/General Obligation Bonds
  - City/Utility Reserve Funds

Further information on the programs is included below and a subsequent section with potential funding scenarios likely to result from the two funding agencies and other variations. In addition, other funding sources are listed that are not specifically considered at this time.

7.2.1 Stormwater Utility

In 2018, the City of Tonasket passed Ordinance No. 792, adopting a Storm Drainage and Surface Water Utility and created new Chapter 12.30 to the Tonasket Municipal Code. The ordinance defines and establishes applicability and a fund to collect fees from landowners in the city to pay for expenditures related to the operation, maintenance, and improvement of drainage systems in the City. The Stormwater Utility also provides funding for future stormwater projects. A copy of Ordinance No. 792 and initial fee structure is included in **Appendix 6A**.

7.2.2 Washington State Department of Ecology

- Centennial Clean Water Program (CCWP) (grants-very limited for stormwater)
- Clean Water State Revolving Fund Loan Program (CWSRF) (loans and forgivable loans)
- Ecology Stormwater Financial Assistance Program (SFAP) (grants)

All three programs are administered by the WA State Department of Ecology (ECY). The programs fund planning, design, and construction costs associated with wastewater facilities and the implementation of non-point activities. To be eligible, projects must be water quality projects that prevent and control pollution of ground and surface waters.

Although the three programs are listed separately and have specific criteria unique to each, they are accessible through a single application process through ECY. Following application submission, ECY reviews and determines the most applicable funding source and amount to be applied from each program, depending on eligibility and other criteria specific to the project.

Interest rates for loans are based on a percent of tax-exempt municipal bonds. For hardship communities, interest rates are lower, depending on the degree of hardship. Forgivable loan (i.e. equivalent to grant) may also be offered to applicants depending on funds available and depending on financial hardship criteria of the community.

Limited grant subsidy is available to applicants that can demonstrate financial hardship. Hardship interest rates and grant subsidy eligibility are shown in **Table 7-5.**

Table 7-5: ECY Hardship Interest Rates and Hardship Grant Eligibility [1]

Sewer Rate [2] ÷ MHI [3]	< 2%	≥ 2% but < 3%	≥ 3% but < 5%	≥ 5%
Hardship Designation	Non-hardship	Moderate Hardship	Elevated Hardship	Severe Hardship
5-year Loan Rates	0.6%	0.4%	0.2%	0.0%
20-year Loan Rates	1.2%	0.8%	0.4%	0.0%
30-year Loan Rates	1.6%	1.2%	.08%	0.4%
Grant Eligibility	Not eligible	50% (up to $5M)	75% (up to $5M)	100% (up to $5M)

(1) *Based on December 2020 MHI information.*
(2) *"Sewer Rate" for this calculation is the potential future sewer that would result if no grant funding was provided.*
(3) *MHI – Median Household Income for the community (Tonasket MHI = $32,917 per 2020 ACS data).*

ECY requires user rates include an annual 20% reserve to be collected during the first five years, equivalent to at least one annual debt service on the loan.

The application cycle for FY 2023 will be between August-October 2021, with an application deadline in October 2021 and a Final Offer List generally published by early summer of 2022 and funds available thereafter. Dates could change.

7.2.3 US Department of Agriculture – Rural Development (RD)

- Water and Waste Disposal Loan and Grant Program

The USDA Rural Development (RD) – Water and Waste Disposal Loan and Grant Program funds projects for small (less than 10,000 people) financially distressed communities to extend and improve water and waste treatment facilities. The program is primarily a loan program however, grants are also offered on projects where sewer rates become excessive as compared to sewer rates being paid in other similar communities in the region.

Applicants must demonstrate effort and subsequent inability to finance the project through their own resources or commercial credit, and demonstrate the financial feasibility of the project, including ability to repay the loan. Loan security is normally a revenue bond ordinance, with loan repayment from utility rates, although repayment from taxes can also be used for RD loans.

- Applications for funding are accepted year around with award typically within 3 to 6 months of application submittal.
- Interest rates vary – Currently RD's rates are at an all-time low at 1.5%, for the intermediate rate; and, lower rates (currently 1.125%) can apply if "poverty level" can be shown and there is a "health and safety threat" due to the need for the project.
- 30 to 40-year loan terms. To obtain grant funding, applicant must accept 40-year term. No prepayment penalty for early repayment.
- Application requirements:
  - Approved environmental assessment
  - Preliminary engineering report
  - Financial feasibility and cost analysis

RD requires that the utility user rates provide for an annual 10% reserve income in addition to annual debt service. Each loan agreement is individual to the applicant. RD funds may be used for all phases of project

costs (i.e., planning, design, construction, some operation) including costs incurred prior to application to RD (including costs for the current facility planning effort). The governing stipulation is that RD funds for reimbursement of early phase costs do not become available for reimbursement until project construction is initiated via a construction contract award

7.2.4 Community Development Block Grant (CDBG)

The WA Department of Commerce administers the CDBG program. These Federal Department of Housing and Urban Development (HUD) funds are available for water and sewer projects for areas with at least 51% low to moderate income (LMI) residents, which have public health and safety or economic development issues.

The maximum grant amount is $900,000. Applications are typically due early June (1st week) each year. Recipients are usually announced in September and, funding contracts executed within three to six months following that.

The CDBG program is highly competitive and funds projects which primarily serve at least 51% LMI residents. Tonasket is eligible for this funding meeting the 51% LMI threshold. Cities can conduct independent income surveys to demonstrate at least 51% LMI. Tonasket has been successful utilizing CDBG funding in the past.

7.2.5 Other Funding Programs

There are other funding programs and mechanisms available that were not considered in depth at this time, but that may have future applicability depending available funding, aggressiveness of Tonasket in pursuing funding or other factors that may emerge as planning moves forward. The following list is not exhaustive but represents the more common funding programs that can be pursued.

7.2.5.1 Public Works Board - PWB (formerly Public Works Trust Fund)

This state program, administered by the WA Department of Commerce, has provided low interest loans for the repair, rehabilitation, and reconstruction of municipal infrastructure. The PWB (originally the Public Works Trust Fund) was established 30 years ago and historically been a sought-after source of low interest loans due to the simplicity and flexibility of the program. The program is loan only and does not offer grant funding. Loan maximum is $10 million for construction; no matching funds required; very low interest rates, with up to 20-year loan term and no loan fee. Interest rates vary, depending on loan term and degree of financially distress of the communities as measured by the affordability index. Currently the application cycle is closed and the PWB has not announced when their next application cycle will be.

7.2.5.2 Line Item – State Budget

A small number of communities have sought assistance from their state representative and/or state senator to obtain funding for their public works project directly from the legislature. The City of Pateros recently used this approach successfully and was able to demonstrate the severe impact of the Carlton Complex fire in the area in 2014 to the local economy and infrastructure.

This approach generally requires significant time and involvement and connections with the area's State Senator and/or Representatives. Usually, a person either part of city government or influential resident that can spend time and effort is needed. A strong case needs to be made by the community and buy-in by the Senator and/or Representatives such that the project request makes it onto the State budget, and through the budget process successfully.

7.2.5.3 Revenue Bonds / General Obligation Bonds

Revenue bonds and general obligation bonds have historically been a means of funding public works projects by some communities. These funding mechanisms will likely not be needed due to the high likelihood Tonasket will qualify favorably for the other loan/grant programs previously discussed. These funding mechanisms can be considered further if other more advantageous sources cannot be obtained.

7.2.5.4 City / Utility Reserve Funds

Accumulated local reserve funds are usually insufficient to fund large scale capital improvements without considerable supplemental funding. Communities are encouraged to budget sufficiently to be able to save and accumulate local reserves for responsible operation, future improvements, and emergency reserves for the utility. In the case where large capital projects are anticipated, local reserves are generally used as seed money to match or leverage funding sources to obtain more favorable funding consideration and funding offers. Communities are encouraged to be accumulating reserves well ahead of project implementation and set utility rates accordingly.

7.2.5.5 System Development Charges

Capital contributions, variously known as "impact fees," "system development charges," "facility charges," or "connection charges" are one-time charges assessed against developers or individual new customers to recover all or a part of the cost of the additional system capacity constructed for their use or benefit (or to "buy in" to reserve capacity of existing facilities). Capital contributions improve financial equity because they require new customers to repay users who have invested in facilities through monthly service charges or fees and/or finance new facilities required to serve new customers.

7.3 Stormwater Utility and Rates

The Storm Drainage and Surface Water Utility was created in 2018. The Stormwater Utility Fund is relatively new. Rates are based on property ownership and a flat rate of $1.50 per month per residential unit and $3.00 per month per business unit. A copy of Ordinance No. 792 and initial fee structure is included in **Appendix 6A**.

8.0 Operation and Maintenance

This chapter describes personnel and procedures used for the day-to-day operation and maintenance of the stormwater system.

8.1 Management and Personnel

Stormwater facilities in the city are overseen by the city of Tonasket Public Works Department, which is responsible for maintenance of the water, sewer, street, cemetery, airport, and parks. The Public Works Department is managed and supervised by the Superintendent, and overseen by the Mayor, and the Tonasket City Council.

The Public Works Department has four full-time equivalent (FTE) employees (Superintendent included). The Public Works Department has operated the system with this level of staff for the past several years. As necessary during an emergency or times of work overload, the Water Department Supervisor can retain contractors to perform non-operational duties and functions.

8.2 Preventive Maintenance Program

The City of Tonasket does not currently have a preventive maintenance program for stormwater facilities, however maintenance is performed on the currently functioning portions of the municipal stormwater system at least one-to-two times per year, as allowed by available personnel and limitations of existing maintenance equipment. Limited resources and equipment limit the scope of any preventative maintenance within the city. Preventive maintenance programs help reduce failures or emergencies that, in turn, reduce overall operation and maintenance (O&M) costs. Recommendations for preventive maintenance are listed below:

- Annual cleaning and vacuuming of structures, conveyance, and piping
- Visual checks of structures and outfalls after every significant rainfall event to confirm functionality
- Periodic visual checks of stormwater detention and retention facilities for standing water and plant growth.
- Planned replacement of infiltration facilities at a maximum interval of every 20 years, depending on service life and functionality.
- The City of Tonasket currently owns and operates a sweeper/vacuum truck that has limited capability to vacuum inlets and catch basin structures. The City does not have water-jetting equipment to clean storm drain piping and would currently contract for services to accomplish storm drain pipe flushing and cleaning.

8.2.1 Existing Stormwater Facilities Not Being Maintained

As mentioned in previous chapters of this Plan, there are existing components of the municipal system that are not functioning or functioning at decreased capacity due to lack of maintenance. In particular are “bubbler” inlets and catch basins in areas around the city. While the lack of functionality of the bubblers has not crippled the system, extended lack of maintenance throughout the system could lead to pavement failures and adds to flooding issues with the rest of the system. Maintenance relates to both conveyance and treatment. It is recommended to adopt a policy and schedule of minimum maintenance that includes all the components of the municipal system and more realistically informs staffing requirements, equipment needs, and costs.

8.3 Monitoring

Stormwater monitoring is not currently required for the Tonasket system and not performed.

8.4 Emergency Response

The City of Tonasket does not have an emergency response plan specific to stormwater. Emergency response for stormwater emergencies could utilize the Okanogan County Emergency Response Plan for natural disasters and floods as a resource.

The Public Works Department has an informal emergency response to flooding on Whitcomb Avenue/US 97. The response is upon receiving information or notification of pending significant rainfall Public Works staff is to travel to the sump grate locations at the intersections of Third Street and Whitcomb and Fourth Street and Whitcomb and manually remove stormwater inlet grates to increase flow into the conveyance system and lower flood conditions in the roadways at those intersections. This procedure creates obvious safety concerns and is intended to be rectified by proposed stormwater facilities improvements proposed in this Plan.

8.5 Safety Procedures

The Public Works Department endeavors to provide a safe place of employment for all personnel. The Department focuses on safety to reduce employee injuries, decrease lost workdays, and maintain equipment and property in working order. Superintendent responsibilities include training employees on-the-job in all practices and equipment necessary to perform their duties. Part of this on-the-job training includes instructing employees concerning the proper use and care of personal protective equipment and making employees aware of hazardous materials they may be exposed to. The superintendent is also responsible for providing ongoing training in all aspects of the employees' work environment and providing up-to-date safety procedures.

The Public Works Department endeavors to provide its employees with ongoing training opportunities. The company has provided or required certain training for all Public Works Department staff. Possible training could include:

- Forklift
- Traffic Flagging
- Electrical Safety
- Defensive Driving
- Hearing Conservation
- Hazards Communications
- Respiratory Protection
- Blood Borne Pathogens
- Personal Protective Equipment
- Lockout/Tagout (Energy Control)
- Construction Equipment and Machines
- Proper Asbestos-Cement Pipe Handling Procedures
- First Aid (all workers required to maintain certification)
- Confined Space Entry Requirements/Limitations/Equipment

- Competent Person Training (Excavation/Trenching/Shoring)
- Cardio-Pulmonary Resuscitation (all workers required to maintain certification)
- Chlorine Handling

Public Works Department personnel are required to attend regularly scheduled safety meetings. A designated safety officer is to maintain the records for the safety meetings. The Department keeps the following safety documents in the office for reference:

- Accident Prevention Plan
- Anthrax Exposure
- Buildings & Grounds Inspection
- Back Safety / Safe Lifting
- CDL Rules and Guidelines
- Circle of Safety / Vehicle Inspection
- Cold Weather / Hypothermia
- Confined Space
- Confined Space Permits (Forms & Test Results)
- Crime Prevention / Lockdown
- Defensive Driving
- Dump Truck Safety
- Emergency Response Plan
- Hazard Recognition
- Heat Exposure
- Ladder Safety
- Lyme Disease
- Mayday
- Medical First Aid
- Methamphetamines
- Material Safety Data Sheet
- Non-Permit Confined Space
- Occupational Hearing Conservation
- Personal Protective Equipment
- Recognizing and Reducing Stress
- Sexual Harassment
- Skin Cancer
- Slings, Chains and Rope Care & Usage
- Small Tool Usage and Guarding
- Spill Prevention / HAZMAT
- Trenching and Shoring
- Workplace Violence

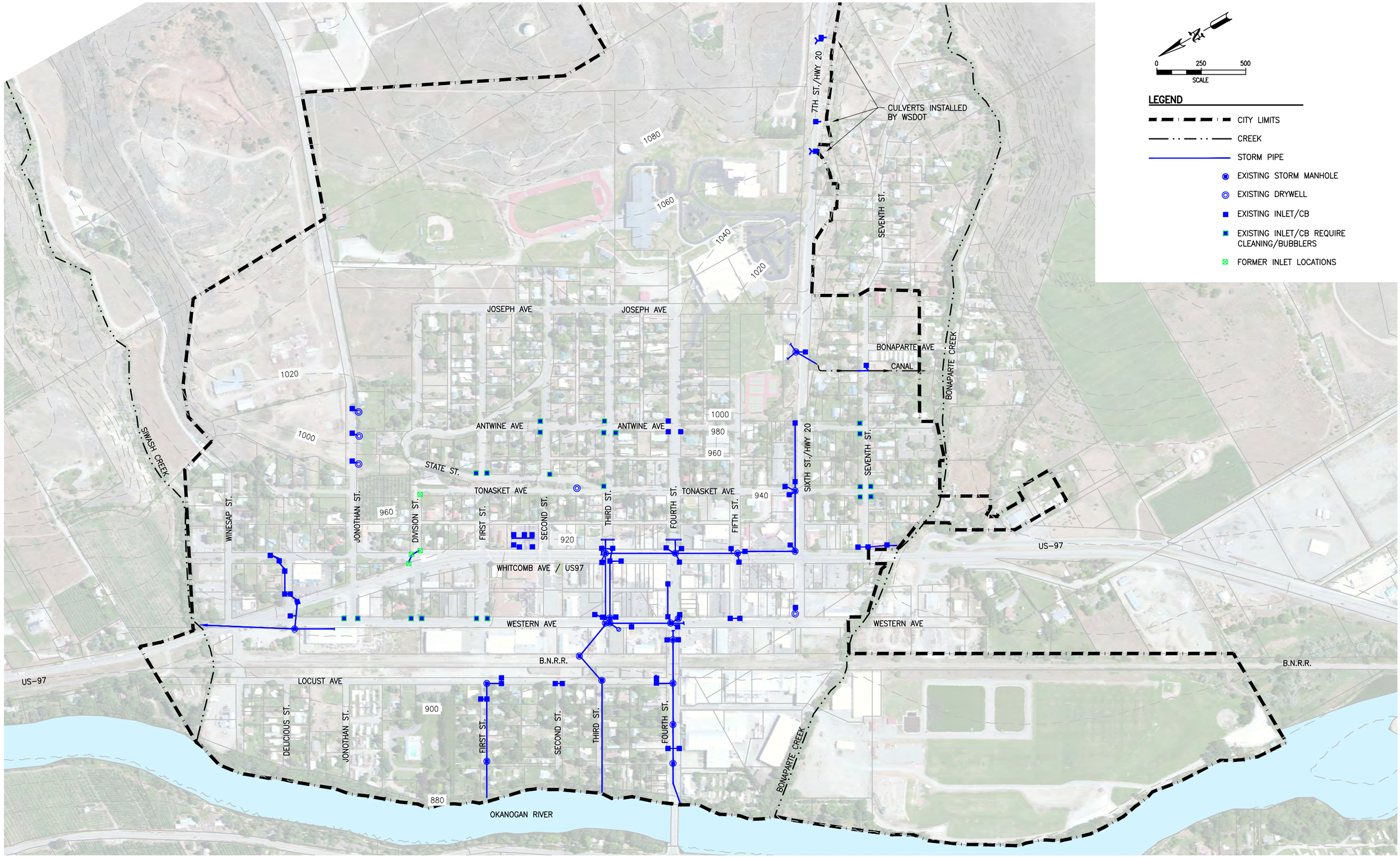
8.5.1 Customer Complaints

Customer complaints regarding stormwater are accepted directly in the Public Works Department office or through City Hall. Public Works staff review complaints and investigate as necessary. No recording of complaints nor actions taken is performed at this time.

8.6 Operation and Maintenance Improvements

No changes in the O&M program or procedures are planned at this time.

The emergency procedure of removing stormwater inlet grates at the intersections of Whitcomb and Third Street and Fourth Street is expected to end with proposed facility improvements identified in this Plan.



582503-Storm Water Planning Exhibit

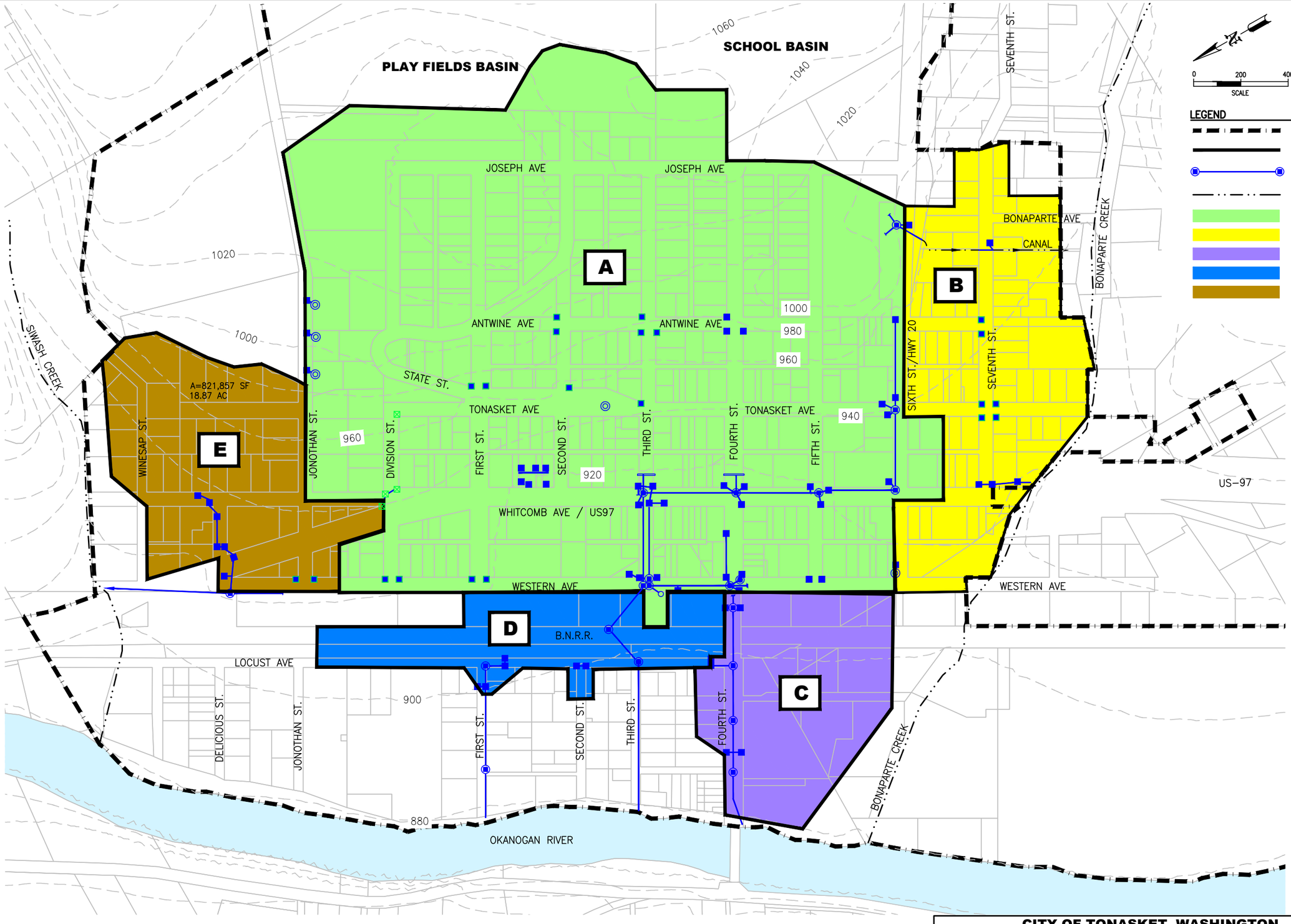
SCALE:	AS SHOWN
DESIGNED:	MEJ
DRAWN:	TVP
CHECKED:	
APPROVED:	
PROJ. NO.:	58-25-03
DATE:	11/24/21

VARELA Engineering & Management

CITY OF TONASKET, WASHINGTON
STORMWATER PLAN

EXISTING STORM SYSTEM

FIGURE **2-1**



582503-Storm Water Planning Exhibit

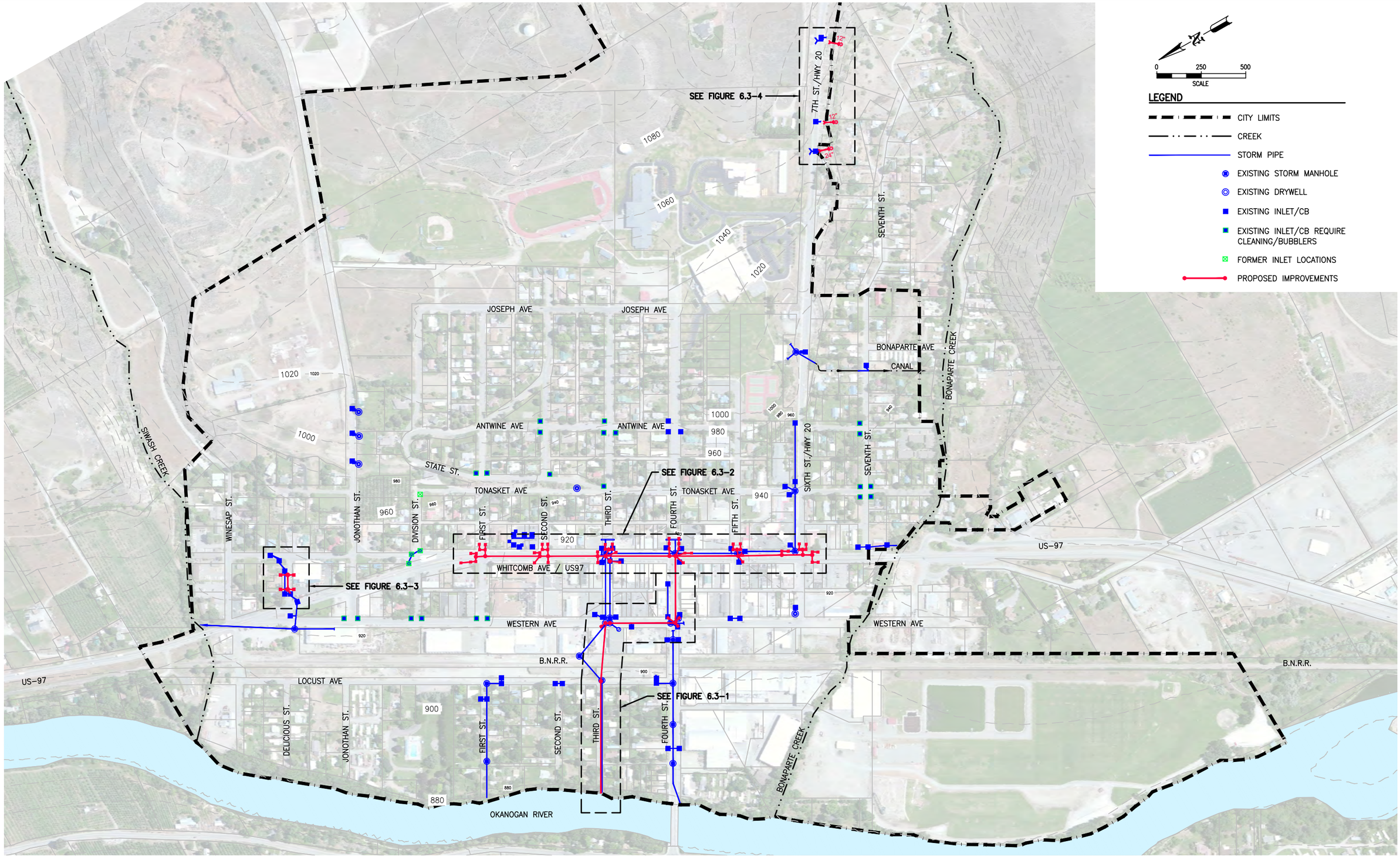
SCALE:	AS SHOWN
DESIGNED:	MEJ
DRAWN:	TVP
CHECKED:	
APPROVED:	
PROJ. NO.:	58-25-03
DATE:	11/24/21

VARELA
Engineering & Management

CITY OF TONASKET, WASHINGTON
STORMWATER EVALUATION

BASIN MAP

FIGURE
4-1



582503-Storm Water Planning Exhibit

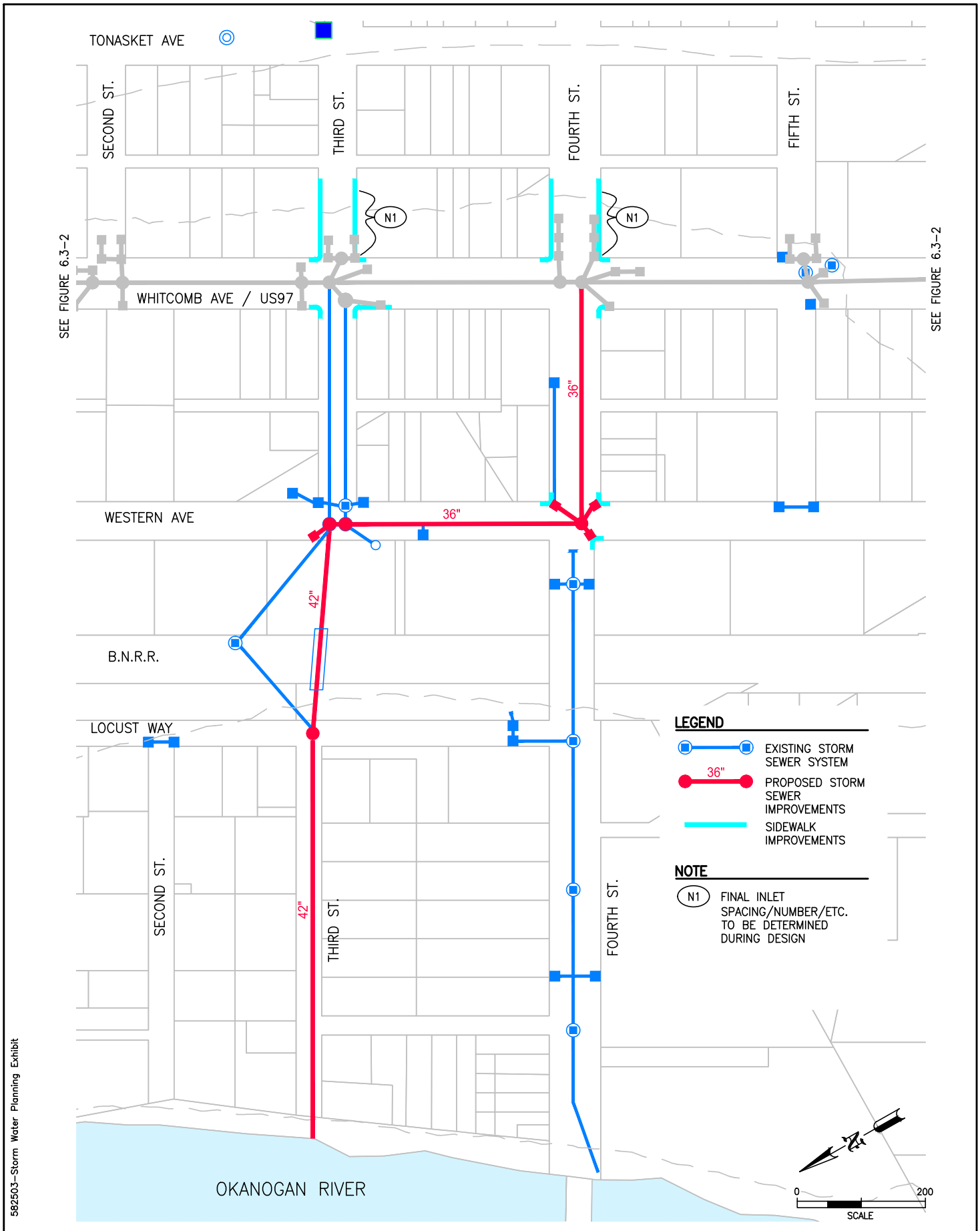
SCALE:	AS SHOWN
DESIGNED:	MEJ
DRAWN:	TVP
CHECKED:	
APPROVED:	
PROJ. NO.:	58-25-03
DATE:	11/24/21

VARELA Engineering & Management

CITY OF TONASKET, WASHINGTON
STORMWATER PLAN

PROPOSED IMPROVEMENTS

FIGURE **6-1**



582503-Storm Water Planning Exhibit

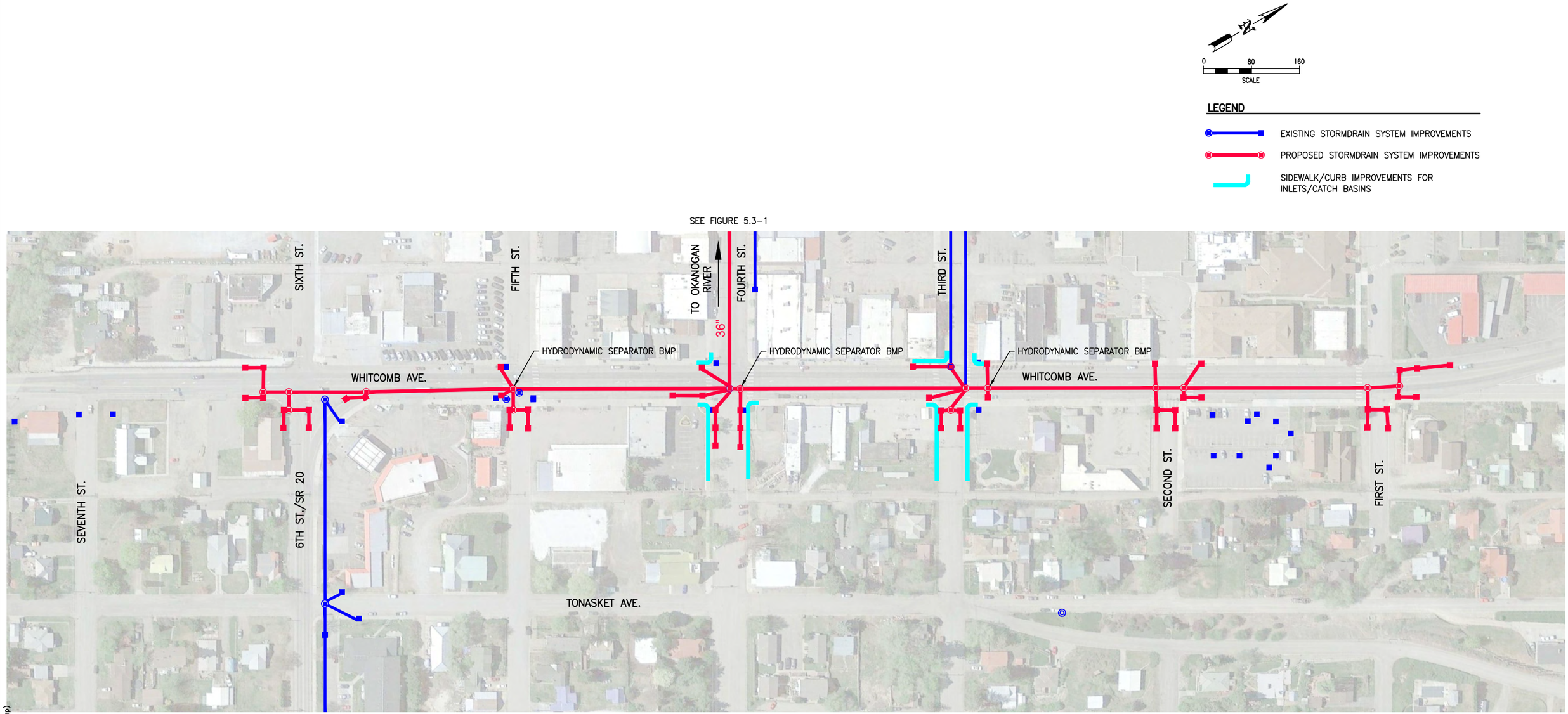
SCALE:	AS SHOWN
DESIGNED:	MEJ
DRAWN:	TVP
CHECKED:	
APPROVED:	
PROJ. NO.:	58-25-03
DATE:	11/24/21

VARELA
Engineering & Management

CITY OF TONASKET, WASHINGTON
STORMWATER PLAN

RECOMMENDED IMPROVEMENTS:
INTERSECTION OF WHITCOMB AVE.
AND 3RD/4TH STREETS TO RIVER

FIGURE
6.3-1



582503-Fig 6.3-2 (Perfect Passage Imp)

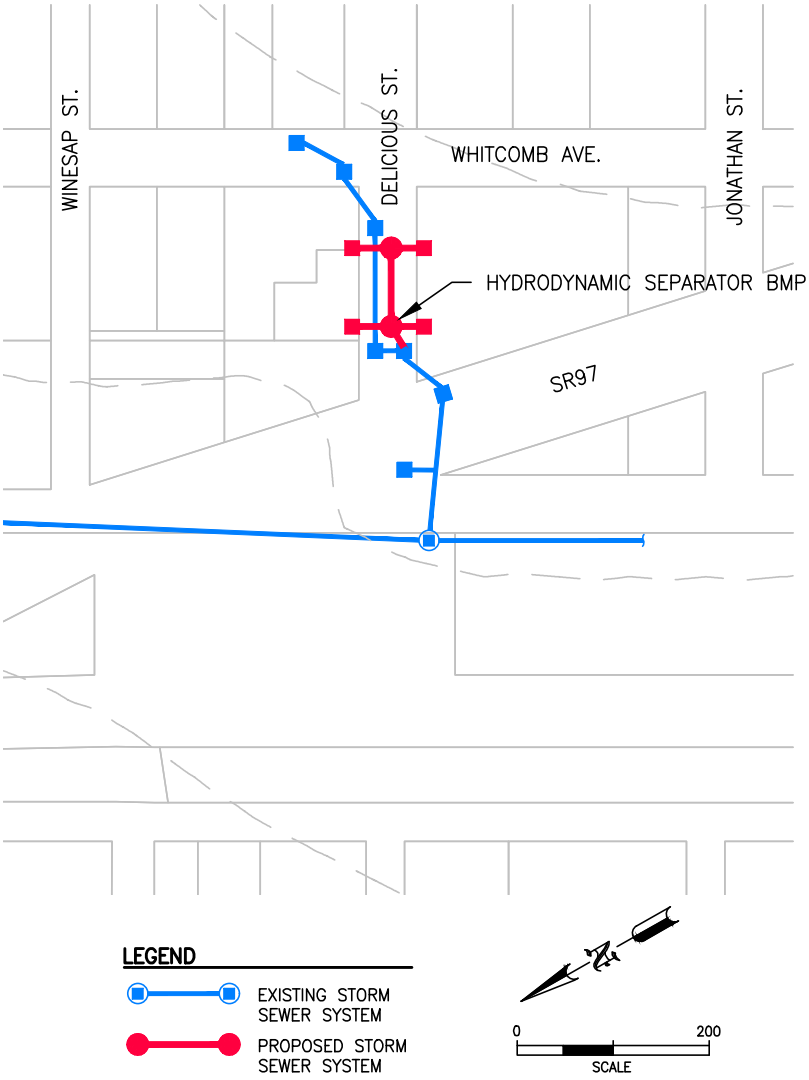
SCALE:	AS SHOWN
DESIGNED:	MEJ
DRAWN:	TVP
CHECKED:	
APPROVED:	
PROJ. NO.:	58-25-03
DATE:	7/26/21

VARELA Engineering & Management

CITY OF TONASKET, WASHINGTON
STORMWATER PLAN

RECOMMENDED IMPROVEMENTS: WITHCOMB AVE. (US97)

FIGURE **6.3-2**



582503-Storm Water Planning Exhibit

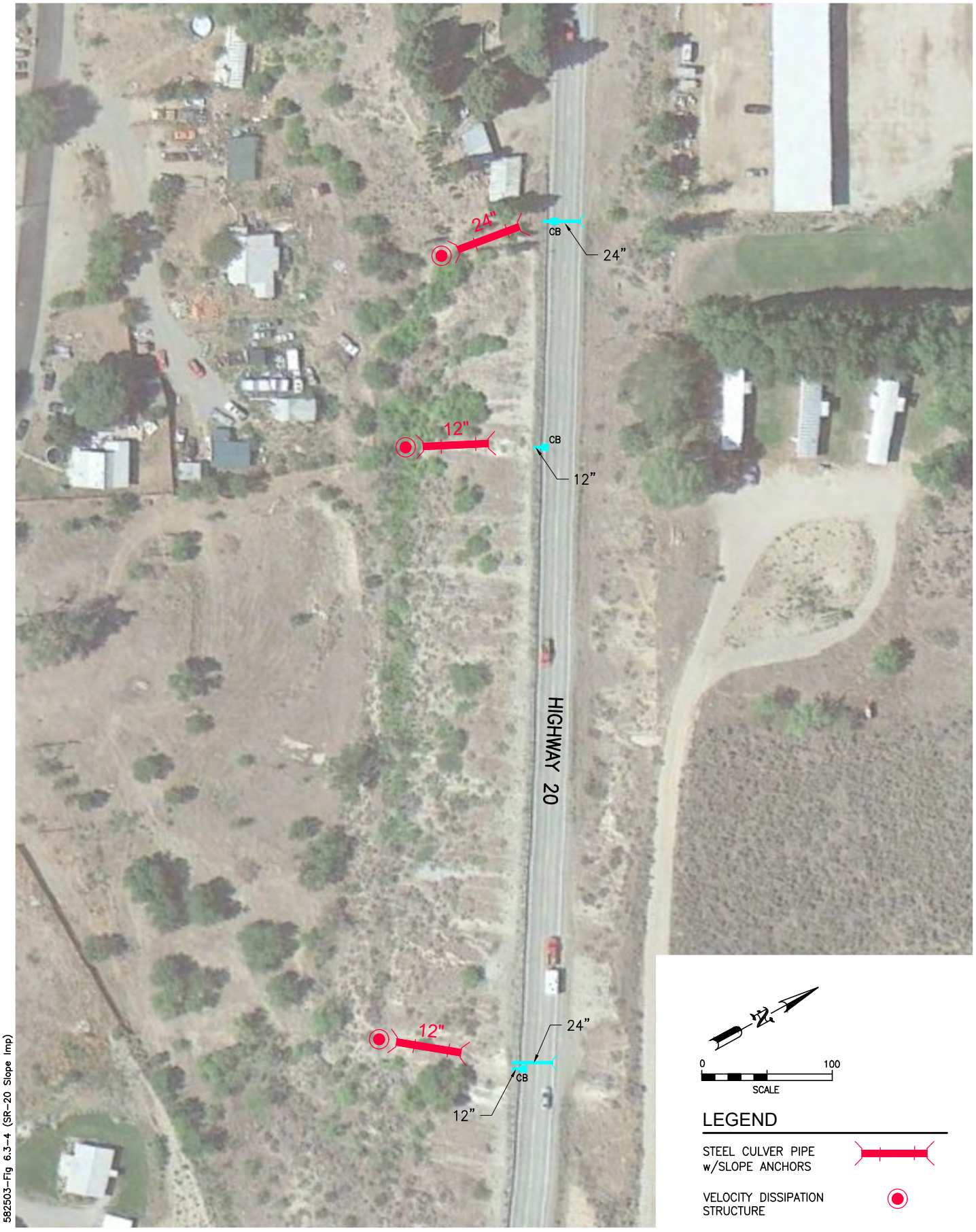
SCALE:	AS SHOWN
DESIGNED:	MEJ
DRAWN:	TVP
CHECKED:	
APPROVED:	
PROJ. NO.:	58-25-03
DATE:	7/26/21

VARELA
Engineering & Management

CITY OF TONASKET, WASHINGTON
STORMWATER PLAN

RECOMMENDED IMPROVEMENTS:
PONDING ON DELICIOUS ST. BETWEEN
WHITCOMB & SR97

FIGURE
6.3-3



582503-Fig 6.3-4 (SR-20 Slope Imp)

SCALE:	AS SHOWN
DESIGNED:	MEJ
DRAWN:	TVP
CHECKED:	
APPROVED:	
PROJ. NO.:	58-25-03
DATE:	10/22/20

VARELA
Engineering & Management

CITY OF TONASKET, WASHINGTON
STORMWATER PLAN

RECOMMENDED IMPROVEMENTS:
SR 20 SLOPE EROSION

FIGURE
6.3-4

Appendix A

Appendix A Wetlands Inventory Map, Tonasket, WA

NRCS Soils Map for Tonasket, WA

Zoning map, **City of Tonasket** 2020 Comprehensive Plan

Existing Land Use, “Map III-1”, **City of Tonasket** 2020 Comprehensive Plan

Land Use Designations, “Map III-2”, **City of Tonasket** 2020 Comprehensive Plan

U.S. Fish and Wildlife Service
National Wetlands Inventory

Tonasket, WA

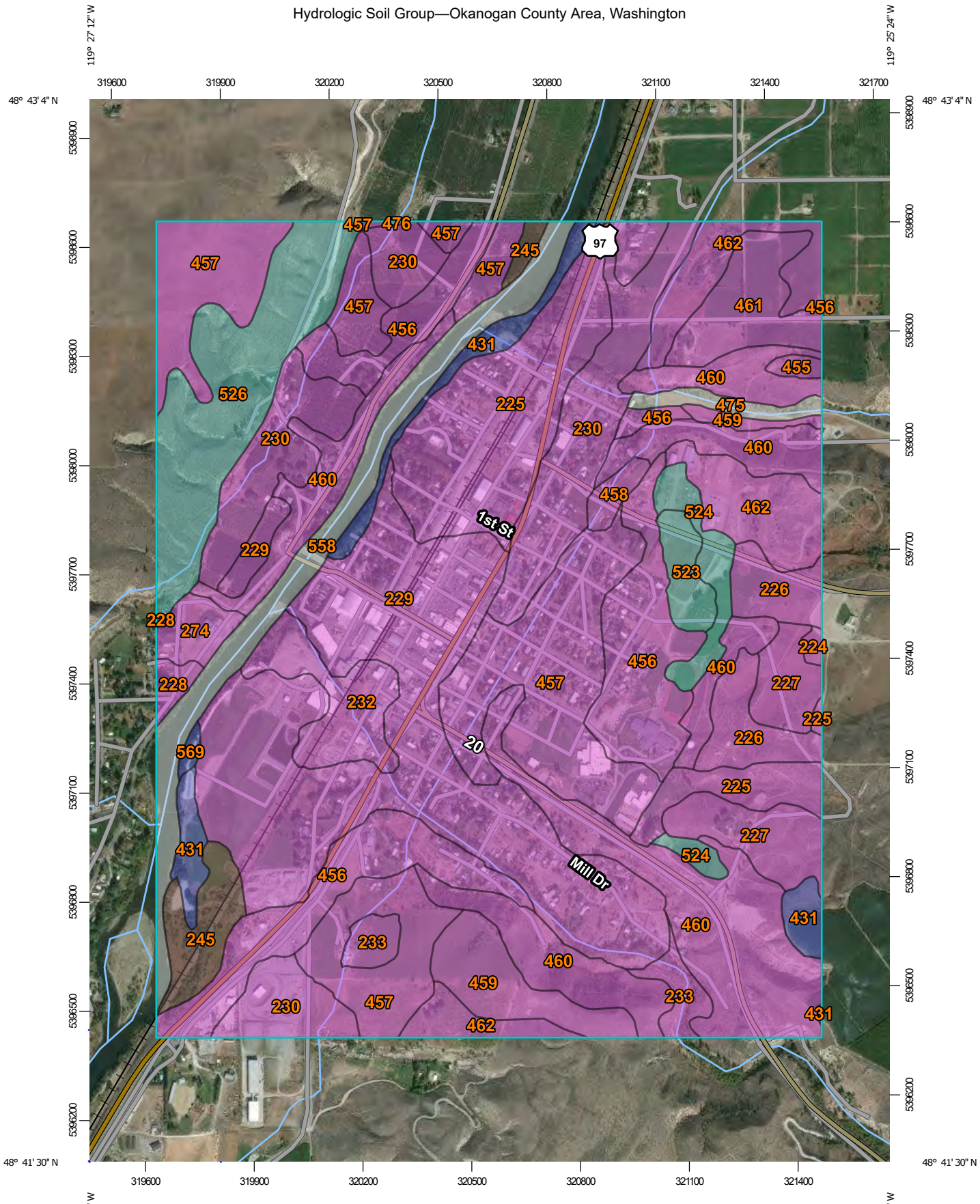
October 2, 2019

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

Hydrologic Soil Group—Okanogan County Area, Washington



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Okanogan County Area, Washington
Survey Area Data: Version 15, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 15, 2010—Sep 20, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
224	Cashmere fine sandy loam, 0 to 3 percent slopes	A	1.2	0.1%
225	Cashmere fine sandy loam, 3 to 8 percent slopes	A	77.1	7.6%
226	Cashmere fine sandy loam, 8 to 15 percent slopes	A	23.7	2.3%
227	Cashmere fine sandy loam, 15 to 25 percent slopes	A	27.2	2.7%
228	Cashmont sandy loam, 0 to 3 percent slopes	A	3.4	0.3%
229	Cashmont sandy loam, 3 to 8 percent slopes	A	157.9	15.5%
230	Cashmont sandy loam, 8 to 15 percent slopes	A	87.1	8.5%
232	Cashmont gravelly sandy loam, 0 to 8 percent slopes	A	21.0	2.1%
233	Cashmont sandy loam, 0 to 25 percent slopes, extremely stony	A	11.0	1.1%
245	Colville silt loam, 0 to 3 percent slopes	B/D	16.9	1.7%
274	Ewall loamy fine sand, 0 to 15 percent slopes	A	7.8	0.8%
431	Okanogan loam, 0 to 5 percent slopes	B	21.5	2.1%
455	Pogue fine sandy loam, 0 to 5 percent slopes	A	2.0	0.2%
456	Pogue fine sandy loam, 3 to 8 percent slopes	A	85.2	8.3%
457	Pogue fine sandy loam, 8 to 15 percent slopes	A	128.7	12.6%
458	Pogue fine sandy loam, 10 to 25 percent slopes	A	4.1	0.4%
459	Pogue gravelly fine sandy loam, 0 to 25 percent slopes, extremely stony	A	22.4	2.2%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
460	Pogue gravelly fine sandy loam, 25 to 65 percent slopes, extremely stony	A	130.0	12.7%
461	Pogue gravelly fine sandy loam, 0 to 8 percent slopes	A	21.9	2.1%
462	Pogue gravelly fine sandy loam, 8 to 25 percent slopes	A	45.2	4.4%
475	Riverwash		5.9	0.6%
476	Rock outcrop		0.1	0.0%
523	Tonasket silt loam, 3 to 8 percent slopes	C	8.6	0.8%
524	Tonasket silt loam, 8 to 15 percent slopes	C	14.4	1.4%
526	Tonasket silt loam, 25 to 45 percent slopes	C	56.1	5.5%
558	Water		39.8	3.9%
569	Xerofluvents, wet, 0 to 3 percent slopes	B	1.3	0.1%
Totals for Area of Interest			**1,021.7**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

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

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

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

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Urban Growth Boundary

City Limits

City Limits

City Limits

City Limits

NELSON RD
WINESAP ST W
DELICIOUS ST W
ZACHMANS CR CT
WINESAP ST E
DELICIOUS ST E
WESTERN AVE N
TONASKET AVE N
JONATHAN ST E
WHITCOMB AVE N
DIVISION ST W
1ST ST W
2ND ST W
LOCUST WAY S
HENDERSON WAY
WESTERN AVE S
STATE ST
JOSEPH AVE S
1ST ST E
TONASKET AVE S
3RD ST E
2ND ST E
RIVERVIEW TR CT
4TH ST W
3RD ST W
6TH ST W
5TH ST W
5TH ST E
4TH ST E
RAILROAD AVE S
ANN WINE AVE S
TONASKET SHOP RD
NORTH STATE FRONTAGE RD
MCLAUGHLIN AVE
BRETZ RD
MILL DR
LILAC LN
CONNITE LN
LONGENECKER RD

Zoning Districts

- C1
- C2
- M1
- MU
- PU
- R1
- R2
- RR

Adopted _____
Ordinance No. _____

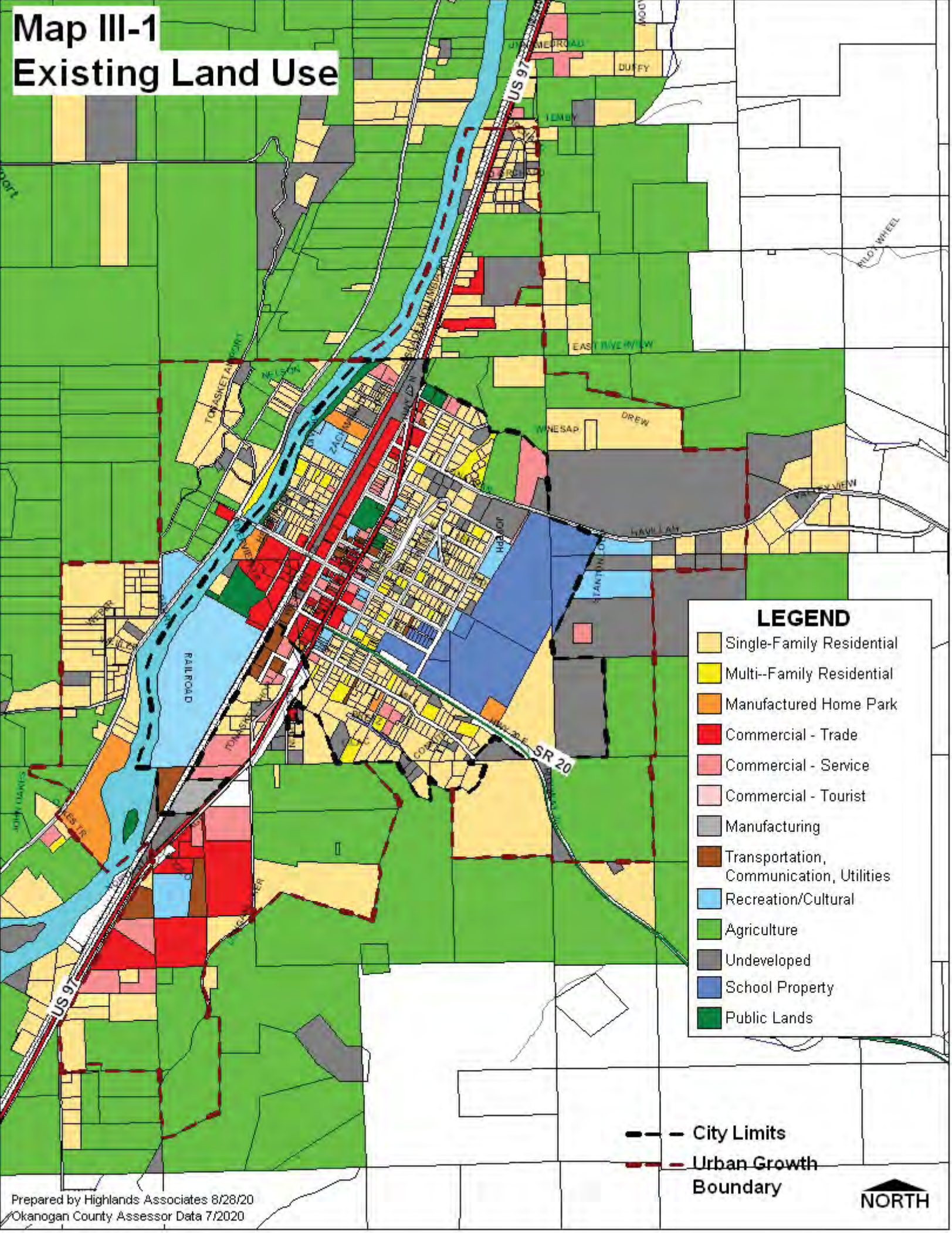
_____
Patrick Plumb, Mayor

_____
Alice Attwood, City Clerk

Prepared 5/29/14
Revised 6/6/15
Approved by Planning Commission 11/17/15
Editied January 19, 2016
Highlands Associates

N

Map III-1
Existing Land Use



Prepared by Highlands Associates 8/28/20
Okanogan County Assessor Data 7/2020

MAP III-2

Airport Inset

Tonasket Cemetary
Public Use

Urban Growth Boundary

City Limits

City Limits

Urban Growth Boundary

Urban Growth Boundary

City Limits

Urban Growth Boundary

TONASKET AIRPORT RD
TONASKET AIRPOR
TONASKET TERRACE RD
NELSON RD
WEBER RD
FRONTAGE RD
TEMBY RD
NORTH DIVISION ST
DIVISION ST
SOUTH DIVISION ST
US 97
NELSON RD
DELICIOUS ST W
WINESAP ST W
WINESAP ST E
DREW RD
ZACHMAN CIR CT
1ST ST W
2ND ST W
3RD ST W
4TH ST W
5TH ST W
6TH ST W
7TH ST W
DELICIOUS ST E
TONASKET AVE N
JONATHAN ST E
DIVISION ST W
STARKEY ST
JOSEPH AVE S
1ST ST E
2ND ST E
4TH ST E
To Havillah
STANTON LOOP RD
WESTERN AVE S
TONASKET AVE S
RIVERVIEW TR CT
PARK RD
WEBER RD
WELLER RD
M PINE CREEK RD
RAILROAD AVE S
OAKES TR CT
JOHN OAKES RD
SR 20
To Republic
AMERICAN AVE S
TONASKET SHOP RD
MCLAUGHLIN AVE
NORTH STAR FRONTAGE RD
BRETZ RD
MILL DR
LILAC LN
CONNITE LN
CLARKSON MILL RD
LONGANECKER RD
US 97

Prepared 6/15/11
Revised 1/15/13
Revised 11/26/13
Revised 7/6/15
Planning Commission approval 11/17/15
Edited 1/19/16
Highlands Associates

Legend

- Industrial
- Mixed Use
- Multi-Family Residential
- Public
- Retail Commercial
- Rural Residential
- Service Commercial
- Single Family Residentia
- Single Family/Multi-Fami
- Tourist Commercial
- Airport Industrial
- Airport Protection Overlay

N

Appendix B

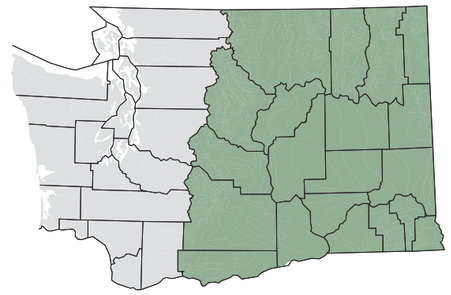
Appendix B NOAA Isopluvial maps

Sample Existing System 50-year Hydraulic Profiles From *2014 Inventory* Data

Proposed Improvements Stormwater Model Input and Output

Hydraulic Calculations for Gutter and Inlet Capacity

Eastern Washington Stormwater Manual



100-Year 24-Hour Isopluvials

Source: NOAA Atlas 2, Volume IX, 1973
Precipitation in inches

- County(2003, 1:24,000)
- City(2003, 1:24,000)
- Latitude/Longitude(1/10 degree)
- Isopluvial(1973, 1:2,000,000)
- NOAA/NWS Station(1931-1998)

N

Scale 1:1,600,000

Miles

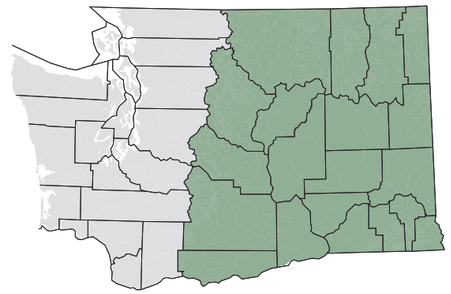
0 16.5 33

Water Quality Program

WASHINGTON STATE DEPARTMENT OF ECOLOGY

GIS Technical Services
02/25/04
Figure_4.3.7

Eastern Washington Stormwater Manual



2-Year 24-Hour Isopluvials

Source: NOAA Atlas 2, Volume IX, 1973

Precipitation in inches

- County(2003, 1:24,000)
- City(2003, 1:24,000)
- Latitude/Longitude(1/10 degree)
- Isopluvial(1973, 1:2,000,000)
- NOAA/NWS Station(1931-1998)

N

Scale 1:1,600,000

Miles

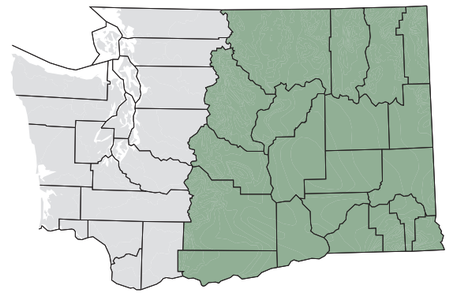
0 16.5 33

Water Quality Program

WASHINGTON STATE DEPARTMENT OF ECOLOGY

GIS Technical Services
02/25/04
Figure_4.3.3

Eastern Washington Stormwater Manual



10-Year 24-Hour Isopluvials

Source: NOAA Atlas 2, Volume IX, 1973
Precipitation in inches

- County(2003, 1:24,000)
- City(2003, 1:24,000)
- Latitude/Longitude(1/10 degree)
- Isopluvial(1973, 1:2,000,000)
- NOAA/NWS Station(1931-1998)

N

Scale 1:1,600,000

Miles

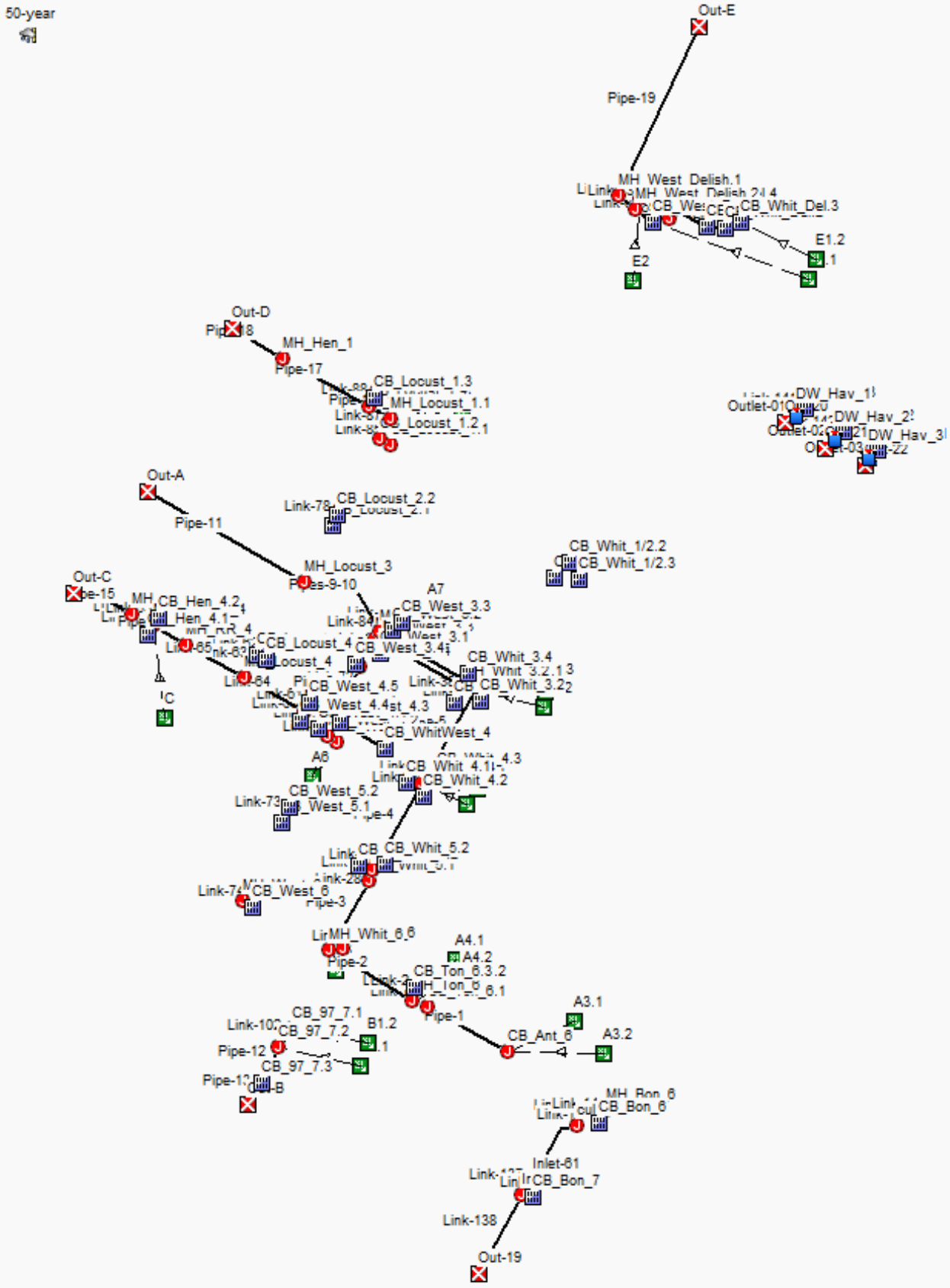
0 16.5 33

Water Quality Program

WASHINGTON STATE DEPARTMENT OF ECOLOGY

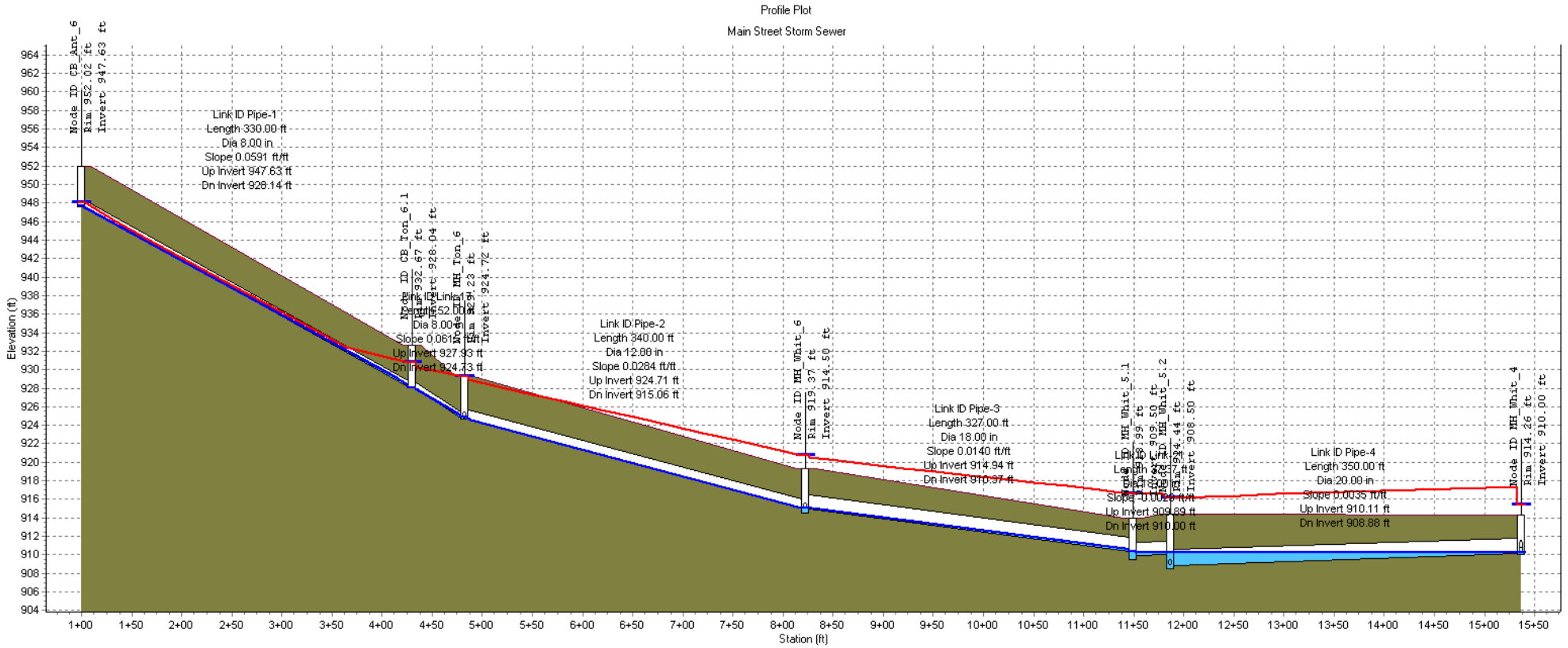
GIS Technical Services
02/25/04
Figure_4.3.4

Tonasket Existing SW System-2014 Basin Values



Tonasket Existing Stormwater System 50-year Storm Profiles

Based on 2014 Inventory SW Basin Analysis

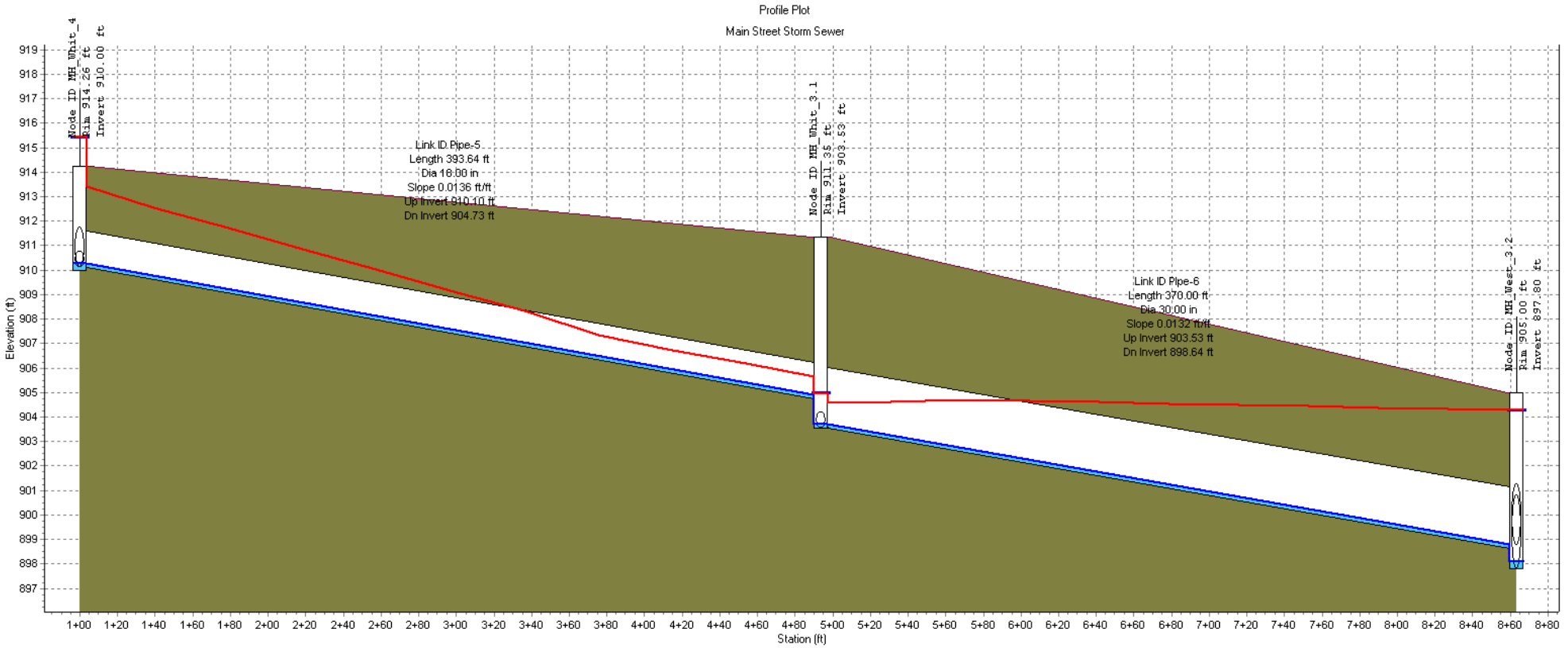


Node ID:	CB_Ant_6	CB_Ton_6	MH_Ton_6	MH_Whit_6	MH_Whit_5.1	MH_Whit_5.2	MH_Whit_4
Rim (ft):	952.02	932.67	929.23	919.37	913.99	914.44	914.26
Invert (ft):	947.63	928.04	924.72	914.50	909.50	908.50	910.00
Min Pipe Cover (ft):	3.72	3.86	3.52	2.92	2.12	2.94	2.48
Max HGL (ft):	948.01	930.91	929.33	921.01	916.67	916.22	915.51

Link ID:	Pipe-1	Link-17	Pipe-2	Pipe-3	Link-21	Pipe-4
Length (ft):	330.00	52.00	340.00	327.00	37.37	350.00
Dia (in):	8.00	8.00	12.00	18.00	18.00	20.00
Slope (ft/ft):	0.0591	0.0615	0.0284	0.0140	-0.0029	0.0035
Up Invert (ft):	947.63	927.93	924.71	914.94	909.89	910.11
Dn Invert (ft):	928.14	924.73	915.06	910.37	910.00	908.88
Max Q (cfs):	1.83	1.92	3.32	7.27	8.27	9.35
Max Vel (ft/s):	8.19	6.04	4.35	4.11	4.68	4.29
Max Depth (ft):	0.52	0.67	1.00	1.50	1.50	1.67

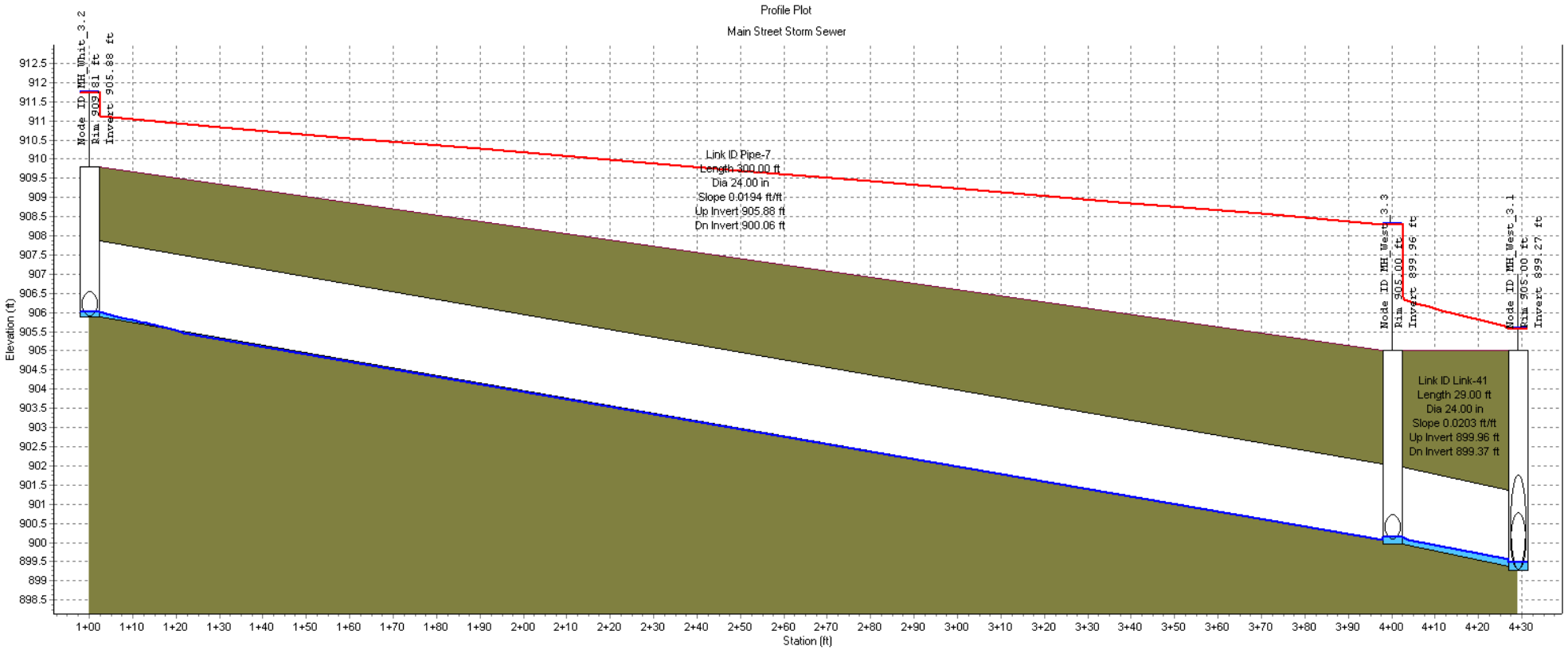
Tonasket Existing Stormwater System 50-year Storm Profiles

Based on 2014 Inventory SW Basin Analysis



Node ID:	MH_Whit_4	MH_Whit_3.1	MH_West_3.2
Rim (ft):	914.26	911.35	905.00
Invert (ft):	910.00	903.53	897.80
Min Pipe Cover (ft):	2.48	5.12	3.73
Max HGL (ft):	915.51	904.99	904.39

Link ID:	Pipe-5	Plpe-6
Length (ft):	393.64	370.00
Dia (in):	18.00	30.00
Slope (ft/ft):	0.0136	0.0132
Up Invert (ft):	910.10	903.53
Dn Invert (ft):	904.73	898.64
Max Q (cfs):	13.62	14.26
Max Vel (ft/s):	7.83	6.80
Max Depth (ft):	1.43	1.95

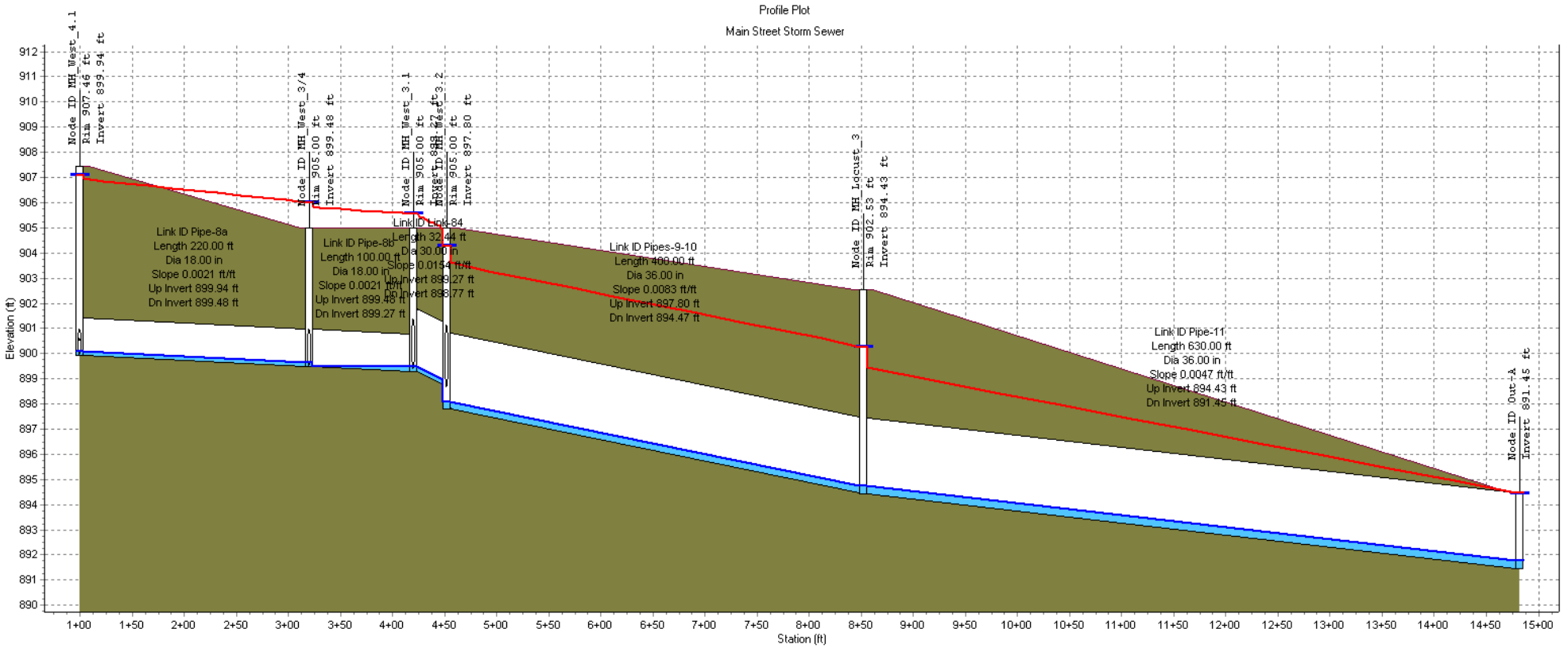


Node ID:	MH_Whit_3.2		MH_West_3.3	MH_West_3.1
Rim (ft):	909.81		905.00	905.00
Invert (ft):	905.88		899.96	899.27
Min Pipe Cover (ft):	1.93		2.94	3.23
Max HGL (ft):	912.20		908.49	905.72

Link ID:	Pipe-7	Link-41
Length (ft):	300.00	29.00
Dia (in):	24.00	24.00
Slope (ft/ft):	0.0194	0.0203
Up Invert (ft):	905.88	899.96
Dn Invert (ft):	900.06	899.37
Max Q (cfs):	19.97	34.67
Max Vel (ft/s):	6.36	11.03
Max Depth (ft):	2.00	2.00

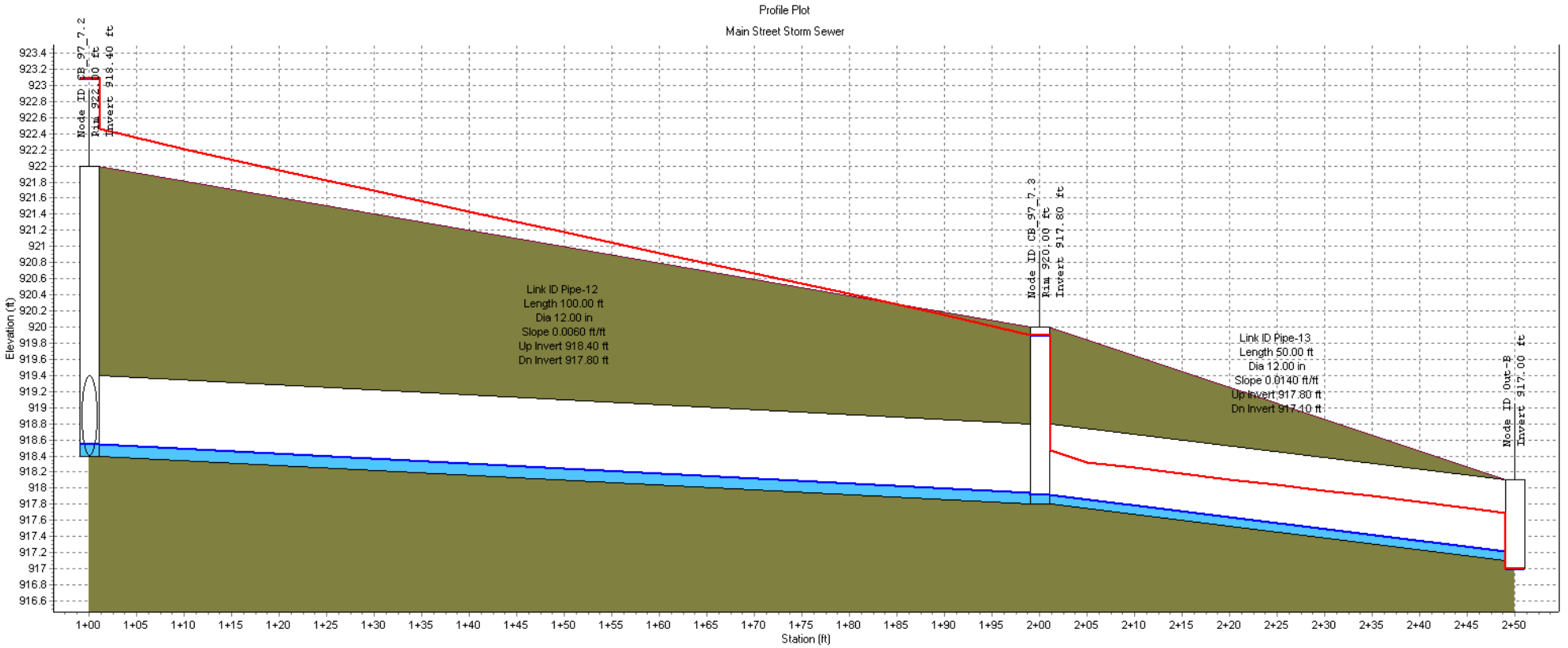
Tonasket Existing Stormwater System 50-year Storm Profiles

Based on 2014 Inventory SW Basin Analysis



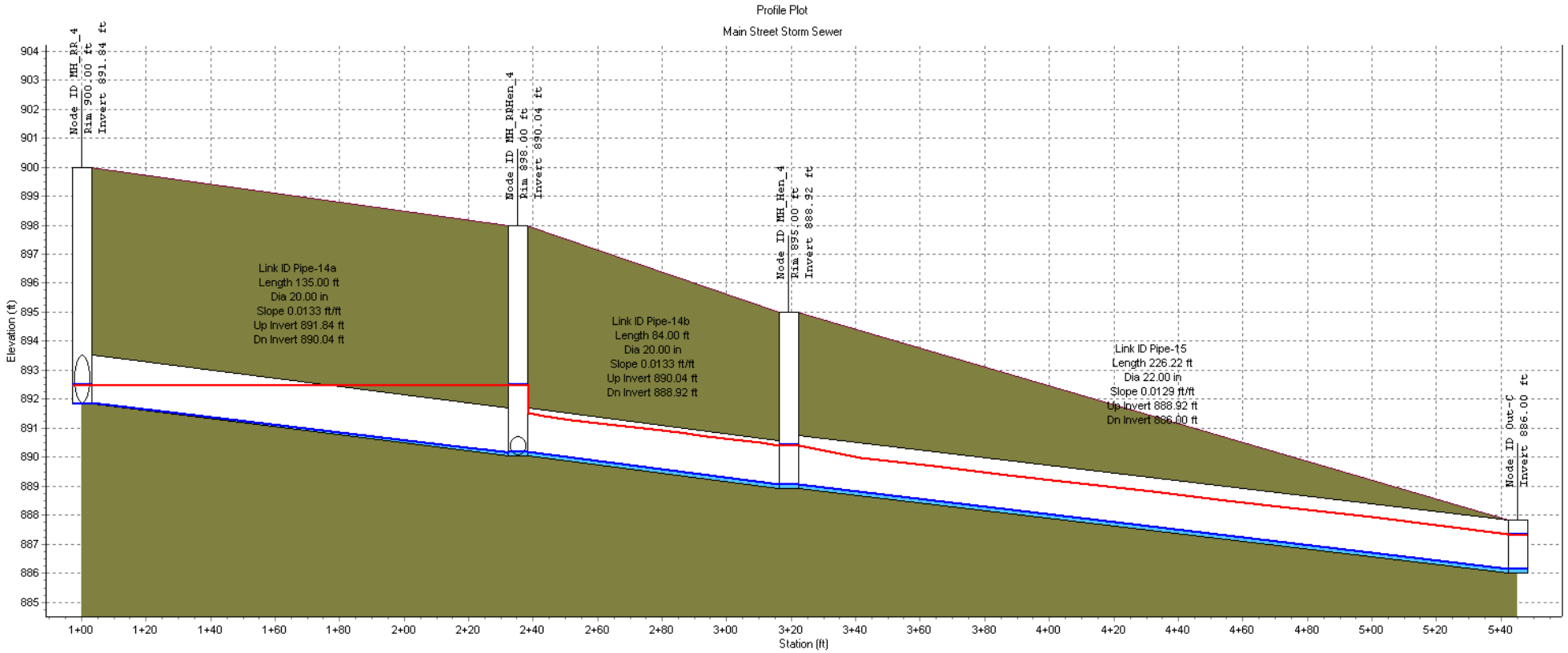
Node ID:	MH_West_4.1	MH_West_3/4	MH_West_3.1	MH_West_3.2	MH_Locust_3	Out-A
Rim (ft):	907.46	905.00	905.00	905.00	902.53	
Invert (ft):	899.94	899.48	899.27	897.80	894.43	891.45
Min Pipe Cover (ft):	6.03	4.02	3.23	3.73	5.06	
Max HGL (ft):	907.26	906.03	905.72	904.39	902.53	894.45

Link ID:	Pipe-8a	Pipe-8b	Link-84	Pipes-9-10	Pipe-11
Length (ft):	220.00	100.00	32.44	400.00	630.00
Dia (in):	18.00	18.00	30.00	36.00	36.00
Slope (ft/ft):	0.0021	0.0021	0.0154	0.0083	0.0047
Up Invert (ft):	899.94	899.48	899.27	897.80	894.43
Dn Invert (ft):	899.48	899.27	898.77	894.47	891.45
Max Q (cfs):	7.77	9.17	39.41	51.78	51.78
Max Vel (ft/s):	4.40	5.19	8.55	7.33	7.33
Max Depth (ft):	1.50	1.50	2.50	3.00	3.00



Node ID:	CB_97_7.2	CB_97_7.3	Out-B
Rim (ft):	922.00	920.00	
Invert (ft):	918.40	917.80	917.00
Min Pipe Cover (ft):	2.60		
Max HGL (ft):	923.20	919.90	917.00

Link ID:	Pipe-12	Pipe-13
Length (ft):	100.00	50.00
Dia (in):	12.00	12.00
Slope (ft/ft):	0.0060	0.0140
Up Invert (ft):	918.40	917.80
Dn Invert (ft):	917.80	917.10
Max Q (cfs):	5.01	5.01
Max Vel (ft/s):	6.38	6.47
Max Depth (ft):	1.00	0.96

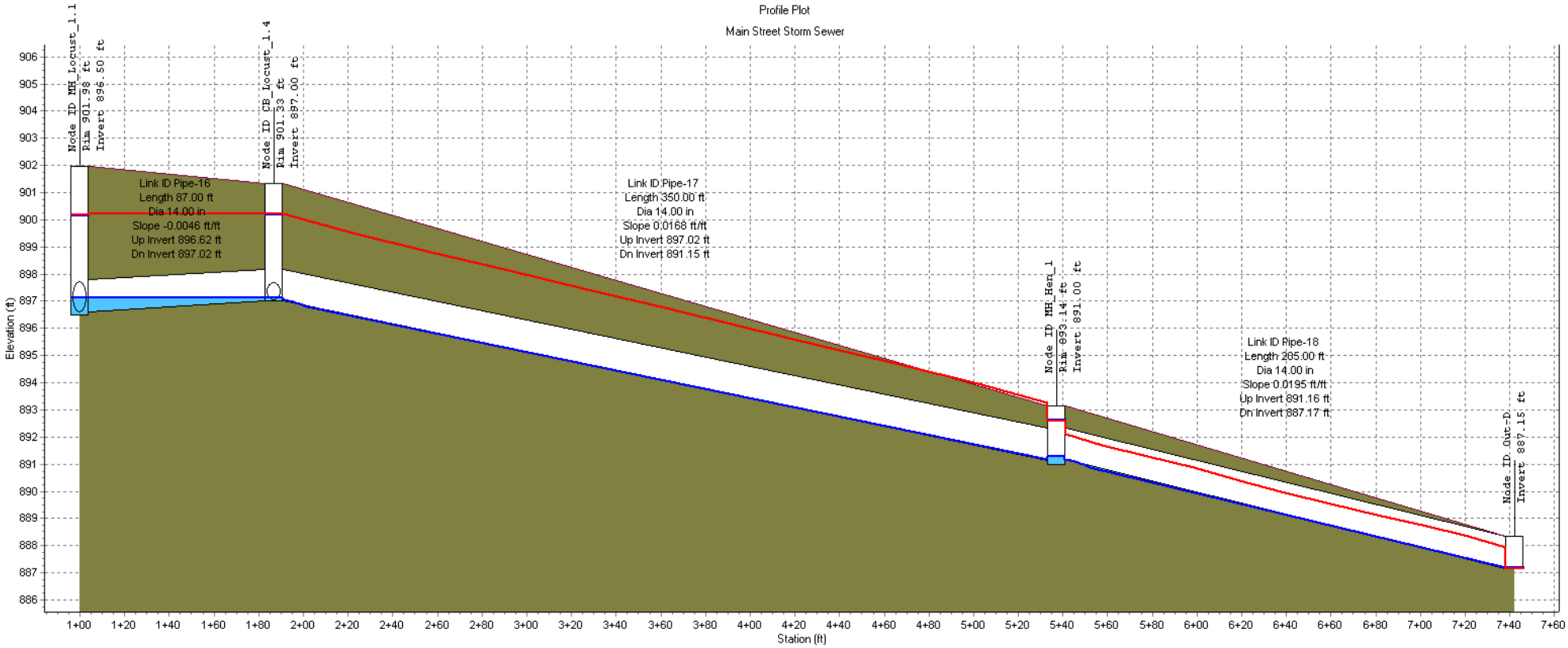


Node ID:	MH_RR_4	MH_RRHen_4	MH_Hen_4	Out-C
Rim (ft):	900.00	898.00	895.00	
Invert (ft):	891.84	890.04	888.92	886.00
Min Pipe Cover (ft):	6.49	6.29	4.25	
Max HGL (ft):	892.51	892.48	890.39	887.31

Link ID:	Pipe-14a	Pipe-14b	Pipe-15
Length (ft):	135.00	84.00	226.22
Dia (in):	20.00	20.00	22.00
Slope (ft/ft):	0.0133	0.0133	0.0129
Up Invert (ft):	891.84	890.04	888.92
Dn Invert (ft):	890.04	888.92	886.00
Max Q (cfs):	1.03	15.17	15.13
Max Vel (ft/s):	0.76	7.12	7.05
Max Depth (ft):	1.15	1.57	1.39

Tonasket Existing Stormwater System 50-year Storm Profiles

Based on 2014 Inventory SW Basin Analysis

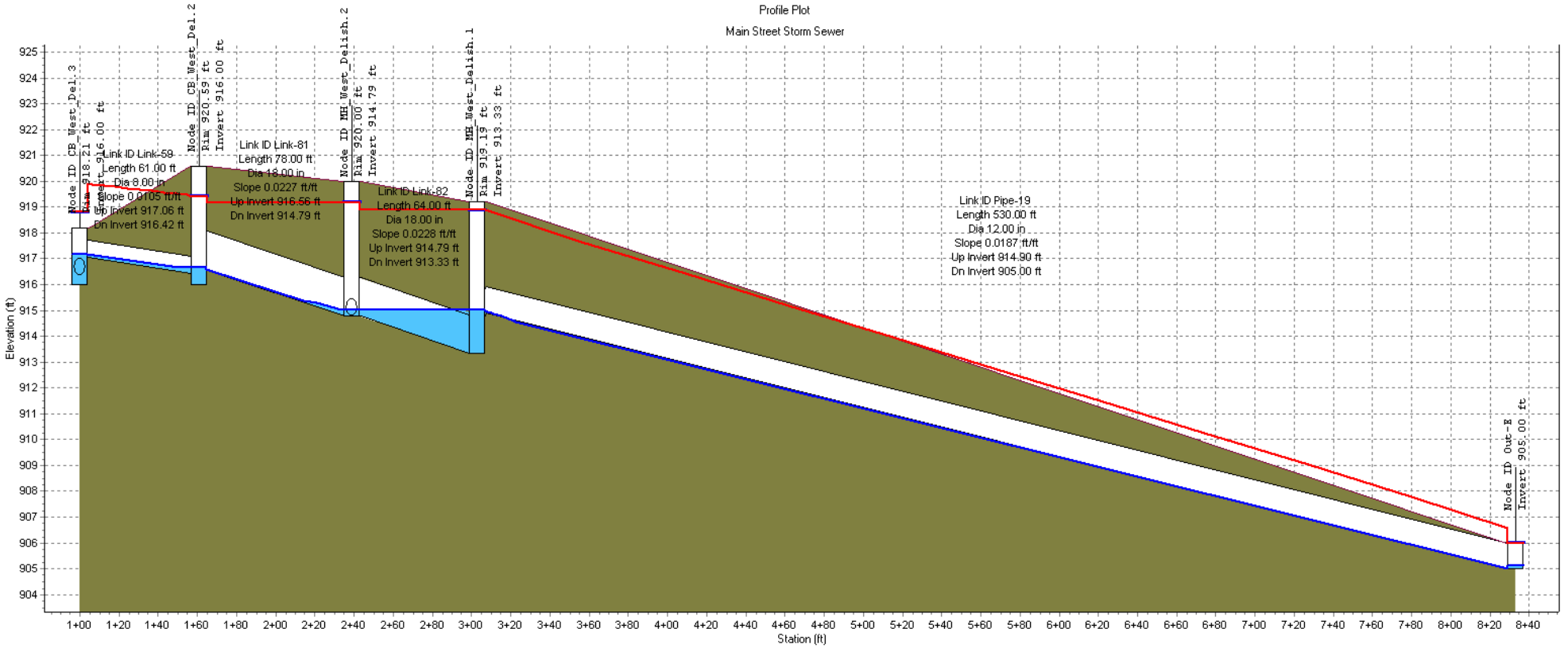


Node ID:		CB_Locust_1.4	MH_Hen_1	Out-D
Rim (ft):	901.98	901.33	893.14	
Invert (ft):	896.50	897.00	891.00	887.15
Min Pipe Cover (ft):	4.19	3.14	0.82	
Max HGL (ft):	900.19	900.22	893.14	887.15

Link ID:	Pipe-16	Pipe-17	Pipe-18
Length (ft):	87.00	350.00	205.00
Dia (in):	14.00	14.00	14.00
Slope (ft/ft):	-0.0046	0.0168	0.0195
Up Invert (ft):	896.62	897.02	891.16
Dn Invert (ft):	897.02	891.15	887.17
Max Q (cfs):	1.07	6.78	6.55
Max Vel (ft/s):	1.00	6.38	6.63
Max Depth (ft):	1.17	1.17	1.10

Tonasket Existing Stormwater System 50-year Storm Profiles

Based on 2014 Inventory SW Basin Analysis

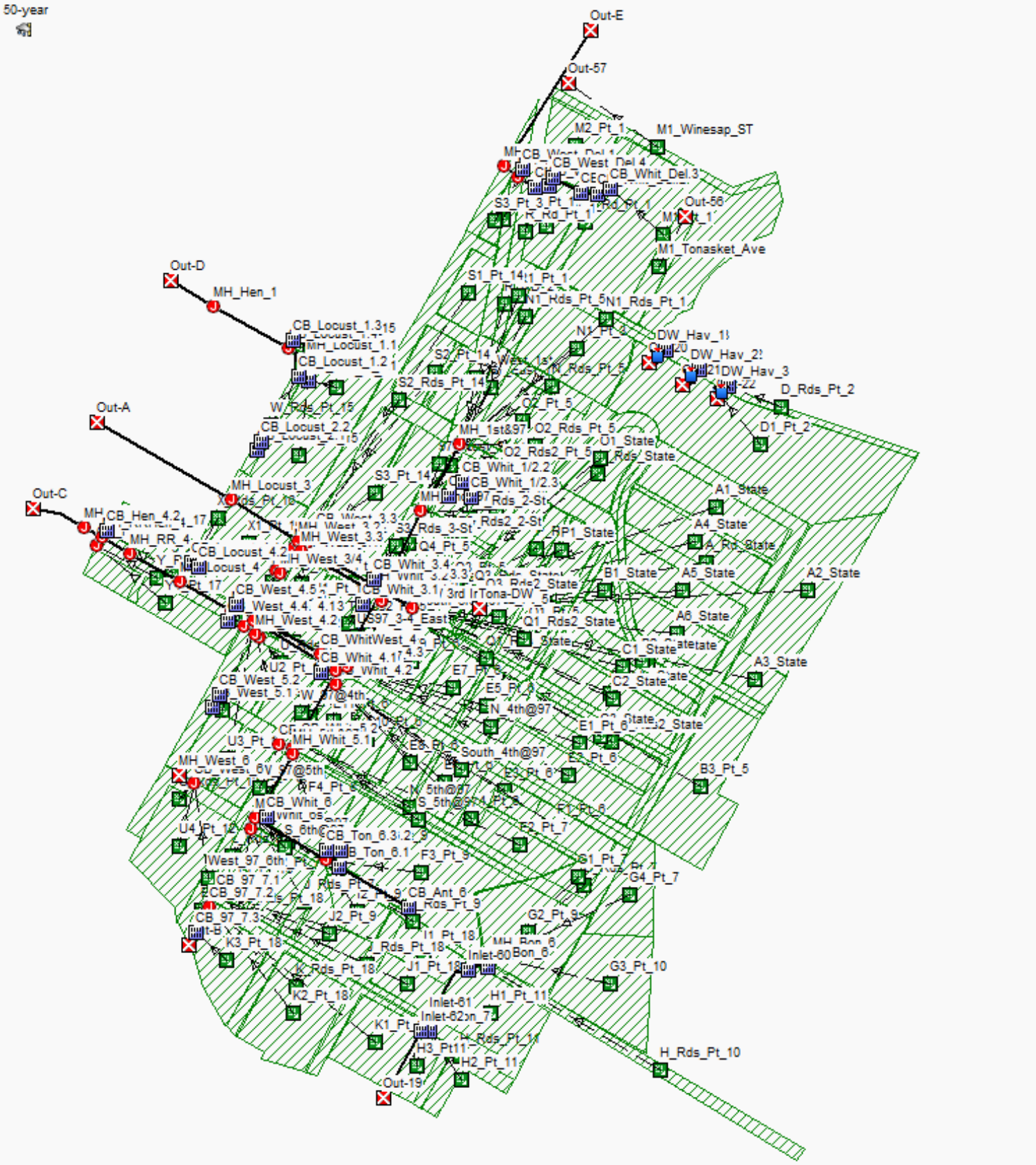


Node ID:		CB_West_Del.2	MH_West_Delish.2	MH_West_Delish.1		Out-E
Rim (ft):	918.21	920.59	920.00	919.19		
Invert (ft):	916.00	916.00	914.79	913.33		905.00
Min Pipe Cover (ft):	0.48		3.71	3.29		
Max HGL (ft):	918.89	919.42	919.19	918.94		906.00

Link ID:	Link-59	Link-81	Link-82	Pipe-19	
Length (ft):	61.00	78.00	64.00	530.00	
Dia (in):	8.00	18.00	18.00	12.00	
Slope (ft/ft):	0.0105	0.0227	0.0228	0.0187	
Up Invert (ft):	917.06	916.56	914.79	914.90	
Dn Invert (ft):	916.42	914.79	913.33	905.00	
Max Q (cfs):	1.46	5.36	5.05	4.71	
Max Vel (ft/s):	4.24	4.29	2.86	6.11	
Max Depth (ft):	0.67	1.50	1.50	1.00	

Autodesk Storm and Sanitary Analysis

5825-Tonasket Proposed



Project Description

File Name ..... 5825-Tonasket Proposed-2019 Inlet Basins.SPF

Project Options

Flow Units ..... CFS
Elevation Type ..... Elevation
Hydrology Method ..... SCS TR-55
Time of Concentration (TOC) Method ..... SCS TR-55
Link Routing Method ..... Hydrodynamic
Enable Overflow Ponding at Nodes ..... YES
Skip Steady State Analysis Time Periods ..... YES

Analysis Options

Start Analysis On ..... Mar 20, 2019 00:00:00
End Analysis On ..... Mar 21, 2019 00:00:00
Start Reporting On ..... Mar 20, 2019 00:00:00
Antecedent Dry Days ..... 0 days
Runoff (Dry Weather) Time Step ..... 0 01:00:00 days hh:mm:ss
Runoff (Wet Weather) Time Step ..... 0 00:05:00 days hh:mm:ss
Reporting Time Step ..... 0 00:05:00 days hh:mm:ss
Routing Time Step ..... 30 seconds

Number of Elements

	Qty
Rain Gages	2
Subbasins	143
Nodes	103
Junctions	47
Outfalls	14
Flow Diversions	0
Inlets	39
Storage Nodes	3
Links	86
Channels	2
Pipes	81
Pumps	0
Orifices	0
Weirs	0
Outlets	3
Pollutants	0
Land Uses	0

Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution
1	50-year	Time Series	50-yr Type II	Intensity	inches	Washington	Okanogan	50	2.00	SCS Type II 24-hr
2	Rain Gage-01	Time Series	6-MO Type-2	Cumulative	inches				0.00	

Subbasin Summary

SN	Subbasin ID	Area (ac)	Peak Rate Factor	Weighted Curve Number	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	97_East_1st	0.42	484.00	98.00	0.83	0.63	0.26	0.39	0 00:06:00
2	97_East_2nd	0.32	484.00	98.00	0.83	0.62	0.20	0.30	0 00:06:00
3	97_West_1st	0.68	484.00	98.00	0.83	0.63	0.43	0.63	0 00:06:00
4	97_West_2nd	0.37	484.00	98.00	0.83	0.63	0.23	0.35	0 00:06:00
5	A_Rd_State	4.20	484.00	98.00	0.83	0.63	2.63	3.68	0 00:08:11
6	A1_State	2.05	484.00	61.00	0.83	0.00	0.00	0.00	0 00:21:07
7	A2_State	3.45	484.00	77.00	0.83	0.02	0.06	0.01	0 00:34:49
8	A3_State	0.73	484.00	61.00	0.83	0.00	0.00	0.00	0 00:19:10
9	A4_State	2.04	484.00	68.00	0.83	0.00	0.00	0.00	0 00:20:04
10	A5_State	1.70	484.00	57.00	0.83	0.00	0.00	0.00	0 00:14:00
11	A6_State	1.42	484.00	57.00	0.83	0.00	0.00	0.00	0 00:14:00
12	B_Rd_State	1.66	484.00	98.00	0.83	0.63	1.04	1.55	0 00:06:00
13	B1_State	0.43	484.00	68.00	0.83	0.00	0.00	0.00	0 00:18:03
14	B2_State	0.77	484.00	54.00	0.83	0.00	0.00	0.00	0 00:18:34
15	B3_Pt_5	3.67	484.00	61.00	0.83	0.00	0.00	0.00	0 00:18:44
16	C_Rds_State	1.71	484.00	98.00	0.83	0.63	1.07	1.60	0 00:06:00
17	C1_State	1.06	484.00	54.00	0.83	0.00	0.00	0.00	0 00:15:46
18	C2_State	1.93	484.00	61.00	0.83	0.00	0.00	0.00	0 00:15:09
19	C3_Rds2_State	0.64	484.00	98.00	0.83	0.63	0.40	0.59	0 00:06:00
20	C3_State	0.80	484.00	57.00	0.83	0.00	0.00	0.00	0 00:16:28
21	D_Rds_Pt_2	0.81	484.00	98.00	0.83	0.63	0.50	0.75	0 00:06:00
22	D1_Pt_2	8.93	484.00	57.80	0.83	0.00	0.00	0.00	0 00:12:20
23	E_97@4th	0.19	484.00	98.00	0.83	0.62	0.12	0.18	0 00:06:00
24	E_97@5th	0.18	484.00	98.00	0.83	0.62	0.11	0.17	0 00:06:00
25	E1_Pt_6	1.12	484.00	57.00	0.83	0.00	0.00	0.00	0 00:17:33
26	E10_Pt_6	0.87	484.00	89.00	0.83	0.19	0.16	0.22	0 00:06:00
27	E11_Pt_6	0.87	484.00	98.00	0.83	0.63	0.55	0.81	0 00:06:00
28	E2_Pt_6	1.92	484.00	57.00	0.83	0.00	0.00	0.00	0 00:17:09
29	E3_Pt_6	0.45	484.00	57.00	0.83	0.00	0.00	0.00	0 00:15:46
30	E4_Pt_6	0.22	484.00	57.00	0.83	0.00	0.00	0.00	0 00:16:07
31	E5_Pt_6	0.95	484.00	57.00	0.83	0.00	0.00	0.00	0 00:16:00
32	E6_Pt_6	0.88	484.00	57.00	0.83	0.00	0.00	0.00	0 00:15:12
33	E7_Pt_6	0.96	484.00	57.00	0.83	0.00	0.00	0.00	0 00:14:48
34	E8_Pt_6	0.87	484.00	57.00	0.83	0.00	0.00	0.00	0 00:14:50
35	E9_Pt_6	0.96	484.00	61.00	0.83	0.00	0.00	0.00	0 00:12:43
36	East_97_7th	0.24	484.00	98.00	0.83	0.62	0.15	0.22	0 00:06:00
37	F_Rds_Pt_9	0.69	484.00	98.00	0.83	0.63	0.43	0.64	0 00:06:00
38	F1_Pt_6	1.24	484.00	57.00	0.83	0.00	0.00	0.00	0 00:19:27
39	F2_Pt_7	1.07	484.00	57.00	0.83	0.00	0.00	0.00	0 00:16:58
40	F3_Pt_9	4.66	484.00	69.00	0.83	0.00	0.00	0.00	0 00:15:45
41	F4_Pt_8	2.02	484.00	89.00	0.83	0.19	0.38	0.51	0 00:07:14
42	G_Rds_Pt_7	0.74	484.00	98.00	0.83	0.63	0.46	0.69	0 00:06:00
43	G1_Pt_7	0.50	484.00	57.00	0.83	0.00	0.00	0.00	0 00:16:54
44	G2_Pt_9	3.12	484.00	39.00	0.83	0.00	0.00	0.00	0 00:30:57
45	G3_Pt_10	3.16	484.00	81.00	0.83	0.05	0.15	0.07	0 00:08:33
46	G4_Pt_7	1.68	484.00	39.00	0.83	0.00	0.00	0.00	0 00:37:09
47	H_Rds_Pt_10	1.49	484.00	98.00	0.83	0.63	0.93	1.39	0 00:06:00
48	H_Rds_Pt_11	0.86	484.00	98.00	0.83	0.63	0.54	0.80	0 00:06:00
49	H1_Pt_11	2.61	484.00	57.00	0.83	0.00	0.00	0.00	0 00:16:53
50	H2_Pt_11	0.76	484.00	57.00	0.83	0.00	0.00	0.00	0 00:16:36
51	H3_Pt11	0.76	484.00	57.00	0.83	0.00	0.00	0.00	0 00:19:54
52	I_Rds_Pt_9	0.45	484.00	98.00	0.83	0.63	0.28	0.42	0 00:06:00
53	I1_Pt_18	0.92	484.00	54.00	0.83	0.00	0.00	0.00	0 00:19:23
54	I2_Pt_9	0.82	484.00	57.00	0.83	0.00	0.00	0.00	0 00:16:22
55	J_Rds_Pt_18	0.88	484.00	98.00	0.83	0.63	0.55	0.82	0 00:06:00
56	J_Rds_Pt_7	0.47	484.00	98.00	0.83	0.63	0.30	0.44	0 00:06:00
57	J1_Pt_18	0.90	484.00	61.00	0.83	0.00	0.00	0.00	0 00:22:57
58	J2_Pt_9	1.22	484.00	61.00	0.83	0.00	0.00	0.00	0 00:19:27
59	K_Rds_Pt_18	1.58	484.00	98.00	0.83	0.63	0.99	1.47	0 00:06:00
60	K1_Pt_18	1.85	484.00	61.00	0.83	0.00	0.00	0.00	0 00:22:54
61	K2_Pt_18	2.92	484.00	61.00	0.83	0.00	0.00	0.00	0 00:20:57
62	K3_Pt_18	1.90	484.00	61.00	0.83	0.00	0.00	0.00	0 00:18:54
63	L_Rds_Pt_18	0.65	484.00	98.00	0.83	0.63	0.41	0.60	0 00:06:00
64	L_Rds_Pt_7	0.53	484.00	98.00	0.83	0.63	0.33	0.49	0 00:06:00
65	L1_Pt_18	0.45	484.00	61.00	0.83	0.00	0.00	0.00	0 00:19:06
66	L2_Pt_7	1.59	484.00	81.00	0.83	0.05	0.08	0.03	0 00:10:06
67	M_Rd_Pt_1	2.84	484.00	98.00	0.83	0.63	1.78	2.65	0 00:06:00
68	M1_Pt_1	7.80	484.00	51.00	0.83	0.00	0.00	0.00	0 00:11:48
69	M1_Tonasket_Ave	0.85	484.00	98.00	0.83	0.63	0.53	0.79	0 00:06:00
70	M1_Winesap_ST	0.98	484.00	98.00	0.83	0.63	0.62	0.91	0 00:06:00
71	M2_Pt_1	1.71	484.00	54.00	0.83	0.00	0.00	0.00	0 00:12:33
72	M3_Pt_1	1.03	484.00	89.00	0.83	0.19	0.19	0.26	0 00:06:00
73	N_4th@97	5.18	484.00	98.00	0.83	0.63	3.24	4.83	0 00:06:00
74	N_4th@Western	0.20	484.00	98.00	0.83	0.62	0.12	0.19	0 00:06:00
75	N_5th@97	1.02	484.00	98.00	0.83	0.63	0.64	0.95	0 00:06:00
76	N_6th@97	0.22	484.00	98.00	0.83	0.62	0.14	0.21	0 00:06:00
77	N_Rds_Pt_5	1.05	484.00	98.00	0.83	0.63	0.66	0.98	0 00:06:00
78	N1_Pt_3	2.91	484.00	51.00	0.83	0.00	0.00	0.00	0 00:12:24
79	N1_Rds_Pt_1	0.44	484.00	98.00	0.83	0.63	0.27	0.41	0 00:06:00
80	N1_Rds_Pt_5	0.44	484.00	98.00	0.83	0.63	0.28	0.41	0 00:06:00
81	North_3rd@97	0.36	484.00	98.00	0.83	0.63	0.22	0.33	0 00:06:00
82	O_Rds_State	3.13	484.00	98.00	0.83	0.63	1.96	2.81	0 00:07:18
83	O1_State	1.66	484.00	57.00	0.83	0.00	0.00	0.00	0 00:18:51
84	O2_Pt_5	1.91	484.00	61.00	0.83	0.00	0.00	0.00	0 00:13:32
85	O2_Rds_Pt_5	1.26	484.00	98.00	0.83	0.63	0.79	1.17	0 00:06:00
86	O2_Rds2_Pt_5	0.35	484.00	98.00	0.83	0.63	0.22	0.33	0 00:06:00
87	P_RD_State	2.42	484.00	98.00	0.83	0.63	1.51	2.26	0 00:06:00
88	P1_State	1.37	484.00	61.00	0.83	0.00	0.00	0.00	0 00:17:46

Subbasin Summary

SN	Subbasin ID	Area (ac)	Peak Rate Factor	Weighted Curve Number	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
89	P2_Pt_5	0.84	484.00	77.00	0.83	0.02	0.01	0.00	0 00:15:07
90	P2_Rds_2-St	0.32	484.00	98.00	0.83	0.62	0.20	0.30	0 00:06:00
91	P2_Rds2_2-St	0.23	484.00	98.00	0.83	0.62	0.14	0.21	0 00:06:00
92	P3_Pt_4	0.85	484.00	89.00	0.83	0.19	0.16	0.22	0 00:06:00
93	Q_Rds2_97	0.30	484.00	98.00	0.83	0.62	0.19	0.28	0 00:06:00
94	Q1_Pt_5	0.97	484.00	57.00	0.83	0.00	0.00	0.00	0 00:16:30
95	Q1_Rds_State	0.32	484.00	98.00	0.83	0.62	0.20	0.30	0 00:06:00
96	Q1_Rds2_State	0.49	484.00	98.00	0.83	0.63	0.30	0.45	0 00:06:00
97	Q2_Pt_5	0.65	484.00	61.00	0.83	0.00	0.00	0.00	0 00:16:32
98	Q3_Pt_5	0.96	484.00	77.00	0.83	0.02	0.02	0.00	0 00:15:19
99	Q3_Rds_State	0.32	484.00	98.00	0.83	0.62	0.20	0.30	0 00:06:00
100	Q3_Rds2_State	0.45	484.00	98.00	0.83	0.63	0.28	0.42	0 00:06:00
101	Q4_Pt_5	0.95	484.00	89.00	0.83	0.19	0.18	0.24	0 00:06:55
102	Q5_Pt_6	0.96	484.00	89.00	0.83	0.19	0.18	0.24	0 00:08:04
103	R_RD_2	0.63	484.00	98.00	0.83	0.63	0.39	0.59	0 00:06:00
104	R_Rd_Pt_1	0.68	484.00	98.00	0.83	0.63	0.43	0.64	0 00:06:00
105	R1_Pt_1	0.27	484.00	39.00	0.83	0.00	0.00	0.00	0 00:18:18
106	S_5th@97	0.73	484.00	98.00	0.83	0.63	0.46	0.68	0 00:06:00
107	S_6th@97	0.16	484.00	98.00	0.83	0.62	0.10	0.15	0 00:06:00
108	S_Rds_Pt_1	1.09	484.00	98.00	0.83	0.63	0.69	1.02	0 00:06:00
109	S1_Pt_14	1.34	484.00	81.00	0.83	0.05	0.06	0.02	0 00:20:23
110	S2_Pt_14	1.59	484.00	89.00	0.83	0.19	0.30	0.33	0 00:14:58
111	S2_Rds_Pt_14	3.53	484.00	98.00	0.83	0.63	2.21	3.30	0 00:06:00
112	S3_Pt_14	4.07	484.00	89.00	0.83	0.19	0.76	0.97	0 00:09:51
113	S3_Pt_3	0.29	484.00	72.00	0.83	0.00	0.00	0.00	0 00:23:33
114	S3_Rds_3-St	0.38	484.00	98.00	0.83	0.63	0.24	0.35	0 00:06:00
115	South_3rd@97	0.22	484.00	98.00	0.83	0.62	0.14	0.21	0 00:06:00
116	South_4th@97	2.64	484.00	98.00	0.83	0.63	1.66	2.47	0 00:06:00
117	T_Rds2_Pt_5	0.51	484.00	98.00	0.83	0.63	0.32	0.48	0 00:06:00
118	U_Rds_Pt_12	1.49	484.00	98.00	0.83	0.63	0.94	1.39	0 00:06:00
119	U_Rds_Pt_13	1.48	484.00	98.00	0.83	0.63	0.93	1.38	0 00:06:00
120	U_Rds_Pt_14	0.26	484.00	98.00	0.83	0.62	0.16	0.24	0 00:06:00
121	U_Rds2_Pt_13	0.38	484.00	98.00	0.83	0.63	0.24	0.35	0 00:06:00
122	U_Rds2_Pt_14	0.50	484.00	98.00	0.83	0.63	0.31	0.47	0 00:06:00
123	U1_Pt_14	1.94	484.00	98.00	0.83	0.63	1.22	1.63	0 00:10:01
124	U2_Pt_13	1.74	484.00	98.00	0.83	0.63	1.09	1.45	0 00:09:58
125	U3_Pt_13	1.91	484.00	98.00	0.83	0.63	1.20	1.51	0 00:12:31
126	U4_Pt_12	2.64	484.00	89.00	0.83	0.19	0.49	0.65	0 00:08:50
127	US97_3-4_East	0.30	484.00	98.00	0.83	0.62	0.19	0.29	0 00:06:00
128	V_Rds_Pt_15	0.36	484.00	98.00	0.83	0.63	0.22	0.33	0 00:06:00
129	V_Rds2_Pt_15	0.13	484.00	98.00	0.83	0.61	0.08	0.12	0 00:06:00
130	W_97@4th	0.45	484.00	98.00	0.83	0.63	0.28	0.42	0 00:06:00
131	W_97@5th	0.42	484.00	98.00	0.83	0.63	0.26	0.39	0 00:06:00
132	W_Rds_Pt_15	0.41	484.00	98.00	0.83	0.63	0.26	0.38	0 00:06:00
133	W1_Pt_15	2.11	484.00	89.00	0.83	0.19	0.39	0.54	0 00:06:00
134	W2_Pt_15	1.96	484.00	89.00	0.83	0.19	0.37	0.48	0 00:08:46
135	West_97_6th	0.46	484.00	98.00	0.83	0.63	0.29	0.42	0 00:06:00
136	X_Rds_Pt_16	0.38	484.00	98.00	0.83	0.63	0.23	0.35	0 00:06:00
137	X_Rds_Pt_17	0.68	484.00	98.00	0.83	0.63	0.42	0.63	0 00:06:00
138	X_Rds2_Pt_13	0.05	484.00	98.00	0.83	0.49	0.03	0.05	0 00:06:00
139	X1_Pt_16	3.16	484.00	57.00	0.83	0.00	0.00	0.00	0 00:25:09
140	X2_Pt_17	1.17	484.00	57.00	0.83	0.00	0.00	0.00	0 00:25:19
141	Y_Rds_Pt_17	0.78	484.00	98.00	0.83	0.63	0.49	0.73	0 00:06:00
142	Y_Rds2_Pt_13	0.06	484.00	98.00	0.83	0.51	0.03	0.05	0 00:06:00
143	Y1_Pt_17	1.77	484.00	98.00	0.83	0.63	1.11	1.37	0 00:13:38

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft²)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	CB_97_7.1	Junction	919.10	921.00	0.00	921.00	10.00	1.41	919.66	0.00	1.34	0 00:00	0.00	0.00
2	CB_97_7.2	Junction	918.40	922.00	0.00	922.00	10.00	3.05	919.61	0.00	2.39	0 00:00	0.00	0.00
3	CB_Hen_4.1	Junction	890.50	900.70	0.00	900.70	10.00	1.97	891.14	0.00	9.56	0 00:00	0.00	0.00
4	CB_Locust_1.4	Junction	897.02	901.33	0.00	901.33	10.00	1.69	897.41	0.00	3.92	0 00:00	0.00	0.00
5	CB_West_3.1	Junction	900.20	907.00	0.00	907.00	10.00	2.00	901.43	0.00	5.57	0 00:00	0.00	0.00
6	CB_West_3.2	Junction	901.00	907.00	0.00	907.00	10.00	3.89	902.80	0.00	4.20	0 00:00	0.00	0.00
7	CB_West_3.3	Junction	900.40	907.00	0.00	907.00	10.00	0.95	903.31	0.00	3.69	0 00:00	0.00	0.00
8	CB_West_3.4	Junction	900.07	906.00	0.00	906.00	10.00	0.24	901.21	0.00	4.79	0 00:00	0.00	0.00
9	CB_West_4.1	Junction	900.25	907.00	0.00	907.00	10.00	0.02	901.60	0.00	5.40	0 00:00	0.00	0.00
10	CB_West_4.2	Junction	900.75	907.50	0.00	907.50	10.00	0.35	901.85	0.00	5.65	0 00:00	0.00	0.00
11	CB_West_4.3	Junction	900.24	907.50	0.00	907.50	10.00	0.18	901.61	0.00	5.89	0 00:00	0.00	0.00
12	CB_West_6	Junction	907.80	914.60	0.00	914.60	240.00	2.25	911.61	0.00	2.99	0 00:00	0.00	0.00
13	CB_Whit_3.2	Junction	906.00	913.50	0.00	913.50	240.00	2.34	906.84	0.00	6.66	0 00:00	0.00	0.00
14	CB_Whit_3.3	Junction	906.10	913.50	0.00	913.50	240.00	0.81	907.38	0.00	6.12	0 00:00	0.00	0.00
15	CB_Whit_4.2	Junction	910.40	912.00	0.00	912.00	10.00	2.65	911.07	0.00	0.93	0 00:00	0.00	0.00
16	CB_Whit_4.3	Junction	910.60	912.00	0.00	912.00	10.00	4.78	911.43	0.00	0.92	0 00:00	0.00	0.00
17	CB_Whit_5.1	Junction	909.60	916.00	0.00	916.00	10.00	0.38	910.33	0.00	5.67	0 00:00	0.00	0.00
18	CB_Whit_5.2	Junction	909.50	916.00	0.00	916.00	10.00	1.62	910.51	0.00	5.49	0 00:00	0.00	0.00
19	CB_Whit_6s	Junction	915.00	919.00	0.00	0.00	0.00	0.49	915.60	0.00	3.40	0 00:00	0.00	0.00
20	CB_WhitWest_4	Junction	905.50	908.00	0.00	908.00	10.00	0.00	905.50	0.00	2.50	0 00:00	0.00	0.00
21	MH_1st&97	Junction	910.47	920.00	0.00	0.00	0.00	4.87	911.20	0.00	8.80	0 00:00	0.00	0.00
22	MH_2nd&97	Junction	907.31	910.00	0.00	910.00	100.00	5.96	908.00	0.00	2.00	0 00:00	0.00	0.00
23	MH_3rd&97	Junction	903.00	911.35	0.00	0.00	0.00	19.89	904.40	0.00	6.95	0 00:00	0.00	0.00
24	MH_4th&97	Junction	907.00	914.26	0.00	914.26	100.00	13.16	907.84	0.00	6.42	0 00:00	0.00	0.00
25	MH_5th&97	Junction	908.80	914.44	0.00	914.44	100.00	4.75	910.31	0.00	4.13	0 00:00	0.00	0.00
26	MH_6th&97	Junction	914.50	919.37	0.00	919.37	100.00	2.30	915.39	0.00	3.98	0 00:00	0.00	0.00
27	MH_Bon_6	Junction	960.01	978.29	0.00	978.29	100.00	2.04	960.31	0.00	17.98	0 00:00	0.00	0.00
28	MH_Hen_1	Junction	891.15	893.14	0.00	893.14	100.00	1.68	891.53	0.00	1.61	0 00:00	0.00	0.00
29	MH_Hen_4	Junction	888.92	895.00	0.00	895.00	100.00	2.90	889.64	0.00	5.36	0 00:00	0.00	0.00
30	MH_Locust_1.1	Junction	896.56	901.98	0.00	901.98	100.00	1.32	897.65	0.00	4.33	0 00:00	0.00	0.00
31	MH_Locust_3	Junction	894.43	902.53	0.00	902.53	100.00	44.20	896.39	0.00	6.13	0 00:00	0.00	0.00
32	MH_Locust_4	Junction	894.92	905.13	0.00	905.13	100.00	0.44	895.12	0.00	10.01	0 00:00	0.00	0.00
33	MH_PT_9	Junction	924.71	929.23	0.00	929.23	100.00	0.64	924.95	0.00	4.28	0 00:00	0.00	0.00
34	MH_RR_4	Junction	891.84	900.00	0.00	900.00	100.00	0.43	892.04	0.00	7.96	0 00:00	0.00	0.00
35	MH_RRHen_4	Junction	890.04	898.00	0.00	898.00	100.00	2.90	890.59	0.00	7.41	0 00:00	0.00	0.00
36	MH_West_3.1	Junction	899.27	905.00	0.00	905.00	100.00	24.44	900.83	0.00	4.17	0 00:00	0.00	0.00
37	MH_West_3.2	Junction	897.80	905.00	0.00	905.00	100.00	44.16	899.44	0.00	5.56	0 00:00	0.00	0.00
38	MH_West_3.3	Junction	899.96	905.00	0.00	905.00	240.00	8.89	901.11	0.00	3.89	0 00:00	0.00	0.00
39	MH_West_3/4	Junction	899.48	905.00	0.00	905.00	100.00	15.70	901.21	0.00	3.79	0 00:00	0.00	0.00
40	MH_West_4.1	Junction	899.50	907.46	0.00	907.46	100.00	15.52	901.60	0.00	5.86	0 00:00	0.00	0.00
41	MH_West_4.2	Junction	900.50	908.00	0.00	908.00	100.00	1.73	901.81	0.00	6.19	0 00:00	0.00	0.00
42	MH_West_4.3	Junction	896.14	907.71	0.00	907.71	100.00	0.10	896.28	0.00	11.43	0 00:00	0.00	0.00
43	MH_West_Delish.1	Junction	913.33	919.19	0.00	919.19	100.00	1.83	913.88	0.00	5.31	0 00:00	0.00	0.00
44	MH_West_Delish.2	Junction	914.79	920.00	0.00	920.00	100.00	1.84	915.17	0.00	4.83	0 00:00	0.00	0.00
45	MH_Whit_3.2	Junction	905.88	909.81	0.00	909.81	100.00	3.16	906.34	0.00	3.47	0 00:00	0.00	0.00
46	MH_Whit_5.1	Junction	909.50	913.99	0.00	913.99	100.00	2.84	910.58	0.00	3.42	0 00:00	0.00	0.00
47	NEW 3rd Inlets	Junction	917.00	922.00	0.00	939.00	100.00	12.25	917.69	0.00	4.31	0 00:00	0.00	0.00
48	MH_West_6	Outfall	907.50					2.25	908.17					
49	Out-19	Outfall	923.00					2.74	923.46					
50	Out-20	Outfall	980.00					0.00	980.00					
51	Out-21	Outfall	990.00					0.00	990.00					
52	Out-22	Outfall	1000.00					0.63	1000.00					
53	Out-56	Outfall	0.00					0.79	0.00					
54	Out-57	Outfall	0.00					0.91	0.00					
55	Out-59	Outfall	915.00					1.55	915.37					
56	Out-A	Outfall	891.45					44.36	893.19					
57	Out-B	Outfall	917.00					3.05	917.51					
58	Out-C	Outfall	888.00					2.90	888.68					
59	Out-D	Outfall	887.15					1.68	887.52					
60	Out-E	Outfall	900.00					1.77	900.55					
61	Tona-DW	Outfall	939.00					0.41	939.00					
62	DW_Hav_1	Storage Node	980.00	990.00	0.00		0.00	0.00	980.00				0.00	0.00
63	DW_Hav_2	Storage Node	990.00	1000.00	0.00		0.00	0.00	990.00				0.00	0.00
64	DW_Hav_3	Storage Node	1000.00	1010.00	0.00		0.00	0.73	1006.27				0.00	0.00

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Diameter or Height (in)	Manning's Roughness	Peak Flow (cfs)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
1	Link-102	Pipe	CB_97_7.1	CB_97_7.2	24.00	919.10	918.40	2.9200	12.000	0.0130	1.41	6.08	0.23	2.57	0.76	0.78	0.00	Calculated
2	Link-103	Pipe	CB_97_7.2	CB_97_7.3	100.00	918.40	917.80	0.6000	12.000	0.0130	3.05	2.76	1.11	4.36	0.83	0.84	0.00	> CAPACITY
3	Link-135	Pipe	MH_Bon_6	Inlet-60	117.16	960.01	956.01	3.4100	30.000	0.0150	2.04	65.64	0.03	4.98	0.34	0.14	0.00	Calculated
4	Link-137	Pipe	Inlet-61	Inlet-62	66.96	942.29	939.12	4.7300	24.000	0.0250	2.00	25.60	0.08	4.16	0.41	0.21	0.00	Calculated
5	Link-139	Pipe	CB_Bon_7	Inlet-62	33.71	942.30	939.12	9.4300	6.000	0.0130	0.79	1.72	0.46	5.59	0.34	0.69	0.00	Calculated
6	Link-14	Pipe	CB_Bon_6	MH_Bon_6	49.74	969.87	969.51	0.7200	10.000	0.0130	1.36	1.86	0.73	3.42	0.57	0.69	0.00	Calculated
7	Link-141	Pipe	CB_Hav_3	DW_Hav_1	40.78	980.20	980.00	0.4900	18.000	0.0150	0.00	6.38	0.00	0.00	0.00	0.00	0.00	Calculated
8	Link-142	Pipe	CB_Hav_2	DW_Hav_2	41.71	990.20	990.00	0.4800	18.000	0.0150	0.00	6.30	0.00	0.00	0.00	0.00	0.00	Calculated
9	Link-143	Pipe	CB_Hav_1	DW_Hav_3	40.63	1000.20	1000.00	0.4900	18.000	0.0150	0.73	6.39	0.11	0.46	1.50	1.00	29.00	SURCHARGED
10	Link-144	Pipe	MH_West_Delish.1	Out-E	530.00	913.33	900.00	2.5200	12.000	0.0240	1.77	3.06	0.58	4.02	0.53	0.55	0.00	Calculated
11	Link-146	Pipe	MH_1st&97	MH_2nd&97	316.01	910.47	907.31	1.0000	18.000	0.0120	4.84	11.38	0.43	5.93	0.70	0.47	0.00	Calculated
12	Link-147	Pipe	MH_2nd&97	MH_3rd&97	367.78	907.31	903.63	1.0000	24.000	0.0120	5.92	24.51	0.24	5.71	0.70	0.36	0.00	Calculated
13	Link-148	Pipe	MH_PT_9	MH_6th&97	340.00	924.74	915.06	2.8500	12.000	0.0120	0.62	6.51	0.10	3.66	0.27	0.27	0.00	Calculated
14	Link-149	Pipe	MH_Whit_5.1	MH_5th&97	11.00	909.89	909.70	1.7400	18.000	0.0120	2.84	15.00	0.19	3.94	0.63	0.43	0.00	Calculated
15	Link-15	Pipe	CB_Ant_6	CB_Ton_6.1	330.00	947.63	928.14	5.9100	8.000	0.0130	0.00	2.94	0.00	0.00	0.00	0.00	0.00	Calculated
16	Link-150	Pipe	MH_5th&97	MH_4th&97	350.00	909.60	907.46	0.6100	24.000	0.0120	4.71	19.16	0.25	4.87	0.68	0.35	0.00	Calculated
17	Link-159	Pipe	NEW 3rd Inlets	MH_3rd&97	200.00	917.00	903.73	6.6300	21.000	0.0120	12.27	44.22	0.28	14.68	0.66	0.38	0.00	Calculated
18	Link-160	Pipe	CB_97_7.3	Out-B	30.00	917.80	917.00	2.6700	12.000	0.0130	3.05	5.82	0.52	6.30	0.58	0.59	0.00	Calculated
19	Link-161	Pipe	CB_Whit_6s	MH_6th&97	56.00	915.30	914.95	0.6200	12.000	0.0150	0.48	2.44	0.20	1.83	0.37	0.37	0.00	Calculated
20	Link-162	Pipe	MH_4th&97	MH_West_4.1	389.96	907.00	901.00	1.5400	27.000	0.0120	11.09	41.62	0.27	8.49	0.80	0.36	0.00	Calculated
21	Link-163	Pipe	MH_West_3.2	MH_Locust_3	320.65	897.80	894.47	1.0400	42.000	0.0100	44.20	133.29	0.33	8.99	1.75	0.51	0.00	Calculated
22	Link-164	Pipe	MH_4th&97	MH_3rd&97	393.00	907.36	904.73	0.6700	24.000	0.0150	1.97	16.04	0.12	3.42	0.46	0.24	0.00	Calculated
23	Link-165	Pipe	CB_West_Del.4	Out-59	43.11	916.23	915.00	2.8600	12.000	0.0150	1.55	5.22	0.30	5.34	0.40	0.40	0.00	Calculated
24	Link-17	Pipe	CB_Ton_6.1	MH_PT_9	52.00	927.94	924.74	6.1500	8.000	0.0130	0.00	3.04	0.00	0.00	0.11	0.16	0.00	Calculated
25	Link-20	Pipe	MH_6th&97	MH_Whit_5.1	327.00	914.95	910.37	1.4000	18.000	0.0130	2.25	12.43	0.18	5.22	0.43	0.29	0.00	Calculated
26	Link-23	Pipe	CB_Ton_6.3	MH_PT_9	45.45	927.00	924.72	5.0200	8.000	0.0130	0.00	2.71	0.00	0.00	0.11	0.17	0.00	Calculated
27	Link-24	Pipe	CB_Ton_6.2	MH_PT_9	70.74	928.50	924.72	5.3400	8.000	0.0130	0.00	2.79	0.00	0.00	0.11	0.17	0.00	Calculated
28	Link-28	Pipe	CB_Whit_5.1	MH_5th&97	53.94	910.00	909.70	0.5600	12.000	0.0120	0.37	2.88	0.13	1.23	0.45	0.47	0.00	Calculated
29	Link-29	Pipe	CB_Whit_5.2	MH_5th&97	47.12	910.00	909.60	0.8500	15.000	0.0120	1.61	6.45	0.25	2.81	0.59	0.48	0.00	Calculated
30	Link-30	Pipe	CB_Whit_6	MH_6th&97	46.46	915.60	915.00	1.2900	8.000	0.0130	0.00	1.37	0.00	0.00	0.19	0.30	0.00	Calculated
31	Link-31	Pipe	CB_Whit_4.1	MH_4th&97	53.92	910.50	910.10	0.7400	8.000	0.0130	0.00	1.04	0.00	0.00	0.00	0.00	0.00	Calculated
32	Link-32	Pipe	CB_Whit_4.3	MH_4th&97	62.67	910.60	910.10	0.8000	21.000	0.0130	4.76	14.15	0.34	4.74	0.76	0.44	0.00	Calculated
33	Link-33	Pipe	CB_Whit_4.2	MH_4th&97	44.48	910.40	910.10	0.6700	18.000	0.0130	2.64	8.63	0.31	3.84	0.61	0.41	0.00	Calculated
34	Link-35	Pipe	CB_Whit_3.4	MH_Whit_3.2	30.00	908.50	908.00	1.6700	8.000	0.0130	0.35	1.56	0.22	3.34	0.22	0.34	0.00	Calculated
35	Link-36	Pipe	CB_Whit_3.3	CB_Whit_3.2	66.20	907.00	906.50	0.7600	12.000	0.0130	0.80	3.10	0.26	3.13	0.36	0.36	0.00	Calculated
36	Link-37	Pipe	CB_Whit_3.2	MH_Whit_3.2	75.45	906.20	905.88	0.4200	18.000	0.0120	2.35	7.40	0.32	4.06	0.54	0.36	0.00	Calculated
37	Link-38	Pipe	CB_Whit_3.1	MH_Whit_3.2	65.45	906.00	905.88	0.1800	12.000	0.0120	0.47	1.65	0.28	1.41	0.43	0.44	0.00	Calculated
38	Link-39	Pipe	MH_3rd&97	MH_West_3.2	370.00	903.53	898.64	1.3200	30.000	0.0150	19.69	81.73	0.24	6.64	0.83	0.34	0.00	Calculated
39	Link-40	Pipe	MH_Whit_3.2	MH_West_3.3	300.00	905.88	900.06	1.9400	24.000	0.0150	3.13	27.31	0.11	2.96	0.74	0.38	0.00	Calculated
40	Link-41	Pipe	MH_West_3.3	MH_West_3.1	29.00	899.96	899.37	2.0300	24.000	0.0150	8.79	27.97	0.31	4.16	1.29	0.65	0.00	Calculated
41	Link-43	Pipe	CB_West_3.1	MH_West_3.3	38.54	901.00	900.06	2.4400	12.000	0.0130	2.00	5.56	0.36	3.32	0.72	0.72	0.00	Calculated
42	Link-44	Pipe	CB_West_3.3	CB_West_3.2	45.82	903.00	902.30	1.5300	15.000	0.0130	0.94	7.98	0.12	3.52	0.39	0.32	0.00	Calculated
43	Link-45	Pipe	CB_West_3.2	MH_West_3.3	51.64	902.20	901.00	2.3200	18.000	0.0130	3.89	16.01	0.24	6.58	0.55	0.37	0.00	Calculated
44	Link-46	Pipe	MH_West_4.2	MH_West_4.1	47.28	900.50	899.99	1.0900	12.000	0.0150	1.73	3.22	0.54	2.20	1.00	1.00	10.00	SURCHARGED
45	Link-47	Pipe	CB_West_4.1	MH_West_4.1	42.10	900.25	899.94	0.7500	8.000	0.0130	0.03	1.04	0.03	0.09	0.67	1.00	21.00	SURCHARGED
46	Link-49	Pipe	CB_West_4.3	MH_West_4.1	39.85	900.24	899.94	0.7600	8.000	0.0130	0.17	1.06	0.16	0.48	0.67	1.00	22.00	SURCHARGED
47	Link-51	Pipe	CB_WhitWest_4	CB_West_4.3	184.87	905.50	903.30	1.1900	8.000	0.0130	0.00	1.32	0.00	0.00	0.00	0.00	0.00	Calculated
48	Link-52	Pipe	CB_West_4.2	MH_West_4.2	34.65	900.75	900.50	0.7200	8.000	0.0130	0.35	1.03	0.34	1.24	0.67	1.00	12.00	SURCHARGED
49	Link-54	Pipe	CB_Whit_Del.2	CB_Whit_Del.3	58.00	919.48	919.05	0.7400	8.000	0.0150	0.34	0.90	0.38	2.44	0.67	1.00	13.00	SURCHARGED
50	Link-55	Pipe	CB_Whit_Del.2	CB_Whit_Del.1	65.00	918.45	918.13	0.4900	8.000	0.0150	0.43	0.73	0.59	1.24	0.67	1.00	18.00	SURCHARGED
51	Link-56	Pipe	CB_Whit_Del.1	CB_West_Del.4	150.00	918.13	916.23	1.2700	8.000	0.0150	1.50	1.18	1.27	4.95	0.54	0.81	0.00	> CAPACITY
52	Link-57	Pipe	CB_West_Del.3	CB_West_Del.4	30.00	917.20	916.36	2.7700	8.000	0.0150	0.05	1.74	0.03	0.62	0.18	0.27	0.00	Calculated
53	Link-59	Pipe	CB_West_Del.3	CB_West_Del.2	61.00	917.06	916.42	1.0500	8.000	0.0150	0.21	1.01	0.21	1.70	0.26	0.39	0.00	Calculated
54	Link-60	Pipe	CB_West_4.4	MH_West_4.3	37.96	900.30	900.00	0.7900	8.000	0.0130	0.05	1.07	0.05	1.56	0.10	0.15	0.00	Calculated
55	Link-61	Pipe	CB_West_4.5	MH_West_4.3	36.00	900.30	900.00	0.8300	8.000	0.0130	0.05	1.10	0.04	1.53	0.09	0.14	0.00	Calculated
56	Link-62	Pipe	CB_Locust_4.2	CB_Locust_4.1	33.71	895.85	895.60	0.7400	8.000	0.0150	0.00	0.90	0.00	0.00	0.00	0.00	0.00	Calculated

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Reported Condition
					(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
57	Link-63	Pipe	CB_Locust_4.1	MH_Locust_4	94.76	895.60	894.92	0.7200	8.000	0.0130	0.00	1.02	0.00	0.00	0.10	0.15	0.00	Calculated
58	Link-64	Pipe	MH_West_4.3	MH_Locust_4	245.00	896.14	894.95	0.4900	12.000	0.0150	0.10	2.15	0.04	1.20	0.15	0.16	0.00	Calculated
59	Link-65	Pipe	MH_Locust_4	MH_RR_4	232.00	894.92	891.84	1.3300	20.000	0.0150	0.43	13.89	0.03	2.88	0.20	0.12	0.00	Calculated
60	Link-66	Pipe	MH_RR_4	MH_RRHen_4	135.00	891.84	890.04	1.3300	20.000	0.0150	0.42	13.92	0.03	1.15	0.38	0.23	0.00	Calculated
61	Link-67	Pipe	MH_RRHen_4	MH_Hen_4	84.00	890.04	888.92	1.3300	20.000	0.0150	2.90	13.92	0.21	3.79	0.64	0.38	0.00	Calculated
62	Link-68	Pipe	CB_Hen_4.1	MH_RRHen_4	37.62	890.50	890.04	1.2200	12.000	0.0150	1.96	3.41	0.58	4.03	0.60	0.60	0.00	Calculated
63	Link-69	Pipe	CB_Hen_4.2	MH_RRHen_4	33.93	890.43	890.04	1.1500	10.000	0.0150	0.63	2.04	0.31	2.20	0.43	0.52	0.00	Calculated
64	Link-70	Pipe	MH_West_3/4	MH_West_3.1	100.00	899.48	899.27	0.2100	36.000	0.0100	15.68	39.73	0.39	3.95	1.63	0.55	0.00	Calculated
65	Link-71	Pipe	MH_West_4.1	MH_West_3/4	220.00	899.94	899.48	0.2100	36.000	0.0100	15.48	39.48	0.39	3.78	1.68	0.57	0.00	Calculated
66	Link-72	Pipe	CB_West_3.4	MH_West_3/4	18.87	900.07	899.48	3.1300	18.000	0.0150	0.22	16.10	0.01	0.17	1.32	0.88	0.00	Calculated
67	Link-73	Pipe	CB_West_5.1	CB_West_5.2	58.43	906.00	905.50	0.8600	8.000	0.0150	0.00	0.97	0.00	0.00	0.00	0.00	0.00	Calculated
68	Link-74	Pipe	CB_West_6	MH_West_6	60.00	907.80	907.50	0.5000	8.000	0.0150	2.25	0.74	3.04	6.46	0.67	1.00	0.00	SURCHARGED
69	Link-76	Pipe	MH_Locust_3	Out-A	630.00	894.43	891.45	0.4700	42.000	0.0100	44.36	89.89	0.49	8.60	1.83	0.53	0.00	Calculated
70	Link-77	Pipe	MH_Hen_4	Out-C	226.22	888.92	888.00	0.4100	22.000	0.0150	2.90	9.91	0.29	3.14	0.70	0.38	0.00	Calculated
71	Link-78	Pipe	CB_Locust_2.1	CB_Locust_2.2	41.32	900.00	899.70	0.7300	8.000	0.0150	0.00	0.89	0.00	0.00	0.00	0.00	0.00	Calculated
72	Link-81	Pipe	CB_West_Del.2	MH_West_Delish.2	78.00	916.56	914.79	2.2700	18.000	0.0150	0.82	13.73	0.06	3.05	0.31	0.21	0.00	Calculated
73	Link-82	Pipe	MH_West_Delish.2	MH_West_Delish.1	64.00	914.79	913.33	2.2800	18.000	0.0150	1.83	13.73	0.13	4.02	0.44	0.31	0.00	Calculated
74	Link-83	Pipe	CB_West_Del.1	MH_West_Delish.2	38.64	915.00	914.79	0.5400	8.000	0.0130	1.02	0.89	1.14	3.46	0.52	0.79	0.00	> CAPACITY
75	Link-84	Pipe	MH_West_3.1	MH_West_3.2	32.44	899.27	898.77	1.5400	36.000	0.0100	24.43	107.65	0.23	8.62	1.26	0.42	0.00	Calculated
76	Link-85	Pipe	CB_Locust_1.1	CB_Locust_1.2	27.00	897.33	897.22	0.4100	8.000	0.0150	1.01	0.67	1.51	3.17	0.57	0.86	0.00	> CAPACITY
77	Link-87	Pipe	CB_Locust_1.2	MH_Locust_1.1	82.00	896.76	896.56	0.2400	14.000	0.0150	1.01	2.30	0.44	1.02	1.01	0.87	0.00	Calculated
78	Link-88	Pipe	CB_Locust_1.3	CB_Locust_1.4	39.36	897.50	897.02	1.2100	8.000	0.0150	0.12	1.15	0.10	0.97	0.26	0.39	0.00	Calculated
79	Link-95	Pipe	MH_Hen_1	Out-D	205.00	891.15	887.15	1.9500	18.000	0.0150	1.68	12.72	0.13	4.89	0.37	0.25	0.00	Calculated
80	Link-96	Pipe	CB_Locust_1.4	MH_Locust_1.1	87.00	897.02	896.62	0.4600	18.000	0.0150	1.32	6.17	0.21	1.60	0.71	0.47	0.00	Calculated
81	Link-97	Pipe	CB_Locust_1.4	MH_Hen_1	350.00	897.02	891.15	1.6800	18.000	0.0150	1.68	11.79	0.14	4.70	0.38	0.26	0.00	Calculated
82	Link-136	Channel	Inlet-60	Inlet-61	285.00	956.01	942.29	4.8100	36.000	0.0320	2.01	97.53	0.02	4.14	0.37	0.13	0.00	
83	Link-138	Channel	Inlet-62	Out-19	318.00	939.12	923.00	5.0700	36.000	0.0320	2.74	100.50	0.03	4.52	0.45	0.15	0.00	
84	Outlet-01	Outlet	DW_Hav_1	Out-20		980.00	980.00				0.00							
85	Outlet-02	Outlet	DW_Hav_2	Out-21		990.00	990.00				0.00							
86	Outlet-03	Outlet	DW_Hav_3	Out-22		1000.00	1000.00				0.63							

Inlet Summary

SN	Element ID	Inlet Manufacturer	Manufacturer Part Number	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Initial Water Elevation (ft)	Ponded Area (ft²)	Peak Flow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Allowable Spread (ft)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)
1	CB_97_7.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	917.80	920.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	920.08
2	CB_Ant_6	FHWA HEC-22 GENERIC	N/A	On Sag	1	947.63	952.02	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	952.09
3	CB_Bon_6	FHWA HEC-22 GENERIC	N/A	On Sag	1	969.87	973.11	0.00	10.00	1.37	N/A	N/A	N/A	7.00	9.03	973.34
4	CB_Bon_7	FHWA HEC-22 GENERIC	N/A	On Sag	1	942.30	944.31	0.00	10.00	0.79	N/A	N/A	N/A	7.00	6.16	944.49
5	CB_Hav_1	FHWA HEC-22 GENERIC	N/A	On Sag	1	1000.20	1010.00	0.00	10.00	0.75	N/A	N/A	N/A	7.00	5.91	1010.18
6	CB_Hav_2	FHWA HEC-22 GENERIC	N/A	On Sag	1	990.20	1000.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	1000.08
7	CB_Hav_3	FHWA HEC-22 GENERIC	N/A	On Sag	1	980.20	990.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	990.08
8	CB_Hen_4.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	890.43	900.70	0.00	10.00	0.63	N/A	N/A	N/A	7.00	5.23	900.86
9	CB_Locust_1.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	897.33	899.63	0.00	10.00	1.01	N/A	N/A	N/A	7.00	7.31	899.84
10	CB_Locust_1.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	896.76	900.21	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	900.29
11	CB_Locust_1.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	897.50	901.50	0.00	10.00	0.12	N/A	N/A	N/A	7.00	1.50	901.59
12	CB_Locust_2.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	900.00	903.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	903.08
13	CB_Locust_2.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	899.70	903.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	903.08
14	CB_Locust_4.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	895.60	904.50	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	904.58
15	CB_Locust_4.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	895.85	904.50	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	904.58
16	CB_Ton_6.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	928.04	932.67	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	932.74
17	CB_Ton_6.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	928.50	932.67	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	932.74
18	CB_Ton_6.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	927.00	932.67	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	932.74
19	CB_West_4.4	FHWA HEC-22 GENERIC	N/A	On Sag	1	900.30	907.50	0.00	10.00	0.05	N/A	N/A	N/A	7.00	1.26	907.58
20	CB_West_4.5	FHWA HEC-22 GENERIC	N/A	On Sag	1	900.30	907.50	0.00	10.00	0.05	N/A	N/A	N/A	7.00	1.24	907.58
21	CB_West_5.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	906.00	909.50	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	909.58
22	CB_West_5.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	905.50	909.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	909.08
23	CB_West_Del.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	915.00	918.50	0.00	10.00	1.01	N/A	N/A	N/A	7.00	7.31	918.70
24	CB_West_Del.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.49	920.59	0.00	10.00	0.63	N/A	N/A	N/A	7.00	5.26	920.76
25	CB_West_Del.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.71	918.21	0.00	10.00	0.26	N/A	N/A	N/A	7.00	1.91	918.31
26	CB_West_Del.4	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.23	918.16	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	918.24
27	CB_Whit_1/2.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	914.50	917.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	917.08
28	CB_Whit_1/2.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.00	919.00	0.00	10.00	0.22	N/A	N/A	N/A	7.00	1.79	919.09
29	CB_Whit_1/2.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	915.20	918.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	918.08
30	CB_Whit_3.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	906.00	912.00	0.00	10.00	0.47	N/A	N/A	N/A	7.00	2.40	912.11
31	CB_Whit_3.4	FHWA HEC-22 GENERIC	N/A	On Sag	1	903.73	913.50	0.00	10.00	0.35	N/A	N/A	N/A	7.00	2.13	913.60
32	CB_Whit_4.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	910.50	912.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	912.08
33	CB_Whit_6	FHWA HEC-22 GENERIC	N/A	On Sag	1	915.60	922.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	922.08
34	CB_Whit_Del.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	918.13	920.53	0.00	10.00	2.62	N/A	N/A	N/A	7.00	14.06	920.87
35	CB_Whit_Del.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	918.45	921.50	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	921.58
36	CB_Whit_Del.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	919.05	921.65	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	921.73
37	Inlet-60	FHWA HEC-22 GENERIC	N/A	On Sag	1	956.01	957.99	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.00	957.99
38	Inlet-61	FHWA HEC-22 GENERIC	N/A	On Sag	1	942.29	945.89	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.00	945.89
39	Inlet-62	FHWA HEC-22 GENERIC	N/A	On Sag	1	939.12	943.08	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.00	943.08

Junction Input

SN	Element ID	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Ground/Rim (Max) Offset (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Surcharge Elevation (ft)	Surcharge Depth (ft)	Ponded Area (ft²)	Minimum Pipe Cover (in)
1	CB_97_7.1	919.10	921.00	1.90	0.00	-919.10	921.00	0.00	10.00	0.00
2	CB_97_7.2	918.40	922.00	3.60	0.00	-918.40	922.00	0.00	10.00	0.00
3	CB_Hen_4.1	890.50	900.70	10.20	0.00	-890.50	900.70	0.00	10.00	0.00
4	CB_Locust_1.4	897.02	901.33	4.31	0.00	-897.02	901.33	0.00	10.00	0.00
5	CB_West_3.1	900.20	907.00	6.80	0.00	-900.20	907.00	0.00	10.00	0.00
6	CB_West_3.2	901.00	907.00	6.00	0.00	-901.00	907.00	0.00	10.00	0.00
7	CB_West_3.3	900.40	907.00	6.60	0.00	-900.40	907.00	0.00	10.00	0.00
8	CB_West_3.4	900.07	906.00	5.93	0.00	-900.07	906.00	0.00	10.00	0.00
9	CB_West_4.1	900.25	907.00	6.75	0.00	-900.25	907.00	0.00	10.00	0.00
10	CB_West_4.2	900.75	907.50	6.75	0.00	-900.75	907.50	0.00	10.00	0.00
11	CB_West_4.3	900.24	907.50	7.26	0.00	-900.24	907.50	0.00	10.00	0.00
12	CB_West_6	907.80	914.60	6.80	0.00	-907.80	914.60	0.00	240.00	0.00
13	CB_Whit_3.2	906.00	913.50	7.50	0.00	-906.00	913.50	0.00	240.00	0.00
14	CB_Whit_3.3	906.10	913.50	7.40	0.00	-906.10	913.50	0.00	240.00	0.00
15	CB_Whit_4.2	910.40	912.00	1.60	0.00	-910.40	912.00	0.00	10.00	0.00
16	CB_Whit_4.3	910.60	912.00	1.40	0.00	-910.60	912.00	0.00	10.00	0.00
17	CB_Whit_5.1	909.60	916.00	6.40	0.00	-909.60	916.00	0.00	10.00	0.00
18	CB_Whit_5.2	909.50	916.00	6.50	0.00	-909.50	916.00	0.00	10.00	0.00
19	CB_Whit_6s	915.00	919.00	4.00	0.00	-915.00	0.00	-919.00	0.00	0.00
20	CB_WhitWest_4	905.50	908.00	2.50	0.00	-905.50	908.00	0.00	10.00	0.00
21	MH_1st&97	910.47	920.00	9.53	0.00	-910.47	0.00	-920.00	0.00	0.00
22	MH_2nd&97	907.31	910.00	2.69	0.00	-907.31	910.00	0.00	100.00	0.00
23	MH_3rd&97	903.00	911.35	8.35	0.00	-903.00	0.00	-911.35	0.00	0.00
24	MH_4th&97	907.00	914.26	7.26	0.00	-907.00	914.26	0.00	100.00	0.00
25	MH_5th&97	908.80	914.44	5.64	0.00	-908.80	914.44	0.00	100.00	0.00
26	MH_6th&97	914.50	919.37	4.87	0.00	-914.50	919.37	0.00	100.00	0.00
27	MH_Bon_6	960.01	978.29	18.28	0.00	-960.01	978.29	0.00	100.00	0.00
28	MH_Hen_1	891.15	893.14	1.99	0.00	-891.15	893.14	0.00	100.00	0.00
29	MH_Hen_4	888.92	895.00	6.08	0.00	-888.92	895.00	0.00	100.00	0.00
30	MH_Locust_1.1	896.56	901.98	5.42	0.00	-896.56	901.98	0.00	100.00	0.00
31	MH_Locust_3	894.43	902.53	8.10	0.00	-894.43	902.53	0.00	100.00	0.00
32	MH_Locust_4	894.92	905.13	10.21	0.00	-894.92	905.13	0.00	100.00	0.00
33	MH_PT_9	924.71	929.23	4.52	0.00	-924.71	929.23	0.00	100.00	0.00
34	MH_RR_4	891.84	900.00	8.16	0.00	-891.84	900.00	0.00	100.00	0.00
35	MH_RRHen_4	890.04	898.00	7.96	0.00	-890.04	898.00	0.00	100.00	0.00
36	MH_West_3.1	899.27	905.00	5.73	0.00	-899.27	905.00	0.00	100.00	0.00
37	MH_West_3.2	897.80	905.00	7.20	0.00	-897.80	905.00	0.00	100.00	0.00
38	MH_West_3.3	899.96	905.00	5.04	0.00	-899.96	905.00	0.00	240.00	0.00
39	MH_West_3/4	899.48	905.00	5.52	0.00	-899.48	905.00	0.00	100.00	0.00
40	MH_West_4.1	899.50	907.46	7.96	0.00	-899.50	907.46	0.00	100.00	0.00
41	MH_West_4.2	900.50	908.00	7.50	0.00	-900.50	908.00	0.00	100.00	0.00
42	MH_West_4.3	896.14	907.71	11.57	0.00	-896.14	907.71	0.00	100.00	0.00
43	MH_West_Delish.1	913.33	919.19	5.86	0.00	-913.33	919.19	0.00	100.00	0.00
44	MH_West_Delish.2	914.79	920.00	5.21	0.00	-914.79	920.00	0.00	100.00	0.00
45	MH_Whit_3.2	905.88	909.81	3.93	0.00	-905.88	909.81	0.00	100.00	0.00
46	MH_Whit_5.1	909.50	913.99	4.49	0.00	-909.50	913.99	0.00	100.00	0.00
47	NEW 3rd Inlets	917.00	922.00	5.00	0.00	-917.00	939.00	17.00	100.00	0.00

Junction Results

SN	Element ID	Peak Inflow (cfs)	Peak Lateral Inflow (cfs)	Max HGL Elevation Attained (ft)	Max HGL Depth Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Average HGL Elevation Attained (ft)	Average HGL Depth Attained (ft)	Time of Max HGL Occurrence (days hh:mm)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	CB_97_7.1	1.41	1.41	919.66	0.56	0.00	1.34	919.20	0.10	0 12:00	0 00:00	0.00	0.00
2	CB_97_7.2	3.05	1.67	919.61	1.21	0.00	2.39	918.64	0.24	0 12:00	0 00:00	0.00	0.00
3	CB_Hen_4.1	1.97	1.97	891.14	0.64	0.00	9.56	890.68	0.18	0 12:05	0 00:00	0.00	0.00
4	CB_Locust_1.4	1.69	0.33	897.41	0.39	0.00	3.92	897.14	0.12	0 12:05	0 00:00	0.00	0.00
5	CB_West_3.1	2.00	2.00	901.43	1.23	0.00	5.57	901.05	0.85	0 12:05	0 00:00	0.00	0.00
6	CB_West_3.2	3.89	3.27	902.80	1.80	0.00	4.20	902.26	1.26	0 12:00	0 00:00	0.00	0.00
7	CB_West_3.3	0.95	0.95	903.31	2.91	0.00	3.69	902.37	1.97	0 12:06	0 00:00	0.00	0.00
8	CB_West_3.4	0.24	0.24	901.21	1.14	0.00	4.79	900.24	0.17	0 12:03	0 00:00	0.00	0.00
9	CB_West_4.1	0.02	0.00	901.60	1.35	0.00	5.40	900.47	0.22	0 12:03	0 00:00	0.00	0.00
10	CB_West_4.2	0.35	0.35	901.85	1.10	0.00	5.65	900.91	0.16	0 12:03	0 00:00	0.00	0.00
11	CB_West_4.3	0.18	0.18	901.61	1.37	0.00	5.89	900.48	0.24	0 12:03	0 00:00	0.00	0.00
12	CB_West_6	2.25	2.25	911.61	3.81	0.00	2.99	908.32	0.52	0 12:00	0 00:00	0.00	0.00
13	CB_Whit_3.2	2.34	1.55	906.84	0.84	0.00	6.66	906.36	0.36	0 12:00	0 00:00	0.00	0.00
14	CB_Whit_3.3	0.81	0.81	907.38	1.28	0.00	6.12	907.00	0.90	0 12:00	0 00:00	0.00	0.00
15	CB_Whit_4.2	2.65	2.65	911.07	0.67	0.00	0.93	910.58	0.18	0 12:00	0 00:00	0.00	0.00
16	CB_Whit_4.3	4.78	4.78	911.43	0.83	0.00	0.92	910.82	0.22	0 12:00	0 00:00	0.00	0.00
17	CB_Whit_5.1	0.38	0.38	910.33	0.73	0.00	5.67	910.03	0.43	0 12:02	0 00:00	0.00	0.00
18	CB_Whit_5.2	1.62	1.62	910.51	1.01	0.00	5.49	910.08	0.58	0 12:00	0 00:00	0.00	0.00
19	CB_Whit_6s	0.49	0.49	915.60	0.60	0.00	3.40	915.36	0.36	0 12:00	0 00:00	0.00	0.00
20	CB_WhitWest_4	0.00	0.00	905.50	0.00	0.00	2.50	905.50	0.00	0 00:00	0 00:00	0.00	0.00
21	MH_1st&97	4.87	4.87	911.20	0.73	0.00	8.80	910.66	0.19	0 12:00	0 00:00	0.00	0.00
22	MH_2nd&97	5.96	1.14	908.00	0.69	0.00	2.00	907.50	0.19	0 12:00	0 00:00	0.00	0.00
23	MH_3rd&97	19.89	0.00	904.40	1.40	0.00	6.95	903.73	0.73	0 12:01	0 00:00	0.00	0.00
24	MH_4th&97	13.16	1.40	907.84	0.84	0.00	6.42	907.25	0.25	0 12:01	0 00:00	0.00	0.00
25	MH_5th&97	4.75	0.00	910.31	1.51	0.00	4.13	909.72	0.92	0 12:02	0 00:00	0.00	0.00
26	MH_6th&97	2.30	1.21	915.39	0.89	0.00	3.98	915.04	0.54	0 12:01	0 00:00	0.00	0.00
27	MH_Bon_6	2.04	0.69	960.31	0.31	0.00	17.98	960.10	0.10	0 12:00	0 00:00	0.00	0.00
28	MH_Hen_1	1.68	0.00	891.53	0.38	0.00	1.61	891.26	0.11	0 12:05	0 00:00	0.00	0.00
29	MH_Hen_4	2.90	0.00	889.64	0.72	0.00	5.36	889.13	0.21	0 12:05	0 00:00	0.00	0.00
30	MH_Locust_1.1	1.32	0.38	897.65	1.09	0.00	4.33	897.12	0.56	0 12:05	0 00:00	0.00	0.00
31	MH_Locust_3	44.20	0.00	896.39	1.96	0.00	6.13	894.96	0.53	0 12:02	0 00:00	0.00	0.00
32	MH_Locust_4	0.44	0.35	895.12	0.20	0.00	10.01	894.98	0.06	0 12:01	0 00:00	0.00	0.00
33	MH_PT_9	0.64	0.64	924.95	0.24	0.00	4.28	924.80	0.09	0 12:00	0 00:00	0.00	0.00
34	MH_RR_4	0.43	0.00	892.04	0.20	0.00	7.96	891.90	0.06	0 12:02	0 00:00	0.00	0.00
35	MH_RRHen_4	2.90	0.00	890.59	0.55	0.00	7.41	890.20	0.16	0 12:05	0 00:00	0.00	0.00
36	MH_West_3.1	24.44	0.00	900.83	1.56	0.00	4.17	899.68	0.41	0 12:03	0 00:00	0.00	0.00
37	MH_West_3.2	44.16	0.34	899.44	1.64	0.00	5.56	898.24	0.44	0 12:02	0 00:00	0.00	0.00
38	MH_West_3.3	8.89	0.00	901.11	1.15	0.00	3.89	900.24	0.28	0 12:02	0 00:00	0.00	0.00
39	MH_West_3/4	15.70	0.00	901.21	1.73	0.00	3.79	899.95	0.47	0 12:03	0 00:00	0.00	0.00
40	MH_West_4.1	15.52	2.66	901.60	2.10	0.00	5.86	900.35	0.85	0 12:03	0 00:00	0.00	0.00
41	MH_West_4.2	1.73	1.43	901.81	1.31	0.00	6.19	900.73	0.23	0 12:03	0 00:00	0.00	0.00
42	MH_West_4.3	0.10	0.00	896.28	0.14	0.00	11.43	896.18	0.04	0 12:02	0 00:00	0.00	0.00
43	MH_West_Delish.1	1.83	0.00	913.88	0.55	0.00	5.31	913.48	0.15	0 12:01	0 00:00	0.00	0.00
44	MH_West_Delish.2	1.84	0.00	915.17	0.38	0.00	4.83	914.90	0.11	0 12:00	0 00:00	0.00	0.00
45	MH_Whit_3.2	3.16	0.00	906.34	0.46	0.00	3.47	906.02	0.14	0 12:01	0 00:00	0.00	0.00
46	MH_Whit_5.1	2.84	0.64	910.58	1.08	0.00	3.42	910.02	0.52	0 12:02	0 00:00	0.00	0.00
47	NEW 3rd Inlets	12.25	12.25	917.69	0.69	0.00	4.31	917.19	0.19	0 12:00	0 00:00	0.00	0.00

Channel Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Shape	Height (ft)	Width (ft)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate
1	Link-136	285.00	956.01	0.00	942.29	0.00	13.72	4.8100	Trapezoidal	3.000	5.000	0.0320	0.5000	0.5000	0.0000	0.00	No
2	Link-138	318.00	939.12	0.00	923.00	0.00	16.12	5.0700	Trapezoidal	3.000	5.020	0.0320	0.5000	0.5000	0.0000	0.00	No

Channel Results

SN	Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Froude Number	Reported Condition
1	Link-136	2.01	0 12:01	97.53	0.02	4.14	1.15	0.37	0.13	0.00		
2	Link-138	2.74	0 12:02	100.50	0.03	4.52	1.17	0.45	0.15	0.00		

Pipe Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Pipe Shape	Pipe Diameter or Height (in)	Pipe Width (in)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate	No. of Barrels
1	Link-102	24.00	919.10	0.00	918.40	0.00	0.70	2.9200	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
2	Link-103	100.00	918.40	0.00	917.80	0.00	0.60	0.6000	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
3	Link-135	117.16	960.01	0.00	956.01	0.00	4.00	3.4100	CIRCULAR	30.000	30.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
4	Link-137	66.96	942.29	0.00	939.12	0.00	3.17	4.7300	CIRCULAR	24.000	24.000	0.0250	0.5000	0.5000	0.0000	0.00	No	1
5	Link-139	33.71	942.30	0.00	939.12	0.00	3.18	9.4300	CIRCULAR	6.000	6.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
6	Link-14	49.74	969.87	0.00	969.51	9.50	0.36	0.7200	CIRCULAR	9.960	9.960	0.0130	0.5000	0.5000	0.0000	0.00	No	1
7	Link-141	40.78	980.20	0.00	980.00	0.00	0.20	0.4900	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
8	Link-142	41.71	990.20	0.00	990.00	0.00	0.20	0.4800	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
9	Link-143	40.63	1000.20	0.00	1000.00	0.00	0.20	0.4900	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
10	Link-144	530.00	913.33	0.00	900.00	0.00	13.33	2.5200	CIRCULAR	12.000	12.000	0.0240	0.5000	0.5000	0.0000	0.00	No	1
11	Link-146	316.01	910.47	0.00	907.31	0.00	3.16	1.0000	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
12	Link-147	367.78	907.31	0.00	903.63	0.63	3.68	1.0000	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
13	Link-148	340.00	924.74	0.03	915.06	0.56	9.68	2.8500	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
14	Link-149	11.00	909.89	0.39	909.70	0.90	0.19	1.7400	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
15	Link-15	330.00	947.63	0.00	928.14	0.10	19.49	5.9100	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
16	Link-150	350.00	909.60	0.80	907.46	0.46	2.14	0.6100	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
17	Link-159	200.00	917.00	0.00	903.73	0.73	13.27	6.6300	CIRCULAR	21.000	21.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
18	Link-160	30.00	917.80	0.00	917.00	0.00	0.80	2.6700	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
19	Link-161	56.00	915.30	0.30	914.95	0.45	0.35	0.6200	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
20	Link-162	389.96	907.00	0.00	901.00	1.50	6.00	1.5400	CIRCULAR	27.000	27.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
21	Link-163	320.65	897.80	0.00	894.47	0.04	3.33	1.0400	CIRCULAR	42.000	42.000	0.0100	0.5000	0.5000	0.0000	0.00	No	1
22	Link-164	393.00	907.36	0.36	904.73	1.73	2.63	0.6700	CIRCULAR	24.000	24.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
23	Link-165	43.11	916.23	0.00	915.00	0.00	1.23	2.8600	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
24	Link-17	52.00	927.94	-0.10	924.74	0.03	3.20	6.1500	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
25	Link-20	327.00	914.95	0.45	910.37	0.87	4.58	1.4000	CIRCULAR	18.000	18.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
26	Link-23	45.45	927.00	0.00	924.72	0.01	2.28	5.0200	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
27	Link-24	70.74	928.50	0.00	924.72	0.01	3.78	5.3400	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
28	Link-28	53.94	910.00	0.40	909.70	0.90	0.30	0.5600	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
29	Link-29	47.12	910.00	0.50	909.60	0.80	0.40	0.8500	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
30	Link-30	46.46	915.60	0.00	915.00	0.50	0.60	1.2900	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
31	Link-31	53.92	910.50	0.00	910.10	3.10	0.40	0.7400	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
32	Link-32	62.67	910.60	0.00	910.10	3.10	0.50	0.8000	CIRCULAR	21.000	21.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
33	Link-33	44.48	910.40	0.00	910.10	3.10	0.30	0.6700	CIRCULAR	18.000	18.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
34	Link-35	30.00	908.50	4.77	908.00	2.12	0.50	1.6700	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
35	Link-36	66.20	907.00	0.90	906.50	0.50	0.50	0.7600	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
36	Link-37	75.45	906.20	0.20	905.88	0.00	0.32	0.4200	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
37	Link-38	65.45	906.00	0.00	905.88	0.00	0.12	0.1800	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
38	Link-39	370.00	903.53	0.53	898.64	0.84	4.89	1.3200	CIRCULAR	30.000	30.000	0.0150	0.5000	0.5000	0.0000	0.00	No	2
39	Link-40	300.00	905.88	0.00	900.06	0.10	5.82	1.9400	CIRCULAR	24.000	24.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
40	Link-41	29.00	899.96	0.00	899.37	0.10	0.59	2.0300	CIRCULAR	24.000	24.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
41	Link-43	38.54	901.00	0.80	900.06	0.10	0.94	2.4400	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
42	Link-44	45.82	903.00	2.60	902.30	1.30	0.70	1.5300	CIRCULAR	15.000	15.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
43	Link-45	51.64	902.20	1.20	901.00	1.04	1.20	2.3200	CIRCULAR	18.000	18.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
44	Link-46	47.28	900.50	0.00	899.99	0.49	0.51	1.0900	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
45	Link-47	42.10	900.25	0.00	899.94	0.44	0.31	0.7500	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
46	Link-49	39.85	900.24	0.00	899.94	0.44	0.30	0.7600	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
47	Link-51	184.87	905.50	0.00	903.30	3.06	2.20	1.1900	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
48	Link-52	34.65	900.75	0.00	900.50	0.00	0.25	0.7200	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
49	Link-54	58.00	919.48	1.03	919.05	0.00	0.43	0.7400	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
50	Link-55	65.00	918.45	0.00	918.13	0.00	0.32	0.4900	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
51	Link-56	150.00	918.13	0.00	916.23	0.00	1.90	1.2700	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
52	Link-57	30.00	917.20	0.48	916.36	0.13	0.83	2.7700	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
53	Link-59	61.00	917.06	0.35	916.42	-0.07	0.64	1.0500	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
54	Link-60	37.96	900.30	0.00	900.00	3.86	0.30	0.7900	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
55	Link-61	36.00	900.30	0.00	900.00	3.86	0.30	0.8300	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
56	Link-62	33.71	895.85	0.00	895.60	0.00	0.25	0.7400	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
57	Link-63	94.76	895.60	0.00	894.92	0.00	0.68	0.7200	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
58	Link-64	245.00	896.14	0.00	894.95	0.03	1.19	0.4900	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
59	Link-65	232.00	894.92	0.00	891.84	0.00	3.08	1.3300	CIRCULAR	20.040	20.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
60	Link-66	135.00	891.84	0.00	890.04	0.00	1.80	1.3300	CIRCULAR	20.040	20.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
61	Link-67	84.00	890.04	0.00	888.92	0.00	1.12	1.3300	CIRCULAR	20.040	20.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
62	Link-68	37.62	890.50	0.00	890.04	0.00	0.46	1.2200	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
63	Link-69	33.93	890.43	0.00	890.04	0.00	0.39	1.1500	CIRCULAR	9.960	9.960	0.0150	0.5000	0.5000	0.0000	0.00	No	1
64	Link-70	100.00	899.48	0.00	899.27	0.00	0.21	0.2100	CIRCULAR	36.000	36.000	0.0100	0.5000	0.5000	0.0000	0.00	No	1
65	Link-71	220.00	899.94	0.44	899.48	0.00	0.46	0.2100	CIRCULAR	36.000	36.000	0.0100	0.5000	0.5000	0.0000	0.00	No	1
66	Link-72	18.87	900.07	0.00	899.48	0.00	0.59	3.1300	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
67	Link-73	58.43	906.00	0.00	905.50	0.00	0.50	0.8600	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
68	Link-74	60.00	907.80	0.00	907.50	0.00	0.30	0.5000	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
69	Link-76	630.00	894.43	0.00	891.45	0.00	2.98	0.4700	CIRCULAR	42.000	42.000	0.0100	0.5000	0.5000	0.0000	0.00	No	1
70	Link-77	226.22	888.92	0.00	888.00	0.00	0.92	0.4100	CIRCULAR	21.960	21.960	0.0150	0.5000	0.5000	0.0000	0.00	No	1
71	Link-78	41.32	900.00	0.00	899.70	0.00	0.30	0.7300	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
72	Link-81	78.00	916.56	0.07	914.79	0.00	1.77	2.2700	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
73	Link-82	64.00	914.79	0.00	913.33	0.00	1.46	2.2800	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
74	Link-83	38.64	915.00	0.00	914.79	0.00	0.21	0.5400	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
75	Link-84	32.44	899.27	0.00	898.77	0.97	0.50	1.5400	CIRCULAR	36.000	36.000	0.0100	0.5000	0.5000	0.0000	0.00	No	1
76	Link-85	27.00	897.33	0.00	897.22	0.46	0.11	0.4100	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
77	Link-87	82.00	896.76	0.00	896.56	0.00	0.20	0.2400	CIRCULAR	14.040	14.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
78	Link-88	39.36	897.50	0.00	897.02	0.00	0.48	1.2100	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
79	Link-95	205.00	891.15	0.00	887.15	0.00	4.00	1.9500	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
80	Link-96	87.00	897.02	0.00	896.62	0.06	0.40	0.4600	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
81	Link-97	350.00	897.02	0.00	891.15	0.00	5.87	1.6800	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1

Pipe Results

SN	Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Froude Number	Reported Condition
1	Link-102	1.41	0 12:00	6.08	0.23	2.57	0.16	0.76	0.78	0.00		Calculated
2	Link-103	3.05	0 12:00	2.76	1.11	4.36	0.38	0.83	0.84	0.00		> CAPACITY
3	Link-135	2.04	0 12:00	65.64	0.03	4.98	0.39	0.34	0.14	0.00		Calculated
4	Link-137	2.00	0 12:01	25.60	0.08	4.16	0.27	0.41	0.21	0.00		Calculated
5	Link-139	0.79	0 12:00	1.72	0.46	5.59	0.10	0.34	0.69	0.00		Calculated
6	Link-14	1.36	0 12:00	1.86	0.73	3.42	0.24	0.57	0.69	0.00		Calculated
7	Link-141	0.00	0 00:00	6.38	0.00	0.00		0.00	0.00	0.00		Calculated
8	Link-142	0.00	0 00:00	6.30	0.00	0.00		0.00	0.00	0.00		Calculated
9	Link-143	0.73	0 12:00	6.39	0.11	0.46	1.47	1.50	1.00	29.00		SURCHARGED
10	Link-144	1.77	0 12:02	3.06	0.58	4.02	2.20	0.53	0.55	0.00		Calculated
11	Link-146	4.84	0 12:00	11.38	0.43	5.93	0.89	0.70	0.47	0.00		Calculated
12	Link-147	5.92	0 12:01	24.51	0.24	5.71	1.07	0.70	0.36	0.00		Calculated
13	Link-148	0.62	0 12:00	6.51	0.10	3.66	1.55	0.27	0.27	0.00		Calculated
14	Link-149	2.84	0 12:01	15.00	0.19	3.94	0.05	0.63	0.43	0.00		Calculated
15	Link-15	0.00	0 00:00	2.94	0.00	0.00		0.00	0.00	0.00		Calculated
16	Link-150	4.71	0 12:02	19.16	0.25	4.87	1.20	0.68	0.35	0.00		Calculated
17	Link-159	12.27	0 12:00	44.22	0.28	14.68	0.23	0.66	0.38	0.00		Calculated
18	Link-160	3.05	0 12:00	5.82	0.52	6.30	0.08	0.58	0.59	0.00		Calculated
19	Link-161	0.48	0 12:00	2.44	0.20	1.83	0.51	0.37	0.37	0.00		Calculated
20	Link-162	11.09	0 12:02	41.62	0.27	8.49	0.77	0.80	0.36	0.00		Calculated
21	Link-163	44.20	0 12:02	133.29	0.33	8.99	0.59	1.75	0.51	0.00		Calculated
22	Link-164	1.97	0 12:02	16.04	0.12	3.42	1.92	0.46	0.24	0.00		Calculated
23	Link-165	1.55	0 12:05	5.22	0.30	5.34	0.13	0.40	0.40	0.00		Calculated
24	Link-17	0.00	0 00:00	3.04	0.00	0.00		0.11	0.16	0.00		Calculated
25	Link-20	2.25	0 12:01	12.43	0.18	5.22	1.04	0.43	0.29	0.00		Calculated
26	Link-23	0.00	0 00:00	2.71	0.00	0.00		0.11	0.17	0.00		Calculated
27	Link-24	0.00	0 00:00	2.79	0.00	0.00		0.11	0.17	0.00		Calculated
28	Link-28	0.37	0 12:00	2.88	0.13	1.23	0.73	0.45	0.47	0.00		Calculated
29	Link-29	1.61	0 12:00	6.45	0.25	2.81	0.28	0.59	0.48	0.00		Calculated
30	Link-30	0.00	0 00:00	1.37	0.00	0.00		0.19	0.30	0.00		Calculated
31	Link-31	0.00	0 00:00	1.04	0.00	0.00		0.00	0.00	0.00		Calculated
32	Link-32	4.76	0 12:00	14.15	0.34	4.74	0.22	0.76	0.44	0.00		Calculated
33	Link-33	2.64	0 12:00	8.63	0.31	3.84	0.19	0.61	0.41	0.00		Calculated
34	Link-35	0.35	0 12:00	1.56	0.22	3.34	0.15	0.22	0.34	0.00		Calculated
35	Link-36	0.80	0 12:00	3.10	0.26	3.13	0.35	0.36	0.36	0.00		Calculated
36	Link-37	2.35	0 12:00	7.40	0.32	4.06	0.31	0.54	0.36	0.00		Calculated
37	Link-38	0.47	0 12:00	1.65	0.28	1.41	0.77	0.43	0.44	0.00		Calculated
38	Link-39	19.69	0 12:02	81.73	0.24	6.64	0.93	0.83	0.34	0.00		Calculated
39	Link-40	3.13	0 12:01	27.31	0.11	2.96	1.69	0.74	0.38	0.00		Calculated
40	Link-41	8.79	0 12:02	27.97	0.31	4.16	0.12	1.29	0.65	0.00		Calculated
41	Link-43	2.00	0 12:05	5.56	0.36	3.32	0.19	0.72	0.72	0.00		Calculated
42	Link-44	0.94	0 12:05	7.98	0.12	3.52	0.22	0.39	0.32	0.00		Calculated
43	Link-45	3.89	0 12:00	16.01	0.24	6.58	0.13	0.55	0.37	0.00		Calculated
44	Link-46	1.73	0 12:05	3.22	0.54	2.20	0.36	1.00	1.00	10.00		SURCHARGED
45	Link-47	0.03	0 12:14	1.04	0.03	0.09	7.80	0.67	1.00	21.00		SURCHARGED
46	Link-49	0.17	0 12:02	1.06	0.16	0.48	1.38	0.67	1.00	22.00		SURCHARGED
47	Link-51	0.00	0 00:00	1.32	0.00	0.00		0.00	0.00	0.00		Calculated
48	Link-52	0.35	0 12:00	1.03	0.34	1.24	0.47	0.67	1.00	12.00		SURCHARGED
49	Link-54	0.34	0 11:55	0.90	0.38	2.44	0.40	0.67	1.00	13.00		SURCHARGED
50	Link-55	0.43	0 11:56	0.73	0.59	1.24	0.87	0.67	1.00	18.00		SURCHARGED
51	Link-56	1.50	0 12:05	1.18	1.27	4.95	0.51	0.54	0.81	0.00		> CAPACITY
52	Link-57	0.05	0 12:05	1.74	0.03	0.62	0.81	0.18	0.27	0.00		Calculated
53	Link-59	0.21	0 12:05	1.01	0.21	1.70	0.60	0.26	0.39	0.00		Calculated
54	Link-60	0.05	0 12:00	1.07	0.05	1.56	0.41	0.10	0.15	0.00		Calculated
55	Link-61	0.05	0 12:00	1.10	0.04	1.53	0.39	0.09	0.14	0.00		Calculated
56	Link-62	0.00	0 00:00	0.90	0.00	0.00		0.00	0.00	0.00		Calculated
57	Link-63	0.00	0 00:00	1.02	0.00	0.00		0.10	0.15	0.00		Calculated
58	Link-64	0.10	0 12:02	2.15	0.04	1.20	3.40	0.15	0.16	0.00		Calculated
59	Link-65	0.43	0 12:01	13.89	0.03	2.88	1.34	0.20	0.12	0.00		Calculated
60	Link-66	0.42	0 12:02	13.92	0.03	1.15	1.96	0.38	0.23	0.00		Calculated
61	Link-67	2.90	0 12:05	13.92	0.21	3.79	0.37	0.64	0.38	0.00		Calculated
62	Link-68	1.96	0 12:05	3.41	0.58	4.03	0.16	0.60	0.60	0.00		Calculated
63	Link-69	0.63	0 12:00	2.04	0.31	2.20	0.26	0.43	0.52	0.00		Calculated
64	Link-70	15.68	0 12:03	39.73	0.39	3.95	0.42	1.63	0.55	0.00		Calculated
65	Link-71	15.48	0 12:02	39.48	0.39	3.78	0.97	1.68	0.57	0.00		Calculated
66	Link-72	0.22	0 12:02	16.10	0.01	0.17	1.85	1.32	0.88	0.00		Calculated
67	Link-73	0.00	0 00:00	0.97	0.00	0.00		0.00	0.00	0.00		Calculated
68	Link-74	2.25	0 12:00	0.74	3.04	6.46	0.15	0.67	1.00	0.00		SURCHARGED
69	Link-76	44.36	0 12:03	89.89	0.49	8.60	1.22	1.83	0.53	0.00		Calculated
70	Link-77	2.90	0 12:05	9.91	0.29	3.14	1.20	0.70	0.38	0.00		Calculated
71	Link-78	0.00	0 00:00	0.89	0.00	0.00		0.00	0.00	0.00		Calculated
72	Link-81	0.82	0 12:00	13.73	0.06	3.05	0.43	0.31	0.21	0.00		Calculated
73	Link-82	1.83	0 12:00	13.73	0.13	4.02	0.27	0.44	0.31	0.00		Calculated
74	Link-83	1.02	0 12:00	0.89	1.14	3.46	0.19	0.52	0.79	0.00		> CAPACITY
75	Link-84	24.43	0 12:03	107.65	0.23	8.62	0.06	1.26	0.42	0.00		Calculated
76	Link-85	1.01	0 12:05	0.67	1.51	3.17	0.14	0.57	0.86	0.00		> CAPACITY
77	Link-87	1.01	0 12:05	2.30	0.44	1.02	1.34	1.01	0.87	0.00		Calculated
78	Link-88	0.12	0 12:00	1.15	0.10	0.97	0.68	0.26	0.39	0.00		Calculated
79	Link-95	1.68	0 12:05	12.72	0.13	4.89	0.70	0.37	0.25	0.00		Calculated
80	Link-96	1.32	0 12:05	6.17	0.21	1.60	0.91	0.71	0.47	0.00		Calculated
81	Link-97	1.68	0 12:05	11.79	0.14	4.70	1.24	0.38	0.26	0.00		Calculated

Inlet Input

SN	Element ID	Inlet Manufacturer	Manufacturer Part Number	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Inlet Depth (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Ponded Area (ft²)	Grate Clogging Factor (%)
1	CB_97_7.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	917.80	920.00	2.20	0.00	0.00	10.00	0.00
2	CB_Ant_6	FHWA HEC-22 GENERIC	N/A	On Sag	1	947.63	952.02	4.39	0.00	0.00	10.00	0.00
3	CB_Bon_6	FHWA HEC-22 GENERIC	N/A	On Sag	1	969.87	973.11	3.24	0.00	0.00	10.00	0.00
4	CB_Bon_7	FHWA HEC-22 GENERIC	N/A	On Sag	1	942.30	944.31	2.01	0.00	0.00	10.00	0.00
5	CB_Hav_1	FHWA HEC-22 GENERIC	N/A	On Sag	1	1000.20	1010.00	9.80	0.00	0.00	10.00	0.00
6	CB_Hav_2	FHWA HEC-22 GENERIC	N/A	On Sag	1	990.20	1000.00	9.80	0.00	0.00	10.00	0.00
7	CB_Hav_3	FHWA HEC-22 GENERIC	N/A	On Sag	1	980.20	990.00	9.80	0.00	0.00	10.00	0.00
8	CB_Hen_4.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	890.43	900.70	10.27	0.00	0.00	10.00	0.00
9	CB_Locust_1.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	897.33	899.63	2.30	0.00	0.00	10.00	0.00
10	CB_Locust_1.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	896.76	900.21	3.45	0.00	0.00	10.00	0.00
11	CB_Locust_1.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	897.50	901.50	4.00	0.00	0.00	10.00	0.00
12	CB_Locust_2.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	900.00	903.00	3.00	0.00	0.00	10.00	0.00
13	CB_Locust_2.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	899.70	903.00	3.30	0.00	0.00	10.00	0.00
14	CB_Locust_4.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	895.60	904.50	8.90	0.00	0.00	10.00	0.00
15	CB_Locust_4.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	895.85	904.50	8.65	0.00	0.00	10.00	0.00
16	CB_Ton_6.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	928.04	932.67	4.63	0.00	0.00	10.00	0.00
17	CB_Ton_6.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	928.50	932.67	4.17	0.00	0.00	10.00	0.00
18	CB_Ton_6.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	927.00	932.67	5.67	0.00	0.00	10.00	0.00
19	CB_West_4.4	FHWA HEC-22 GENERIC	N/A	On Sag	1	900.30	907.50	7.20	0.00	0.00	10.00	0.00
20	CB_West_4.5	FHWA HEC-22 GENERIC	N/A	On Sag	1	900.30	907.50	7.20	0.00	0.00	10.00	0.00
21	CB_West_5.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	906.00	909.50	3.50	0.00	0.00	10.00	0.00
22	CB_West_5.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	905.50	909.00	3.50	0.00	0.00	10.00	0.00
23	CB_West_Del.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	915.00	918.50	3.50	0.00	0.00	10.00	0.00
24	CB_West_Del.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.49	920.59	4.10	0.00	0.00	10.00	0.00
25	CB_West_Del.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.71	918.21	1.50	0.00	0.00	10.00	0.00
26	CB_West_Del.4	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.23	918.16	1.93	0.00	0.00	10.00	0.00
27	CB_Whit_1/2.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	914.50	917.00	2.50	0.00	0.00	10.00	0.00
28	CB_Whit_1/2.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.00	919.00	3.00	0.00	0.00	10.00	0.00
29	CB_Whit_1/2.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	915.20	918.00	2.80	0.00	0.00	10.00	0.00
30	CB_Whit_3.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	906.00	912.00	6.00	0.00	0.00	10.00	0.00
31	CB_Whit_3.4	FHWA HEC-22 GENERIC	N/A	On Sag	1	903.73	913.50	9.77	0.00	0.00	10.00	0.00
32	CB_Whit_4.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	910.50	912.00	1.50	0.00	0.00	10.00	0.00
33	CB_Whit_6	FHWA HEC-22 GENERIC	N/A	On Sag	1	915.60	922.00	6.40	0.00	0.00	10.00	0.00
34	CB_Whit_Del.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	918.13	920.53	2.40	0.00	0.00	10.00	0.00
35	CB_Whit_Del.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	918.45	921.50	3.05	0.00	0.00	10.00	0.00
36	CB_Whit_Del.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	919.05	921.65	2.60	0.00	0.00	10.00	0.00
37	Inlet-60	FHWA HEC-22 GENERIC	N/A	On Sag	1	956.01	957.99	1.98	0.00	0.00	10.00	0.00
38	Inlet-61	FHWA HEC-22 GENERIC	N/A	On Sag	1	942.29	945.89	3.60	0.00	0.00	10.00	0.00
39	Inlet-62	FHWA HEC-22 GENERIC	N/A	On Sag	1	939.12	943.08	3.96	0.00	0.00	10.00	0.00

Roadway & Gutter Input

SN	Element ID	Roadway Longitudinal Slope (ft/ft)	Roadway Cross Slope (ft/ft)	Roadway Manning's Roughness	Gutter Cross Slope (ft/ft)	Gutter Width (ft)	Gutter Depression (in)	Allowable Spread (ft)
1	CB_97_7.3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
2	CB_Ant_6	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
3	CB_Bon_6	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
4	CB_Bon_7	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
5	CB_Hav_1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
6	CB_Hav_2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
7	CB_Hav_3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
8	CB_Hen_4.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
9	CB_Locust_1.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
10	CB_Locust_1.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
11	CB_Locust_1.3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
12	CB_Locust_2.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
13	CB_Locust_2.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
14	CB_Locust_4.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
15	CB_Locust_4.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
16	CB_Ton_6.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
17	CB_Ton_6.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
18	CB_Ton_6.3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
19	CB_West_4.4	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
20	CB_West_4.5	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
21	CB_West_5.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
22	CB_West_5.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
23	CB_West_Del.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
24	CB_West_Del.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
25	CB_West_Del.3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
26	CB_West_Del.4	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
27	CB_Whit_1/2.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
28	CB_Whit_1/2.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
29	CB_Whit_1/2.3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
30	CB_Whit_3.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
31	CB_Whit_3.4	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
32	CB_Whit_4.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
33	CB_Whit_6	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
34	CB_Whit_Del.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
35	CB_Whit_Del.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
36	CB_Whit_Del.3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
37	Inlet-60	N/A	0.0200	0.0160	0.0620	2.00	0.0656	7.00
38	Inlet-61	N/A	0.0200	0.0160	0.0620	2.00	0.0656	7.00
39	Inlet-62	N/A	0.0200	0.0160	0.0620	2.00	0.0656	7.00

Inlet Results

SN	Element ID	Peak Flow (cfs)	Peak Lateral Inflow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)	Max Gutter Water Depth during Peak Flow (ft)	Time of Max Depth Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	CB_97_7.3	0.00	0.00	N/A	N/A	N/A	0.92	920.08	0.08	0 12:00	0.00	0.00
2	CB_Ant_6	0.00	0.00	N/A	N/A	N/A	0.92	952.09	0.08	0 00:00	0.00	0.00
3	CB_Bon_6	1.37	1.37	N/A	N/A	N/A	9.03	973.34	0.24	0 12:00	0.00	0.00
4	CB_Bon_7	0.79	0.79	N/A	N/A	N/A	6.16	944.49	0.18	0 12:00	0.00	0.00
5	CB_Hav_1	0.75	0.75	N/A	N/A	N/A	5.91	1010.18	0.18	0 12:05	0.00	0.00
6	CB_Hav_2	0.00	0.00	N/A	N/A	N/A	0.92	1000.08	0.08	0 00:00	0.00	0.00
7	CB_Hav_3	0.00	0.00	N/A	N/A	N/A	0.92	990.08	0.08	0 00:00	0.00	0.00
8	CB_Hen_4.2	0.63	0.63	N/A	N/A	N/A	5.23	900.86	0.16	0 12:00	0.00	0.00
9	CB_Locust_1.1	1.01	1.01	N/A	N/A	N/A	7.31	899.84	0.20	0 12:05	0.00	0.00
10	CB_Locust_1.2	0.00	0.00	N/A	N/A	N/A	0.92	900.29	0.08	0 12:05	0.00	0.00
11	CB_Locust_1.3	0.12	0.12	N/A	N/A	N/A	1.50	901.59	0.09	0 12:00	0.00	0.00
12	CB_Locust_2.1	0.00	0.00	N/A	N/A	N/A	0.92	903.08	0.08	0 00:00	0.00	0.00
13	CB_Locust_2.2	0.00	0.00	N/A	N/A	N/A	0.92	903.08	0.08	0 00:00	0.00	0.00
14	CB_Locust_4.1	0.00	0.00	N/A	N/A	N/A	0.92	904.58	0.08	0 00:00	0.00	0.00
15	CB_Locust_4.2	0.00	0.00	N/A	N/A	N/A	0.92	904.58	0.08	0 00:00	0.00	0.00
16	CB_Ton_6.1	0.00	0.00	N/A	N/A	N/A	0.92	932.74	0.08	0 00:00	0.00	0.00
17	CB_Ton_6.2	0.00	0.00	N/A	N/A	N/A	0.92	932.74	0.08	0 00:00	0.00	0.00
18	CB_Ton_6.3	0.00	0.00	N/A	N/A	N/A	0.92	932.74	0.08	0 00:00	0.00	0.00
19	CB_West_4.4	0.05	0.05	N/A	N/A	N/A	1.26	907.58	0.08	0 12:00	0.00	0.00
20	CB_West_4.5	0.05	0.05	N/A	N/A	N/A	1.24	907.58	0.08	0 12:00	0.00	0.00
21	CB_West_5.1	0.00	0.00	N/A	N/A	N/A	0.92	909.58	0.08	0 00:00	0.00	0.00
22	CB_West_5.2	0.00	0.00	N/A	N/A	N/A	0.92	909.08	0.08	0 00:00	0.00	0.00
23	CB_West_Del.1	1.01	1.01	N/A	N/A	N/A	7.31	918.70	0.20	0 12:00	0.00	0.00
24	CB_West_Del.2	0.63	0.63	N/A	N/A	N/A	5.26	920.76	0.16	0 12:00	0.00	0.00
25	CB_West_Del.3	0.26	0.26	N/A	N/A	N/A	1.91	918.31	0.10	0 12:05	0.00	0.00
26	CB_West_Del.4	0.00	0.00	N/A	N/A	N/A	0.92	918.24	0.08	0 12:05	0.00	0.00
27	CB_Whit_1/2.1	0.00	0.00	N/A	N/A	N/A	0.92	917.08	0.08	0 00:00	0.00	0.00
28	CB_Whit_1/2.2	0.22	0.22	N/A	N/A	N/A	1.79	919.09	0.09	0 11:40	0.00	0.00
29	CB_Whit_1/2.3	0.00	0.00	N/A	N/A	N/A	0.92	918.08	0.08	0 00:00	0.00	0.00
30	CB_Whit_3.1	0.47	0.47	N/A	N/A	N/A	2.40	912.11	0.11	0 12:00	0.00	0.00
31	CB_Whit_3.4	0.35	0.35	N/A	N/A	N/A	2.13	913.60	0.10	0 12:00	0.00	0.00
32	CB_Whit_4.1	0.00	0.00	N/A	N/A	N/A	0.92	912.08	0.08	0 00:00	0.00	0.00
33	CB_Whit_6	0.00	0.00	N/A	N/A	N/A	0.92	922.08	0.08	0 00:00	0.00	0.00
34	CB_Whit_Del.1	2.62	2.62	N/A	N/A	N/A	14.06	920.87	0.34	0 11:56	0.14	12.00
35	CB_Whit_Del.2	0.00	0.00	N/A	N/A	N/A	0.92	921.58	0.08	0 11:56	0.00	0.00
36	CB_Whit_Del.3	0.00	0.00	N/A	N/A	N/A	0.92	921.73	0.08	0 11:55	0.00	0.00
37	Inlet-60	0.00	0.00	N/A	N/A	N/A	0.00	957.99	0.00	0 12:01	0.00	0.00
38	Inlet-61	0.00	0.00	N/A	N/A	N/A	0.00	945.89	0.00	0 12:01	0.00	0.00
39	Inlet-62	0.00	0.00	N/A	N/A	N/A	0.00	943.08	0.00	0 12:02	0.00	0.00

Storage Nodes

Storage Node : DW_Hav_1

Input Data

Invert Elevation (ft)	980.00
Max (Rim) Elevation (ft)	990.00
Max (Rim) Offset (ft)	10.00
Initial Water Elevation (ft)	0.00
Initial Water Depth (ft)	-980.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Output Summary Results

Peak Inflow (cfs)	0.00
Peak Lateral Inflow (cfs)	0.00
Peak Outflow (cfs)	0.00
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	980.00
Max HGL Depth Attained (ft)	0
Average HGL Elevation Attained (ft)	980.00
Average HGL Depth Attained (ft)	0
Time of Max HGL Occurrence (days hh:mm)	0 00:00
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : DW_Hav_2

Input Data

Invert Elevation (ft)	990.00
Max (Rim) Elevation (ft)	1000.00
Max (Rim) Offset (ft)	10.00
Initial Water Elevation (ft)	0.00
Initial Water Depth (ft)	-990.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Output Summary Results

Peak Inflow (cfs)	0.00
Peak Lateral Inflow (cfs)	0.00
Peak Outflow (cfs)	0.00
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	990.00
Max HGL Depth Attained (ft)	0
Average HGL Elevation Attained (ft)	990.00
Average HGL Depth Attained (ft)	0
Time of Max HGL Occurrence (days hh:mm)	0 00:00
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : DW_Hav_3

Input Data

Invert Elevation (ft)	1000.00
Max (Rim) Elevation (ft)	1010.00
Max (Rim) Offset (ft)	10.00
Initial Water Elevation (ft)	0.00
Initial Water Depth (ft)	-1000.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Output Summary Results

Peak Inflow (cfs)	0.73
Peak Lateral Inflow (cfs)	0.00
Peak Outflow (cfs)	0.63
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	1006.27
Max HGL Depth Attained (ft)	6.27
Average HGL Elevation Attained (ft)	1001.06
Average HGL Depth Attained (ft)	1.06
Time of Max HGL Occurrence (days hh:mm)	0 12:05
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Project Description

File Name ..... 5825-Tonasket Proposed-2019 Inlet Basins.SPF

Project Options

Flow Units ..... CFS
Elevation Type ..... Elevation
Hydrology Method ..... SCS TR-55
Time of Concentration (TOC) Method ..... SCS TR-55
Link Routing Method ..... Hydrodynamic
Enable Overflow Ponding at Nodes ..... YES
Skip Steady State Analysis Time Periods ..... YES

Analysis Options

Start Analysis On ..... Mar 20, 2019 00:00:00
End Analysis On ..... Mar 21, 2019 00:00:00
Start Reporting On ..... Mar 20, 2019 00:00:00
Antecedent Dry Days ..... 0 days
Runoff (Dry Weather) Time Step ..... 0 01:00:00 days hh:mm:ss
Runoff (Wet Weather) Time Step ..... 0 00:05:00 days hh:mm:ss
Reporting Time Step ..... 0 00:05:00 days hh:mm:ss
Routing Time Step ..... 30 seconds

Number of Elements

	Qty
Rain Gages	2
Subbasins	143
Nodes	103
Junctions	47
Outfalls	14
Flow Diversions	0
Inlets	39
Storage Nodes	3
Links	86
Channels	2
Pipes	81
Pumps	0
Orifices	0
Weirs	0
Outlets	3
Pollutants	0
Land Uses	0

Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution
1	50-year	Time Series	50-yr Type II	Intensity	inches	Washington	Okanogan	50	2.00	SCS Type II 24-hr
2	Rain Gage-01	Time Series	10-YR Type-2	Intensity	inches	Washington	Adams	100	1.60	SCS Type II 24-hr

Subbasin Summary

SN	Subbasin ID	Area (ac)	Peak Rate Factor	Weighted Curve Number	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	97_East_1st	0.42	484.00	98.00	1.60	1.38	0.58	0.83	0 00:06:00
2	97_East_2nd	0.32	484.00	98.00	1.60	1.38	0.44	0.63	0 00:06:00
3	97_West_1st	0.68	484.00	98.00	1.60	1.38	0.94	1.33	0 00:06:00
4	97_West_2nd	0.37	484.00	98.00	1.60	1.38	0.51	0.73	0 00:06:00
5	A_Rd_State	4.20	484.00	98.00	1.60	1.38	5.79	7.75	0 00:08:11
6	A1_State	2.05	484.00	61.00	1.60	0.02	0.03	0.00	0 00:21:07
7	A2_State	3.45	484.00	77.00	1.60	0.25	0.87	0.48	0 00:34:49
8	A3_State	0.73	484.00	61.00	1.60	0.01	0.01	0.00	0 00:19:10
9	A4_State	2.04	484.00	68.00	1.60	0.08	0.17	0.04	0 00:20:04
10	A5_State	1.70	484.00	57.00	1.60	0.00	0.00	0.00	0 00:14:00
11	A6_State	1.42	484.00	57.00	1.60	0.00	0.00	0.00	0 00:14:00
12	B_Rd_State	1.66	484.00	98.00	1.60	1.38	2.29	3.27	0 00:06:00
13	B1_State	0.43	484.00	68.00	1.60	0.08	0.03	0.01	0 00:18:03
14	B2_State	0.77	484.00	54.00	1.60	0.00	0.00	0.00	0 00:18:34
15	B3_Pt_5	3.67	484.00	61.00	1.60	0.02	0.06	0.01	0 00:18:44
16	C_Rds_State	1.71	484.00	98.00	1.60	1.38	2.36	3.37	0 00:06:00
17	C1_State	1.06	484.00	54.00	1.60	0.00	0.00	0.00	0 00:15:46
18	C2_State	1.93	484.00	61.00	1.60	0.02	0.03	0.00	0 00:15:09
19	C3_Rds2_State	0.64	484.00	98.00	1.60	1.38	0.88	1.24	0 00:06:00
20	C3_State	0.80	484.00	57.00	1.60	0.00	0.00	0.00	0 00:16:28
21	D_Rds_Pt_2	0.81	484.00	98.00	1.60	1.38	1.11	1.58	0 00:06:00
22	D1_Pt_2	8.93	484.00	57.80	1.60	0.00	0.03	0.01	0 00:12:20
23	E_97@4th	0.19	484.00	98.00	1.60	1.38	0.27	0.38	0 00:06:00
24	E_97@5th	0.18	484.00	98.00	1.60	1.37	0.25	0.35	0 00:06:00
25	E1_Pt_6	1.12	484.00	57.00	1.60	0.00	0.00	0.00	0 00:17:33
26	E10_Pt_6	0.87	484.00	89.00	1.60	0.71	0.62	0.94	0 00:06:00
27	E11_Pt_6	0.87	484.00	98.00	1.60	1.38	1.20	1.71	0 00:06:00
28	E2_Pt_6	1.92	484.00	57.00	1.60	0.00	0.00	0.00	0 00:17:09
29	E3_Pt_6	0.45	484.00	57.00	1.60	0.00	0.00	0.00	0 00:15:46
30	E4_Pt_6	0.22	484.00	57.00	1.60	0.00	0.00	0.00	0 00:16:07
31	E5_Pt_6	0.95	484.00	57.00	1.60	0.00	0.00	0.00	0 00:16:00
32	E6_Pt_6	0.88	484.00	57.00	1.60	0.00	0.00	0.00	0 00:15:12
33	E7_Pt_6	0.96	484.00	57.00	1.60	0.00	0.00	0.00	0 00:14:48
34	E8_Pt_6	0.87	484.00	57.00	1.60	0.00	0.00	0.00	0 00:14:50
35	E9_Pt_6	0.96	484.00	61.00	1.60	0.02	0.01	0.00	0 00:12:43
36	East_97_7th	0.24	484.00	98.00	1.60	1.38	0.33	0.46	0 00:06:00
37	F_Rds_Pt_9	0.69	484.00	98.00	1.60	1.38	0.95	1.36	0 00:06:00
38	F1_Pt_6	1.24	484.00	57.00	1.60	0.00	0.00	0.00	0 00:19:27
39	F2_Pt_7	1.07	484.00	57.00	1.60	0.00	0.00	0.00	0 00:16:58
40	F3_Pt_9	4.66	484.00	69.00	1.60	0.10	0.44	0.15	0 00:15:45
41	F4_Pt_8	2.02	484.00	89.00	1.60	0.71	1.43	2.10	0 00:07:14
42	G_Rds_Pt_7	0.74	484.00	98.00	1.60	1.38	1.02	1.46	0 00:06:00
43	G1_Pt_7	0.50	484.00	57.00	1.60	0.00	0.00	0.00	0 00:16:54
44	G2_Pt_9	3.12	484.00	39.00	1.60	0.00	0.00	0.00	0 00:30:57
45	G3_Pt_10	3.16	484.00	81.00	1.60	0.37	1.16	1.53	0 00:08:33
46	G4_Pt_7	1.68	484.00	39.00	1.60	0.00	0.00	0.00	0 00:37:09
47	H_Rds_Pt_10	1.49	484.00	98.00	1.60	1.38	2.05	2.91	0 00:06:00
48	H_Rds_Pt_11	0.86	484.00	98.00	1.60	1.38	1.18	1.68	0 00:06:00
49	H1_Pt_11	2.61	484.00	57.00	1.60	0.00	0.00	0.00	0 00:16:53
50	H2_Pt_11	0.76	484.00	57.00	1.60	0.00	0.00	0.00	0 00:16:36
51	H3_Pt11	0.76	484.00	57.00	1.60	0.00	0.00	0.00	0 00:19:54
52	I_Rds_Pt_9	0.45	484.00	98.00	1.60	1.38	0.62	0.89	0 00:06:00
53	I1_Pt_18	0.92	484.00	54.00	1.60	0.00	0.00	0.00	0 00:19:23
54	I2_Pt_9	0.82	484.00	57.00	1.60	0.00	0.00	0.00	0 00:16:22
55	J_Rds_Pt_18	0.88	484.00	98.00	1.60	1.38	1.22	1.73	0 00:06:00
56	J_Rds_Pt_7	0.47	484.00	98.00	1.60	1.38	0.65	0.93	0 00:06:00
57	J1_Pt_18	0.90	484.00	61.00	1.60	0.01	0.01	0.00	0 00:22:57
58	J2_Pt_9	1.22	484.00	61.00	1.60	0.02	0.02	0.00	0 00:19:27
59	K_Rds_Pt_18	1.58	484.00	98.00	1.60	1.38	2.17	3.09	0 00:06:00
60	K1_Pt_18	1.85	484.00	61.00	1.60	0.02	0.03	0.00	0 00:22:54
61	K2_Pt_18	2.92	484.00	61.00	1.60	0.02	0.04	0.01	0 00:20:57
62	K3_Pt_18	1.90	484.00	61.00	1.60	0.02	0.03	0.00	0 00:18:54
63	L_Rds_Pt_18	0.65	484.00	98.00	1.60	1.38	0.89	1.27	0 00:06:00
64	L_Rds_Pt_7	0.53	484.00	98.00	1.60	1.38	0.73	1.03	0 00:06:00
65	L1_Pt_18	0.45	484.00	61.00	1.60	0.00	0.00	0.00	0 00:19:06
66	L2_Pt_7	1.59	484.00	81.00	1.60	0.37	0.59	0.75	0 00:10:06
67	M_Rd_Pt_1	2.84	484.00	98.00	1.60	1.38	3.91	5.56	0 00:06:00
68	M1_Pt_1	7.80	484.00	51.00	1.60	0.00	0.00	0.00	0 00:11:48
69	M1_Tonasket_Ave	0.85	484.00	98.00	1.60	1.38	1.17	1.67	0 00:06:00
70	M1_Winesap_ST	0.98	484.00	98.00	1.60	1.38	1.35	1.92	0 00:06:00
71	M2_Pt_1	1.71	484.00	54.00	1.60	0.00	0.00	0.00	0 00:12:33
72	M3_Pt_1	1.03	484.00	89.00	1.60	0.71	0.73	1.11	0 00:06:00
73	N_4th@97	5.18	484.00	98.00	1.60	1.38	7.14	10.16	0 00:06:00
74	N_4th@Western	0.20	484.00	98.00	1.60	1.38	0.28	0.39	0 00:06:00
75	N_5th@97	1.02	484.00	98.00	1.60	1.38	1.40	2.00	0 00:06:00
76	N_6th@97	0.22	484.00	98.00	1.60	1.38	0.31	0.44	0 00:06:00
77	N_Rds_Pt_5	1.05	484.00	98.00	1.60	1.38	1.45	2.06	0 00:06:00
78	N1_Pt_3	2.91	484.00	51.00	1.60	0.00	0.00	0.00	0 00:12:24
79	N1_Rds_Pt_1	0.44	484.00	98.00	1.60	1.38	0.60	0.85	0 00:06:00
80	N1_Rds_Pt_5	0.44	484.00	98.00	1.60	1.38	0.61	0.87	0 00:06:00
81	North_3rd@97	0.36	484.00	98.00	1.60	1.38	0.49	0.70	0 00:06:00
82	O_Rds_State	3.13	484.00	98.00	1.60	1.38	4.31	5.91	0 00:07:18
83	O1_State	1.66	484.00	57.00	1.60	0.00	0.00	0.00	0 00:18:51
84	O2_Pt_5	1.91	484.00	61.00	1.60	0.02	0.03	0.00	0 00:13:32
85	O2_Rds_Pt_5	1.26	484.00	98.00	1.60	1.38	1.73	2.46	0 00:06:00
86	O2_Rds2_Pt_5	0.35	484.00	98.00	1.60	1.38	0.49	0.69	0 00:06:00
87	P_RD_State	2.42	484.00	98.00	1.60	1.38	3.33	4.75	0 00:06:00
88	P1_State	1.37	484.00	61.00	1.60	0.02	0.02	0.00	0 00:17:46

Subbasin Summary

SN	Subbasin ID	Area (ac)	Peak Rate Factor	Weighted Curve Number	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
89	P2_Pt_5	0.84	484.00	77.00	1.60	0.25	0.21	0.20	0 00:15:07
90	P2_Rds_2-St	0.32	484.00	98.00	1.60	1.38	0.44	0.63	0 00:06:00
91	P2_Rds2_2-St	0.23	484.00	98.00	1.60	1.38	0.31	0.44	0 00:06:00
92	P3_Pt_4	0.85	484.00	89.00	1.60	0.71	0.60	0.92	0 00:06:00
93	Q_Rds2_97	0.30	484.00	98.00	1.60	1.38	0.41	0.59	0 00:06:00
94	Q1_Pt_5	0.97	484.00	57.00	1.60	0.00	0.00	0.00	0 00:16:30
95	Q1_Rds_State	0.32	484.00	98.00	1.60	1.38	0.44	0.63	0 00:06:00
96	Q1_Rds2_State	0.49	484.00	98.00	1.60	1.38	0.67	0.95	0 00:06:00
97	Q2_Pt_5	0.65	484.00	61.00	1.60	0.01	0.01	0.00	0 00:16:32
98	Q3_Pt_5	0.96	484.00	77.00	1.60	0.25	0.24	0.23	0 00:15:19
99	Q3_Rds_State	0.32	484.00	98.00	1.60	1.38	0.44	0.63	0 00:06:00
100	Q3_Rds2_State	0.45	484.00	98.00	1.60	1.38	0.62	0.88	0 00:06:00
101	Q4_Pt_5	0.95	484.00	89.00	1.60	0.71	0.67	1.00	0 00:06:55
102	Q5_Pt_6	0.96	484.00	89.00	1.60	0.71	0.68	0.98	0 00:08:04
103	R_RD_2	0.63	484.00	98.00	1.60	1.38	0.86	1.23	0 00:06:00
104	R_Rd_Pt_1	0.68	484.00	98.00	1.60	1.38	0.94	1.34	0 00:06:00
105	R1_Pt_1	0.27	484.00	39.00	1.60	0.00	0.00	0.00	0 00:18:18
106	S_5th@97	0.73	484.00	98.00	1.60	1.38	1.00	1.43	0 00:06:00
107	S_6th@97	0.16	484.00	98.00	1.60	1.37	0.22	0.31	0 00:06:00
108	S_Rds_Pt_1	1.09	484.00	98.00	1.60	1.38	1.51	2.15	0 00:06:00
109	S1_Pt_14	1.34	484.00	81.00	1.60	0.37	0.49	0.47	0 00:20:23
110	S2_Pt_14	1.59	484.00	89.00	1.60	0.71	1.13	1.39	0 00:14:58
111	S2_Rds_Pt_14	3.53	484.00	98.00	1.60	1.38	4.87	6.93	0 00:06:00
112	S3_Pt_14	4.07	484.00	89.00	1.60	0.71	2.87	3.98	0 00:09:51
113	S3_Pt_3	0.29	484.00	72.00	1.60	0.14	0.04	0.02	0 00:23:33
114	S3_Rds_3-St	0.38	484.00	98.00	1.60	1.38	0.52	0.74	0 00:06:00
115	South_3rd@97	0.22	484.00	98.00	1.60	1.38	0.31	0.44	0 00:06:00
116	South_4th@97	2.64	484.00	98.00	1.60	1.38	3.64	5.19	0 00:06:00
117	T_Rds2_Pt_5	0.51	484.00	98.00	1.60	1.38	0.71	1.00	0 00:06:00
118	U_Rds_Pt_12	1.49	484.00	98.00	1.60	1.38	2.06	2.93	0 00:06:00
119	U_Rds_Pt_13	1.48	484.00	98.00	1.60	1.38	2.04	2.90	0 00:06:00
120	U_Rds_Pt_14	0.26	484.00	98.00	1.60	1.38	0.36	0.51	0 00:06:00
121	U_Rds2_Pt_13	0.38	484.00	98.00	1.60	1.38	0.52	0.74	0 00:06:00
122	U_Rds2_Pt_14	0.50	484.00	98.00	1.60	1.38	0.69	0.98	0 00:06:00
123	U1_Pt_14	1.94	484.00	98.00	1.60	1.38	2.68	3.43	0 00:10:01
124	U2_Pt_13	1.74	484.00	98.00	1.60	1.38	2.39	3.06	0 00:09:58
125	U3_Pt_13	1.91	484.00	98.00	1.60	1.38	2.63	3.18	0 00:12:31
126	U4_Pt_12	2.64	484.00	89.00	1.60	0.71	1.87	2.65	0 00:08:50
127	US97_3-4_East	0.30	484.00	98.00	1.60	1.38	0.42	0.60	0 00:06:00
128	V_Rds_Pt_15	0.36	484.00	98.00	1.60	1.38	0.49	0.70	0 00:06:00
129	V_Rds2_Pt_15	0.13	484.00	98.00	1.60	1.37	0.18	0.25	0 00:06:00
130	W_97@4th	0.45	484.00	98.00	1.60	1.38	0.62	0.88	0 00:06:00
131	W_97@5th	0.42	484.00	98.00	1.60	1.38	0.58	0.82	0 00:06:00
132	W_Rds_Pt_15	0.41	484.00	98.00	1.60	1.38	0.57	0.80	0 00:06:00
133	W1_Pt_15	2.11	484.00	89.00	1.60	0.71	1.49	2.29	0 00:06:00
134	W2_Pt_15	1.96	484.00	89.00	1.60	0.71	1.38	1.97	0 00:08:46
135	West_97_6th	0.46	484.00	98.00	1.60	1.38	0.63	0.89	0 00:06:00
136	X_Rds_Pt_16	0.38	484.00	98.00	1.60	1.38	0.52	0.74	0 00:06:00
137	X_Rds_Pt_17	0.68	484.00	98.00	1.60	1.38	0.93	1.33	0 00:06:00
138	X_Rds2_Pt_13	0.05	484.00	98.00	1.60	1.29	0.07	0.10	0 00:06:00
139	X1_Pt_16	3.16	484.00	57.00	1.60	0.00	0.00	0.00	0 00:25:09
140	X2_Pt_17	1.17	484.00	57.00	1.60	0.00	0.00	0.00	0 00:25:19
141	Y_Rds_Pt_17	0.78	484.00	98.00	1.60	1.38	1.07	1.53	0 00:06:00
142	Y_Rds2_Pt_13	0.06	484.00	98.00	1.60	1.34	0.07	0.11	0 00:06:00
143	Y1_Pt_17	1.77	484.00	98.00	1.60	1.38	2.45	2.89	0 00:13:38

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft²)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	CB_97_7.1	Junction	919.10	921.00	0.00	921.00	10.00	2.98	924.08	3.08	0.00	0 11:56	0.01	11.00
2	CB_97_7.2	Junction	918.40	922.00	0.00	922.00	10.00	6.29	923.73	1.73	0.00	0 12:00	0.02	9.00
3	CB_Hen_4.1	Junction	890.50	900.70	0.00	900.70	10.00	4.13	892.03	0.00	8.67	0 00:00	0.00	0.00
4	CB_Locust_1.4	Junction	897.02	901.33	0.00	901.33	10.00	3.70	897.62	0.00	3.72	0 00:00	0.00	0.00
5	CB_West_3.1	Junction	900.20	907.00	0.00	907.00	10.00	4.17	906.12	0.00	0.88	0 00:00	0.00	0.00
6	CB_West_3.2	Junction	901.00	907.00	0.00	907.00	10.00	10.07	906.10	0.00	0.90	0 00:00	0.00	0.00
7	CB_West_3.3	Junction	900.40	907.00	0.00	907.00	10.00	3.98	906.45	0.00	0.55	0 00:00	0.00	0.00
8	CB_West_3.4	Junction	900.07	906.00	0.00	906.00	10.00	0.56	905.24	0.00	0.76	0 00:00	0.00	0.00
9	CB_West_4.1	Junction	900.25	907.00	0.00	907.00	10.00	0.05	907.00	0.00	0.00	0 12:01	0.00	0.00
10	CB_West_4.2	Junction	900.75	907.50	0.00	907.50	10.00	0.74	907.50	0.00	0.00	0 12:01	0.00	0.00
11	CB_West_4.3	Junction	900.24	907.50	0.00	907.50	10.00	1.70	907.53	0.03	0.00	0 12:02	0.00	0.00
12	CB_West_6	Junction	907.80	914.60	0.00	914.60	240.00	6.06	919.76	5.16	0.00	0 12:00	0.35	27.00
13	CB_Whit_3.2	Junction	906.00	913.50	0.00	913.50	240.00	5.97	907.31	0.00	6.19	0 00:00	0.00	0.00
14	CB_Whit_3.3	Junction	906.10	913.50	0.00	913.50	240.00	2.23	907.76	0.00	5.74	0 00:00	0.00	0.00
15	CB_Whit_4.2	Junction	910.40	912.00	0.00	912.00	10.00	6.08	911.58	0.00	0.42	0 00:00	0.00	0.00
16	CB_Whit_4.3	Junction	910.60	912.00	0.00	912.00	10.00	10.10	911.98	0.00	0.37	0 00:00	0.00	0.00
17	CB_Whit_5.1	Junction	909.60	916.00	0.00	916.00	10.00	0.81	910.85	0.00	5.15	0 00:00	0.00	0.00
18	CB_Whit_5.2	Junction	909.50	916.00	0.00	916.00	10.00	3.41	911.00	0.00	5.00	0 00:00	0.00	0.00
19	CB_Whit_6s	Junction	915.00	919.00	0.00	0.00	0.00	1.58	915.97	0.00	3.03	0 00:00	0.00	0.00
20	CB_WhitWest_4	Junction	905.50	908.00	0.00	908.00	10.00	0.15	905.52	0.00	2.48	0 00:00	0.00	0.00
21	MH_1st&97	Junction	910.47	920.00	0.00	0.00	0.00	10.25	911.72	0.00	8.28	0 00:00	0.00	0.00
22	MH_2nd&97	Junction	907.31	910.00	0.00	910.00	100.00	12.58	908.39	0.00	1.61	0 00:00	0.00	0.00
23	MH_3rd&97	Junction	903.00	911.35	0.00	0.00	0.00	44.24	904.95	0.00	6.40	0 00:00	0.00	0.00
24	MH_4th&97	Junction	907.00	914.26	0.00	914.26	100.00	29.88	908.30	0.00	5.96	0 00:00	0.00	0.00
25	MH_5th&97	Junction	908.80	914.44	0.00	914.44	100.00	11.56	910.82	0.00	3.62	0 00:00	0.00	0.00
26	MH_6th&97	Junction	914.50	919.37	0.00	919.37	100.00	5.35	915.64	0.00	3.73	0 00:00	0.00	0.00
27	MH_Bon_6	Junction	960.01	978.29	0.00	978.29	100.00	5.58	960.50	0.00	17.79	0 00:00	0.00	0.00
28	MH_Hen_1	Junction	891.15	893.14	0.00	893.14	100.00	3.68	891.73	0.00	1.41	0 00:00	0.00	0.00
29	MH_Hen_4	Junction	888.92	895.00	0.00	895.00	100.00	6.08	890.05	0.00	4.95	0 00:00	0.00	0.00
30	MH_Locust_1.1	Junction	896.56	901.98	0.00	901.98	100.00	2.76	897.99	0.00	3.99	0 00:00	0.00	0.00
31	MH_Locust_3	Junction	894.43	902.53	0.00	902.53	100.00	96.04	902.53	0.01	0.00	0 12:00	0.00	0.00
32	MH_Locust_4	Junction	894.92	905.13	0.00	905.13	100.00	0.92	895.22	0.00	9.91	0 00:00	0.00	0.00
33	MH_PT_9	Junction	924.71	929.23	0.00	929.23	100.00	1.35	925.05	0.00	4.18	0 00:00	0.00	0.00
34	MH_RR_4	Junction	891.84	900.00	0.00	900.00	100.00	0.91	892.13	0.00	7.87	0 00:00	0.00	0.00
35	MH_RRHen_4	Junction	890.04	898.00	0.00	898.00	100.00	6.08	890.91	0.00	7.09	0 00:00	0.00	0.00
36	MH_West_3.1	Junction	899.27	905.00	0.00	905.00	100.00	54.31	905.00	0.00	0.00	0 12:02	0.00	0.00
37	MH_West_3.2	Junction	897.80	905.00	0.00	905.00	100.00	99.77	905.00	0.00	0.00	0 12:02	0.00	0.00
38	MH_West_3.3	Junction	899.96	905.00	0.00	905.00	240.00	21.68	905.16	0.16	0.00	0 12:02	0.02	4.00
39	MH_West_3/4	Junction	899.48	905.00	0.00	905.00	100.00	32.72	905.00	0.00	0.00	0 12:02	0.00	0.00
40	MH_West_4.1	Junction	899.50	907.46	0.00	907.46	100.00	33.20	907.04	0.00	0.42	0 00:00	0.00	0.00
41	MH_West_4.2	Junction	900.50	908.00	0.00	908.00	100.00	3.61	907.87	0.00	0.13	0 00:00	0.00	0.00
42	MH_West_4.3	Junction	896.14	907.71	0.00	907.71	100.00	0.21	896.35	0.00	11.36	0 00:00	0.00	0.00
43	MH_West_Delish.1	Junction	913.33	919.19	0.00	919.19	100.00	4.11	917.51	0.00	1.69	0 00:00	0.00	0.00
44	MH_West_Delish.2	Junction	914.79	920.00	0.00	920.00	100.00	4.04	917.52	0.00	2.48	0 00:00	0.00	0.00
45	MH_Whit_3.2	Junction	905.88	909.81	0.00	909.81	100.00	7.69	906.60	0.00	3.21	0 00:00	0.00	0.00
46	MH_Whit_5.1	Junction	909.50	913.99	0.00	913.99	100.00	7.64	911.30	0.00	2.70	0 00:00	0.00	0.00
47	NEW 3rd Inlets	Junction	917.00	922.00	0.00	939.00	100.00	25.92	918.09	0.00	3.91	0 00:00	0.00	0.00
48	MH_West_6	Outfall	907.50					4.15	908.17					
49	Out-19	Outfall	923.00					6.95	923.78					
50	Out-20	Outfall	980.00					0.00	980.00					
51	Out-21	Outfall	990.00					0.01	990.00					
52	Out-22	Outfall	1000.00					1.00	1000.00					
53	Out-56	Outfall	0.00					1.66	0.00					
54	Out-57	Outfall	0.00					1.91	0.00					
55	Out-59	Outfall	915.00					2.01	915.43					
56	Out-A	Outfall	891.45					96.04	894.95					
57	Out-B	Outfall	917.00					6.13	918.00					
58	Out-C	Outfall	888.00					6.07	889.04					
59	Out-D	Outfall	887.15					3.67	887.70					
60	Out-E	Outfall	900.00					3.32	901.00					
61	Tona-DW	Outfall	939.00					0.87	939.00					
62	DW_Hav_1	Storage Node	980.00	990.00	0.00		0.00	0.00	980.00				0.00	0.00
63	DW_Hav_2	Storage Node	990.00	1000.00	0.00		0.00	0.01	990.06				0.00	0.00
64	DW_Hav_3	Storage Node	1000.00	1010.00	0.00		0.00	1.38	1010.00				0.00	0.00

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Reported Condition
					(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
1	Link-102	Pipe	CB_97_7.1	CB_97_7.2	24.00	919.10	918.40	2.9200	12.000	0.0130	2.81	6.08	0.46	3.58	1.00	1.00	15.00	SURCHARGED
2	Link-103	Pipe	CB_97_7.2	CB_97_7.3	100.00	918.40	917.80	0.6000	12.000	0.0130	6.13	2.76	2.22	7.80	1.00	1.00	11.00	SURCHARGED
3	Link-135	Pipe	MH_Bon_6	Inlet-60	117.16	960.01	956.01	3.4100	30.000	0.0150	5.47	65.64	0.08	6.09	0.59	0.24	0.00	Calculated
4	Link-137	Pipe	Inlet-61	Inlet-62	66.96	942.29	939.12	4.7300	24.000	0.0250	5.39	25.60	0.21	5.35	0.70	0.36	0.00	Calculated
5	Link-139	Pipe	CB_Bon_7	Inlet-62	33.71	942.30	939.12	9.4300	6.000	0.0130	1.67	1.72	0.97	8.52	0.50	1.00	6.00	SURCHARGED
6	Link-14	Pipe	CB_Bon_6	MH_Bon_6	49.74	969.87	969.51	0.7200	10.000	0.0130	2.96	1.86	1.59	5.51	0.79	0.95	0.00	> CAPACITY
7	Link-141	Pipe	CB_Hav_3	DW_Hav_1	40.78	980.20	980.00	0.4900	18.000	0.0150	0.00	6.38	0.00	0.00	0.00	0.00	0.00	Calculated
8	Link-142	Pipe	CB_Hav_2	DW_Hav_2	41.71	990.20	990.00	0.4800	18.000	0.0150	0.01	6.30	0.00	0.46	0.05	0.03	0.00	Calculated
9	Link-143	Pipe	CB_Hav_1	DW_Hav_3	40.63	1000.20	1000.00	0.4900	18.000	0.0150	1.38	6.39	0.22	0.78	1.50	1.00	51.00	SURCHARGED
10	Link-144	Pipe	MH_West_Delish.1	Out-E	530.00	913.33	900.00	2.5200	12.000	0.0240	3.32	3.06	1.08	4.43	1.00	1.00	10.00	SURCHARGED
11	Link-146	Pipe	MH_1st&97	MH_2nd&97	316.01	910.47	907.31	1.0000	18.000	0.0120	10.15	11.38	0.89	6.93	1.14	0.77	0.00	Calculated
12	Link-147	Pipe	MH_2nd&97	MH_3rd&97	367.78	907.31	903.63	1.0000	24.000	0.0120	12.51	24.51	0.51	6.75	1.13	0.58	0.00	Calculated
13	Link-148	Pipe	MH_PT_9	MH_6th&97	340.00	924.74	915.06	2.8500	12.000	0.0120	1.32	6.51	0.20	3.96	0.44	0.44	0.00	Calculated
14	Link-149	Pipe	MH_Whit_5.1	MH_5th&97	11.00	909.89	909.70	1.7400	18.000	0.0120	7.56	15.00	0.50	4.86	1.22	0.84	0.00	Calculated
15	Link-15	Pipe	CB_Ant_6	CB_Ton_6.1	330.00	947.63	928.14	5.9100	8.000	0.0130	0.00	2.94	0.00	0.00	0.00	0.00	0.00	Calculated
16	Link-150	Pipe	MH_5th&97	MH_4th&97	350.00	909.60	907.46	0.6100	24.000	0.0120	11.51	19.16	0.60	6.03	1.14	0.59	0.00	Calculated
17	Link-159	Pipe	NEW 3rd Inlets	MH_3rd&97	200.00	917.00	903.73	6.6300	21.000	0.0120	25.92	44.22	0.59	16.45	1.09	0.63	0.00	Calculated
18	Link-160	Pipe	CB_97_7.3	Out-B	30.00	917.80	917.00	2.6700	12.000	0.0130	6.13	5.82	1.05	7.80	1.00	1.00	5.00	SURCHARGED
19	Link-161	Pipe	CB_Whit_6s	MH_6th&97	56.00	915.30	914.95	0.6200	12.000	0.0150	1.57	2.44	0.65	2.84	0.66	0.67	0.00	Calculated
20	Link-162	Pipe	MH_4th&97	MH_West_4.1	389.96	907.00	901.00	1.5400	27.000	0.0120	24.11	41.62	0.58	9.00	1.76	0.79	0.00	Calculated
21	Link-163	Pipe	MH_West_3.2	MH_Locust_3	320.65	897.80	894.47	1.0400	42.000	0.0100	96.04	133.29	0.72	9.98	3.50	1.00	6.00	SURCHARGED
22	Link-164	Pipe	MH_4th&97	MH_3rd&97	393.00	907.36	904.73	0.6700	24.000	0.0150	6.67	16.04	0.42	4.74	0.89	0.46	0.00	Calculated
23	Link-165	Pipe	CB_West_Del.4	Out-59	43.11	916.23	915.00	2.8600	12.000	0.0150	2.01	5.22	0.39	5.67	0.46	0.46	0.00	Calculated
24	Link-17	Pipe	CB_Ton_6.1	MH_PT_9	52.00	927.94	924.74	6.1500	8.000	0.0130	0.00	3.04	0.00	0.00	0.15	0.23	0.00	Calculated
25	Link-20	Pipe	MH_6th&97	MH_Whit_5.1	327.00	914.95	910.37	1.4000	18.000	0.0130	5.34	12.43	0.43	6.00	0.78	0.54	0.00	Calculated
26	Link-23	Pipe	CB_Ton_6.3	MH_PT_9	45.45	927.00	924.72	5.0200	8.000	0.0130	0.00	2.71	0.00	0.00	0.16	0.24	0.00	Calculated
27	Link-24	Pipe	CB_Ton_6.2	MH_PT_9	70.74	928.50	924.72	5.3400	8.000	0.0130	0.00	2.79	0.00	0.00	0.16	0.24	0.00	Calculated
28	Link-28	Pipe	CB_Whit_5.1	MH_5th&97	53.94	910.00	909.70	0.5600	12.000	0.0120	0.78	2.88	0.27	1.16	0.90	0.93	0.00	Calculated
29	Link-29	Pipe	CB_Whit_5.2	MH_5th&97	47.12	910.00	909.60	0.8500	15.000	0.0120	3.36	6.45	0.52	3.02	1.06	0.89	0.00	Calculated
30	Link-30	Pipe	CB_Whit_6	MH_6th&97	46.46	915.60	915.00	1.2900	8.000	0.0130	0.02	1.37	0.01	0.09	0.33	0.51	0.00	Calculated
31	Link-31	Pipe	CB_Whit_4.1	MH_4th&97	53.92	910.50	910.10	0.7400	8.000	0.0130	0.00	1.04	0.00	0.00	0.00	0.00	0.00	Calculated
32	Link-32	Pipe	CB_Whit_4.3	MH_4th&97	62.67	910.60	910.10	0.8000	21.000	0.0130	10.04	14.15	0.71	5.54	1.23	0.71	0.00	Calculated
33	Link-33	Pipe	CB_Whit_4.2	MH_4th&97	44.48	910.40	910.10	0.6700	18.000	0.0130	6.05	8.63	0.70	4.57	1.05	0.70	0.00	Calculated
34	Link-35	Pipe	CB_Whit_3.4	MH_Whit_3.2	30.00	908.50	908.00	1.6700	8.000	0.0130	0.73	1.56	0.47	3.97	0.35	0.52	0.00	Calculated
35	Link-36	Pipe	CB_Whit_3.3	CB_Whit_3.2	66.20	907.00	906.50	0.7600	12.000	0.0130	2.22	3.10	0.72	3.38	0.77	0.78	0.00	Calculated
36	Link-37	Pipe	CB_Whit_3.2	MH_Whit_3.2	75.45	906.20	905.88	0.4200	18.000	0.0120	5.97	7.40	0.81	5.31	0.90	0.61	0.00	Calculated
37	Link-38	Pipe	CB_Whit_3.1	MH_Whit_3.2	65.45	906.00	905.88	0.1800	12.000	0.0120	0.98	1.65	0.60	1.66	0.70	0.71	0.00	Calculated
38	Link-39	Pipe	MH_3rd&97	MH_West_3.2	370.00	903.53	898.64	1.3200	30.000	0.0150	44.14	81.73	0.54	6.79	1.95	0.78	0.00	Calculated
39	Link-40	Pipe	MH_Whit_3.2	MH_West_3.3	300.00	905.88	900.06	1.9400	24.000	0.0150	7.63	27.31	0.28	3.35	1.35	0.68	0.00	Calculated
40	Link-41	Pipe	MH_West_3.3	MH_West_3.1	29.00	899.96	899.37	2.0300	24.000	0.0150	21.73	27.97	0.78	6.92	2.00	1.00	12.00	SURCHARGED
41	Link-43	Pipe	CB_West_3.1	MH_West_3.3	38.54	901.00	900.06	2.4400	12.000	0.0130	4.17	5.56	0.75	5.31	1.00	1.00	15.00	SURCHARGED
42	Link-44	Pipe	CB_West_3.3	CB_West_3.2	45.82	903.00	902.30	1.5300	15.000	0.0130	3.98	7.98	0.50	4.68	1.25	1.00	6.00	SURCHARGED
43	Link-45	Pipe	CB_West_3.2	MH_West_3.3	51.64	902.20	901.00	2.3200	18.000	0.0130	10.08	16.01	0.63	7.47	1.50	1.00	7.00	SURCHARGED
44	Link-46	Pipe	MH_West_4.2	MH_West_4.1	47.28	900.50	899.99	1.0900	12.000	0.0150	3.61	3.22	1.12	4.60	1.00	1.00	24.00	SURCHARGED
45	Link-47	Pipe	CB_West_4.1	MH_West_4.1	42.10	900.25	899.94	0.7500	8.000	0.0130	0.05	1.04	0.05	0.15	0.67	1.00	37.00	SURCHARGED
46	Link-49	Pipe	CB_West_4.3	MH_West_4.1	39.85	900.24	899.94	0.7600	8.000	0.0130	1.35	1.06	1.28	3.86	0.67	1.00	37.00	SURCHARGED
47	Link-51	Pipe	CB_WhitWest_4	CB_West_4.3	184.87	905.50	903.30	1.1900	8.000	0.0130	0.15	1.32	0.11	0.83	0.34	0.51	0.00	Calculated
48	Link-52	Pipe	CB_West_4.2	MH_West_4.2	34.65	900.75	900.50	0.7200	8.000	0.0130	0.82	1.03	0.80	2.36	0.67	1.00	26.00	SURCHARGED
49	Link-54	Pipe	CB_Whit_Del.2	CB_Whit_Del.3	58.00	919.48	919.05	0.7400	8.000	0.0150	0.38	0.90	0.42	2.57	0.67	1.00	26.00	SURCHARGED
50	Link-55	Pipe	CB_Whit_Del.2	CB_Whit_Del.1	65.00	918.45	918.13	0.4900	8.000	0.0150	0.44	0.73	0.60	1.25	0.67	1.00	31.00	SURCHARGED
51	Link-56	Pipe	CB_Whit_Del.1	CB_West_Del.4	150.00	918.13	916.23	1.2700	8.000	0.0150	1.53	1.18	1.30	4.94	0.58	0.87	0.00	> CAPACITY
52	Link-57	Pipe	CB_West_Del.3	CB_West_Del.4	30.00	917.20	916.36	2.7700	8.000	0.0150	0.48	1.74	0.28	3.06	0.31	0.46	0.00	Calculated
53	Link-59	Pipe	CB_West_Del.3	CB_West_Del.2	61.00	917.06	916.42	1.0500	8.000	0.0150	0.60	1.01	0.59	2.58	0.48	0.74	0.00	Calculated
54	Link-60	Pipe	CB_West_4.4	MH_West_4.3	37.96	900.30	900.00	0.7900	8.000	0.0130	0.11	1.07	0.10	1.91	0.15	0.22	0.00	Calculated
55	Link-61	Pipe	CB_West_4.5	MH_West_4.3	36.00	900.30	900.00	0.8300	8.000	0.0130	0.10	1.10	0.09	1.88	0.14	0.21	0.00	Calculated
56	Link-62	Pipe	CB_Locust_4.2	CB_Locust_4.1	33.71	895.85	895.60	0.7400	8.000	0.0150	0.00	0.90	0.00	0.60	0.02	0.03	0.00	Calculated

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Reported Condition
					(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
57	Link-63	Pipe	CB_Locust_4.1	MH_Locust_4	94.76	895.60	894.92	0.7200	8.000	0.0130	0.00	1.02	0.00	0.24	0.14	0.22	0.00	Calculated
58	Link-64	Pipe	MH_West_4.3	MH_Locust_4	245.00	896.14	894.95	0.4900	12.000	0.0150	0.20	2.15	0.09	1.44	0.23	0.24	0.00	Calculated
59	Link-65	Pipe	MH_Locust_4	MH_RR_4	232.00	894.92	891.84	1.3300	20.000	0.0150	0.91	13.89	0.07	3.58	0.28	0.17	0.00	Calculated
60	Link-66	Pipe	MH_RR_4	MH_RRHen_4	135.00	891.84	890.04	1.3300	20.000	0.0150	0.90	13.92	0.06	1.34	0.57	0.35	0.00	Calculated
61	Link-67	Pipe	MH_RRHen_4	MH_Hen_4	84.00	890.04	888.92	1.3300	20.000	0.0150	6.08	13.92	0.44	4.46	1.00	0.60	0.00	Calculated
62	Link-68	Pipe	CB_Hen_4.1	MH_RRHen_4	37.62	890.50	890.04	1.2200	12.000	0.0150	4.13	3.41	1.21	5.41	0.94	0.94	0.00	> CAPACITY
63	Link-69	Pipe	CB_Hen_4.2	MH_RRHen_4	33.93	890.43	890.04	1.1500	10.000	0.0150	1.30	2.04	0.64	2.51	0.75	0.91	0.00	Calculated
64	Link-70	Pipe	MH_West_3/4	MH_West_3.1	100.00	899.48	899.27	0.2100	36.000	0.0100	32.74	39.73	0.82	4.63	3.00	1.00	7.00	SURCHARGED
65	Link-71	Pipe	MH_West_4.1	MH_West_3/4	220.00	899.94	899.48	0.2100	36.000	0.0100	32.22	39.48	0.82	4.56	3.00	1.00	7.00	SURCHARGED
66	Link-72	Pipe	CB_West_3.4	MH_West_3/4	18.87	900.07	899.48	3.1300	18.000	0.0150	0.68	16.10	0.04	0.39	1.50	1.00	15.00	SURCHARGED
67	Link-73	Pipe	CB_West_5.1	CB_West_5.2	58.43	906.00	905.50	0.8600	8.000	0.0150	0.00	0.97	0.00	0.00	0.00	0.00	0.00	Calculated
68	Link-74	Pipe	CB_West_6	MH_West_6	60.00	907.80	907.50	0.5000	8.000	0.0150	4.15	0.74	5.60	11.87	0.67	1.00	0.00	SURCHARGED
69	Link-76	Pipe	MH_Locust_3	Out-A	630.00	894.43	891.45	0.4700	42.000	0.0100	96.04	89.89	1.07	9.98	3.50	1.00	5.00	SURCHARGED
70	Link-77	Pipe	MH_Hen_4	Out-C	226.22	888.92	888.00	0.4100	22.000	0.0150	6.07	9.91	0.61	3.73	1.09	0.59	0.00	Calculated
71	Link-78	Pipe	CB_Locust_2.1	CB_Locust_2.2	41.32	900.00	899.70	0.7300	8.000	0.0150	0.00	0.89	0.00	0.00	0.00	0.00	0.00	Calculated
72	Link-81	Pipe	CB_West_Del.2	MH_West_Delish.2	78.00	916.56	914.79	2.2700	18.000	0.0150	1.92	13.73	0.14	4.04	1.02	0.69	0.00	Calculated
73	Link-82	Pipe	MH_West_Delish.2	MH_West_Delish.1	64.00	914.79	913.33	2.2800	18.000	0.0150	4.11	13.73	0.30	4.29	1.50	1.00	3.00	SURCHARGED
74	Link-83	Pipe	CB_West_Del.1	MH_West_Delish.2	38.64	915.00	914.79	0.5400	8.000	0.0130	2.14	0.89	2.40	6.36	0.67	1.00	8.00	SURCHARGED
75	Link-84	Pipe	MH_West_3.1	MH_West_3.2	32.44	899.27	898.77	1.5400	36.000	0.0100	54.49	107.65	0.51	9.61	3.00	1.00	5.00	SURCHARGED
76	Link-85	Pipe	CB_Locust_1.1	CB_Locust_1.2	27.00	897.33	897.22	0.4100	8.000	0.0150	2.03	0.67	3.03	5.80	0.67	1.00	21.00	SURCHARGED
77	Link-87	Pipe	CB_Locust_1.2	MH_Locust_1.1	82.00	896.76	896.56	0.2400	14.000	0.0150	2.03	2.30	0.88	1.90	1.17	1.00	20.00	SURCHARGED
78	Link-88	Pipe	CB_Locust_1.3	CB_Locust_1.4	39.36	897.50	897.02	1.2100	8.000	0.0150	0.25	1.15	0.21	1.13	0.40	0.60	0.00	Calculated
79	Link-95	Pipe	MH_Hen_1	Out-D	205.00	891.15	887.15	1.9500	18.000	0.0150	3.67	12.72	0.29	6.03	0.55	0.38	0.00	Calculated
80	Link-96	Pipe	CB_Locust_1.4	MH_Locust_1.1	87.00	897.02	896.62	0.4600	18.000	0.0150	2.76	6.17	0.45	2.26	0.98	0.65	0.00	Calculated
81	Link-97	Pipe	CB_Locust_1.4	MH_Hen_1	350.00	897.02	891.15	1.6800	18.000	0.0150	3.68	11.79	0.31	5.79	0.58	0.39	0.00	Calculated
82	Link-136	Channel	Inlet-60	Inlet-61	285.00	956.01	942.29	4.8100	36.000	0.0320	5.40	97.53	0.06	5.54	0.66	0.22	0.00	
83	Link-138	Channel	Inlet-62	Out-19	318.00	939.12	923.00	5.0700	36.000	0.0320	6.95	100.50	0.07	5.77	0.77	0.26	0.00	
84	Outlet-01	Outlet	DW_Hav_1	Out-20		980.00	980.00				0.00							
85	Outlet-02	Outlet	DW_Hav_2	Out-21		990.00	990.00				0.01							
86	Outlet-03	Outlet	DW_Hav_3	Out-22		1000.00	1000.00				1.00							

Inlet Summary

SN	Element ID	Inlet Manufacturer	Manufacturer Part Number	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Initial Water Elevation (ft)	Ponded Area (ft²)	Peak Flow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Allowable Spread (ft)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)
1	CB_97_7.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	917.80	920.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.97	920.08
2	CB_Ant_6	FHWA HEC-22 GENERIC	N/A	On Sag	1	947.63	952.02	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	952.09
3	CB_Bon_6	FHWA HEC-22 GENERIC	N/A	On Sag	1	969.87	973.11	0.00	10.00	2.90	N/A	N/A	N/A	7.00	15.04	973.46
4	CB_Bon_7	FHWA HEC-22 GENERIC	N/A	On Sag	1	942.30	944.31	0.00	10.00	1.67	N/A	N/A	N/A	7.00	10.34	944.57
5	CB_Hav_1	FHWA HEC-22 GENERIC	N/A	On Sag	1	1000.20	1010.00	0.00	10.00	1.57	N/A	N/A	N/A	7.00	9.91	1010.26
6	CB_Hav_2	FHWA HEC-22 GENERIC	N/A	On Sag	1	990.20	1000.00	0.00	10.00	0.01	N/A	N/A	N/A	7.00	1.00	1000.08
7	CB_Hav_3	FHWA HEC-22 GENERIC	N/A	On Sag	1	980.20	990.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	990.08
8	CB_Hen_4.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	890.43	900.70	0.00	10.00	1.32	N/A	N/A	N/A	7.00	8.79	900.93
9	CB_Locust_1.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	897.33	899.63	0.00	10.00	4.01	N/A	N/A	N/A	7.00	18.76	900.07
10	CB_Locust_1.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	896.76	900.21	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	900.29
11	CB_Locust_1.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	897.50	901.50	0.00	10.00	0.25	N/A	N/A	N/A	7.00	1.88	901.60
12	CB_Locust_2.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	900.00	903.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	903.08
13	CB_Locust_2.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	899.70	903.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	903.08
14	CB_Locust_4.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	895.60	904.50	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	904.58
15	CB_Locust_4.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	895.85	904.50	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.94	904.58
16	CB_Ton_6.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	928.04	932.67	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	932.74
17	CB_Ton_6.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	928.50	932.67	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	932.74
18	CB_Ton_6.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	927.00	932.67	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	932.74
19	CB_West_4.4	FHWA HEC-22 GENERIC	N/A	On Sag	1	900.30	907.50	0.00	10.00	0.11	N/A	N/A	N/A	7.00	1.48	907.59
20	CB_West_4.5	FHWA HEC-22 GENERIC	N/A	On Sag	1	900.30	907.50	0.00	10.00	0.10	N/A	N/A	N/A	7.00	1.44	907.59
21	CB_West_5.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	906.00	909.50	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	909.58
22	CB_West_5.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	905.50	909.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	909.08
23	CB_West_Del.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	915.00	918.50	0.00	10.00	2.13	N/A	N/A	N/A	7.00	12.22	918.80
24	CB_West_Del.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.49	920.59	0.00	10.00	1.33	N/A	N/A	N/A	7.00	8.85	920.83
25	CB_West_Del.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.71	918.21	0.00	10.00	1.08	N/A	N/A	N/A	7.00	7.65	918.42
26	CB_West_Del.4	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.23	918.16	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	918.24
27	CB_Whit_1/2.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	914.50	917.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	917.08
28	CB_Whit_1/2.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.00	919.00	0.00	10.00	0.90	N/A	N/A	N/A	7.00	6.72	919.19
29	CB_Whit_1/2.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	915.20	918.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	918.08
30	CB_Whit_3.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	906.00	912.00	0.00	10.00	1.00	N/A	N/A	N/A	7.00	7.23	912.20
31	CB_Whit_3.4	FHWA HEC-22 GENERIC	N/A	On Sag	1	903.73	913.50	0.00	10.00	0.74	N/A	N/A	N/A	7.00	5.85	913.68
32	CB_Whit_4.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	910.50	912.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	912.08
33	CB_Whit_6	FHWA HEC-22 GENERIC	N/A	On Sag	1	915.60	922.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	922.08
34	CB_Whit_Del.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	918.13	920.53	0.00	10.00	5.53	N/A	N/A	N/A	7.00	23.33	921.06
35	CB_Whit_Del.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	918.45	921.50	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	921.58
36	CB_Whit_Del.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	919.05	921.65	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	921.73
37	Inlet-60	FHWA HEC-22 GENERIC	N/A	On Sag	1	956.01	957.99	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.00	957.99
38	Inlet-61	FHWA HEC-22 GENERIC	N/A	On Sag	1	942.29	945.89	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.13	946.00
39	Inlet-62	FHWA HEC-22 GENERIC	N/A	On Sag	1	939.12	943.08	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.00	943.08

Junction Input

SN	Element ID	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Ground/Rim (Max) Offset (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Surcharge Elevation (ft)	Surcharge Depth (ft)	Ponded Area (ft²)	Minimum Pipe Cover (in)
1	CB_97_7.1	919.10	921.00	1.90	0.00	-919.10	921.00	0.00	10.00	0.00
2	CB_97_7.2	918.40	922.00	3.60	0.00	-918.40	922.00	0.00	10.00	0.00
3	CB_Hen_4.1	890.50	900.70	10.20	0.00	-890.50	900.70	0.00	10.00	0.00
4	CB_Locust_1.4	897.02	901.33	4.31	0.00	-897.02	901.33	0.00	10.00	0.00
5	CB_West_3.1	900.20	907.00	6.80	0.00	-900.20	907.00	0.00	10.00	0.00
6	CB_West_3.2	901.00	907.00	6.00	0.00	-901.00	907.00	0.00	10.00	0.00
7	CB_West_3.3	900.40	907.00	6.60	0.00	-900.40	907.00	0.00	10.00	0.00
8	CB_West_3.4	900.07	906.00	5.93	0.00	-900.07	906.00	0.00	10.00	0.00
9	CB_West_4.1	900.25	907.00	6.75	0.00	-900.25	907.00	0.00	10.00	0.00
10	CB_West_4.2	900.75	907.50	6.75	0.00	-900.75	907.50	0.00	10.00	0.00
11	CB_West_4.3	900.24	907.50	7.26	0.00	-900.24	907.50	0.00	10.00	0.00
12	CB_West_6	907.80	914.60	6.80	0.00	-907.80	914.60	0.00	240.00	0.00
13	CB_Whit_3.2	906.00	913.50	7.50	0.00	-906.00	913.50	0.00	240.00	0.00
14	CB_Whit_3.3	906.10	913.50	7.40	0.00	-906.10	913.50	0.00	240.00	0.00
15	CB_Whit_4.2	910.40	912.00	1.60	0.00	-910.40	912.00	0.00	10.00	0.00
16	CB_Whit_4.3	910.60	912.00	1.40	0.00	-910.60	912.00	0.00	10.00	0.00
17	CB_Whit_5.1	909.60	916.00	6.40	0.00	-909.60	916.00	0.00	10.00	0.00
18	CB_Whit_5.2	909.50	916.00	6.50	0.00	-909.50	916.00	0.00	10.00	0.00
19	CB_Whit_6s	915.00	919.00	4.00	0.00	-915.00	0.00	-919.00	0.00	0.00
20	CB_WhitWest_4	905.50	908.00	2.50	0.00	-905.50	908.00	0.00	10.00	0.00
21	MH_1st&97	910.47	920.00	9.53	0.00	-910.47	0.00	-920.00	0.00	0.00
22	MH_2nd&97	907.31	910.00	2.69	0.00	-907.31	910.00	0.00	100.00	0.00
23	MH_3rd&97	903.00	911.35	8.35	0.00	-903.00	0.00	-911.35	0.00	0.00
24	MH_4th&97	907.00	914.26	7.26	0.00	-907.00	914.26	0.00	100.00	0.00
25	MH_5th&97	908.80	914.44	5.64	0.00	-908.80	914.44	0.00	100.00	0.00
26	MH_6th&97	914.50	919.37	4.87	0.00	-914.50	919.37	0.00	100.00	0.00
27	MH_Bon_6	960.01	978.29	18.28	0.00	-960.01	978.29	0.00	100.00	0.00
28	MH_Hen_1	891.15	893.14	1.99	0.00	-891.15	893.14	0.00	100.00	0.00
29	MH_Hen_4	888.92	895.00	6.08	0.00	-888.92	895.00	0.00	100.00	0.00
30	MH_Locust_1.1	896.56	901.98	5.42	0.00	-896.56	901.98	0.00	100.00	0.00
31	MH_Locust_3	894.43	902.53	8.10	0.00	-894.43	902.53	0.00	100.00	0.00
32	MH_Locust_4	894.92	905.13	10.21	0.00	-894.92	905.13	0.00	100.00	0.00
33	MH_PT_9	924.71	929.23	4.52	0.00	-924.71	929.23	0.00	100.00	0.00
34	MH_RR_4	891.84	900.00	8.16	0.00	-891.84	900.00	0.00	100.00	0.00
35	MH_RRHen_4	890.04	898.00	7.96	0.00	-890.04	898.00	0.00	100.00	0.00
36	MH_West_3.1	899.27	905.00	5.73	0.00	-899.27	905.00	0.00	100.00	0.00
37	MH_West_3.2	897.80	905.00	7.20	0.00	-897.80	905.00	0.00	100.00	0.00
38	MH_West_3.3	899.96	905.00	5.04	0.00	-899.96	905.00	0.00	240.00	0.00
39	MH_West_3/4	899.48	905.00	5.52	0.00	-899.48	905.00	0.00	100.00	0.00
40	MH_West_4.1	899.50	907.46	7.96	0.00	-899.50	907.46	0.00	100.00	0.00
41	MH_West_4.2	900.50	908.00	7.50	0.00	-900.50	908.00	0.00	100.00	0.00
42	MH_West_4.3	896.14	907.71	11.57	0.00	-896.14	907.71	0.00	100.00	0.00
43	MH_West_Delish.1	913.33	919.19	5.86	0.00	-913.33	919.19	0.00	100.00	0.00
44	MH_West_Delish.2	914.79	920.00	5.21	0.00	-914.79	920.00	0.00	100.00	0.00
45	MH_Whit_3.2	905.88	909.81	3.93	0.00	-905.88	909.81	0.00	100.00	0.00
46	MH_Whit_5.1	909.50	913.99	4.49	0.00	-909.50	913.99	0.00	100.00	0.00
47	NEW 3rd Inlets	917.00	922.00	5.00	0.00	-917.00	939.00	17.00	100.00	0.00

Junction Results

SN	Element ID	Peak Inflow (cfs)	Peak Lateral Inflow (cfs)	Max HGL Elevation Attained (ft)	Max HGL Depth Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Average HGL Elevation Attained (ft)	Average HGL Depth Attained (ft)	Time of Max HGL Occurrence (days hh:mm)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	CB_97_7.1	2.98	2.98	924.08	4.98	3.08	0.00	919.49	0.39	0 12:01	0 11:56	0.01	11.00
2	CB_97_7.2	6.29	3.53	923.73	5.33	1.73	0.00	918.95	0.55	0 12:01	0 12:00	0.02	9.00
3	CB_Hen_4.1	4.13	4.13	892.03	1.53	0.00	8.67	890.78	0.28	0 12:04	0 00:00	0.00	0.00
4	CB_Locust_1.4	3.70	0.70	897.62	0.60	0.00	3.72	897.21	0.19	0 12:00	0 00:00	0.00	0.00
5	CB_West_3.1	4.17	4.17	906.12	5.92	0.00	0.88	901.37	1.17	0 12:04	0 00:00	0.00	0.00
6	CB_West_3.2	10.07	6.89	906.10	5.10	0.00	0.90	902.52	1.52	0 12:03	0 00:00	0.00	0.00
7	CB_West_3.3	3.98	3.98	906.45	6.05	0.00	0.55	902.95	2.55	0 12:02	0 00:00	0.00	0.00
8	CB_West_3.4	0.56	0.51	905.24	5.17	0.00	0.76	900.45	0.38	0 12:02	0 00:00	0.00	0.00
9	CB_West_4.1	0.05	0.00	907.00	6.75	0.00	0.00	900.72	0.47	0 12:01	0 12:01	0.00	0.00
10	CB_West_4.2	0.74	0.74	907.50	6.75	0.00	0.00	901.19	0.44	0 12:01	0 12:01	0.00	0.00
11	CB_West_4.3	1.70	0.39	907.53	7.29	0.03	0.00	900.73	0.49	0 12:02	0 12:02	0.00	0.00
12	CB_West_6	6.06	6.06	919.76	11.96	5.16	0.00	909.51	1.71	0 12:08	0 12:00	0.35	27.00
13	CB_Whit_3.2	5.97	3.77	907.31	1.31	0.00	6.19	906.47	0.47	0 12:00	0 00:00	0.00	0.00
14	CB_Whit_3.3	2.23	2.23	907.76	1.66	0.00	5.74	907.14	1.04	0 12:00	0 00:00	0.00	0.00
15	CB_Whit_4.2	6.08	6.08	911.58	1.18	0.00	0.42	910.66	0.26	0 12:00	0 00:00	0.00	0.00
16	CB_Whit_4.3	10.10	10.10	911.98	1.38	0.00	0.37	910.90	0.30	0 12:00	0 00:00	0.00	0.00
17	CB_Whit_5.1	0.81	0.81	910.85	1.25	0.00	5.15	910.12	0.52	0 12:01	0 00:00	0.00	0.00
18	CB_Whit_5.2	3.41	3.41	911.00	1.50	0.00	5.00	910.18	0.68	0 12:01	0 00:00	0.00	0.00
19	CB_Whit_6s	1.58	1.58	915.97	0.97	0.00	3.03	915.46	0.46	0 12:05	0 00:00	0.00	0.00
20	CB_WhitWest_4	0.15	0.00	905.52	0.02	0.00	2.48	905.50	0.00	0 12:02	0 00:00	0.00	0.00
21	MH_1st&97	10.25	10.25	911.72	1.25	0.00	8.28	910.74	0.27	0 12:00	0 00:00	0.00	0.00
22	MH_2nd&97	12.58	2.46	908.39	1.08	0.00	1.61	907.58	0.27	0 12:00	0 00:00	0.00	0.00
23	MH_3rd&97	44.24	0.00	904.95	1.95	0.00	6.40	903.86	0.86	0 12:03	0 00:00	0.00	0.00
24	MH_4th&97	29.88	2.94	908.30	1.30	0.00	5.96	907.35	0.35	0 12:03	0 00:00	0.00	0.00
25	MH_5th&97	11.56	0.00	910.82	2.02	0.00	3.62	909.89	1.09	0 12:01	0 00:00	0.00	0.00
26	MH_6th&97	5.35	2.56	915.64	1.14	0.00	3.73	915.13	0.63	0 12:00	0 00:00	0.00	0.00
27	MH_Bon_6	5.58	2.72	960.50	0.50	0.00	17.79	960.15	0.15	0 12:00	0 00:00	0.00	0.00
28	MH_Hen_1	3.68	0.00	891.73	0.58	0.00	1.41	891.33	0.18	0 12:01	0 00:00	0.00	0.00
29	MH_Hen_4	6.08	0.00	890.05	1.13	0.00	4.95	889.22	0.30	0 12:05	0 00:00	0.00	0.00
30	MH_Locust_1.1	2.76	0.80	897.99	1.43	0.00	3.99	897.28	0.72	0 12:00	0 00:00	0.00	0.00
31	MH_Locust_3	96.04	0.00	902.53	8.10	0.01	0.00	895.32	0.89	0 12:00	0 12:00	0.00	0.00
32	MH_Locust_4	0.92	0.74	895.22	0.30	0.00	9.91	895.00	0.08	0 12:01	0 00:00	0.00	0.00
33	MH_PT_9	1.35	1.35	925.05	0.34	0.00	4.18	924.84	0.13	0 12:00	0 00:00	0.00	0.00
34	MH_RR_4	0.91	0.00	892.13	0.29	0.00	7.87	891.92	0.08	0 12:02	0 00:00	0.00	0.00
35	MH_RRHen_4	6.08	0.00	890.91	0.87	0.00	7.09	890.27	0.23	0 12:04	0 00:00	0.00	0.00
36	MH_West_3.1	54.31	0.00	905.00	5.73	0.00	0.00	899.96	0.69	0 12:02	0 12:02	0.00	0.00
37	MH_West_3.2	99.77	1.80	905.00	7.20	0.00	0.00	898.56	0.76	0 12:02	0 12:02	0.00	0.00
38	MH_West_3.3	21.68	0.00	905.16	5.20	0.16	0.00	900.54	0.58	0 12:04	0 12:02	0.02	4.00
39	MH_West_3/4	32.72	0.00	905.00	5.52	0.00	0.00	900.25	0.77	0 12:02	0 12:02	0.00	0.00
40	MH_West_4.1	33.20	5.56	907.04	7.54	0.00	0.42	900.67	1.17	0 12:01	0 00:00	0.00	0.00
41	MH_West_4.2	3.61	3.00	907.87	7.37	0.00	0.13	901.03	0.53	0 12:01	0 00:00	0.00	0.00
42	MH_West_4.3	0.21	0.00	896.35	0.21	0.00	11.36	896.20	0.06	0 12:01	0 00:00	0.00	0.00
43	MH_West_Delish.1	4.11	0.00	917.51	4.18	0.00	1.69	913.67	0.34	0 12:03	0 00:00	0.00	0.00
44	MH_West_Delish.2	4.04	0.00	917.52	2.73	0.00	2.48	915.00	0.21	0 12:03	0 00:00	0.00	0.00
45	MH_Whit_3.2	7.69	0.00	906.60	0.72	0.00	3.21	906.08	0.20	0 12:00	0 00:00	0.00	0.00
46	MH_Whit_5.1	7.64	2.30	911.30	1.80	0.00	2.70	910.18	0.68	0 12:01	0 00:00	0.00	0.00
47	NEW 3rd Inlets	25.92	25.92	918.09	1.09	0.00	3.91	917.27	0.27	0 12:00	0 00:00	0.00	0.00

Channel Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Shape	Height (ft)	Width (ft)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate
1	Link-136	285.00	956.01	0.00	942.29	0.00	13.72	4.8100	Trapezoidal	3.000	5.000	0.0320	0.5000	0.5000	0.0000	0.00	No
2	Link-138	318.00	939.12	0.00	923.00	0.00	16.12	5.0700	Trapezoidal	3.000	5.020	0.0320	0.5000	0.5000	0.0000	0.00	No

Channel Results

SN	Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Froude Number	Reported Condition
1	Link-136	5.40	0 12:01	97.53	0.06	5.54	0.86	0.66	0.22	0.00		
2	Link-138	6.95	0 12:01	100.50	0.07	5.77	0.92	0.77	0.26	0.00		

Pipe Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Pipe Shape	Pipe Diameter or Height (in)	Pipe Width (in)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate	No. of Barrels
1	Link-102	24.00	919.10	0.00	918.40	0.00	0.70	2.9200	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
2	Link-103	100.00	918.40	0.00	917.80	0.00	0.60	0.6000	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
3	Link-135	117.16	960.01	0.00	956.01	0.00	4.00	3.4100	CIRCULAR	30.000	30.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
4	Link-137	66.96	942.29	0.00	939.12	0.00	3.17	4.7300	CIRCULAR	24.000	24.000	0.0250	0.5000	0.5000	0.0000	0.00	No	1
5	Link-139	33.71	942.30	0.00	939.12	0.00	3.18	9.4300	CIRCULAR	6.000	6.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
6	Link-14	49.74	969.87	0.00	969.51	9.50	0.36	0.7200	CIRCULAR	9.960	9.960	0.0130	0.5000	0.5000	0.0000	0.00	No	1
7	Link-141	40.78	980.20	0.00	980.00	0.00	0.20	0.4900	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
8	Link-142	41.71	990.20	0.00	990.00	0.00	0.20	0.4800	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
9	Link-143	40.63	1000.20	0.00	1000.00	0.00	0.20	0.4900	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
10	Link-144	530.00	913.33	0.00	900.00	0.00	13.33	2.5200	CIRCULAR	12.000	12.000	0.0240	0.5000	0.5000	0.0000	0.00	No	1
11	Link-146	316.01	910.47	0.00	907.31	0.00	3.16	1.0000	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
12	Link-147	367.78	907.31	0.00	903.63	0.63	3.68	1.0000	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
13	Link-148	340.00	924.74	0.03	915.06	0.56	9.68	2.8500	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
14	Link-149	11.00	909.89	0.39	909.70	0.90	0.19	1.7400	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
15	Link-15	330.00	947.63	0.00	928.14	0.10	19.49	5.9100	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
16	Link-150	350.00	909.60	0.80	907.46	0.46	2.14	0.6100	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
17	Link-159	200.00	917.00	0.00	903.73	0.73	13.27	6.6300	CIRCULAR	21.000	21.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
18	Link-160	30.00	917.80	0.00	917.00	0.00	0.80	2.6700	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
19	Link-161	56.00	915.30	0.30	914.95	0.45	0.35	0.6200	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
20	Link-162	389.96	907.00	0.00	901.00	1.50	6.00	1.5400	CIRCULAR	27.000	27.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
21	Link-163	320.65	897.80	0.00	894.47	0.04	3.33	1.0400	CIRCULAR	42.000	42.000	0.0100	0.5000	0.5000	0.0000	0.00	No	1
22	Link-164	393.00	907.36	0.36	904.73	1.73	2.63	0.6700	CIRCULAR	24.000	24.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
23	Link-165	43.11	916.23	0.00	915.00	0.00	1.23	2.8600	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
24	Link-17	52.00	927.94	-0.10	924.74	0.03	3.20	6.1500	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
25	Link-20	327.00	914.95	0.45	910.37	0.87	4.58	1.4000	CIRCULAR	18.000	18.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
26	Link-23	45.45	927.00	0.00	924.72	0.01	2.28	5.0200	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
27	Link-24	70.74	928.50	0.00	924.72	0.01	3.78	5.3400	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
28	Link-28	53.94	910.00	0.40	909.70	0.90	0.30	0.5600	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
29	Link-29	47.12	910.00	0.50	909.60	0.80	0.40	0.8500	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
30	Link-30	46.46	915.60	0.00	915.00	0.50	0.60	1.2900	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
31	Link-31	53.92	910.50	0.00	910.10	3.10	0.40	0.7400	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
32	Link-32	62.67	910.60	0.00	910.10	3.10	0.50	0.8000	CIRCULAR	21.000	21.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
33	Link-33	44.48	910.40	0.00	910.10	3.10	0.30	0.6700	CIRCULAR	18.000	18.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
34	Link-35	30.00	908.50	4.77	908.00	2.12	0.50	1.6700	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
35	Link-36	66.20	907.00	0.90	906.50	0.50	0.50	0.7600	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
36	Link-37	75.45	906.20	0.20	905.88	0.00	0.32	0.4200	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
37	Link-38	65.45	906.00	0.00	905.88	0.00	0.12	0.1800	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
38	Link-39	370.00	903.53	0.53	898.64	0.84	4.89	1.3200	CIRCULAR	30.000	30.000	0.0150	0.5000	0.5000	0.0000	0.00	No	2
39	Link-40	300.00	905.88	0.00	900.06	0.10	5.82	1.9400	CIRCULAR	24.000	24.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
40	Link-41	29.00	899.96	0.00	899.37	0.10	0.59	2.0300	CIRCULAR	24.000	24.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
41	Link-43	38.54	901.00	0.80	900.06	0.10	0.94	2.4400	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
42	Link-44	45.82	903.00	2.60	902.30	1.30	0.70	1.5300	CIRCULAR	15.000	15.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
43	Link-45	51.64	902.20	1.20	901.00	1.04	1.20	2.3200	CIRCULAR	18.000	18.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
44	Link-46	47.28	900.50	0.00	899.99	0.49	0.51	1.0900	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
45	Link-47	42.10	900.25	0.00	899.94	0.44	0.31	0.7500	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
46	Link-49	39.85	900.24	0.00	899.94	0.44	0.30	0.7600	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
47	Link-51	184.87	905.50	0.00	903.30	3.06	2.20	1.1900	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
48	Link-52	34.65	900.75	0.00	900.50	0.00	0.25	0.7200	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
49	Link-54	58.00	919.48	1.03	919.05	0.00	0.43	0.7400	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
50	Link-55	65.00	918.45	0.00	918.13	0.00	0.32	0.4900	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
51	Link-56	150.00	918.13	0.00	916.23	0.00	1.90	1.2700	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
52	Link-57	30.00	917.20	0.48	916.36	0.13	0.83	2.7700	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
53	Link-59	61.00	917.06	0.35	916.42	-0.07	0.64	1.0500	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
54	Link-60	37.96	900.30	0.00	900.00	3.86	0.30	0.7900	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
55	Link-61	36.00	900.30	0.00	900.00	3.86	0.30	0.8300	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
56	Link-62	33.71	895.85	0.00	895.60	0.00	0.25	0.7400	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
57	Link-63	94.76	895.60	0.00	894.92	0.00	0.68	0.7200	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
58	Link-64	245.00	896.14	0.00	894.95	0.03	1.19	0.4900	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
59	Link-65	232.00	894.92	0.00	891.84	0.00	3.08	1.3300	CIRCULAR	20.040	20.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
60	Link-66	135.00	891.84	0.00	890.04	0.00	1.80	1.3300	CIRCULAR	20.040	20.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
61	Link-67	84.00	890.04	0.00	888.92	0.00	1.12	1.3300	CIRCULAR	20.040	20.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
62	Link-68	37.62	890.50	0.00	890.04	0.00	0.46	1.2200	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
63	Link-69	33.93	890.43	0.00	890.04	0.00	0.39	1.1500	CIRCULAR	9.960	9.960	0.0150	0.5000	0.5000	0.0000	0.00	No	1
64	Link-70	100.00	899.48	0.00	899.27	0.00	0.21	0.2100	CIRCULAR	36.000	36.000	0.0100	0.5000	0.5000	0.0000	0.00	No	1
65	Link-71	220.00	899.94	0.44	899.48	0.00	0.46	0.2100	CIRCULAR	36.000	36.000	0.0100	0.5000	0.5000	0.0000	0.00	No	1
66	Link-72	18.87	900.07	0.00	899.48	0.00	0.59	3.1300	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
67	Link-73	58.43	906.00	0.00	905.50	0.00	0.50	0.8600	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
68	Link-74	60.00	907.80	0.00	907.50	0.00	0.30	0.5000	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
69	Link-76	630.00	894.43	0.00	891.45	0.00	2.98	0.4700	CIRCULAR	42.000	42.000	0.0100	0.5000	0.5000	0.0000	0.00	No	1
70	Link-77	226.22	888.92	0.00	888.00	0.00	0.92	0.4100	CIRCULAR	21.960	21.960	0.0150	0.5000	0.5000	0.0000	0.00	No	1
71	Link-78	41.32	900.00	0.00	899.70	0.00	0.30	0.7300	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
72	Link-81	78.00	916.56	0.07	914.79	0.00	1.77	2.2700	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
73	Link-82	64.00	914.79	0.00	913.33	0.00	1.46	2.2800	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
74	Link-83	38.64	915.00	0.00	914.79	0.00	0.21	0.5400	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
75	Link-84	32.44	899.27	0.00	898.77	0.97	0.50	1.5400	CIRCULAR	36.000	36.000	0.0100	0.5000	0.5000	0.0000	0.00	No	1
76	Link-85	27.00	897.33	0.00	897.22	0.46	0.11	0.4100	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
77	Link-87	82.00	896.76	0.00	896.56	0.00	0.20	0.2400	CIRCULAR	14.040	14.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
78	Link-88	39.36	897.50	0.00	897.02	0.00	0.48	1.2100	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
79	Link-95	205.00	891.15	0.00	887.15	0.00	4.00	1.9500	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
80	Link-96	87.00	897.02	0.00	896.62	0.06	0.40	0.4600	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
81	Link-97	350.00	897.02	0.00	891.15	0.00	5.87	1.6800	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1

Pipe Results

SN	Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Froude Number	Reported Condition
		(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)		
1	Link-102	2.81	0 12:01	6.08	0.46	3.58	0.11	1.00	1.00	15.00		SURCHARGED
2	Link-103	6.13	0 12:01	2.76	2.22	7.80	0.21	1.00	1.00	11.00		SURCHARGED
3	Link-135	5.47	0 12:00	65.64	0.08	6.09	0.32	0.59	0.24	0.00		Calculated
4	Link-137	5.39	0 12:01	25.60	0.21	5.35	0.21	0.70	0.36	0.00		Calculated
5	Link-139	1.67	0 12:00	1.72	0.97	8.52	0.07	0.50	1.00	6.00		SURCHARGED
6	Link-14	2.96	0 12:01	1.86	1.59	5.51	0.15	0.79	0.95	0.00		> CAPACITY
7	Link-141	0.00	0 00:00	6.38	0.00	0.00		0.00	0.00	0.00		Calculated
8	Link-142	0.01	0 23:51	6.30	0.00	0.46	1.51	0.05	0.03	0.00		Calculated
9	Link-143	1.38	0 11:58	6.39	0.22	0.78	0.87	1.50	1.00	51.00		SURCHARGED
10	Link-144	3.32	0 12:05	3.06	1.08	4.43	1.99	1.00	1.00	10.00		SURCHARGED
11	Link-146	10.15	0 12:00	11.38	0.89	6.93	0.76	1.14	0.77	0.00		Calculated
12	Link-147	12.51	0 12:01	24.51	0.51	6.75	0.91	1.13	0.58	0.00		Calculated
13	Link-148	1.32	0 12:00	6.51	0.20	3.96	1.43	0.44	0.44	0.00		Calculated
14	Link-149	7.56	0 12:01	15.00	0.50	4.86	0.04	1.22	0.84	0.00		Calculated
15	Link-15	0.00	0 00:00	2.94	0.00	0.00		0.00	0.00	0.00		Calculated
16	Link-150	11.51	0 12:02	19.16	0.60	6.03	0.97	1.14	0.59	0.00		Calculated
17	Link-159	25.92	0 12:00	44.22	0.59	16.45	0.20	1.09	0.63	0.00		Calculated
18	Link-160	6.13	0 12:01	5.82	1.05	7.80	0.06	1.00	1.00	5.00		SURCHARGED
19	Link-161	1.57	0 12:05	2.44	0.65	2.84	0.33	0.66	0.67	0.00		Calculated
20	Link-162	24.11	0 12:01	41.62	0.58	9.00	0.72	1.76	0.79	0.00		Calculated
21	Link-163	96.04	0 12:04	133.29	0.72	9.98	0.54	3.50	1.00	6.00		SURCHARGED
22	Link-164	6.67	0 12:03	16.04	0.42	4.74	1.38	0.89	0.46	0.00		Calculated
23	Link-165	2.01	0 12:00	5.22	0.39	5.67	0.13	0.46	0.46	0.00		Calculated
24	Link-17	0.00	0 00:00	3.04	0.00	0.00		0.15	0.23	0.00		Calculated
25	Link-20	5.34	0 12:01	12.43	0.43	6.00	0.91	0.78	0.54	0.00		Calculated
26	Link-23	0.00	0 00:00	2.71	0.00	0.00		0.16	0.24	0.00		Calculated
27	Link-24	0.00	0 00:00	2.79	0.00	0.00		0.16	0.24	0.00		Calculated
28	Link-28	0.78	0 12:00	2.88	0.27	1.16	0.78	0.90	0.93	0.00		Calculated
29	Link-29	3.36	0 12:00	6.45	0.52	3.02	0.26	1.06	0.89	0.00		Calculated
30	Link-30	0.02	0 11:59	1.37	0.01	0.09	8.60	0.33	0.51	0.00		Calculated
31	Link-31	0.00	0 00:00	1.04	0.00	0.00		0.00	0.00	0.00		Calculated
32	Link-32	10.04	0 12:00	14.15	0.71	5.54	0.19	1.23	0.71	0.00		Calculated
33	Link-33	6.05	0 12:00	8.63	0.70	4.57	0.16	1.05	0.70	0.00		Calculated
34	Link-35	0.73	0 12:00	1.56	0.47	3.97	0.13	0.35	0.52	0.00		Calculated
35	Link-36	2.22	0 12:00	3.10	0.72	3.38	0.33	0.77	0.78	0.00		Calculated
36	Link-37	5.97	0 12:00	7.40	0.81	5.31	0.24	0.90	0.61	0.00		Calculated
37	Link-38	0.98	0 12:00	1.65	0.60	1.66	0.66	0.70	0.71	0.00		Calculated
38	Link-39	44.14	0 12:01	81.73	0.54	6.79	0.91	1.95	0.78	0.00		Calculated
39	Link-40	7.63	0 12:00	27.31	0.28	3.35	1.49	1.35	0.68	0.00		Calculated
40	Link-41	21.73	0 12:05	27.97	0.78	6.92	0.07	2.00	1.00	12.00		SURCHARGED
41	Link-43	4.17	0 12:05	5.56	0.75	5.31	0.12	1.00	1.00	15.00		SURCHARGED
42	Link-44	3.98	0 12:05	7.98	0.50	4.68	0.16	1.25	1.00	6.00		SURCHARGED
43	Link-45	10.08	0 12:01	16.01	0.63	7.47	0.12	1.50	1.00	7.00		SURCHARGED
44	Link-46	3.61	0 12:05	3.22	1.12	4.60	0.17	1.00	1.00	24.00		SURCHARGED
45	Link-47	0.05	0 12:01	1.04	0.05	0.15	4.68	0.67	1.00	37.00		SURCHARGED
46	Link-49	1.35	0 12:02	1.06	1.28	3.86	0.17	0.67	1.00	37.00		SURCHARGED
47	Link-51	0.15	0 12:02	1.32	0.11	0.83	3.71	0.34	0.51	0.00		Calculated
48	Link-52	0.82	0 12:01	1.03	0.80	2.36	0.24	0.67	1.00	26.00		SURCHARGED
49	Link-54	0.38	0 11:47	0.90	0.42	2.57	0.38	0.67	1.00	26.00		SURCHARGED
50	Link-55	0.44	0 11:47	0.73	0.60	1.25	0.87	0.67	1.00	31.00		SURCHARGED
51	Link-56	1.53	0 12:00	1.18	1.30	4.94	0.51	0.58	0.87	0.00		> CAPACITY
52	Link-57	0.48	0 12:00	1.74	0.28	3.06	0.16	0.31	0.46	0.00		Calculated
53	Link-59	0.60	0 12:00	1.01	0.59	2.58	0.39	0.48	0.74	0.00		Calculated
54	Link-60	0.11	0 12:00	1.07	0.10	1.91	0.33	0.15	0.22	0.00		Calculated
55	Link-61	0.10	0 12:00	1.10	0.09	1.88	0.32	0.14	0.21	0.00		Calculated
56	Link-62	0.00	0 23:12	0.90	0.00	0.60	0.94	0.02	0.03	0.00		Calculated
57	Link-63	0.00	0 23:21	1.02	0.00	0.24	6.58	0.14	0.22	0.00		Calculated
58	Link-64	0.20	0 12:01	2.15	0.09	1.44	2.84	0.23	0.24	0.00		Calculated
59	Link-65	0.91	0 12:01	13.89	0.07	3.58	1.08	0.28	0.17	0.00		Calculated
60	Link-66	0.90	0 12:02	13.92	0.06	1.34	1.68	0.57	0.35	0.00		Calculated
61	Link-67	6.08	0 12:04	13.92	0.44	4.46	0.31	1.00	0.60	0.00		Calculated
62	Link-68	4.13	0 12:05	3.41	1.21	5.41	0.12	0.94	0.94	0.00		> CAPACITY
63	Link-69	1.30	0 12:00	2.04	0.64	2.51	0.23	0.75	0.91	0.00		Calculated
64	Link-70	32.74	0 12:01	39.73	0.82	4.63	0.36	3.00	1.00	7.00		SURCHARGED
65	Link-71	32.22	0 12:01	39.48	0.82	4.56	0.80	3.00	1.00	7.00		SURCHARGED
66	Link-72	0.68	0 12:02	16.10	0.04	0.39	0.81	1.50	1.00	15.00		SURCHARGED
67	Link-73	0.00	0 00:00	0.97	0.00	0.00		0.00	0.00	0.00		Calculated
68	Link-74	4.15	0 12:08	0.74	5.60	11.87	0.08	0.67	1.00	0.00		SURCHARGED
69	Link-76	96.04	0 12:04	89.89	1.07	9.98	1.05	3.50	1.00	5.00		SURCHARGED
70	Link-77	6.07	0 12:05	9.91	0.61	3.73	1.01	1.09	0.59	0.00		Calculated
71	Link-78	0.00	0 00:00	0.89	0.00	0.00		0.00	0.00	0.00		Calculated
72	Link-81	1.92	0 12:00	13.73	0.14	4.04	0.32	1.02	0.69	0.00		Calculated
73	Link-82	4.11	0 11:59	13.73	0.30	4.29	0.25	1.50	1.00	3.00		SURCHARGED
74	Link-83	2.14	0 12:01	0.89	2.40	6.36	0.10	0.67	1.00	8.00		SURCHARGED
75	Link-84	54.49	0 12:01	107.65	0.51	9.61	0.06	3.00	1.00	5.00		SURCHARGED
76	Link-85	2.03	0 12:11	0.67	3.03	5.80	0.08	0.67	1.00	21.00		SURCHARGED
77	Link-87	2.03	0 12:11	2.30	0.88	1.90	0.72	1.17	1.00	20.00		SURCHARGED
78	Link-88	0.25	0 12:00	1.15	0.21	1.13	0.58	0.40	0.60	0.00		Calculated
79	Link-95	3.67	0 12:01	12.72	0.29	6.03	0.57	0.55	0.38	0.00		Calculated
80	Link-96	2.76	0 12:00	6.17	0.45	2.26	0.64	0.98	0.65	0.00		Calculated
81	Link-97	3.68	0 12:00	11.79	0.31	5.79	1.01	0.58	0.39	0.00		Calculated

Inlet Input

SN	Element ID	Inlet Manufacturer	Manufacturer Part Number	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Inlet Depth (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Ponded Area (ft²)	Grate Clogging Factor (%)
1	CB_97_7.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	917.80	920.00	2.20	0.00	0.00	10.00	0.00
2	CB_Ant_6	FHWA HEC-22 GENERIC	N/A	On Sag	1	947.63	952.02	4.39	0.00	0.00	10.00	0.00
3	CB_Bon_6	FHWA HEC-22 GENERIC	N/A	On Sag	1	969.87	973.11	3.24	0.00	0.00	10.00	0.00
4	CB_Bon_7	FHWA HEC-22 GENERIC	N/A	On Sag	1	942.30	944.31	2.01	0.00	0.00	10.00	0.00
5	CB_Hav_1	FHWA HEC-22 GENERIC	N/A	On Sag	1	1000.20	1010.00	9.80	0.00	0.00	10.00	0.00
6	CB_Hav_2	FHWA HEC-22 GENERIC	N/A	On Sag	1	990.20	1000.00	9.80	0.00	0.00	10.00	0.00
7	CB_Hav_3	FHWA HEC-22 GENERIC	N/A	On Sag	1	980.20	990.00	9.80	0.00	0.00	10.00	0.00
8	CB_Hen_4.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	890.43	900.70	10.27	0.00	0.00	10.00	0.00
9	CB_Locust_1.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	897.33	899.63	2.30	0.00	0.00	10.00	0.00
10	CB_Locust_1.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	896.76	900.21	3.45	0.00	0.00	10.00	0.00
11	CB_Locust_1.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	897.50	901.50	4.00	0.00	0.00	10.00	0.00
12	CB_Locust_2.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	900.00	903.00	3.00	0.00	0.00	10.00	0.00
13	CB_Locust_2.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	899.70	903.00	3.30	0.00	0.00	10.00	0.00
14	CB_Locust_4.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	895.60	904.50	8.90	0.00	0.00	10.00	0.00
15	CB_Locust_4.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	895.85	904.50	8.65	0.00	0.00	10.00	0.00
16	CB_Ton_6.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	928.04	932.67	4.63	0.00	0.00	10.00	0.00
17	CB_Ton_6.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	928.50	932.67	4.17	0.00	0.00	10.00	0.00
18	CB_Ton_6.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	927.00	932.67	5.67	0.00	0.00	10.00	0.00
19	CB_West_4.4	FHWA HEC-22 GENERIC	N/A	On Sag	1	900.30	907.50	7.20	0.00	0.00	10.00	0.00
20	CB_West_4.5	FHWA HEC-22 GENERIC	N/A	On Sag	1	900.30	907.50	7.20	0.00	0.00	10.00	0.00
21	CB_West_5.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	906.00	909.50	3.50	0.00	0.00	10.00	0.00
22	CB_West_5.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	905.50	909.00	3.50	0.00	0.00	10.00	0.00
23	CB_West_Del.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	915.00	918.50	3.50	0.00	0.00	10.00	0.00
24	CB_West_Del.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.49	920.59	4.10	0.00	0.00	10.00	0.00
25	CB_West_Del.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.71	918.21	1.50	0.00	0.00	10.00	0.00
26	CB_West_Del.4	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.23	918.16	1.93	0.00	0.00	10.00	0.00
27	CB_Whit_1/2.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	914.50	917.00	2.50	0.00	0.00	10.00	0.00
28	CB_Whit_1/2.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.00	919.00	3.00	0.00	0.00	10.00	0.00
29	CB_Whit_1/2.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	915.20	918.00	2.80	0.00	0.00	10.00	0.00
30	CB_Whit_3.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	906.00	912.00	6.00	0.00	0.00	10.00	0.00
31	CB_Whit_3.4	FHWA HEC-22 GENERIC	N/A	On Sag	1	903.73	913.50	9.77	0.00	0.00	10.00	0.00
32	CB_Whit_4.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	910.50	912.00	1.50	0.00	0.00	10.00	0.00
33	CB_Whit_6	FHWA HEC-22 GENERIC	N/A	On Sag	1	915.60	922.00	6.40	0.00	0.00	10.00	0.00
34	CB_Whit_Del.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	918.13	920.53	2.40	0.00	0.00	10.00	0.00
35	CB_Whit_Del.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	918.45	921.50	3.05	0.00	0.00	10.00	0.00
36	CB_Whit_Del.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	919.05	921.65	2.60	0.00	0.00	10.00	0.00
37	Inlet-60	FHWA HEC-22 GENERIC	N/A	On Sag	1	956.01	957.99	1.98	0.00	0.00	10.00	0.00
38	Inlet-61	FHWA HEC-22 GENERIC	N/A	On Sag	1	942.29	945.89	3.60	0.00	0.00	10.00	0.00
39	Inlet-62	FHWA HEC-22 GENERIC	N/A	On Sag	1	939.12	943.08	3.96	0.00	0.00	10.00	0.00

Roadway & Gutter Input

SN	Element ID	Roadway Longitudinal Slope (ft/ft)	Roadway Cross Slope (ft/ft)	Roadway Manning's Roughness	Gutter Cross Slope (ft/ft)	Gutter Width (ft)	Gutter Depression (in)	Allowable Spread (ft)
1	CB_97_7.3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
2	CB_Ant_6	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
3	CB_Bon_6	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
4	CB_Bon_7	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
5	CB_Hav_1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
6	CB_Hav_2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
7	CB_Hav_3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
8	CB_Hen_4.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
9	CB_Locust_1.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
10	CB_Locust_1.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
11	CB_Locust_1.3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
12	CB_Locust_2.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
13	CB_Locust_2.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
14	CB_Locust_4.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
15	CB_Locust_4.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
16	CB_Ton_6.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
17	CB_Ton_6.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
18	CB_Ton_6.3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
19	CB_West_4.4	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
20	CB_West_4.5	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
21	CB_West_5.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
22	CB_West_5.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
23	CB_West_Del.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
24	CB_West_Del.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
25	CB_West_Del.3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
26	CB_West_Del.4	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
27	CB_Whit_1/2.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
28	CB_Whit_1/2.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
29	CB_Whit_1/2.3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
30	CB_Whit_3.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
31	CB_Whit_3.4	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
32	CB_Whit_4.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
33	CB_Whit_6	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
34	CB_Whit_Del.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
35	CB_Whit_Del.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
36	CB_Whit_Del.3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
37	Inlet-60	N/A	0.0200	0.0160	0.0620	2.00	0.0656	7.00
38	Inlet-61	N/A	0.0200	0.0160	0.0620	2.00	0.0656	7.00
39	Inlet-62	N/A	0.0200	0.0160	0.0620	2.00	0.0656	7.00

Inlet Results

SN	Element ID	Peak Flow (cfs)	Peak Lateral Inflow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)	Max Gutter Water Depth during Peak Flow (ft)	Time of Max Depth Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	CB_97_7.3	0.00	0.00	N/A	N/A	N/A	0.97	920.08	0.08	0 12:01	0.00	0.00
2	CB_Ant_6	0.00	0.00	N/A	N/A	N/A	0.92	952.09	0.08	0 00:00	0.00	0.00
3	CB_Bon_6	2.90	2.90	N/A	N/A	N/A	15.04	973.46	0.36	0 12:01	0.00	0.00
4	CB_Bon_7	1.67	1.67	N/A	N/A	N/A	10.34	944.57	0.26	0 12:02	0.00	0.00
5	CB_Hav_1	1.57	1.57	N/A	N/A	N/A	9.91	1010.26	0.26	0 11:58	0.05	9.00
6	CB_Hav_2	0.01	0.01	N/A	N/A	N/A	1.00	1000.08	0.08	0 23:52	0.00	0.00
7	CB_Hav_3	0.00	0.00	N/A	N/A	N/A	0.92	990.08	0.08	0 00:00	0.00	0.00
8	CB_Hen_4.2	1.32	1.32	N/A	N/A	N/A	8.79	900.93	0.23	0 12:00	0.00	0.00
9	CB_Locust_1.1	4.01	4.01	N/A	N/A	N/A	18.76	900.07	0.43	0 11:54	0.35	17.00
10	CB_Locust_1.2	0.00	0.00	N/A	N/A	N/A	0.92	900.29	0.08	0 12:00	0.00	0.00
11	CB_Locust_1.3	0.25	0.25	N/A	N/A	N/A	1.88	901.60	0.10	0 12:00	0.00	0.00
12	CB_Locust_2.1	0.00	0.00	N/A	N/A	N/A	0.92	903.08	0.08	0 00:00	0.00	0.00
13	CB_Locust_2.2	0.00	0.00	N/A	N/A	N/A	0.92	903.08	0.08	0 00:00	0.00	0.00
14	CB_Locust_4.1	0.00	0.00	N/A	N/A	N/A	0.92	904.58	0.08	0 23:21	0.00	0.00
15	CB_Locust_4.2	0.00	0.00	N/A	N/A	N/A	0.94	904.58	0.08	0 23:09	0.00	0.00
16	CB_Ton_6.1	0.00	0.00	N/A	N/A	N/A	0.92	932.74	0.08	0 00:00	0.00	0.00
17	CB_Ton_6.2	0.00	0.00	N/A	N/A	N/A	0.92	932.74	0.08	0 00:00	0.00	0.00
18	CB_Ton_6.3	0.00	0.00	N/A	N/A	N/A	0.92	932.74	0.08	0 00:00	0.00	0.00
19	CB_West_4.4	0.11	0.11	N/A	N/A	N/A	1.48	907.59	0.09	0 12:00	0.00	0.00
20	CB_West_4.5	0.10	0.10	N/A	N/A	N/A	1.44	907.59	0.09	0 12:00	0.00	0.00
21	CB_West_5.1	0.00	0.00	N/A	N/A	N/A	0.92	909.58	0.08	0 00:00	0.00	0.00
22	CB_West_5.2	0.00	0.00	N/A	N/A	N/A	0.92	909.08	0.08	0 00:00	0.00	0.00
23	CB_West_Del.1	2.13	2.13	N/A	N/A	N/A	12.22	918.80	0.30	0 12:01	0.00	0.00
24	CB_West_Del.2	1.33	1.33	N/A	N/A	N/A	8.85	920.83	0.24	0 12:05	0.00	0.00
25	CB_West_Del.3	1.08	1.08	N/A	N/A	N/A	7.65	918.42	0.21	0 12:00	0.00	0.00
26	CB_West_Del.4	0.00	0.00	N/A	N/A	N/A	0.92	918.24	0.08	0 12:00	0.00	0.00
27	CB_Whit_1/2.1	0.00	0.00	N/A	N/A	N/A	0.92	917.08	0.08	0 00:00	0.00	0.00
28	CB_Whit_1/2.2	0.90	0.90	N/A	N/A	N/A	6.72	919.19	0.19	0 09:40	0.00	0.00
29	CB_Whit_1/2.3	0.00	0.00	N/A	N/A	N/A	0.92	918.08	0.08	0 00:00	0.00	0.00
30	CB_Whit_3.1	1.00	1.00	N/A	N/A	N/A	7.23	912.20	0.20	0 12:00	0.00	0.00
31	CB_Whit_3.4	0.74	0.74	N/A	N/A	N/A	5.85	913.68	0.18	0 12:00	0.00	0.00
32	CB_Whit_4.1	0.00	0.00	N/A	N/A	N/A	0.92	912.08	0.08	0 00:00	0.00	0.00
33	CB_Whit_6	0.00	0.00	N/A	N/A	N/A	0.92	922.08	0.08	0 12:00	0.00	0.00
34	CB_Whit_Del.1	5.53	5.53	N/A	N/A	N/A	23.33	921.06	0.52	0 11:47	0.82	25.00
35	CB_Whit_Del.2	0.00	0.00	N/A	N/A	N/A	0.92	921.58	0.08	0 11:47	0.00	0.00
36	CB_Whit_Del.3	0.00	0.00	N/A	N/A	N/A	0.92	921.73	0.08	0 11:47	0.00	1.00
37	Inlet-60	0.00	0.00	N/A	N/A	N/A	0.00	957.99	0.00	0 12:00	0.00	0.00
38	Inlet-61	0.00	0.00	N/A	N/A	N/A	0.13	946.00	0.11	0 12:01	0.00	0.00
39	Inlet-62	0.00	0.00	N/A	N/A	N/A	0.00	943.08	0.00	0 12:01	0.00	0.00

Storage Nodes

Storage Node : DW_Hav_1

Input Data

Invert Elevation (ft)	980.00
Max (Rim) Elevation (ft)	990.00
Max (Rim) Offset (ft)	10.00
Initial Water Elevation (ft)	0.00
Initial Water Depth (ft)	-980.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Output Summary Results

Peak Inflow (cfs)	0.00
Peak Lateral Inflow (cfs)	0.00
Peak Outflow (cfs)	0.00
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	980.00
Max HGL Depth Attained (ft)	0
Average HGL Elevation Attained (ft)	980.00
Average HGL Depth Attained (ft)	0
Time of Max HGL Occurrence (days hh:mm)	0 00:00
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : DW_Hav_2

Input Data

Invert Elevation (ft)	990.00
Max (Rim) Elevation (ft)	1000.00
Max (Rim) Offset (ft)	10.00
Initial Water Elevation (ft)	0.00
Initial Water Depth (ft)	-990.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Output Summary Results

Peak Inflow (cfs)	0.01
Peak Lateral Inflow (cfs)	0.00
Peak Outflow (cfs)	0.01
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	990.06
Max HGL Depth Attained (ft)	0.06
Average HGL Elevation Attained (ft)	990.01
Average HGL Depth Attained (ft)	0.01
Time of Max HGL Occurrence (days hh:mm)	1 00:00
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : DW_Hav_3

Input Data

Invert Elevation (ft)	1000.00
Max (Rim) Elevation (ft)	1010.00
Max (Rim) Offset (ft)	10.00
Initial Water Elevation (ft)	0.00
Initial Water Depth (ft)	-1000.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Output Summary Results

Peak Inflow (cfs)	1.38
Peak Lateral Inflow (cfs)	0.00
Peak Outflow (cfs)	1.00
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	1010.00
Max HGL Depth Attained (ft)	10
Average HGL Elevation Attained (ft)	1001.76
Average HGL Depth Attained (ft)	1.76
Time of Max HGL Occurrence (days hh:mm)	0 11:58
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0.00
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Project Description

File Name	5825-Tonasket Proposed-2019 Inlet Basins.SPF

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	SCS TR-55
Time of Concentration (TOC) Method	SCS TR-55
Link Routing Method	Hydrodynamic
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	YES

Analysis Options

Start Analysis On	Mar 20, 2019	00:00:00
End Analysis On	Mar 21, 2019	00:00:00
Start Reporting On	Mar 20, 2019	00:00:00
Antecedent Dry Days	0	days
Runoff (Dry Weather) Time Step	0 01:00:00	days hh:mm:ss
Runoff (Wet Weather) Time Step	0 00:05:00	days hh:mm:ss
Reporting Time Step	0 00:05:00	days hh:mm:ss
Routing Time Step	30	seconds

Number of Elements

	Qty
Rain Gages	2
Subbasins	143
Nodes	103
Junctions	47
Outfalls	14
Flow Diversions	0
Inlets	39
Storage Nodes	3
Links	86
Channels	2
Pipes	81
Pumps	0
Orifices	0
Weirs	0
Outlets	3
Pollutants	0
Land Uses	0

Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution
1	50-year	Time Series	50-yr Type II	Intensity	inches	Washington	Okanogan	50	2.00	SCS Type II 24-hr
2	Rain Gage-01	Time Series	100-YR Type-2	Cumulative	inches				0.00	

Subbasin Summary

SN	Subbasin ID	Area	Peak Rate Factor	Weighted Curve Number	Total Rainfall	Total Runoff	Total Runoff Volume	Peak Runoff	Time of Concentration
		(ac)			(in)	(in)	(ac-in)	(cfs)	(days hh:mm:ss)
1	97_East_1st	0.42	484.00	98.00	2.00	1.77	0.75	1.05	0 00:06:00
2	97_East_2nd	0.32	484.00	98.00	2.00	1.77	0.57	0.80	0 00:06:00
3	97_West_1st	0.68	484.00	98.00	2.00	1.77	1.21	1.69	0 00:06:00
4	97_West_2nd	0.37	484.00	98.00	2.00	1.77	0.66	0.92	0 00:06:00
5	A_Rd_State	4.20	484.00	98.00	2.00	1.77	7.45	9.84	0 00:08:11
6	A1_State	2.05	484.00	61.00	2.00	0.07	0.15	0.02	0 00:21:07
7	A2_State	3.45	484.00	77.00	2.00	0.45	1.54	1.03	0 00:34:49
8	A3_State	0.73	484.00	61.00	2.00	0.07	0.05	0.01	0 00:19:10
9	A4_State	2.04	484.00	68.00	2.00	0.19	0.40	0.22	0 00:20:04
10	A5_State	1.70	484.00	57.00	2.00	0.03	0.05	0.01	0 00:14:00
11	A6_State	1.42	484.00	57.00	2.00	0.03	0.04	0.00	0 00:14:00
12	B_Rd_State	1.66	484.00	98.00	2.00	1.77	2.95	4.14	0 00:06:00
13	B1_State	0.43	484.00	68.00	2.00	0.19	0.08	0.05	0 00:18:03
14	B2_State	0.77	484.00	54.00	2.00	0.00	0.00	0.00	0 00:18:34
15	B3_Pt_5	3.67	484.00	61.00	2.00	0.07	0.27	0.04	0 00:18:44
16	C_Rds_State	1.71	484.00	98.00	2.00	1.77	3.04	4.27	0 00:06:00
17	C1_State	1.06	484.00	54.00	2.00	0.01	0.01	0.00	0 00:15:46
18	C2_State	1.93	484.00	61.00	2.00	0.07	0.14	0.02	0 00:15:09
19	C3_Rds2_State	0.64	484.00	98.00	2.00	1.77	1.13	1.58	0 00:06:00
20	C3_State	0.80	484.00	57.00	2.00	0.03	0.02	0.00	0 00:16:28
21	D_Rds_Pt_2	0.81	484.00	98.00	2.00	1.77	1.43	2.01	0 00:06:00
22	D1_Pt_2	8.93	484.00	57.80	2.00	0.04	0.33	0.03	0 00:12:20
23	E_97@4th	0.19	484.00	98.00	2.00	1.77	0.34	0.48	0 00:06:00
24	E_97@5th	0.18	484.00	98.00	2.00	1.77	0.32	0.45	0 00:06:00
25	E1_Pt_6	1.12	484.00	57.00	2.00	0.03	0.03	0.00	0 00:17:33
26	E10_Pt_6	0.87	484.00	89.00	2.00	1.03	0.90	1.38	0 00:06:00
27	E11_Pt_6	0.87	484.00	98.00	2.00	1.77	1.55	2.17	0 00:06:00
28	E2_Pt_6	1.92	484.00	57.00	2.00	0.03	0.06	0.01	0 00:17:09
29	E3_Pt_6	0.45	484.00	57.00	2.00	0.03	0.01	0.00	0 00:15:46
30	E4_Pt_6	0.22	484.00	57.00	2.00	0.00	0.00	0.00	0 00:16:07
31	E5_Pt_6	0.95	484.00	57.00	2.00	0.03	0.03	0.00	0 00:16:00
32	E6_Pt_6	0.88	484.00	57.00	2.00	0.03	0.03	0.00	0 00:15:12
33	E7_Pt_6	0.96	484.00	57.00	2.00	0.03	0.03	0.00	0 00:14:48
34	E8_Pt_6	0.87	484.00	57.00	2.00	0.03	0.03	0.00	0 00:14:50
35	E9_Pt_6	0.96	484.00	61.00	2.00	0.07	0.07	0.01	0 00:12:43
36	East_97_7th	0.24	484.00	98.00	2.00	1.77	0.42	0.59	0 00:06:00
37	F_Rds_Pt_9	0.69	484.00	98.00	2.00	1.77	1.22	1.72	0 00:06:00
38	F1_Pt_6	1.24	484.00	57.00	2.00	0.03	0.04	0.00	0 00:19:27
39	F2_Pt_7	1.07	484.00	57.00	2.00	0.03	0.03	0.00	0 00:16:58
40	F3_Pt_9	4.66	484.00	69.00	2.00	0.22	1.01	0.73	0 00:15:45
41	F4_Pt_8	2.02	484.00	89.00	2.00	1.03	2.08	3.08	0 00:07:14
42	G_Rds_Pt_7	0.74	484.00	98.00	2.00	1.77	1.32	1.85	0 00:06:00
43	G1_Pt_7	0.50	484.00	57.00	2.00	0.03	0.01	0.00	0 00:16:54
44	G2_Pt_9	3.12	484.00	39.00	2.00	0.00	0.00	0.00	0 00:30:57
45	G3_Pt_10	3.16	484.00	81.00	2.00	0.61	1.91	2.63	0 00:08:33
46	G4_Pt_7	1.68	484.00	39.00	2.00	0.00	0.00	0.00	0 00:37:09
47	H_Rds_Pt_10	1.49	484.00	98.00	2.00	1.77	2.64	3.70	0 00:06:00
48	H_Rds_Pt_11	0.86	484.00	98.00	2.00	1.77	1.52	2.13	0 00:06:00
49	H1_Pt_11	2.61	484.00	57.00	2.00	0.03	0.08	0.01	0 00:16:53
50	H2_Pt_11	0.76	484.00	57.00	2.00	0.03	0.02	0.00	0 00:16:36
51	H3_Pt11	0.76	484.00	57.00	2.00	0.03	0.02	0.00	0 00:19:54
52	I_Rds_Pt_9	0.45	484.00	98.00	2.00	1.77	0.80	1.13	0 00:06:00
53	I1_Pt_18	0.92	484.00	54.00	2.00	0.01	0.01	0.00	0 00:19:23
54	I2_Pt_9	0.82	484.00	57.00	2.00	0.03	0.02	0.00	0 00:16:22
55	J_Rds_Pt_18	0.88	484.00	98.00	2.00	1.77	1.57	2.20	0 00:06:00
56	J_Rds_Pt_7	0.47	484.00	98.00	2.00	1.77	0.84	1.18	0 00:06:00
57	J1_Pt_18	0.90	484.00	61.00	2.00	0.07	0.07	0.01	0 00:22:57
58	J2_Pt_9	1.22	484.00	61.00	2.00	0.07	0.09	0.01	0 00:19:27
59	K_Rds_Pt_18	1.58	484.00	98.00	2.00	1.77	2.80	3.92	0 00:06:00
60	K1_Pt_18	1.85	484.00	61.00	2.00	0.07	0.14	0.02	0 00:22:54
61	K2_Pt_18	2.92	484.00	61.00	2.00	0.07	0.21	0.03	0 00:20:57
62	K3_Pt_18	1.90	484.00	61.00	2.00	0.07	0.14	0.02	0 00:18:54
63	L_Rds_Pt_18	0.65	484.00	98.00	2.00	1.77	1.15	1.61	0 00:06:00
64	L_Rds_Pt_7	0.53	484.00	98.00	2.00	1.77	0.93	1.31	0 00:06:00
65	L1_Pt_18	0.45	484.00	61.00	2.00	0.07	0.03	0.01	0 00:19:06
66	L2_Pt_7	1.59	484.00	81.00	2.00	0.60	0.96	1.29	0 00:10:06
67	M_Rd_Pt_1	2.84	484.00	98.00	2.00	1.77	5.03	7.06	0 00:06:00
68	M1_Pt_1	7.80	484.00	51.00	2.00	0.00	0.01	0.00	0 00:11:48
69	M1_Tonasket_Ave	0.85	484.00	98.00	2.00	1.77	1.51	2.12	0 00:06:00
70	M1_Winesap_ST	0.98	484.00	98.00	2.00	1.77	1.74	2.44	0 00:06:00
71	M2_Pt_1	1.71	484.00	54.00	2.00	0.01	0.02	0.00	0 00:12:33
72	M3_Pt_1	1.03	484.00	89.00	2.00	1.03	1.06	1.62	0 00:06:00
73	N_4th@97	5.18	484.00	98.00	2.00	1.77	9.18	12.89	0 00:06:00
74	N_4th@Western	0.20	484.00	98.00	2.00	1.77	0.35	0.49	0 00:06:00
75	N_5th@97	1.02	484.00	98.00	2.00	1.77	1.80	2.53	0 00:06:00
76	N_6th@97	0.22	484.00	98.00	2.00	1.77	0.39	0.56	0 00:06:00
77	N_Rds_Pt_5	1.05	484.00	98.00	2.00	1.77	1.87	2.61	0 00:06:00
78	N1_Pt_3	2.91	484.00	51.00	2.00	0.00	0.00	0.00	0 00:12:24
79	N1_Rds_Pt_1	0.44	484.00	98.00	2.00	1.77	0.78	1.08	0 00:06:00
80	N1_Rds_Pt_5	0.44	484.00	98.00	2.00	1.77	0.79	1.10	0 00:06:00
81	North_3rd@97	0.36	484.00	98.00	2.00	1.77	0.64	0.89	0 00:06:00
82	O_Rds_State	3.13	484.00	98.00	2.00	1.77	5.54	7.50	0 00:07:18
83	O1_State	1.66	484.00	57.00	2.00	0.03	0.05	0.01	0 00:18:51
84	O2_Pt_5	1.91	484.00	61.00	2.00	0.07	0.14	0.02	0 00:13:32
85	O2_Rds_Pt_5	1.26	484.00	98.00	2.00	1.77	2.23	3.12	0 00:06:00
86	O2_Rds2_Pt_5	0.35	484.00	98.00	2.00	1.77	0.62	0.88	0 00:06:00
87	P_RD_State	2.42	484.00	98.00	2.00	1.77	4.29	6.02	0 00:06:00
88	P1_State	1.37	484.00	61.00	2.00	0.07	0.10	0.02	0 00:17:46

Subbasin Summary

SN	Subbasin ID	Area (ac)	Peak Rate Factor	Weighted Curve Number	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
89	P2_Pt_5	0.84	484.00	77.00	2.00	0.45	0.38	0.42	0 00:15:07
90	P2_Rds_2-St	0.32	484.00	98.00	2.00	1.77	0.57	0.80	0 00:06:00
91	P2_Rds2_2-St	0.23	484.00	98.00	2.00	1.77	0.40	0.56	0 00:06:00
92	P3_Pt_4	0.85	484.00	89.00	2.00	1.03	0.88	1.35	0 00:06:00
93	Q_Rds2_97	0.30	484.00	98.00	2.00	1.77	0.53	0.75	0 00:06:00
94	Q1_Pt_5	0.97	484.00	57.00	2.00	0.03	0.03	0.00	0 00:16:30
95	Q1_Rds_State	0.32	484.00	98.00	2.00	1.77	0.57	0.80	0 00:06:00
96	Q1_Rds2_State	0.49	484.00	98.00	2.00	1.77	0.86	1.21	0 00:06:00
97	Q2_Pt_5	0.65	484.00	61.00	2.00	0.07	0.05	0.01	0 00:16:32
98	Q3_Pt_5	0.96	484.00	77.00	2.00	0.45	0.43	0.47	0 00:15:19
99	Q3_Rds_State	0.32	484.00	98.00	2.00	1.77	0.56	0.80	0 00:06:00
100	Q3_Rds2_State	0.45	484.00	98.00	2.00	1.77	0.80	1.11	0 00:06:00
101	Q4_Pt_5	0.95	484.00	89.00	2.00	1.03	0.97	1.46	0 00:06:55
102	Q5_Pt_6	0.96	484.00	89.00	2.00	1.03	0.99	1.43	0 00:08:04
103	R_RD_2	0.63	484.00	98.00	2.00	1.77	1.11	1.56	0 00:06:00
104	R_Rd_Pt_1	0.68	484.00	98.00	2.00	1.77	1.21	1.70	0 00:06:00
105	R1_Pt_1	0.27	484.00	39.00	2.00	0.00	0.00	0.00	0 00:18:18
106	S_5th@97	0.73	484.00	98.00	2.00	1.77	1.29	1.82	0 00:06:00
107	S_6th@97	0.16	484.00	98.00	2.00	1.77	0.28	0.40	0 00:06:00
108	S_Rds_Pt_1	1.09	484.00	98.00	2.00	1.77	1.94	2.72	0 00:06:00
109	S1_Pt_14	1.34	484.00	81.00	2.00	0.60	0.81	0.83	0 00:20:23
110	S2_Pt_14	1.59	484.00	89.00	2.00	1.03	1.64	2.03	0 00:14:58
111	S2_Rds_Pt_14	3.53	484.00	98.00	2.00	1.77	6.27	8.79	0 00:06:00
112	S3_Pt_14	4.07	484.00	89.00	2.00	1.03	4.18	5.81	0 00:09:51
113	S3_Pt_3	0.29	484.00	72.00	2.00	0.29	0.08	0.06	0 00:23:33
114	S3_Rds_3-St	0.38	484.00	98.00	2.00	1.77	0.67	0.94	0 00:06:00
115	South_3rd@97	0.22	484.00	98.00	2.00	1.77	0.40	0.56	0 00:06:00
116	South_4th@97	2.64	484.00	98.00	2.00	1.77	4.69	6.58	0 00:06:00
117	T_Rds2_Pt_5	0.51	484.00	98.00	2.00	1.77	0.91	1.27	0 00:06:00
118	U_Rds_Pt_12	1.49	484.00	98.00	2.00	1.77	2.65	3.71	0 00:06:00
119	U_Rds_Pt_13	1.48	484.00	98.00	2.00	1.77	2.62	3.68	0 00:06:00
120	U_Rds_Pt_14	0.26	484.00	98.00	2.00	1.77	0.47	0.65	0 00:06:00
121	U_Rds2_Pt_13	0.38	484.00	98.00	2.00	1.77	0.67	0.94	0 00:06:00
122	U_Rds2_Pt_14	0.50	484.00	98.00	2.00	1.77	0.89	1.24	0 00:06:00
123	U1_Pt_14	1.94	484.00	98.00	2.00	1.77	3.45	4.36	0 00:10:01
124	U2_Pt_13	1.74	484.00	98.00	2.00	1.77	3.08	3.89	0 00:09:58
125	U3_Pt_13	1.91	484.00	98.00	2.00	1.77	3.39	4.04	0 00:12:31
126	U4_Pt_12	2.64	484.00	89.00	2.00	1.03	2.71	3.87	0 00:08:50
127	US97_3-4_East	0.30	484.00	98.00	2.00	1.77	0.54	0.76	0 00:06:00
128	V_Rds_Pt_15	0.36	484.00	98.00	2.00	1.77	0.63	0.89	0 00:06:00
129	V_Rds2_Pt_15	0.13	484.00	98.00	2.00	1.77	0.23	0.32	0 00:06:00
130	W_97@4th	0.45	484.00	98.00	2.00	1.77	0.79	1.11	0 00:06:00
131	W_97@5th	0.42	484.00	98.00	2.00	1.77	0.74	1.04	0 00:06:00
132	W_Rds_Pt_15	0.41	484.00	98.00	2.00	1.77	0.73	1.02	0 00:06:00
133	W1_Pt_15	2.11	484.00	89.00	2.00	1.03	2.17	3.35	0 00:06:00
134	W2_Pt_15	1.96	484.00	89.00	2.00	1.03	2.01	2.87	0 00:08:46
135	West_97_6th	0.46	484.00	98.00	2.00	1.77	0.81	1.13	0 00:06:00
136	X_Rds_Pt_16	0.38	484.00	98.00	2.00	1.77	0.67	0.94	0 00:06:00
137	X_Rds_Pt_17	0.68	484.00	98.00	2.00	1.77	1.20	1.69	0 00:06:00
138	X_Rds2_Pt_13	0.05	484.00	98.00	2.00	1.74	0.09	0.13	0 00:06:00
139	X1_Pt_16	3.16	484.00	57.00	2.00	0.03	0.09	0.01	0 00:25:09
140	X2_Pt_17	1.17	484.00	57.00	2.00	0.03	0.04	0.00	0 00:25:19
141	Y_Rds_Pt_17	0.78	484.00	98.00	2.00	1.77	1.38	1.94	0 00:06:00
142	Y_Rds2_Pt_13	0.06	484.00	98.00	2.00	1.75	0.10	0.14	0 00:06:00
143	Y1_Pt_17	1.77	484.00	98.00	2.00	1.77	3.15	3.67	0 00:13:38

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft²)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	CB_97_7.1	Junction	919.10	921.00	0.00	921.00	10.00	3.78	926.89	5.89	0.00	0 11:58	0.03	16.00
2	CB_97_7.2	Junction	918.40	922.00	0.00	922.00	10.00	7.97	926.33	4.33	0.00	0 11:58	0.04	13.00
3	CB_Hen_4.1	Junction	890.50	900.70	0.00	900.70	10.00	5.24	892.85	0.00	7.85	0 00:00	0.00	0.00
4	CB_Locust_1.4	Junction	897.02	901.33	0.00	901.33	10.00	4.14	897.65	0.00	3.68	0 00:00	0.00	0.00
5	CB_West_3.1	Junction	900.20	907.00	0.00	907.00	10.00	5.28	909.92	2.92	0.00	0 12:00	0.02	12.00
6	CB_West_3.2	Junction	901.00	907.00	0.00	907.00	10.00	13.26	909.98	2.98	0.00	0 11:59	0.03	12.00
7	CB_West_3.3	Junction	900.40	907.00	0.00	907.00	10.00	5.79	910.66	3.66	0.00	0 11:59	0.02	13.00
8	CB_West_3.4	Junction	900.07	906.00	0.00	906.00	10.00	0.65	907.55	1.55	0.00	0 12:01	0.01	10.00
9	CB_West_4.1	Junction	900.25	907.00	0.00	907.00	10.00	0.32	908.17	1.17	0.00	0 12:01	0.01	9.00
10	CB_West_4.2	Junction	900.75	907.50	0.00	907.50	10.00	0.93	909.53	2.03	0.00	0 11:58	0.01	12.00
11	CB_West_4.3	Junction	900.24	907.50	0.00	907.50	10.00	2.24	908.18	0.68	0.00	0 11:58	0.02	10.00
12	CB_West_6	Junction	907.80	914.60	0.00	914.60	240.00	8.21	924.89	10.29	0.00	0 12:00	0.70	39.00
13	CB_Whit_3.2	Junction	906.00	913.50	0.00	913.50	240.00	8.00	909.64	0.00	3.86	0 00:00	0.00	0.00
14	CB_Whit_3.3	Junction	906.10	913.50	0.00	913.50	240.00	3.03	910.20	0.00	3.30	0 00:00	0.00	0.00
15	CB_Whit_4.2	Junction	910.40	912.00	0.00	912.00	10.00	7.88	911.92	0.00	0.08	0 00:00	0.00	0.00
16	CB_Whit_4.3	Junction	910.60	912.00	0.00	912.00	10.00	12.81	912.43	0.08	0.00	0 11:59	0.00	1.00
17	CB_Whit_5.1	Junction	909.60	916.00	0.00	916.00	10.00	1.03	911.37	0.00	4.63	0 00:00	0.00	0.00
18	CB_Whit_5.2	Junction	909.50	916.00	0.00	916.00	10.00	4.32	911.54	0.00	4.46	0 00:00	0.00	0.00
19	CB_Whit_6s	Junction	915.00	919.00	0.00	0.00	0.00	2.35	916.24	0.00	2.76	0 00:00	0.00	0.00
20	CB_WhitWest_4	Junction	905.50	908.00	0.00	908.00	10.00	0.78	908.23	0.23	0.00	0 12:01	0.01	8.00
21	MH_1st&97	Junction	910.47	920.00	0.00	0.00	0.00	13.02	920.00	0.00	0.00	0 11:58	0.00	0.00
22	MH_2nd&97	Junction	907.31	910.00	0.00	910.00	100.00	16.25	910.05	0.05	0.00	0 12:03	0.00	2.00
23	MH_3rd&97	Junction	903.00	911.35	0.00	0.00	0.00	61.45	911.35	0.00	0.00	0 12:01	0.01	0.00
24	MH_4th&97	Junction	907.00	914.26	0.00	914.26	100.00	38.72	910.11	0.00	4.15	0 00:00	0.00	0.00
25	MH_5th&97	Junction	908.80	914.44	0.00	914.44	100.00	15.39	911.33	0.00	3.11	0 00:00	0.00	0.00
26	MH_6th&97	Junction	914.50	919.37	0.00	919.37	100.00	7.17	915.76	0.00	3.61	0 00:00	0.00	0.00
27	MH_Bon_6	Junction	960.01	978.29	0.00	978.29	100.00	7.64	960.59	0.00	17.69	0 00:00	0.00	0.00
28	MH_Hen_1	Junction	891.15	893.14	0.00	893.14	100.00	4.12	891.77	0.00	1.37	0 00:00	0.00	0.00
29	MH_Hen_4	Junction	888.92	895.00	0.00	895.00	100.00	7.70	890.27	0.00	4.73	0 00:00	0.00	0.00
30	MH_Locust_1.1	Junction	896.56	901.98	0.00	901.98	100.00	3.01	898.03	0.00	3.95	0 00:00	0.00	0.00
31	MH_Locust_3	Junction	894.43	902.53	0.00	902.53	100.00	111.12	902.53	0.00	0.00	0 11:57	0.00	0.00
32	MH_Locust_4	Junction	894.92	905.13	0.00	905.13	100.00	1.17	895.25	0.00	9.88	0 00:00	0.00	0.00
33	MH_PT_9	Junction	924.71	929.23	0.00	929.23	100.00	1.78	925.10	0.00	4.13	0 00:00	0.00	0.00
34	MH_RR_4	Junction	891.84	900.00	0.00	900.00	100.00	1.16	892.16	0.00	7.84	0 00:00	0.00	0.00
35	MH_RRHen_4	Junction	890.04	898.00	0.00	898.00	100.00	7.70	891.07	0.00	6.93	0 00:00	0.00	0.00
36	MH_West_3.1	Junction	899.27	905.00	0.00	905.00	100.00	59.67	907.09	2.09	0.00	0 12:01	0.11	11.00
37	MH_West_3.2	Junction	897.80	905.00	0.00	905.00	100.00	112.53	905.96	0.96	0.00	0 11:58	0.19	9.00
38	MH_West_3.3	Junction	899.96	905.00	0.00	905.00	240.00	26.73	908.54	3.54	0.00	0 11:58	0.42	14.00
39	MH_West_3/4	Junction	899.48	905.00	0.00	905.00	100.00	35.87	907.55	2.55	0.00	0 11:58	0.21	13.00
40	MH_West_4.1	Junction	899.50	907.46	0.00	907.46	100.00	35.24	908.15	0.69	0.00	0 12:04	0.08	7.00
41	MH_West_4.2	Junction	900.50	908.00	0.00	908.00	100.00	4.50	909.39	1.39	0.00	0 12:02	0.04	10.00
42	MH_West_4.3	Junction	896.14	907.71	0.00	907.71	100.00	0.27	896.37	0.00	11.34	0 00:00	0.00	0.00
43	MH_West_Delish.1	Junction	913.33	919.19	0.00	919.19	100.00	4.36	919.19	0.00	0.00	0 00:00	0.00	0.00
44	MH_West_Delish.2	Junction	914.79	920.00	0.00	920.00	100.00	4.77	919.25	0.00	0.75	0 00:00	0.00	0.00
45	MH_Whit_3.2	Junction	905.88	909.81	0.00	909.81	100.00	10.36	909.14	0.00	0.68	0 00:00	0.00	0.00
46	MH_Whit_5.1	Junction	909.50	913.99	0.00	913.99	100.00	10.43	911.89	0.00	2.10	0 00:00	0.00	0.00
47	NEW 3rd Inlets	Junction	917.00	922.00	0.00	939.00	100.00	33.20	918.38	0.00	3.62	0 00:00	0.00	0.00
48	MH_West_6	Outfall	907.50					4.98	908.17					
49	Out-19	Outfall	923.00					9.23	923.92					
50	Out-20	Outfall	980.00					0.00	980.00					
51	Out-21	Outfall	990.00					0.03	990.00					
52	Out-22	Outfall	1000.00					1.00	1000.00					
53	Out-56	Outfall	0.00					2.11	0.00					
54	Out-57	Outfall	0.00					2.42	0.00					
55	Out-59	Outfall	915.00					2.91	915.53					
56	Out-A	Outfall	891.45					111.12	894.95					
57	Out-B	Outfall	917.00					6.40	918.00					
58	Out-C	Outfall	888.00					7.69	889.21					
59	Out-D	Outfall	887.15					4.10	887.74					
60	Out-E	Outfall	900.00					3.37	901.00					
61	Tona-DW	Outfall	939.00					1.11	939.00					
62	DW_Hav_1	Storage Node	980.00	990.00	0.00		0.00	0.00	980.00				0.00	0.00
63	DW_Hav_2	Storage Node	990.00	1000.00	0.00		0.00	0.03	990.35				0.00	0.00
64	DW_Hav_3	Storage Node	1000.00	1010.00	0.00		0.00	1.54	1010.00				0.00	0.00

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Diameter or Height (in)	Manning's Roughness	Peak Flow (cfs)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
1	Link-102	Pipe	CB_97_7.1	CB_97_7.2	24.00	919.10	918.40	2.9200	12.000	0.0130	3.58	6.08	0.59	4.56	1.00	1.00	18.00	SURCHARGED
2	Link-103	Pipe	CB_97_7.2	CB_97_7.3	100.00	918.40	917.80	0.6000	12.000	0.0130	7.80	2.76	2.83	9.93	1.00	1.00	15.00	SURCHARGED
3	Link-135	Pipe	MH_Bon_6	Inlet-60	117.16	960.01	956.01	3.4100	30.000	0.0150	7.64	65.64	0.12	6.55	0.71	0.29	0.00	Calculated
4	Link-137	Pipe	Inlet-61	Inlet-62	66.96	942.29	939.12	4.7300	24.000	0.0250	7.55	25.60	0.30	5.93	0.84	0.43	0.00	Calculated
5	Link-139	Pipe	CB_Bon_7	Inlet-62	33.71	942.30	939.12	9.4300	6.000	0.0130	1.73	1.72	1.00	8.81	0.50	1.00	11.00	SURCHARGED
6	Link-14	Pipe	CB_Bon_6	MH_Bon_6	49.74	969.87	969.51	0.7200	10.000	0.0130	3.71	1.86	1.99	6.85	0.81	0.98	0.00	> CAPACITY
7	Link-141	Pipe	CB_Hav_3	DW_Hav_1	40.78	980.20	980.00	0.4900	18.000	0.0150	0.00	6.38	0.00	0.00	0.00	0.00	0.00	Calculated
8	Link-142	Pipe	CB_Hav_2	DW_Hav_2	41.71	990.20	990.00	0.4800	18.000	0.0150	0.03	6.30	0.01	0.60	0.25	0.17	0.00	Calculated
9	Link-143	Pipe	CB_Hav_1	DW_Hav_3	40.63	1000.20	1000.00	0.4900	18.000	0.0150	1.54	6.39	0.24	0.87	1.50	1.00	61.00	SURCHARGED
10	Link-144	Pipe	MH_West_Delish.1	Out-E	530.00	913.33	900.00	2.5200	12.000	0.0240	3.37	3.06	1.10	4.42	1.00	1.00	15.00	SURCHARGED
11	Link-146	Pipe	MH_1st&97	MH_2nd&97	316.01	910.47	907.31	1.0000	18.000	0.0120	13.02	11.38	1.14	7.72	1.50	1.00	5.00	SURCHARGED
12	Link-147	Pipe	MH_2nd&97	MH_3rd&97	367.78	907.31	903.63	1.0000	24.000	0.0120	16.64	24.51	0.68	6.74	2.00	1.00	4.00	SURCHARGED
13	Link-148	Pipe	MH_PT_9	MH_6th&97	340.00	924.74	915.06	2.8500	12.000	0.0120	1.78	6.51	0.27	4.69	0.52	0.53	0.00	Calculated
14	Link-149	Pipe	MH_Whit_5.1	MH_5th&97	11.00	909.89	909.70	1.7400	18.000	0.0120	10.46	15.00	0.70	6.00	1.50	1.00	3.00	SURCHARGED
15	Link-15	Pipe	CB_Ant_6	CB_Ton_6.1	330.00	947.63	928.14	5.9100	8.000	0.0130	0.00	2.94	0.00	0.00	0.00	0.00	0.00	Calculated
16	Link-150	Pipe	MH_5th&97	MH_4th&97	350.00	909.60	907.46	0.6100	24.000	0.0120	15.75	19.16	0.82	6.23	1.84	0.93	0.00	Calculated
17	Link-159	Pipe	NEW 3rd Inlets	MH_3rd&97	200.00	917.00	903.73	6.6300	21.000	0.0120	33.04	44.22	0.75	16.83	1.53	0.89	0.00	Calculated
18	Link-160	Pipe	CB_97_7.3	Out-B	30.00	917.80	917.00	2.6700	12.000	0.0130	6.40	5.82	1.10	8.15	1.00	1.00	10.00	SURCHARGED
19	Link-161	Pipe	CB_Whit_6s	MH_6th&97	56.00	915.30	914.95	0.6200	12.000	0.0150	2.35	2.44	0.96	3.24	0.87	0.87	0.00	Calculated
20	Link-162	Pipe	MH_4th&97	MH_West_4.1	389.96	907.00	901.00	1.5400	27.000	0.0120	24.91	41.62	0.60	9.04	2.25	1.00	6.00	SURCHARGED
21	Link-163	Pipe	MH_West_3.2	MH_Locust_3	320.65	897.80	894.47	1.0400	42.000	0.0100	111.12	133.29	0.83	11.55	3.50	1.00	14.00	SURCHARGED
22	Link-164	Pipe	MH_4th&97	MH_3rd&97	393.00	907.36	904.73	0.6700	24.000	0.0150	14.21	16.04	0.89	5.22	2.00	1.00	6.00	SURCHARGED
23	Link-165	Pipe	CB_West_Del.4	Out-59	43.11	916.23	915.00	2.8600	12.000	0.0150	2.91	5.22	0.56	6.12	0.56	0.58	0.00	Calculated
24	Link-17	Pipe	CB_Ton_6.1	MH_PT_9	52.00	927.94	924.74	6.1500	8.000	0.0130	0.00	3.04	0.00	0.00	0.18	0.27	0.00	Calculated
25	Link-20	Pipe	MH_6th&97	MH_Whit_5.1	327.00	914.95	910.37	1.4000	18.000	0.0130	7.12	12.43	0.57	6.01	1.13	0.76	0.00	Calculated
26	Link-23	Pipe	CB_Ton_6.3	MH_PT_9	45.45	927.00	924.72	5.0200	8.000	0.0130	0.00	2.71	0.00	0.00	0.19	0.28	0.00	Calculated
27	Link-24	Pipe	CB_Ton_6.2	MH_PT_9	70.74	928.50	924.72	5.3400	8.000	0.0130	0.00	2.79	0.00	0.00	0.19	0.28	0.00	Calculated
28	Link-28	Pipe	CB_Whit_5.1	MH_5th&97	53.94	910.00	909.70	0.5600	12.000	0.0120	1.04	2.88	0.36	1.32	1.00	1.00	9.00	SURCHARGED
29	Link-29	Pipe	CB_Whit_5.2	MH_5th&97	47.12	910.00	909.60	0.8500	15.000	0.0120	4.32	6.45	0.67	3.52	1.25	1.00	8.00	SURCHARGED
30	Link-30	Pipe	CB_Whit_6	MH_6th&97	46.46	915.60	915.00	1.2900	8.000	0.0130	0.02	1.37	0.02	0.12	0.41	0.62	0.00	Calculated
31	Link-31	Pipe	CB_Whit_4.1	MH_4th&97	53.92	910.50	910.10	0.7400	8.000	0.0130	0.00	1.04	0.00	0.00	0.00	0.01	0.00	Calculated
32	Link-32	Pipe	CB_Whit_4.3	MH_4th&97	62.67	910.60	910.10	0.8000	21.000	0.0130	12.74	14.15	0.90	5.73	1.52	0.87	0.00	Calculated
33	Link-33	Pipe	CB_Whit_4.2	MH_4th&97	44.48	910.40	910.10	0.6700	18.000	0.0130	7.87	8.63	0.91	4.86	1.29	0.86	0.00	Calculated
34	Link-35	Pipe	CB_Whit_3.4	MH_Whit_3.2	30.00	908.50	908.00	1.6700	8.000	0.0130	0.93	1.56	0.60	4.17	0.67	1.00	2.00	SURCHARGED
35	Link-36	Pipe	CB_Whit_3.3	CB_Whit_3.2	66.20	907.00	906.50	0.7600	12.000	0.0130	3.02	3.10	0.98	3.85	1.00	1.00	11.00	SURCHARGED
36	Link-37	Pipe	CB_Whit_3.2	MH_Whit_3.2	75.45	906.20	905.88	0.4200	18.000	0.0120	8.06	7.40	1.09	5.63	1.50	1.00	9.00	SURCHARGED
37	Link-38	Pipe	CB_Whit_3.1	MH_Whit_3.2	65.45	906.00	905.88	0.1800	12.000	0.0120	1.77	1.65	1.07	2.25	1.00	1.00	10.00	SURCHARGED
38	Link-39	Pipe	MH_3rd&97	MH_West_3.2	370.00	903.53	898.64	1.3200	30.000	0.0150	56.40	81.73	0.69	6.76	2.50	1.00	10.00	SURCHARGED
39	Link-40	Pipe	MH_Whit_3.2	MH_West_3.3	300.00	905.88	900.06	1.9400	24.000	0.0150	9.12	27.31	0.33	3.89	2.00	1.00	7.00	SURCHARGED
40	Link-41	Pipe	MH_West_3.3	MH_West_3.1	29.00	899.96	899.37	2.0300	24.000	0.0150	30.74	27.97	1.10	9.79	2.00	1.00	19.00	SURCHARGED
41	Link-43	Pipe	CB_West_3.1	MH_West_3.3	38.54	901.00	900.06	2.4400	12.000	0.0130	5.17	5.56	0.93	6.58	1.00	1.00	21.00	SURCHARGED
42	Link-44	Pipe	CB_West_3.3	CB_West_3.2	45.82	903.00	902.30	1.5300	15.000	0.0130	5.68	7.98	0.71	5.26	1.25	1.00	15.00	SURCHARGED
43	Link-45	Pipe	CB_West_3.2	MH_West_3.3	51.64	902.20	901.00	2.3200	18.000	0.0130	12.93	16.01	0.81	7.46	1.50	1.00	15.00	SURCHARGED
44	Link-46	Pipe	MH_West_4.2	MH_West_4.1	47.28	900.50	899.99	1.0900	12.000	0.0150	4.81	3.22	1.49	6.12	1.00	1.00	29.00	SURCHARGED
45	Link-47	Pipe	CB_West_4.1	MH_West_4.1	42.10	900.25	899.94	0.7500	8.000	0.0130	0.67	1.04	0.65	1.93	0.67	1.00	46.00	SURCHARGED
46	Link-49	Pipe	CB_West_4.3	MH_West_4.1	39.85	900.24	899.94	0.7600	8.000	0.0130	1.79	1.06	1.70	5.13	0.67	1.00	47.00	SURCHARGED
47	Link-51	Pipe	CB_WhitWest_4	CB_West_4.3	184.87	905.50	903.30	1.1900	8.000	0.0130	0.83	1.32	0.63	2.80	0.67	1.00	8.00	SURCHARGED
48	Link-52	Pipe	CB_West_4.2	MH_West_4.2	34.65	900.75	900.50	0.7200	8.000	0.0130	1.34	1.03	1.31	3.85	0.67	1.00	31.00	SURCHARGED
49	Link-54	Pipe	CB_Whit_Del.2	CB_Whit_Del.3	58.00	919.48	919.05	0.7400	8.000	0.0150	0.52	0.90	0.57	2.62	0.67	1.00	29.00	SURCHARGED
50	Link-55	Pipe	CB_Whit_Del.2	CB_Whit_Del.1	65.00	918.45	918.13	0.4900	8.000	0.0150	0.45	0.73	0.61	1.28	0.67	1.00	35.00	SURCHARGED
51	Link-56	Pipe	CB_Whit_Del.1	CB_West_Del.4	150.00	918.13	916.23	1.2700	8.000	0.0150	1.62	1.18	1.38	4.93	0.63	0.97	0.00	> CAPACITY
52	Link-57	Pipe	CB_West_Del.3	CB_West_Del.4	30.00	917.20	916.36	2.7700	8.000	0.0150	1.29	1.74	0.74	4.52	0.46	0.76	0.00	Calculated
53	Link-59	Pipe	CB_West_Del.3	CB_West_Del.2	61.00	917.06	916.42	1.0500	8.000	0.0150	0.80	1.01	0.79	2.79	0.62	0.98	0.00	Calculated
54	Link-60	Pipe	CB_West_4.4	MH_West_4.3	37.96	900.30	900.00	0.7900	8.000	0.0130	0.14	1.07	0.13	2.04	0.17	0.25	0.00	Calculated
55	Link-61	Pipe	CB_West_4.5	MH_West_4.3	36.00	900.30	900.00	0.8300	8.000	0.0130	0.12	1.10	0.11	2.01	0.15	0.23	0.00	Calculated
56	Link-62	Pipe	CB_Locust_4.2	CB_Locust_4.1	33.71	895.85	895.60	0.7400	8.000	0.0150	0.01	0.90	0.01	0.87	0.05	0.07	0.00	Calculated

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Reported Condition
					(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
57	Link-63	Pipe	CB_Locust_4.1	MH_Locust_4	94.76	895.60	894.92	0.7200	8.000	0.0130	0.01	1.02	0.01	0.83	0.16	0.25	0.00	Calculated
58	Link-64	Pipe	MH_West_4.3	MH_Locust_4	245.00	896.14	894.95	0.4900	12.000	0.0150	0.26	2.15	0.12	1.53	0.26	0.27	0.00	Calculated
59	Link-65	Pipe	MH_Locust_4	MH_RR_4	232.00	894.92	891.84	1.3300	20.000	0.0150	1.16	13.89	0.08	3.83	0.32	0.20	0.00	Calculated
60	Link-66	Pipe	MH_RR_4	MH_RRHen_4	135.00	891.84	890.04	1.3300	20.000	0.0150	1.15	13.92	0.08	1.38	0.67	0.41	0.00	Calculated
61	Link-67	Pipe	MH_RRHen_4	MH_Hen_4	84.00	890.04	888.92	1.3300	20.000	0.0150	7.70	13.92	0.55	4.68	1.19	0.71	0.00	Calculated
62	Link-68	Pipe	CB_Hen_4.1	MH_RRHen_4	37.62	890.50	890.04	1.2200	12.000	0.0150	5.24	3.41	1.54	6.68	1.00	1.00	6.00	SURCHARGED
63	Link-69	Pipe	CB_Hen_4.2	MH_RRHen_4	33.93	890.43	890.04	1.1500	10.000	0.0150	1.68	2.04	0.82	3.08	0.83	1.00	7.00	SURCHARGED
64	Link-70	Pipe	MH_West_3/4	MH_West_3.1	100.00	899.48	899.27	0.2100	36.000	0.0100	34.37	39.73	0.87	4.86	3.00	1.00	14.00	SURCHARGED
65	Link-71	Pipe	MH_West_4.1	MH_West_3/4	220.00	899.94	899.48	0.2100	36.000	0.0100	35.24	39.48	0.89	4.99	3.00	1.00	15.00	SURCHARGED
66	Link-72	Pipe	CB_West_3.4	MH_West_3/4	18.87	900.07	899.48	3.1300	18.000	0.0150	1.45	16.10	0.09	0.82	1.50	1.00	21.00	SURCHARGED
67	Link-73	Pipe	CB_West_5.1	CB_West_5.2	58.43	906.00	905.50	0.8600	8.000	0.0150	0.00	0.97	0.00	0.00	0.00	0.00	0.00	Calculated
68	Link-74	Pipe	CB_West_6	MH_West_6	60.00	907.80	907.50	0.5000	8.000	0.0150	4.98	0.74	6.72	14.27	0.67	1.00	0.00	SURCHARGED
69	Link-76	Pipe	MH_Locust_3	Out-A	630.00	894.43	891.45	0.4700	42.000	0.0100	111.12	89.89	1.24	11.55	3.50	1.00	14.00	SURCHARGED
70	Link-77	Pipe	MH_Hen_4	Out-C	226.22	888.92	888.00	0.4100	22.000	0.0150	7.69	9.91	0.78	3.91	1.28	0.70	0.00	Calculated
71	Link-78	Pipe	CB_Locust_2.1	CB_Locust_2.2	41.32	900.00	899.70	0.7300	8.000	0.0150	0.00	0.89	0.00	0.00	0.00	0.00	0.00	Calculated
72	Link-81	Pipe	CB_West_Del.2	MH_West_Delish.2	78.00	916.56	914.79	2.2700	18.000	0.0150	2.31	13.73	0.17	4.13	1.25	0.87	0.00	Calculated
73	Link-82	Pipe	MH_West_Delish.2	MH_West_Delish.1	64.00	914.79	913.33	2.2800	18.000	0.0150	4.36	13.73	0.32	4.23	1.50	1.00	10.00	SURCHARGED
74	Link-83	Pipe	CB_West_Del.1	MH_West_Delish.2	38.64	915.00	914.79	0.5400	8.000	0.0130	2.50	0.89	2.81	7.17	0.67	1.00	12.00	SURCHARGED
75	Link-84	Pipe	MH_West_3.1	MH_West_3.2	32.44	899.27	898.77	1.5400	36.000	0.0100	61.17	107.65	0.57	9.55	3.00	1.00	14.00	SURCHARGED
76	Link-85	Pipe	CB_Locust_1.1	CB_Locust_1.2	27.00	897.33	897.22	0.4100	8.000	0.0150	2.03	0.67	3.03	5.81	0.67	1.00	27.00	SURCHARGED
77	Link-87	Pipe	CB_Locust_1.2	MH_Locust_1.1	82.00	896.76	896.56	0.2400	14.000	0.0150	2.03	2.30	0.88	1.90	1.17	1.00	26.00	SURCHARGED
78	Link-88	Pipe	CB_Locust_1.3	CB_Locust_1.4	39.36	897.50	897.02	1.2100	8.000	0.0150	0.31	1.15	0.27	1.31	0.43	0.65	0.00	Calculated
79	Link-95	Pipe	MH_Hen_1	Out-D	205.00	891.15	887.15	1.9500	18.000	0.0150	4.10	12.72	0.32	6.20	0.59	0.40	0.00	Calculated
80	Link-96	Pipe	CB_Locust_1.4	MH_Locust_1.1	87.00	897.02	896.62	0.4600	18.000	0.0150	2.95	6.17	0.48	2.31	1.02	0.68	0.00	Calculated
81	Link-97	Pipe	CB_Locust_1.4	MH_Hen_1	350.00	897.02	891.15	1.6800	18.000	0.0150	4.12	11.79	0.35	5.95	0.62	0.41	0.00	Calculated
82	Link-136	Channel	Inlet-60	Inlet-61	285.00	956.01	942.29	4.8100	36.000	0.0320	7.57	97.53	0.08	6.02	0.80	0.27	0.00	
83	Link-138	Channel	Inlet-62	Out-19	318.00	939.12	923.00	5.0700	36.000	0.0320	9.23	100.50	0.09	6.19	0.91	0.31	0.00	
84	Outlet-01	Outlet	DW_Hav_1	Out-20		980.00	980.00				0.00							
85	Outlet-02	Outlet	DW_Hav_2	Out-21		990.00	990.00				0.03							
86	Outlet-03	Outlet	DW_Hav_3	Out-22		1000.00	1000.00				1.00							

Inlet Summary

SN	Element ID	Inlet Manufacturer	Manufacturer Part Number	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Initial Water Elevation (ft)	Ponded Area (ft²)	Peak Flow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Allowable Spread (ft)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)
1	CB_97_7.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	917.80	920.00	0.00	10.00	0.02	N/A	N/A	N/A	7.00	1.10	920.08
2	CB_Ant_6	FHWA HEC-22 GENERIC	N/A	On Sag	1	947.63	952.02	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	952.09
3	CB_Bon_6	FHWA HEC-22 GENERIC	N/A	On Sag	1	969.87	973.11	0.00	10.00	3.68	N/A	N/A	N/A	7.00	17.70	973.52
4	CB_Bon_7	FHWA HEC-22 GENERIC	N/A	On Sag	1	942.30	944.31	0.00	10.00	2.12	N/A	N/A	N/A	7.00	12.18	944.61
5	CB_Hav_1	FHWA HEC-22 GENERIC	N/A	On Sag	1	1000.20	1010.00	0.00	10.00	2.00	N/A	N/A	N/A	7.00	11.67	1010.29
6	CB_Hav_2	FHWA HEC-22 GENERIC	N/A	On Sag	1	990.20	1000.00	0.00	10.00	0.04	N/A	N/A	N/A	7.00	1.18	1000.08
7	CB_Hav_3	FHWA HEC-22 GENERIC	N/A	On Sag	1	980.20	990.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	990.08
8	CB_Hen_4.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	890.43	900.70	0.00	10.00	1.68	N/A	N/A	N/A	7.00	10.36	900.97
9	CB_Locust_1.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	897.33	899.63	0.00	10.00	5.80	N/A	N/A	N/A	7.00	24.09	900.17
10	CB_Locust_1.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	896.76	900.21	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	900.29
11	CB_Locust_1.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	897.50	901.50	0.00	10.00	0.32	N/A	N/A	N/A	7.00	2.05	901.60
12	CB_Locust_2.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	900.00	903.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	903.08
13	CB_Locust_2.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	899.70	903.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	903.08
14	CB_Locust_4.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	895.60	904.50	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	904.58
15	CB_Locust_4.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	895.85	904.50	0.00	10.00	0.01	N/A	N/A	N/A	7.00	1.03	904.58
16	CB_Ton_6.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	928.04	932.67	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	932.74
17	CB_Ton_6.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	928.50	932.67	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	932.74
18	CB_Ton_6.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	927.00	932.67	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	932.74
19	CB_West_4.4	FHWA HEC-22 GENERIC	N/A	On Sag	1	900.30	907.50	0.00	10.00	0.14	N/A	N/A	N/A	7.00	1.58	907.59
20	CB_West_4.5	FHWA HEC-22 GENERIC	N/A	On Sag	1	900.30	907.50	0.00	10.00	0.13	N/A	N/A	N/A	7.00	1.53	907.59
21	CB_West_5.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	906.00	909.50	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	909.58
22	CB_West_5.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	905.50	909.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	909.08
23	CB_West_Del.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	915.00	918.50	0.00	10.00	2.72	N/A	N/A	N/A	7.00	14.41	918.85
24	CB_West_Del.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.49	920.59	0.00	10.00	1.69	N/A	N/A	N/A	7.00	10.43	920.86
25	CB_West_Del.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.71	918.21	0.00	10.00	1.59	N/A	N/A	N/A	7.00	9.98	918.47
26	CB_West_Del.4	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.23	918.16	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.96	918.24
27	CB_Whit_1/2.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	914.50	917.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	917.08
28	CB_Whit_1/2.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.00	919.00	0.00	10.00	1.32	N/A	N/A	N/A	7.00	8.79	919.23
29	CB_Whit_1/2.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	915.20	918.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	918.08
30	CB_Whit_3.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	906.00	912.00	0.00	10.00	1.27	N/A	N/A	N/A	7.00	8.54	912.23
31	CB_Whit_3.4	FHWA HEC-22 GENERIC	N/A	On Sag	1	903.73	913.50	0.00	10.00	0.93	N/A	N/A	N/A	7.00	6.91	913.70
32	CB_Whit_4.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	910.50	912.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	912.08
33	CB_Whit_6	FHWA HEC-22 GENERIC	N/A	On Sag	1	915.60	922.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	922.08
34	CB_Whit_Del.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	918.13	920.53	0.00	10.00	7.01	N/A	N/A	N/A	7.00	27.37	921.14
35	CB_Whit_Del.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	918.45	921.50	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	921.58
36	CB_Whit_Del.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	919.05	921.65	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.97	921.73
37	Inlet-60	FHWA HEC-22 GENERIC	N/A	On Sag	1	956.01	957.99	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.00	957.99
38	Inlet-61	FHWA HEC-22 GENERIC	N/A	On Sag	1	942.29	945.89	0.00	10.00	0.01	N/A	N/A	N/A	7.00	0.52	946.01
39	Inlet-62	FHWA HEC-22 GENERIC	N/A	On Sag	1	939.12	943.08	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.21	943.19

Junction Input

SN	Element ID	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Ground/Rim (Max) Offset (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Surcharge Elevation (ft)	Surcharge Depth (ft)	Ponded Area (ft²)	Minimum Pipe Cover (in)
1	CB_97_7.1	919.10	921.00	1.90	0.00	-919.10	921.00	0.00	10.00	0.00
2	CB_97_7.2	918.40	922.00	3.60	0.00	-918.40	922.00	0.00	10.00	0.00
3	CB_Hen_4.1	890.50	900.70	10.20	0.00	-890.50	900.70	0.00	10.00	0.00
4	CB_Locust_1.4	897.02	901.33	4.31	0.00	-897.02	901.33	0.00	10.00	0.00
5	CB_West_3.1	900.20	907.00	6.80	0.00	-900.20	907.00	0.00	10.00	0.00
6	CB_West_3.2	901.00	907.00	6.00	0.00	-901.00	907.00	0.00	10.00	0.00
7	CB_West_3.3	900.40	907.00	6.60	0.00	-900.40	907.00	0.00	10.00	0.00
8	CB_West_3.4	900.07	906.00	5.93	0.00	-900.07	906.00	0.00	10.00	0.00
9	CB_West_4.1	900.25	907.00	6.75	0.00	-900.25	907.00	0.00	10.00	0.00
10	CB_West_4.2	900.75	907.50	6.75	0.00	-900.75	907.50	0.00	10.00	0.00
11	CB_West_4.3	900.24	907.50	7.26	0.00	-900.24	907.50	0.00	10.00	0.00
12	CB_West_6	907.80	914.60	6.80	0.00	-907.80	914.60	0.00	240.00	0.00
13	CB_Whit_3.2	906.00	913.50	7.50	0.00	-906.00	913.50	0.00	240.00	0.00
14	CB_Whit_3.3	906.10	913.50	7.40	0.00	-906.10	913.50	0.00	240.00	0.00
15	CB_Whit_4.2	910.40	912.00	1.60	0.00	-910.40	912.00	0.00	10.00	0.00
16	CB_Whit_4.3	910.60	912.00	1.40	0.00	-910.60	912.00	0.00	10.00	0.00
17	CB_Whit_5.1	909.60	916.00	6.40	0.00	-909.60	916.00	0.00	10.00	0.00
18	CB_Whit_5.2	909.50	916.00	6.50	0.00	-909.50	916.00	0.00	10.00	0.00
19	CB_Whit_6s	915.00	919.00	4.00	0.00	-915.00	0.00	-919.00	0.00	0.00
20	CB_WhitWest_4	905.50	908.00	2.50	0.00	-905.50	908.00	0.00	10.00	0.00
21	MH_1st&97	910.47	920.00	9.53	0.00	-910.47	0.00	-920.00	0.00	0.00
22	MH_2nd&97	907.31	910.00	2.69	0.00	-907.31	910.00	0.00	100.00	0.00
23	MH_3rd&97	903.00	911.35	8.35	0.00	-903.00	0.00	-911.35	0.00	0.00
24	MH_4th&97	907.00	914.26	7.26	0.00	-907.00	914.26	0.00	100.00	0.00
25	MH_5th&97	908.80	914.44	5.64	0.00	-908.80	914.44	0.00	100.00	0.00
26	MH_6th&97	914.50	919.37	4.87	0.00	-914.50	919.37	0.00	100.00	0.00
27	MH_Bon_6	960.01	978.29	18.28	0.00	-960.01	978.29	0.00	100.00	0.00
28	MH_Hen_1	891.15	893.14	1.99	0.00	-891.15	893.14	0.00	100.00	0.00
29	MH_Hen_4	888.92	895.00	6.08	0.00	-888.92	895.00	0.00	100.00	0.00
30	MH_Locust_1.1	896.56	901.98	5.42	0.00	-896.56	901.98	0.00	100.00	0.00
31	MH_Locust_3	894.43	902.53	8.10	0.00	-894.43	902.53	0.00	100.00	0.00
32	MH_Locust_4	894.92	905.13	10.21	0.00	-894.92	905.13	0.00	100.00	0.00
33	MH_PT_9	924.71	929.23	4.52	0.00	-924.71	929.23	0.00	100.00	0.00
34	MH_RR_4	891.84	900.00	8.16	0.00	-891.84	900.00	0.00	100.00	0.00
35	MH_RRHen_4	890.04	898.00	7.96	0.00	-890.04	898.00	0.00	100.00	0.00
36	MH_West_3.1	899.27	905.00	5.73	0.00	-899.27	905.00	0.00	100.00	0.00
37	MH_West_3.2	897.80	905.00	7.20	0.00	-897.80	905.00	0.00	100.00	0.00
38	MH_West_3.3	899.96	905.00	5.04	0.00	-899.96	905.00	0.00	240.00	0.00
39	MH_West_3/4	899.48	905.00	5.52	0.00	-899.48	905.00	0.00	100.00	0.00
40	MH_West_4.1	899.50	907.46	7.96	0.00	-899.50	907.46	0.00	100.00	0.00
41	MH_West_4.2	900.50	908.00	7.50	0.00	-900.50	908.00	0.00	100.00	0.00
42	MH_West_4.3	896.14	907.71	11.57	0.00	-896.14	907.71	0.00	100.00	0.00
43	MH_West_Delish.1	913.33	919.19	5.86	0.00	-913.33	919.19	0.00	100.00	0.00
44	MH_West_Delish.2	914.79	920.00	5.21	0.00	-914.79	920.00	0.00	100.00	0.00
45	MH_Whit_3.2	905.88	909.81	3.93	0.00	-905.88	909.81	0.00	100.00	0.00
46	MH_Whit_5.1	909.50	913.99	4.49	0.00	-909.50	913.99	0.00	100.00	0.00
47	NEW 3rd Inlets	917.00	922.00	5.00	0.00	-917.00	939.00	17.00	100.00	0.00

Junction Results

SN	Element ID	Peak Inflow (cfs)	Peak Lateral Inflow (cfs)	Max HGL Elevation Attained (ft)	Max HGL Depth Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Average HGL Elevation Attained (ft)	Average HGL Depth Attained (ft)	Time of Max HGL Occurrence (days hh:mm)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	CB_97_7.1	3.78	3.78	926.89	7.79	5.89	0.00	919.69	0.59	0 12:01	0 11:58	0.03	16.00
2	CB_97_7.2	7.97	4.48	926.33	7.93	4.33	0.00	919.16	0.76	0 12:01	0 11:58	0.04	13.00
3	CB_Hen_4.1	5.24	5.24	892.85	2.35	0.00	7.85	890.85	0.35	0 12:04	0 00:00	0.00	0.00
4	CB_Locust_1.4	4.14	0.89	897.65	0.63	0.00	3.68	897.23	0.21	0 12:00	0 00:00	0.00	0.00
5	CB_West_3.1	5.28	5.28	909.92	9.72	2.92	0.00	901.72	1.52	0 12:05	0 12:00	0.02	12.00
6	CB_West_3.2	13.26	8.74	909.98	8.98	2.98	0.00	902.86	1.86	0 12:05	0 11:59	0.03	12.00
7	CB_West_3.3	5.79	5.79	910.66	10.26	3.66	0.00	903.36	2.96	0 12:05	0 11:59	0.02	13.00
8	CB_West_3.4	0.65	0.65	907.55	7.48	1.55	0.00	900.73	0.66	0 12:06	0 12:01	0.01	10.00
9	CB_West_4.1	0.32	0.00	908.17	7.92	1.17	0.00	901.03	0.78	0 12:06	0 12:01	0.01	9.00
10	CB_West_4.2	0.93	0.93	909.53	8.78	2.03	0.00	901.51	0.76	0 12:06	0 11:58	0.01	12.00
11	CB_West_4.3	2.24	0.49	908.18	7.94	0.68	0.00	901.04	0.80	0 12:06	0 11:58	0.02	10.00
12	CB_West_6	8.21	8.21	924.89	17.09	10.29	0.00	910.21	2.41	0 12:09	0 12:00	0.70	39.00
13	CB_Whit_3.2	8.00	4.98	909.64	3.64	0.00	3.86	906.59	0.59	0 12:05	0 00:00	0.00	0.00
14	CB_Whit_3.3	3.03	3.03	910.20	4.10	0.00	3.30	907.25	1.15	0 12:05	0 00:00	0.00	0.00
15	CB_Whit_4.2	7.88	7.88	911.92	1.52	0.00	0.08	910.70	0.30	0 12:00	0 00:00	0.00	0.00
16	CB_Whit_4.3	12.81	12.81	912.43	1.83	0.08	0.00	910.95	0.35	0 12:00	0 11:59	0.00	1.00
17	CB_Whit_5.1	1.03	1.03	911.37	1.77	0.00	4.63	910.16	0.56	0 12:05	0 00:00	0.00	0.00
18	CB_Whit_5.2	4.32	4.32	911.54	2.04	0.00	4.46	910.23	0.73	0 12:05	0 00:00	0.00	0.00
19	CB_Whit_6s	2.35	2.35	916.24	1.24	0.00	2.76	915.50	0.50	0 12:05	0 00:00	0.00	0.00
20	CB_WhitWest_4	0.78	0.00	908.23	2.73	0.23	0.00	905.62	0.12	0 12:06	0 12:01	0.01	8.00
21	MH_1st&97	13.02	13.02	920.00	9.53	0.00	0.00	910.85	0.38	0 11:58	0 11:58	0.00	0.00
22	MH_2nd&97	16.25	3.23	910.05	2.74	0.05	0.00	907.65	0.34	0 12:03	0 12:03	0.00	2.00
23	MH_3rd&97	61.45	0.00	911.35	8.35	0.00	0.00	904.08	1.08	0 12:01	0 12:01	0.01	0.00
24	MH_4th&97	38.72	3.74	910.11	3.11	0.00	4.15	907.46	0.46	0 12:05	0 00:00	0.00	0.00
25	MH_5th&97	15.39	0.00	911.33	2.53	0.00	3.11	909.96	1.16	0 12:05	0 00:00	0.00	0.00
26	MH_6th&97	7.17	3.25	915.76	1.26	0.00	3.61	915.18	0.68	0 12:01	0 00:00	0.00	0.00
27	MH_Bon_6	7.64	4.14	960.59	0.59	0.00	17.69	960.17	0.17	0 12:00	0 00:00	0.00	0.00
28	MH_Hen_1	4.12	0.00	891.77	0.62	0.00	1.37	891.36	0.21	0 12:01	0 00:00	0.00	0.00
29	MH_Hen_4	7.70	0.00	890.27	1.35	0.00	4.73	889.26	0.34	0 12:05	0 00:00	0.00	0.00
30	MH_Locust_1.1	3.01	1.01	898.03	1.47	0.00	3.95	897.33	0.77	0 12:00	0 00:00	0.00	0.00
31	MH_Locust_3	111.12	0.00	902.53	8.10	0.00	0.00	895.58	1.15	0 11:57	0 11:57	0.00	0.00
32	MH_Locust_4	1.17	0.93	895.25	0.33	0.00	9.88	895.02	0.10	0 12:01	0 00:00	0.00	0.00
33	MH_PT_9	1.78	1.78	925.10	0.39	0.00	4.13	924.86	0.15	0 12:05	0 00:00	0.00	0.00
34	MH_RR_4	1.16	0.00	892.16	0.32	0.00	7.84	891.93	0.09	0 12:02	0 00:00	0.00	0.00
35	MH_RRHen_4	7.70	0.00	891.07	1.03	0.00	6.93	890.30	0.26	0 12:04	0 00:00	0.00	0.00
36	MH_West_3.1	59.67	0.00	907.09	7.82	2.09	0.00	900.28	1.01	0 12:06	0 12:01	0.11	11.00
37	MH_West_3.2	112.53	2.77	905.96	8.16	0.96	0.00	898.88	1.08	0 12:06	0 11:58	0.19	9.00
38	MH_West_3.3	26.73	0.00	908.54	8.58	3.54	0.00	900.87	0.91	0 12:06	0 11:58	0.42	14.00
39	MH_West_3/4	35.87	0.00	907.55	8.07	2.55	0.00	900.57	1.09	0 12:06	0 11:58	0.21	13.00
40	MH_West_4.1	35.24	7.05	908.15	8.65	0.69	0.00	901.00	1.50	0 12:06	0 12:04	0.08	7.00
41	MH_West_4.2	4.50	3.81	909.39	8.89	1.39	0.00	901.35	0.85	0 12:06	0 12:02	0.04	10.00
42	MH_West_4.3	0.27	0.00	896.37	0.23	0.00	11.34	896.21	0.07	0 12:01	0 00:00	0.00	0.00
43	MH_West_Delish.1	4.36	0.00	919.19	5.86	0.00	0.00	913.78	0.45	0 11:58	0 00:00	0.00	0.00
44	MH_West_Delish.2	4.77	0.00	919.25	4.46	0.00	0.75	915.09	0.30	0 11:59	0 00:00	0.00	0.00
45	MH_Whit_3.2	10.36	0.00	909.14	3.26	0.00	0.68	906.19	0.31	0 12:05	0 00:00	0.00	0.00
46	MH_Whit_5.1	10.43	3.33	911.89	2.39	0.00	2.10	910.26	0.76	0 12:05	0 00:00	0.00	0.00
47	NEW 3rd Inlets	33.20	33.20	918.38	1.38	0.00	3.62	917.32	0.32	0 12:01	0 00:00	0.00	0.00

Channel Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Shape	Height (ft)	Width (ft)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate
1	Link-136	285.00	956.01	0.00	942.29	0.00	13.72	4.8100	Trapezoidal	3.000	5.000	0.0320	0.5000	0.5000	0.0000	0.00	No
2	Link-138	318.00	939.12	0.00	923.00	0.00	16.12	5.0700	Trapezoidal	3.000	5.020	0.0320	0.5000	0.5000	0.0000	0.00	No

Channel Results

SN	Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Froude Number	Reported Condition
1	Link-136	7.57	0 12:01	97.53	0.08	6.02	0.79	0.80	0.27	0.00		
2	Link-138	9.23	0 12:02	100.50	0.09	6.19	0.86	0.91	0.31	0.00		

Pipe Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Pipe Shape	Pipe Diameter or Height (in)	Pipe Width (in)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate	No. of Barrels
1	Link-102	24.00	919.10	0.00	918.40	0.00	0.70	2.9200	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
2	Link-103	100.00	918.40	0.00	917.80	0.00	0.60	0.6000	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
3	Link-135	117.16	960.01	0.00	956.01	0.00	4.00	3.4100	CIRCULAR	30.000	30.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
4	Link-137	66.96	942.29	0.00	939.12	0.00	3.17	4.7300	CIRCULAR	24.000	24.000	0.0250	0.5000	0.5000	0.0000	0.00	No	1
5	Link-139	33.71	942.30	0.00	939.12	0.00	3.18	9.4300	CIRCULAR	6.000	6.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
6	Link-14	49.74	969.87	0.00	969.51	9.50	0.36	0.7200	CIRCULAR	9.960	9.960	0.0130	0.5000	0.5000	0.0000	0.00	No	1
7	Link-141	40.78	980.20	0.00	980.00	0.00	0.20	0.4900	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
8	Link-142	41.71	990.20	0.00	990.00	0.00	0.20	0.4800	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
9	Link-143	40.63	1000.20	0.00	1000.00	0.00	0.20	0.4900	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
10	Link-144	530.00	913.33	0.00	900.00	0.00	13.33	2.5200	CIRCULAR	12.000	12.000	0.0240	0.5000	0.5000	0.0000	0.00	No	1
11	Link-146	316.01	910.47	0.00	907.31	0.00	3.16	1.0000	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
12	Link-147	367.78	907.31	0.00	903.63	0.63	3.68	1.0000	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
13	Link-148	340.00	924.74	0.03	915.06	0.56	9.68	2.8500	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
14	Link-149	11.00	909.89	0.39	909.70	0.90	0.19	1.7400	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
15	Link-15	330.00	947.63	0.00	928.14	0.10	19.49	5.9100	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
16	Link-150	350.00	909.60	0.80	907.46	0.46	2.14	0.6100	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
17	Link-159	200.00	917.00	0.00	903.73	0.73	13.27	6.6300	CIRCULAR	21.000	21.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
18	Link-160	30.00	917.80	0.00	917.00	0.00	0.80	2.6700	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
19	Link-161	56.00	915.30	0.30	914.95	0.45	0.35	0.6200	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
20	Link-162	389.96	907.00	0.00	901.00	1.50	6.00	1.5400	CIRCULAR	27.000	27.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
21	Link-163	320.65	897.80	0.00	894.47	0.04	3.33	1.0400	CIRCULAR	42.000	42.000	0.0100	0.5000	0.5000	0.0000	0.00	No	1
22	Link-164	393.00	907.36	0.36	904.73	1.73	2.63	0.6700	CIRCULAR	24.000	24.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
23	Link-165	43.11	916.23	0.00	915.00	0.00	1.23	2.8600	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
24	Link-17	52.00	927.94	-0.10	924.74	0.03	3.20	6.1500	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
25	Link-20	327.00	914.95	0.45	910.37	0.87	4.58	1.4000	CIRCULAR	18.000	18.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
26	Link-23	45.45	927.00	0.00	924.72	0.01	2.28	5.0200	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
27	Link-24	70.74	928.50	0.00	924.72	0.01	3.78	5.3400	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
28	Link-28	53.94	910.00	0.40	909.70	0.90	0.30	0.5600	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
29	Link-29	47.12	910.00	0.50	909.60	0.80	0.40	0.8500	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
30	Link-30	46.46	915.60	0.00	915.00	0.50	0.60	1.2900	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
31	Link-31	53.92	910.50	0.00	910.10	3.10	0.40	0.7400	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
32	Link-32	62.67	910.60	0.00	910.10	3.10	0.50	0.8000	CIRCULAR	21.000	21.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
33	Link-33	44.48	910.40	0.00	910.10	3.10	0.30	0.6700	CIRCULAR	18.000	18.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
34	Link-35	30.00	908.50	4.77	908.00	2.12	0.50	1.6700	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
35	Link-36	66.20	907.00	0.90	906.50	0.50	0.50	0.7600	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
36	Link-37	75.45	906.20	0.20	905.88	0.00	0.32	0.4200	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
37	Link-38	65.45	906.00	0.00	905.88	0.00	0.12	0.1800	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
38	Link-39	370.00	903.53	0.53	898.64	0.84	4.89	1.3200	CIRCULAR	30.000	30.000	0.0150	0.5000	0.5000	0.0000	0.00	No	2
39	Link-40	300.00	905.88	0.00	900.06	0.10	5.82	1.9400	CIRCULAR	24.000	24.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
40	Link-41	29.00	899.96	0.00	899.37	0.10	0.59	2.0300	CIRCULAR	24.000	24.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
41	Link-43	38.54	901.00	0.80	900.06	0.10	0.94	2.4400	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
42	Link-44	45.82	903.00	2.60	902.30	1.30	0.70	1.5300	CIRCULAR	15.000	15.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
43	Link-45	51.64	902.20	1.20	901.00	1.04	1.20	2.3200	CIRCULAR	18.000	18.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
44	Link-46	47.28	900.50	0.00	899.99	0.49	0.51	1.0900	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
45	Link-47	42.10	900.25	0.00	899.94	0.44	0.31	0.7500	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
46	Link-49	39.85	900.24	0.00	899.94	0.44	0.30	0.7600	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
47	Link-51	184.87	905.50	0.00	903.30	3.06	2.20	1.1900	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
48	Link-52	34.65	900.75	0.00	900.50	0.00	0.25	0.7200	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
49	Link-54	58.00	919.48	1.03	919.05	0.00	0.43	0.7400	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
50	Link-55	65.00	918.45	0.00	918.13	0.00	0.32	0.4900	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
51	Link-56	150.00	918.13	0.00	916.23	0.00	1.90	1.2700	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
52	Link-57	30.00	917.20	0.48	916.36	0.13	0.83	2.7700	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
53	Link-59	61.00	917.06	0.35	916.42	-0.07	0.64	1.0500	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
54	Link-60	37.96	900.30	0.00	900.00	3.86	0.30	0.7900	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
55	Link-61	36.00	900.30	0.00	900.00	3.86	0.30	0.8300	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
56	Link-62	33.71	895.85	0.00	895.60	0.00	0.25	0.7400	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
57	Link-63	94.76	895.60	0.00	894.92	0.00	0.68	0.7200	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
58	Link-64	245.00	896.14	0.00	894.95	0.03	1.19	0.4900	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
59	Link-65	232.00	894.92	0.00	891.84	0.00	3.08	1.3300	CIRCULAR	20.040	20.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
60	Link-66	135.00	891.84	0.00	890.04	0.00	1.80	1.3300	CIRCULAR	20.040	20.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
61	Link-67	84.00	890.04	0.00	888.92	0.00	1.12	1.3300	CIRCULAR	20.040	20.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
62	Link-68	37.62	890.50	0.00	890.04	0.00	0.46	1.2200	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
63	Link-69	33.93	890.43	0.00	890.04	0.00	0.39	1.1500	CIRCULAR	9.960	9.960	0.0150	0.5000	0.5000	0.0000	0.00	No	1
64	Link-70	100.00	899.48	0.00	899.27	0.00	0.21	0.2100	CIRCULAR	36.000	36.000	0.0100	0.5000	0.5000	0.0000	0.00	No	1
65	Link-71	220.00	899.94	0.44	899.48	0.00	0.46	0.2100	CIRCULAR	36.000	36.000	0.0100	0.5000	0.5000	0.0000	0.00	No	1
66	Link-72	18.87	900.07	0.00	899.48	0.00	0.59	3.1300	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
67	Link-73	58.43	906.00	0.00	905.50	0.00	0.50	0.8600	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
68	Link-74	60.00	907.80	0.00	907.50	0.00	0.30	0.5000	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
69	Link-76	630.00	894.43	0.00	891.45	0.00	2.98	0.4700	CIRCULAR	42.000	42.000	0.0100	0.5000	0.5000	0.0000	0.00	No	1
70	Link-77	226.22	888.92	0.00	888.00	0.00	0.92	0.4100	CIRCULAR	21.960	21.960	0.0150	0.5000	0.5000	0.0000	0.00	No	1
71	Link-78	41.32	900.00	0.00	899.70	0.00	0.30	0.7300	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
72	Link-81	78.00	916.56	0.07	914.79	0.00	1.77	2.2700	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
73	Link-82	64.00	914.79	0.00	913.33	0.00	1.46	2.2800	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
74	Link-83	38.64	915.00	0.00	914.79	0.00	0.21	0.5400	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
75	Link-84	32.44	899.27	0.00	898.77	0.97	0.50	1.5400	CIRCULAR	36.000	36.000	0.0100	0.5000	0.5000	0.0000	0.00	No	1
76	Link-85	27.00	897.33	0.00	897.22	0.46	0.11	0.4100	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
77	Link-87	82.00	896.76	0.00	896.56	0.00	0.20	0.2400	CIRCULAR	14.040	14.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
78	Link-88	39.36	897.50	0.00	897.02	0.00	0.48	1.2100	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
79	Link-95	205.00	891.15	0.00	887.15	0.00	4.00	1.9500	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
80	Link-96	87.00	897.02	0.00	896.62	0.06	0.40	0.4600	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
81	Link-97	350.00	897.02	0.00	891.15	0.00	5.87	1.6800	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1

Pipe Results

SN	Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Froude Number	Reported Condition
		(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)		
1	Link-102	3.58	0 12:01	6.08	0.59	4.56	0.09	1.00	1.00	18.00		SURCHARGED
2	Link-103	7.80	0 12:01	2.76	2.83	9.93	0.17	1.00	1.00	15.00		SURCHARGED
3	Link-135	7.64	0 12:00	65.64	0.12	6.55	0.30	0.71	0.29	0.00		Calculated
4	Link-137	7.55	0 12:01	25.60	0.30	5.93	0.19	0.84	0.43	0.00		Calculated
5	Link-139	1.73	0 11:57	1.72	1.00	8.81	0.06	0.50	1.00	11.00		SURCHARGED
6	Link-14	3.71	0 11:59	1.86	1.99	6.85	0.12	0.81	0.98	0.00		> CAPACITY
7	Link-141	0.00	0 00:00	6.38	0.00	0.00		0.00	0.00	0.00		Calculated
8	Link-142	0.03	0 15:30	6.30	0.01	0.60	1.16	0.25	0.17	0.00		Calculated
9	Link-143	1.54	0 12:13	6.39	0.24	0.87	0.78	1.50	1.00	61.00		SURCHARGED
10	Link-144	3.37	0 12:01	3.06	1.10	4.42	2.00	1.00	1.00	15.00		SURCHARGED
11	Link-146	13.02	0 12:00	11.38	1.14	7.72	0.68	1.50	1.00	5.00		SURCHARGED
12	Link-147	16.64	0 12:00	24.51	0.68	6.74	0.91	2.00	1.00	4.00		SURCHARGED
13	Link-148	1.78	0 12:05	6.51	0.27	4.69	1.21	0.52	0.53	0.00		Calculated
14	Link-149	10.46	0 12:02	15.00	0.70	6.00	0.03	1.50	1.00	3.00		SURCHARGED
15	Link-15	0.00	0 00:00	2.94	0.00	0.00		0.00	0.00	0.00		Calculated
16	Link-150	15.75	0 12:02	19.16	0.82	6.23	0.94	1.84	0.93	0.00		Calculated
17	Link-159	33.04	0 12:00	44.22	0.75	16.83	0.20	1.53	0.89	0.00		Calculated
18	Link-160	6.40	0 12:02	5.82	1.10	8.15	0.06	1.00	1.00	10.00		SURCHARGED
19	Link-161	2.35	0 12:05	2.44	0.96	3.24	0.29	0.87	0.87	0.00		Calculated
20	Link-162	24.91	0 11:58	41.62	0.60	9.04	0.72	2.25	1.00	6.00		SURCHARGED
21	Link-163	111.12	0 12:06	133.29	0.83	11.55	0.46	3.50	1.00	14.00		SURCHARGED
22	Link-164	14.21	0 12:01	16.04	0.89	5.22	1.25	2.00	1.00	6.00		SURCHARGED
23	Link-165	2.91	0 12:01	5.22	0.56	6.12	0.12	0.56	0.58	0.00		Calculated
24	Link-17	0.00	0 00:00	3.04	0.00	0.00		0.18	0.27	0.00		Calculated
25	Link-20	7.12	0 12:01	12.43	0.57	6.01	0.91	1.13	0.76	0.00		Calculated
26	Link-23	0.00	0 00:00	2.71	0.00	0.00		0.19	0.28	0.00		Calculated
27	Link-24	0.00	0 00:00	2.79	0.00	0.00		0.19	0.28	0.00		Calculated
28	Link-28	1.04	0 12:00	2.88	0.36	1.32	0.68	1.00	1.00	9.00		SURCHARGED
29	Link-29	4.32	0 12:00	6.45	0.67	3.52	0.22	1.25	1.00	8.00		SURCHARGED
30	Link-30	0.02	0 11:57	1.37	0.02	0.12	6.45	0.41	0.62	0.00		Calculated
31	Link-31	0.00	0 00:00	1.04	0.00	0.00		0.00	0.01	0.00		Calculated
32	Link-32	12.74	0 12:00	14.15	0.90	5.73	0.18	1.52	0.87	0.00		Calculated
33	Link-33	7.87	0 12:00	8.63	0.91	4.86	0.15	1.29	0.86	0.00		Calculated
34	Link-35	0.93	0 12:00	1.56	0.60	4.17	0.12	0.67	1.00	2.00		SURCHARGED
35	Link-36	3.02	0 12:00	3.10	0.98	3.85	0.29	1.00	1.00	11.00		SURCHARGED
36	Link-37	8.06	0 12:00	7.40	1.09	5.63	0.22	1.50	1.00	9.00		SURCHARGED
37	Link-38	1.77	0 12:01	1.65	1.07	2.25	0.48	1.00	1.00	10.00		SURCHARGED
38	Link-39	56.40	0 12:03	81.73	0.69	6.76	0.91	2.50	1.00	10.00		SURCHARGED
39	Link-40	9.12	0 11:59	27.31	0.33	3.89	1.29	2.00	1.00	7.00		SURCHARGED
40	Link-41	30.74	0 12:12	27.97	1.10	9.79	0.05	2.00	1.00	19.00		SURCHARGED
41	Link-43	5.17	0 12:05	5.56	0.93	6.58	0.10	1.00	1.00	21.00		SURCHARGED
42	Link-44	5.68	0 12:05	7.98	0.71	5.26	0.15	1.25	1.00	15.00		SURCHARGED
43	Link-45	12.93	0 12:01	16.01	0.81	7.46	0.12	1.50	1.00	15.00		SURCHARGED
44	Link-46	4.81	0 12:09	3.22	1.49	6.12	0.13	1.00	1.00	29.00		SURCHARGED
45	Link-47	0.67	0 11:58	1.04	0.65	1.93	0.36	0.67	1.00	46.00		SURCHARGED
46	Link-49	1.79	0 11:58	1.06	1.70	5.13	0.13	0.67	1.00	47.00		SURCHARGED
47	Link-51	0.83	0 12:11	1.32	0.63	2.80	1.10	0.67	1.00	8.00		SURCHARGED
48	Link-52	1.34	0 11:58	1.03	1.31	3.85	0.15	0.67	1.00	31.00		SURCHARGED
49	Link-54	0.52	0 12:05	0.90	0.57	2.62	0.37	0.67	1.00	29.00		SURCHARGED
50	Link-55	0.45	0 11:45	0.73	0.61	1.28	0.85	0.67	1.00	35.00		SURCHARGED
51	Link-56	1.62	0 12:01	1.18	1.38	4.93	0.51	0.63	0.97	0.00		> CAPACITY
52	Link-57	1.29	0 12:01	1.74	0.74	4.52	0.11	0.46	0.76	0.00		Calculated
53	Link-59	0.80	0 11:59	1.01	0.79	2.79	0.36	0.62	0.98	0.00		Calculated
54	Link-60	0.14	0 12:00	1.07	0.13	2.04	0.31	0.17	0.25	0.00		Calculated
55	Link-61	0.12	0 12:00	1.10	0.11	2.01	0.30	0.15	0.23	0.00		Calculated
56	Link-62	0.01	0 15:17	0.90	0.01	0.87	0.65	0.05	0.07	0.00		Calculated
57	Link-63	0.01	0 16:57	1.02	0.01	0.83	1.90	0.16	0.25	0.00		Calculated
58	Link-64	0.26	0 12:01	2.15	0.12	1.53	2.67	0.26	0.27	0.00		Calculated
59	Link-65	1.16	0 12:01	13.89	0.08	3.83	1.01	0.32	0.20	0.00		Calculated
60	Link-66	1.15	0 12:02	13.92	0.08	1.38	1.63	0.67	0.41	0.00		Calculated
61	Link-67	7.70	0 12:04	13.92	0.55	4.68	0.30	1.19	0.71	0.00		Calculated
62	Link-68	5.24	0 12:05	3.41	1.54	6.68	0.09	1.00	1.00	6.00		SURCHARGED
63	Link-69	1.68	0 12:00	2.04	0.82	3.08	0.18	0.83	1.00	7.00		SURCHARGED
64	Link-70	34.37	0 11:58	39.73	0.87	4.86	0.34	3.00	1.00	14.00		SURCHARGED
65	Link-71	35.24	0 12:00	39.48	0.89	4.99	0.73	3.00	1.00	15.00		SURCHARGED
66	Link-72	1.45	0 11:58	16.10	0.09	0.82	0.38	1.50	1.00	21.00		SURCHARGED
67	Link-73	0.00	0 00:00	0.97	0.00	0.00		0.00	0.00	0.00		Calculated
68	Link-74	4.98	0 12:09	0.74	6.72	14.27	0.07	0.67	1.00	0.00		SURCHARGED
69	Link-76	111.12	0 12:06	89.89	1.24	11.55	0.91	3.50	1.00	14.00		SURCHARGED
70	Link-77	7.69	0 12:05	9.91	0.78	3.91	0.96	1.28	0.70	0.00		Calculated
71	Link-78	0.00	0 00:00	0.89	0.00	0.00		0.00	0.00	0.00		Calculated
72	Link-81	2.31	0 11:59	13.73	0.17	4.13	0.31	1.25	0.87	0.00		Calculated
73	Link-82	4.36	0 11:58	13.73	0.32	4.23	0.25	1.50	1.00	10.00		SURCHARGED
74	Link-83	2.50	0 11:59	0.89	2.81	7.17	0.09	0.67	1.00	12.00		SURCHARGED
75	Link-84	61.17	0 12:10	107.65	0.57	9.55	0.06	3.00	1.00	14.00		SURCHARGED
76	Link-85	2.03	0 12:13	0.67	3.03	5.81	0.08	0.67	1.00	27.00		SURCHARGED
77	Link-87	2.03	0 12:13	2.30	0.88	1.90	0.72	1.17	1.00	26.00		SURCHARGED
78	Link-88	0.31	0 12:00	1.15	0.27	1.31	0.50	0.43	0.65	0.00		Calculated
79	Link-95	4.10	0 12:01	12.72	0.32	6.20	0.55	0.59	0.40	0.00		Calculated
80	Link-96	2.95	0 12:00	6.17	0.48	2.31	0.63	1.02	0.68	0.00		Calculated
81	Link-97	4.12	0 12:00	11.79	0.35	5.95	0.98	0.62	0.41	0.00		Calculated

Inlet Input

SN	Element ID	Inlet Manufacturer	Manufacturer Part Number	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Inlet Depth (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Ponded Area (ft²)	Grate Clogging Factor (%)
1	CB_97_7.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	917.80	920.00	2.20	0.00	0.00	10.00	0.00
2	CB_Ant_6	FHWA HEC-22 GENERIC	N/A	On Sag	1	947.63	952.02	4.39	0.00	0.00	10.00	0.00
3	CB_Bon_6	FHWA HEC-22 GENERIC	N/A	On Sag	1	969.87	973.11	3.24	0.00	0.00	10.00	0.00
4	CB_Bon_7	FHWA HEC-22 GENERIC	N/A	On Sag	1	942.30	944.31	2.01	0.00	0.00	10.00	0.00
5	CB_Hav_1	FHWA HEC-22 GENERIC	N/A	On Sag	1	1000.20	1010.00	9.80	0.00	0.00	10.00	0.00
6	CB_Hav_2	FHWA HEC-22 GENERIC	N/A	On Sag	1	990.20	1000.00	9.80	0.00	0.00	10.00	0.00
7	CB_Hav_3	FHWA HEC-22 GENERIC	N/A	On Sag	1	980.20	990.00	9.80	0.00	0.00	10.00	0.00
8	CB_Hen_4.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	890.43	900.70	10.27	0.00	0.00	10.00	0.00
9	CB_Locust_1.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	897.33	899.63	2.30	0.00	0.00	10.00	0.00
10	CB_Locust_1.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	896.76	900.21	3.45	0.00	0.00	10.00	0.00
11	CB_Locust_1.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	897.50	901.50	4.00	0.00	0.00	10.00	0.00
12	CB_Locust_2.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	900.00	903.00	3.00	0.00	0.00	10.00	0.00
13	CB_Locust_2.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	899.70	903.00	3.30	0.00	0.00	10.00	0.00
14	CB_Locust_4.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	895.60	904.50	8.90	0.00	0.00	10.00	0.00
15	CB_Locust_4.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	895.85	904.50	8.65	0.00	0.00	10.00	0.00
16	CB_Ton_6.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	928.04	932.67	4.63	0.00	0.00	10.00	0.00
17	CB_Ton_6.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	928.50	932.67	4.17	0.00	0.00	10.00	0.00
18	CB_Ton_6.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	927.00	932.67	5.67	0.00	0.00	10.00	0.00
19	CB_West_4.4	FHWA HEC-22 GENERIC	N/A	On Sag	1	900.30	907.50	7.20	0.00	0.00	10.00	0.00
20	CB_West_4.5	FHWA HEC-22 GENERIC	N/A	On Sag	1	900.30	907.50	7.20	0.00	0.00	10.00	0.00
21	CB_West_5.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	906.00	909.50	3.50	0.00	0.00	10.00	0.00
22	CB_West_5.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	905.50	909.00	3.50	0.00	0.00	10.00	0.00
23	CB_West_Del.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	915.00	918.50	3.50	0.00	0.00	10.00	0.00
24	CB_West_Del.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.49	920.59	4.10	0.00	0.00	10.00	0.00
25	CB_West_Del.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.71	918.21	1.50	0.00	0.00	10.00	0.00
26	CB_West_Del.4	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.23	918.16	1.93	0.00	0.00	10.00	0.00
27	CB_Whit_1/2.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	914.50	917.00	2.50	0.00	0.00	10.00	0.00
28	CB_Whit_1/2.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.00	919.00	3.00	0.00	0.00	10.00	0.00
29	CB_Whit_1/2.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	915.20	918.00	2.80	0.00	0.00	10.00	0.00
30	CB_Whit_3.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	906.00	912.00	6.00	0.00	0.00	10.00	0.00
31	CB_Whit_3.4	FHWA HEC-22 GENERIC	N/A	On Sag	1	903.73	913.50	9.77	0.00	0.00	10.00	0.00
32	CB_Whit_4.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	910.50	912.00	1.50	0.00	0.00	10.00	0.00
33	CB_Whit_6	FHWA HEC-22 GENERIC	N/A	On Sag	1	915.60	922.00	6.40	0.00	0.00	10.00	0.00
34	CB_Whit_Del.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	918.13	920.53	2.40	0.00	0.00	10.00	0.00
35	CB_Whit_Del.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	918.45	921.50	3.05	0.00	0.00	10.00	0.00
36	CB_Whit_Del.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	919.05	921.65	2.60	0.00	0.00	10.00	0.00
37	Inlet-60	FHWA HEC-22 GENERIC	N/A	On Sag	1	956.01	957.99	1.98	0.00	0.00	10.00	0.00
38	Inlet-61	FHWA HEC-22 GENERIC	N/A	On Sag	1	942.29	945.89	3.60	0.00	0.00	10.00	0.00
39	Inlet-62	FHWA HEC-22 GENERIC	N/A	On Sag	1	939.12	943.08	3.96	0.00	0.00	10.00	0.00

Roadway & Gutter Input

SN	Element ID	Roadway Longitudinal Slope (ft/ft)	Roadway Cross Slope (ft/ft)	Roadway Manning's Roughness	Gutter Cross Slope (ft/ft)	Gutter Width (ft)	Gutter Depression (in)	Allowable Spread (ft)
1	CB_97_7.3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
2	CB_Ant_6	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
3	CB_Bon_6	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
4	CB_Bon_7	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
5	CB_Hav_1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
6	CB_Hav_2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
7	CB_Hav_3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
8	CB_Hen_4.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
9	CB_Locust_1.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
10	CB_Locust_1.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
11	CB_Locust_1.3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
12	CB_Locust_2.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
13	CB_Locust_2.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
14	CB_Locust_4.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
15	CB_Locust_4.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
16	CB_Ton_6.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
17	CB_Ton_6.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
18	CB_Ton_6.3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
19	CB_West_4.4	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
20	CB_West_4.5	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
21	CB_West_5.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
22	CB_West_5.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
23	CB_West_Del.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
24	CB_West_Del.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
25	CB_West_Del.3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
26	CB_West_Del.4	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
27	CB_Whit_1/2.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
28	CB_Whit_1/2.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
29	CB_Whit_1/2.3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
30	CB_Whit_3.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
31	CB_Whit_3.4	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
32	CB_Whit_4.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
33	CB_Whit_6	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
34	CB_Whit_Del.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
35	CB_Whit_Del.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
36	CB_Whit_Del.3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
37	Inlet-60	N/A	0.0200	0.0160	0.0620	2.00	0.0656	7.00
38	Inlet-61	N/A	0.0200	0.0160	0.0620	2.00	0.0656	7.00
39	Inlet-62	N/A	0.0200	0.0160	0.0620	2.00	0.0656	7.00

Inlet Results

SN	Element ID	Peak Flow (cfs)	Peak Lateral Inflow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)	Max Gutter Water Depth during Peak Flow (ft)	Time of Max Depth Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	CB_97_7.3	0.02	0.02	N/A	N/A	N/A	1.10	920.08	0.08	0 11:58	0.12	8.00
2	CB_Ant_6	0.00	0.00	N/A	N/A	N/A	0.92	952.09	0.08	0 00:00	0.00	0.00
3	CB_Bon_6	3.68	3.68	N/A	N/A	N/A	17.70	973.52	0.41	0 11:58	0.00	0.00
4	CB_Bon_7	2.12	2.12	N/A	N/A	N/A	12.18	944.61	0.30	0 11:57	0.03	8.00
5	CB_Hav_1	2.00	2.00	N/A	N/A	N/A	11.67	1010.29	0.29	0 11:55	0.13	13.00
6	CB_Hav_2	0.04	0.04	N/A	N/A	N/A	1.18	1000.08	0.08	0 15:30	0.00	0.00
7	CB_Hav_3	0.00	0.00	N/A	N/A	N/A	0.92	990.08	0.08	0 00:00	0.00	0.00
8	CB_Hen_4.2	1.68	1.68	N/A	N/A	N/A	10.36	900.97	0.27	0 12:00	0.00	0.00
9	CB_Locust_1.1	5.80	5.80	N/A	N/A	N/A	24.09	900.17	0.54	0 11:50	0.82	23.00
10	CB_Locust_1.2	0.00	0.00	N/A	N/A	N/A	0.92	900.29	0.08	0 12:00	0.00	0.00
11	CB_Locust_1.3	0.32	0.32	N/A	N/A	N/A	2.05	901.60	0.10	0 12:00	0.00	0.00
12	CB_Locust_2.1	0.00	0.00	N/A	N/A	N/A	0.92	903.08	0.08	0 00:00	0.00	0.00
13	CB_Locust_2.2	0.00	0.00	N/A	N/A	N/A	0.92	903.08	0.08	0 00:00	0.00	0.00
14	CB_Locust_4.1	0.00	0.00	N/A	N/A	N/A	0.92	904.58	0.08	0 16:57	0.00	0.00
15	CB_Locust_4.2	0.01	0.01	N/A	N/A	N/A	1.03	904.58	0.08	0 15:16	0.00	0.00
16	CB_Ton_6.1	0.00	0.00	N/A	N/A	N/A	0.92	932.74	0.08	0 00:00	0.00	0.00
17	CB_Ton_6.2	0.00	0.00	N/A	N/A	N/A	0.92	932.74	0.08	0 00:00	0.00	0.00
18	CB_Ton_6.3	0.00	0.00	N/A	N/A	N/A	0.92	932.74	0.08	0 00:00	0.00	0.00
19	CB_West_4.4	0.14	0.14	N/A	N/A	N/A	1.58	907.59	0.09	0 12:00	0.00	0.00
20	CB_West_4.5	0.13	0.13	N/A	N/A	N/A	1.53	907.59	0.09	0 12:00	0.00	0.00
21	CB_West_5.1	0.00	0.00	N/A	N/A	N/A	0.92	909.58	0.08	0 00:00	0.00	0.00
22	CB_West_5.2	0.00	0.00	N/A	N/A	N/A	0.92	909.08	0.08	0 00:00	0.00	0.00
23	CB_West_Del.1	2.72	2.72	N/A	N/A	N/A	14.41	918.85	0.35	0 11:58	0.10	9.00
24	CB_West_Del.2	1.69	1.69	N/A	N/A	N/A	10.43	920.86	0.27	0 12:01	0.00	0.00
25	CB_West_Del.3	1.59	1.59	N/A	N/A	N/A	9.98	918.47	0.26	0 12:01	0.00	0.00
26	CB_West_Del.4	0.00	0.00	N/A	N/A	N/A	0.96	918.24	0.08	0 12:01	0.00	0.00
27	CB_Whit_1/2.1	0.00	0.00	N/A	N/A	N/A	0.92	917.08	0.08	0 00:00	0.00	0.00
28	CB_Whit_1/2.2	1.32	1.32	N/A	N/A	N/A	8.79	919.23	0.23	0 08:35	0.00	0.00
29	CB_Whit_1/2.3	0.00	0.00	N/A	N/A	N/A	0.92	918.08	0.08	0 00:00	0.00	0.00
30	CB_Whit_3.1	1.27	1.27	N/A	N/A	N/A	8.54	912.23	0.23	0 12:01	0.00	0.00
31	CB_Whit_3.4	0.93	0.93	N/A	N/A	N/A	6.91	913.70	0.20	0 12:05	0.00	0.00
32	CB_Whit_4.1	0.00	0.00	N/A	N/A	N/A	0.92	912.08	0.08	0 00:00	0.00	0.00
33	CB_Whit_6	0.00	0.00	N/A	N/A	N/A	0.92	922.08	0.08	0 12:01	0.00	0.00
34	CB_Whit_Del.1	7.01	7.01	N/A	N/A	N/A	27.37	921.14	0.61	0 11:45	1.22	28.00
35	CB_Whit_Del.2	0.00	0.00	N/A	N/A	N/A	0.92	921.58	0.08	0 11:45	0.00	1.00
36	CB_Whit_Del.3	0.00	0.00	N/A	N/A	N/A	0.97	921.73	0.08	0 11:44	0.00	3.00
37	Inlet-60	0.00	0.00	N/A	N/A	N/A	0.00	957.99	0.00	0 12:00	0.00	0.00
38	Inlet-61	0.01	0.01	N/A	N/A	N/A	0.52	946.01	0.12	0 12:01	0.00	0.00
39	Inlet-62	0.00	0.00	N/A	N/A	N/A	0.21	943.19	0.11	0 12:02	0.00	0.00

Storage Nodes

Storage Node : DW_Hav_1

Input Data

Invert Elevation (ft)	980.00
Max (Rim) Elevation (ft)	990.00
Max (Rim) Offset (ft)	10.00
Initial Water Elevation (ft)	0.00
Initial Water Depth (ft)	-980.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Output Summary Results

Peak Inflow (cfs)	0.00
Peak Lateral Inflow (cfs)	0.00
Peak Outflow (cfs)	0.00
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	980.00
Max HGL Depth Attained (ft)	0
Average HGL Elevation Attained (ft)	980.00
Average HGL Depth Attained (ft)	0
Time of Max HGL Occurrence (days hh:mm)	0 00:00
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : DW_Hav_2

Input Data

Invert Elevation (ft)	990.00
Max (Rim) Elevation (ft)	1000.00
Max (Rim) Offset (ft)	10.00
Initial Water Elevation (ft)	0.00
Initial Water Depth (ft)	-990.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Output Summary Results

Peak Inflow (cfs)	0.03
Peak Lateral Inflow (cfs)	0.00
Peak Outflow (cfs)	0.03
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	990.35
Max HGL Depth Attained (ft)	0.35
Average HGL Elevation Attained (ft)	990.14
Average HGL Depth Attained (ft)	0.14
Time of Max HGL Occurrence (days hh:mm)	0 15:30
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : DW_Hav_3

Input Data

Invert Elevation (ft)	1000.00
Max (Rim) Elevation (ft)	1010.00
Max (Rim) Offset (ft)	10.00
Initial Water Elevation (ft)	0.00
Initial Water Depth (ft)	-1000.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Output Summary Results

Peak Inflow (cfs)	1.54
Peak Lateral Inflow (cfs)	0.00
Peak Outflow (cfs)	1.44
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	1010.00
Max HGL Depth Attained (ft)	10
Average HGL Elevation Attained (ft)	1001.95
Average HGL Depth Attained (ft)	1.95
Time of Max HGL Occurrence (days hh:mm)	0 11:55
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0.00
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Project Description

File Name	5825-Tonasket Proposed-2019 Inlet Basins.SPF

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	SCS TR-55
Time of Concentration (TOC) Method	SCS TR-55
Link Routing Method	Hydrodynamic
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	YES

Analysis Options

Start Analysis On	Mar 20, 2019	00:00:00
End Analysis On	Mar 21, 2019	00:00:00
Start Reporting On	Mar 20, 2019	00:00:00
Antecedent Dry Days	0	days
Runoff (Dry Weather) Time Step	0 01:00:00	days hh:mm:ss
Runoff (Wet Weather) Time Step	0 00:05:00	days hh:mm:ss
Reporting Time Step	0 00:05:00	days hh:mm:ss
Routing Time Step	30	seconds

Number of Elements

	Qty
Rain Gages	2
Subbasins	143
Nodes	103
Junctions	47
Outfalls	14
Flow Diversions	0
Inlets	39
Storage Nodes	3
Links	86
Channels	2
Pipes	81
Pumps	0
Orifices	0
Weirs	0
Outlets	3
Pollutants	0
Land Uses	0

Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution
1	50-year	Time Series	50-yr Type II	Intensity	inches	Washington	Okanogan	50	2.00	SCS Type II 24-hr
2	Rain Gage-01	Time Series	100-YR Type-2	Cumulative	inches				0.00	

Subbasin Summary

SN	Subbasin ID	Area (ac)	Peak Rate Factor	Weighted Curve Number	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	97_East_1st	0.42	484.00	98.00	2.20	1.97	0.83	1.16	0 00:06:00
2	97_East_2nd	0.32	484.00	98.00	2.20	1.97	0.63	0.88	0 00:06:00
3	97_West_1st	0.68	484.00	98.00	2.20	1.97	1.34	1.87	0 00:06:00
4	97_West_2nd	0.37	484.00	98.00	2.20	1.97	0.73	1.02	0 00:06:00
5	A_Rd_State	4.20	484.00	98.00	2.20	1.97	8.28	10.88	0 00:08:11
6	A1_State	2.05	484.00	61.00	2.20	0.12	0.24	0.06	0 00:21:07
7	A2_State	3.45	484.00	77.00	2.20	0.56	1.93	1.34	0 00:34:49
8	A3_State	0.73	484.00	61.00	2.20	0.12	0.08	0.02	0 00:19:10
9	A4_State	2.04	484.00	68.00	2.20	0.27	0.54	0.37	0 00:20:04
10	A5_State	1.70	484.00	57.00	2.20	0.06	0.10	0.01	0 00:14:00
11	A6_State	1.42	484.00	57.00	2.20	0.06	0.08	0.01	0 00:14:00
12	B_Rd_State	1.66	484.00	98.00	2.20	1.97	3.28	4.58	0 00:06:00
13	B1_State	0.43	484.00	68.00	2.20	0.27	0.11	0.08	0 00:18:03
14	B2_State	0.77	484.00	54.00	2.20	0.03	0.02	0.00	0 00:18:34
15	B3_Pt_5	3.67	484.00	61.00	2.20	0.12	0.43	0.11	0 00:18:44
16	C_Rds_State	1.71	484.00	98.00	2.20	1.97	3.38	4.72	0 00:06:00
17	C1_State	1.06	484.00	54.00	2.20	0.03	0.03	0.00	0 00:15:46
18	C2_State	1.93	484.00	61.00	2.20	0.12	0.22	0.06	0 00:15:09
19	C3_Rds2_State	0.64	484.00	98.00	2.20	1.97	1.25	1.74	0 00:06:00
20	C3_State	0.80	484.00	57.00	2.20	0.06	0.05	0.01	0 00:16:28
21	D_Rds_Pt_2	0.81	484.00	98.00	2.20	1.97	1.59	2.22	0 00:06:00
22	D1_Pt_2	8.93	484.00	57.80	2.20	0.07	0.61	0.08	0 00:12:20
23	E_97@4th	0.19	484.00	98.00	2.20	1.97	0.38	0.53	0 00:06:00
24	E_97@5th	0.18	484.00	98.00	2.20	1.97	0.35	0.49	0 00:06:00
25	E1_Pt_6	1.12	484.00	57.00	2.20	0.06	0.07	0.01	0 00:17:33
26	E10_Pt_6	0.87	484.00	89.00	2.20	1.20	1.04	1.60	0 00:06:00
27	E11_Pt_6	0.87	484.00	98.00	2.20	1.97	1.72	2.39	0 00:06:00
28	E2_Pt_6	1.92	484.00	57.00	2.20	0.06	0.11	0.01	0 00:17:09
29	E3_Pt_6	0.45	484.00	57.00	2.20	0.06	0.03	0.00	0 00:15:46
30	E4_Pt_6	0.22	484.00	57.00	2.20	0.04	0.01	0.00	0 00:16:07
31	E5_Pt_6	0.95	484.00	57.00	2.20	0.06	0.06	0.01	0 00:16:00
32	E6_Pt_6	0.88	484.00	57.00	2.20	0.06	0.05	0.01	0 00:15:12
33	E7_Pt_6	0.96	484.00	57.00	2.20	0.06	0.06	0.01	0 00:14:48
34	E8_Pt_6	0.87	484.00	57.00	2.20	0.06	0.05	0.01	0 00:14:50
35	E9_Pt_6	0.96	484.00	61.00	2.20	0.12	0.11	0.03	0 00:12:43
36	East_97_7th	0.24	484.00	98.00	2.20	1.97	0.47	0.65	0 00:06:00
37	F_Rds_Pt_9	0.69	484.00	98.00	2.20	1.97	1.36	1.90	0 00:06:00
38	F1_Pt_6	1.24	484.00	57.00	2.20	0.06	0.07	0.01	0 00:19:27
39	F2_Pt_7	1.07	484.00	57.00	2.20	0.06	0.06	0.01	0 00:16:58
40	F3_Pt_9	4.66	484.00	69.00	2.20	0.29	1.36	1.15	0 00:15:45
41	F4_Pt_8	2.02	484.00	89.00	2.20	1.20	2.41	3.58	0 00:07:14
42	G_Rds_Pt_7	0.74	484.00	98.00	2.20	1.97	1.46	2.04	0 00:06:00
43	G1_Pt_7	0.50	484.00	57.00	2.20	0.06	0.03	0.00	0 00:16:54
44	G2_Pt_9	3.12	484.00	39.00	2.20	0.00	0.00	0.00	0 00:30:57
45	G3_Pt_10	3.16	484.00	81.00	2.20	0.74	2.32	3.23	0 00:08:33
46	G4_Pt_7	1.68	484.00	39.00	2.20	0.00	0.00	0.00	0 00:37:09
47	H_Rds_Pt_10	1.49	484.00	98.00	2.20	1.97	2.93	4.08	0 00:06:00
48	H_Rds_Pt_11	0.86	484.00	98.00	2.20	1.97	1.69	2.36	0 00:06:00
49	H1_Pt_11	2.61	484.00	57.00	2.20	0.06	0.15	0.02	0 00:16:53
50	H2_Pt_11	0.76	484.00	57.00	2.20	0.06	0.04	0.01	0 00:16:36
51	H3_Pt11	0.76	484.00	57.00	2.20	0.06	0.04	0.01	0 00:19:54
52	I_Rds_Pt_9	0.45	484.00	98.00	2.20	1.97	0.89	1.25	0 00:06:00
53	I1_Pt_18	0.92	484.00	54.00	2.20	0.03	0.02	0.00	0 00:19:23
54	I2_Pt_9	0.82	484.00	57.00	2.20	0.06	0.05	0.01	0 00:16:22
55	J_Rds_Pt_18	0.88	484.00	98.00	2.20	1.97	1.74	2.43	0 00:06:00
56	J_Rds_Pt_7	0.47	484.00	98.00	2.20	1.97	0.94	1.30	0 00:06:00
57	J1_Pt_18	0.90	484.00	61.00	2.20	0.12	0.10	0.02	0 00:22:57
58	J2_Pt_9	1.22	484.00	61.00	2.20	0.12	0.14	0.03	0 00:19:27
59	K_Rds_Pt_18	1.58	484.00	98.00	2.20	1.97	3.11	4.33	0 00:06:00
60	K1_Pt_18	1.85	484.00	61.00	2.20	0.12	0.22	0.05	0 00:22:54
61	K2_Pt_18	2.92	484.00	61.00	2.20	0.12	0.34	0.08	0 00:20:57
62	K3_Pt_18	1.90	484.00	61.00	2.20	0.12	0.22	0.05	0 00:18:54
63	L_Rds_Pt_18	0.65	484.00	98.00	2.20	1.97	1.28	1.78	0 00:06:00
64	L_Rds_Pt_7	0.53	484.00	98.00	2.20	1.97	1.04	1.44	0 00:06:00
65	L1_Pt_18	0.45	484.00	61.00	2.20	0.12	0.05	0.01	0 00:19:06
66	L2_Pt_7	1.59	484.00	81.00	2.20	0.74	1.17	1.59	0 00:10:06
67	M_Rd_Pt_1	2.84	484.00	98.00	2.20	1.97	5.59	7.80	0 00:06:00
68	M1_Pt_1	7.80	484.00	51.00	2.20	0.01	0.06	0.01	0 00:11:48
69	M1_Tonasket_Ave	0.85	484.00	98.00	2.20	1.97	1.68	2.34	0 00:06:00
70	M1_Winesap_ST	0.98	484.00	98.00	2.20	1.97	1.94	2.69	0 00:06:00
71	M2_Pt_1	1.71	484.00	54.00	2.20	0.03	0.05	0.01	0 00:12:33
72	M3_Pt_1	1.03	484.00	89.00	2.20	1.20	1.23	1.89	0 00:06:00
73	N_4th@97	5.18	484.00	98.00	2.20	1.97	10.21	14.24	0 00:06:00
74	N_4th@Western	0.20	484.00	98.00	2.20	1.97	0.39	0.55	0 00:06:00
75	N_5th@97	1.02	484.00	98.00	2.20	1.97	2.00	2.80	0 00:06:00
76	N_6th@97	0.22	484.00	98.00	2.20	1.97	0.44	0.62	0 00:06:00
77	N_Rds_Pt_5	1.05	484.00	98.00	2.20	1.97	2.08	2.89	0 00:06:00
78	N1_Pt_3	2.91	484.00	51.00	2.20	0.01	0.02	0.00	0 00:12:24
79	N1_Rds_Pt_1	0.44	484.00	98.00	2.20	1.97	0.86	1.20	0 00:06:00
80	N1_Rds_Pt_5	0.44	484.00	98.00	2.20	1.97	0.88	1.21	0 00:06:00
81	North_3rd@97	0.36	484.00	98.00	2.20	1.97	0.71	0.99	0 00:06:00
82	O_Rds_State	3.13	484.00	98.00	2.20	1.97	6.17	8.29	0 00:07:18
83	O1_State	1.66	484.00	57.00	2.20	0.06	0.10	0.01	0 00:18:51
84	O2_Pt_5	1.91	484.00	61.00	2.20	0.12	0.22	0.06	0 00:13:32
85	O2_Rds_Pt_5	1.26	484.00	98.00	2.20	1.97	2.48	3.45	0 00:06:00
86	O2_Rds2_Pt_5	0.35	484.00	98.00	2.20	1.97	0.69	0.97	0 00:06:00
87	P_RD_State	2.42	484.00	98.00	2.20	1.97	4.77	6.65	0 00:06:00
88	P1_State	1.37	484.00	61.00	2.20	0.12	0.16	0.04	0 00:17:46

Subbasin Summary

SN	Subbasin ID	Area (ac)	Peak Rate Factor	Weighted Curve Number	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
89	P2_Pt_5	0.84	484.00	77.00	2.20	0.56	0.47	0.54	0 00:15:07
90	P2_Rds_2-St	0.32	484.00	98.00	2.20	1.97	0.63	0.88	0 00:06:00
91	P2_Rds2_2-St	0.23	484.00	98.00	2.20	1.97	0.44	0.62	0 00:06:00
92	P3_Pt_4	0.85	484.00	89.00	2.20	1.20	1.02	1.57	0 00:06:00
93	Q_Rds2_97	0.30	484.00	98.00	2.20	1.97	0.59	0.83	0 00:06:00
94	Q1_Pt_5	0.97	484.00	57.00	2.20	0.06	0.06	0.01	0 00:16:30
95	Q1_Rds_State	0.32	484.00	98.00	2.20	1.97	0.63	0.88	0 00:06:00
96	Q1_Rds2_State	0.49	484.00	98.00	2.20	1.97	0.96	1.34	0 00:06:00
97	Q2_Pt_5	0.65	484.00	61.00	2.20	0.12	0.08	0.02	0 00:16:32
98	Q3_Pt_5	0.96	484.00	77.00	2.20	0.56	0.54	0.61	0 00:15:19
99	Q3_Rds_State	0.32	484.00	98.00	2.20	1.97	0.63	0.88	0 00:06:00
100	Q3_Rds2_State	0.45	484.00	98.00	2.20	1.97	0.88	1.23	0 00:06:00
101	Q4_Pt_5	0.95	484.00	89.00	2.20	1.20	1.13	1.70	0 00:06:55
102	Q5_Pt_6	0.96	484.00	89.00	2.20	1.20	1.15	1.67	0 00:08:04
103	R_RD_2	0.63	484.00	98.00	2.20	1.97	1.23	1.73	0 00:06:00
104	R_Rd_Pt_1	0.68	484.00	98.00	2.20	1.97	1.35	1.88	0 00:06:00
105	R1_Pt_1	0.27	484.00	39.00	2.20	0.00	0.00	0.00	0 00:18:18
106	S_5th@97	0.73	484.00	98.00	2.20	1.97	1.44	2.01	0 00:06:00
107	S_6th@97	0.16	484.00	98.00	2.20	1.97	0.31	0.44	0 00:06:00
108	S_Rds_Pt_1	1.09	484.00	98.00	2.20	1.97	2.16	3.01	0 00:06:00
109	S1_Pt_14	1.34	484.00	81.00	2.20	0.74	0.98	1.03	0 00:20:23
110	S2_Pt_14	1.59	484.00	89.00	2.20	1.20	1.90	2.37	0 00:14:58
111	S2_Rds_Pt_14	3.53	484.00	98.00	2.20	1.97	6.97	9.72	0 00:06:00
112	S3_Pt_14	4.07	484.00	89.00	2.20	1.20	4.86	6.75	0 00:09:51
113	S3_Pt_3	0.29	484.00	72.00	2.20	0.38	0.11	0.08	0 00:23:33
114	S3_Rds_3-St	0.38	484.00	98.00	2.20	1.97	0.75	1.04	0 00:06:00
115	South_3rd@97	0.22	484.00	98.00	2.20	1.97	0.44	0.62	0 00:06:00
116	South_4th@97	2.64	484.00	98.00	2.20	1.97	5.21	7.27	0 00:06:00
117	T_Rds2_Pt_5	0.51	484.00	98.00	2.20	1.97	1.01	1.41	0 00:06:00
118	U_Rds_Pt_12	1.49	484.00	98.00	2.20	1.97	2.95	4.10	0 00:06:00
119	U_Rds_Pt_13	1.48	484.00	98.00	2.20	1.97	2.92	4.07	0 00:06:00
120	U_Rds_Pt_14	0.26	484.00	98.00	2.20	1.97	0.52	0.72	0 00:06:00
121	U_Rds2_Pt_13	0.38	484.00	98.00	2.20	1.97	0.74	1.04	0 00:06:00
122	U_Rds2_Pt_14	0.50	484.00	98.00	2.20	1.97	0.99	1.37	0 00:06:00
123	U1_Pt_14	1.94	484.00	98.00	2.20	1.97	3.84	4.81	0 00:10:01
124	U2_Pt_13	1.74	484.00	98.00	2.20	1.97	3.43	4.30	0 00:09:58
125	U3_Pt_13	1.91	484.00	98.00	2.20	1.97	3.77	4.47	0 00:12:31
126	U4_Pt_12	2.64	484.00	89.00	2.20	1.20	3.16	4.50	0 00:08:50
127	US97_3-4_East	0.30	484.00	98.00	2.20	1.97	0.60	0.84	0 00:06:00
128	V_Rds_Pt_15	0.36	484.00	98.00	2.20	1.97	0.71	0.99	0 00:06:00
129	V_Rds2_Pt_15	0.13	484.00	98.00	2.20	1.97	0.25	0.35	0 00:06:00
130	W_97@4th	0.45	484.00	98.00	2.20	1.97	0.88	1.23	0 00:06:00
131	W_97@5th	0.42	484.00	98.00	2.20	1.97	0.82	1.14	0 00:06:00
132	W_Rds_Pt_15	0.41	484.00	98.00	2.20	1.97	0.81	1.13	0 00:06:00
133	W1_Pt_15	2.11	484.00	89.00	2.20	1.20	2.52	3.89	0 00:06:00
134	W2_Pt_15	1.96	484.00	89.00	2.20	1.20	2.34	3.34	0 00:08:46
135	West_97_6th	0.46	484.00	98.00	2.20	1.97	0.90	1.25	0 00:06:00
136	X_Rds_Pt_16	0.38	484.00	98.00	2.20	1.97	0.74	1.04	0 00:06:00
137	X_Rds_Pt_17	0.68	484.00	98.00	2.20	1.97	1.34	1.87	0 00:06:00
138	X_Rds2_Pt_13	0.05	484.00	98.00	2.20	1.94	0.10	0.14	0 00:06:00
139	X1_Pt_16	3.16	484.00	57.00	2.20	0.06	0.18	0.02	0 00:25:09
140	X2_Pt_17	1.17	484.00	57.00	2.20	0.06	0.07	0.01	0 00:25:19
141	Y_Rds_Pt_17	0.78	484.00	98.00	2.20	1.97	1.54	2.15	0 00:06:00
142	Y_Rds2_Pt_13	0.06	484.00	98.00	2.20	1.95	0.11	0.16	0 00:06:00
143	Y1_Pt_17	1.77	484.00	98.00	2.20	1.97	3.50	4.06	0 00:13:38

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft²)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	CB_97_7.1	Junction	919.10	921.00	0.00	921.00	10.00	4.18	928.37	7.37	0.00	0 11:57	0.04	18.00
2	CB_97_7.2	Junction	918.40	922.00	0.00	922.00	10.00	8.80	927.69	5.69	0.00	0 11:57	0.06	15.00
3	CB_Hen_4.1	Junction	890.50	900.70	0.00	900.70	10.00	5.79	893.33	0.00	7.37	0 00:00	0.00	0.00
4	CB_Locust_1.4	Junction	897.02	901.33	0.00	901.33	10.00	4.36	897.67	0.00	3.66	0 00:00	0.00	0.00
5	CB_West_3.1	Junction	900.20	907.00	0.00	907.00	10.00	5.84	911.90	4.90	0.00	0 12:01	0.03	15.00
6	CB_West_3.2	Junction	901.00	907.00	0.00	907.00	10.00	14.91	912.04	5.04	0.00	0 11:58	0.05	15.00
7	CB_West_3.3	Junction	900.40	907.00	0.00	907.00	10.00	6.72	912.95	5.95	0.00	0 11:58	0.04	16.00
8	CB_West_3.4	Junction	900.07	906.00	0.00	906.00	10.00	1.09	909.22	3.22	0.00	0 12:00	0.02	13.00
9	CB_West_4.1	Junction	900.25	907.00	0.00	907.00	10.00	0.35	909.88	2.88	0.00	0 12:01	0.01	13.00
10	CB_West_4.2	Junction	900.75	907.50	0.00	907.50	10.00	1.03	911.41	3.91	0.00	0 11:57	0.02	16.00
11	CB_West_4.3	Junction	900.24	907.50	0.00	907.50	10.00	2.25	909.92	2.42	0.00	0 11:57	0.04	14.00
12	CB_West_6	Junction	907.80	914.60	0.00	914.60	240.00	9.28	927.72	13.12	0.00	0 12:00	0.90	44.00
13	CB_Whit_3.2	Junction	906.00	913.50	0.00	913.50	240.00	9.01	911.47	0.00	2.03	0 00:00	0.00	0.00
14	CB_Whit_3.3	Junction	906.10	913.50	0.00	913.50	240.00	3.42	912.06	0.00	1.44	0 00:00	0.00	0.00
15	CB_Whit_4.2	Junction	910.40	912.00	0.00	912.00	10.00	8.80	912.66	0.66	0.00	0 12:04	0.01	7.00
16	CB_Whit_4.3	Junction	910.60	912.00	0.00	912.00	10.00	14.15	912.89	0.54	0.00	0 12:04	0.01	8.00
17	CB_Whit_5.1	Junction	909.60	916.00	0.00	916.00	10.00	1.14	913.95	0.00	2.05	0 00:00	0.00	0.00
18	CB_Whit_5.2	Junction	909.50	916.00	0.00	916.00	10.00	4.77	914.18	0.00	1.82	0 00:00	0.00	0.00
19	CB_Whit_6s	Junction	915.00	919.00	0.00	0.00	0.00	2.76	916.79	0.00	2.21	0 00:00	0.00	0.00
20	CB_WhitWest_4	Junction	905.50	908.00	0.00	908.00	10.00	0.87	909.96	1.96	0.00	0 11:59	0.02	11.00
21	MH_1st&97	Junction	910.47	920.00	0.00	0.00	0.00	14.38	920.00	0.00	0.00	0 11:57	0.00	0.00
22	MH_2nd&97	Junction	907.31	910.00	0.00	910.00	100.00	18.01	911.95	1.95	0.00	0 12:00	0.18	9.00
23	MH_3rd&97	Junction	903.00	911.35	0.00	0.00	0.00	66.28	911.35	0.00	0.00	0 11:59	0.01	0.00
24	MH_4th&97	Junction	907.00	914.26	0.00	914.26	100.00	44.25	912.18	0.00	2.08	0 00:00	0.00	0.00
25	MH_5th&97	Junction	908.80	914.44	0.00	914.44	100.00	17.69	913.91	0.00	0.53	0 00:00	0.00	0.00
26	MH_6th&97	Junction	914.50	919.37	0.00	919.37	100.00	8.19	916.20	0.00	3.17	0 00:00	0.00	0.00
27	MH_Bon_6	Junction	960.01	978.29	0.00	978.29	100.00	8.79	960.64	0.00	17.64	0 00:00	0.00	0.00
28	MH_Hen_1	Junction	891.15	893.14	0.00	893.14	100.00	4.33	891.79	0.00	1.36	0 00:00	0.00	0.00
29	MH_Hen_4	Junction	888.92	895.00	0.00	895.00	100.00	8.50	890.38	0.00	4.62	0 00:00	0.00	0.00
30	MH_Locust_1.1	Junction	896.56	901.98	0.00	901.98	100.00	3.30	898.05	0.00	3.93	0 00:00	0.00	0.00
31	MH_Locust_3	Junction	894.43	902.53	0.00	902.53	100.00	118.47	902.53	0.00	0.00	0 11:56	0.00	0.00
32	MH_Locust_4	Junction	894.92	905.13	0.00	905.13	100.00	1.30	895.27	0.00	9.86	0 00:00	0.00	0.00
33	MH_PT_9	Junction	924.71	929.23	0.00	929.23	100.00	2.25	925.14	0.00	4.09	0 00:00	0.00	0.00
34	MH_RR_4	Junction	891.84	900.00	0.00	900.00	100.00	1.28	892.18	0.00	7.82	0 00:00	0.00	0.00
35	MH_RRHen_4	Junction	890.04	898.00	0.00	898.00	100.00	8.57	891.16	0.00	6.84	0 00:00	0.00	0.00
36	MH_West_3.1	Junction	899.27	905.00	0.00	905.00	100.00	60.08	908.72	3.72	0.00	0 11:59	0.20	15.00
37	MH_West_3.2	Junction	897.80	905.00	0.00	905.00	100.00	120.24	907.47	2.47	0.00	0 11:57	0.48	13.00
38	MH_West_3.3	Junction	899.96	905.00	0.00	905.00	240.00	31.06	910.32	5.32	0.00	0 11:57	0.61	17.00
39	MH_West_3/4	Junction	899.48	905.00	0.00	905.00	100.00	36.47	909.22	4.22	0.00	0 12:00	0.34	16.00
40	MH_West_4.1	Junction	899.50	907.46	0.00	907.46	100.00	36.83	909.87	2.41	0.00	0 11:57	0.28	12.00
41	MH_West_4.2	Junction	900.50	908.00	0.00	908.00	100.00	4.92	911.26	3.26	0.00	0 12:02	0.10	14.00
42	MH_West_4.3	Junction	896.14	907.71	0.00	907.71	100.00	0.29	896.39	0.00	11.32	0 00:00	0.00	0.00
43	MH_West_Delish.1	Junction	913.33	919.19	0.00	919.19	100.00	4.38	919.19	0.00	0.00	0 11:58	0.00	0.00
44	MH_West_Delish.2	Junction	914.79	920.00	0.00	920.00	100.00	4.81	919.58	0.00	0.42	0 00:00	0.00	0.00
45	MH_Whit_3.2	Junction	905.88	909.81	0.00	909.81	100.00	11.90	910.96	1.15	0.00	0 12:03	0.08	8.00
46	MH_Whit_5.1	Junction	909.50	913.99	0.00	913.99	100.00	11.98	914.57	0.57	0.00	0 12:04	0.04	6.00
47	NEW 3rd Inlets	Junction	917.00	922.00	0.00	939.00	100.00	36.85	922.02	0.02	0.00	0 12:00	0.00	0.00
48	MH_West_6	Outfall	907.50					5.38	908.17					
49	Out-19	Outfall	923.00					10.34	923.97					
50	Out-20	Outfall	980.00					0.00	980.00					
51	Out-21	Outfall	990.00					0.08	990.00					
52	Out-22	Outfall	1000.00					1.00	1000.00					
53	Out-56	Outfall	0.00					2.33	0.00					
54	Out-57	Outfall	0.00					2.68	0.00					
55	Out-59	Outfall	915.00					3.11	915.56					
56	Out-A	Outfall	891.45					118.47	894.95					
57	Out-B	Outfall	917.00					6.40	918.00					
58	Out-C	Outfall	888.00					8.50	889.31					
59	Out-D	Outfall	887.15					4.31	887.75					
60	Out-E	Outfall	900.00					3.39	901.00					
61	Tona-DW	Outfall	939.00					1.22	939.00					
62	DW_Hav_1	Storage Node	980.00	990.00	0.00		0.00	0.00	980.00				0.00	0.00
63	DW_Hav_2	Storage Node	990.00	1000.00	0.00		0.00	0.08	990.75				0.00	0.00
64	DW_Hav_3	Storage Node	1000.00	1010.00	0.00		0.00	1.71	1010.00				0.00	0.00

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Diameter or Height (in)	Manning's Roughness	Peak Flow (cfs)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
1	Link-102	Pipe	CB_97_7.1	CB_97_7.2	24.00	919.10	918.40	2.9200	12.000	0.0130	3.95	6.08	0.65	5.02	1.00	1.00	20.00	SURCHARGED
2	Link-103	Pipe	CB_97_7.2	CB_97_7.3	100.00	918.40	917.80	0.6000	12.000	0.0130	8.60	2.76	3.12	10.95	1.00	1.00	17.00	SURCHARGED
3	Link-135	Pipe	MH_Bon_6	Inlet-60	117.16	960.01	956.01	3.4100	30.000	0.0150	8.78	65.64	0.13	6.76	0.77	0.31	0.00	Calculated
4	Link-137	Pipe	Inlet-61	Inlet-62	66.96	942.29	939.12	4.7300	24.000	0.0250	8.68	25.60	0.34	6.20	0.90	0.46	0.00	Calculated
5	Link-139	Pipe	CB_Bon_7	Inlet-62	33.71	942.30	939.12	9.4300	6.000	0.0130	1.73	1.72	1.00	8.80	0.50	1.00	12.00	SURCHARGED
6	Link-14	Pipe	CB_Bon_6	MH_Bon_6	49.74	969.87	969.51	0.7200	10.000	0.0130	4.07	1.86	2.18	7.49	0.82	0.98	0.00	> CAPACITY
7	Link-141	Pipe	CB_Hav_3	DW_Hav_1	40.78	980.20	980.00	0.4900	18.000	0.0150	0.00	6.38	0.00	0.00	0.00	0.00	0.00	Calculated
8	Link-142	Pipe	CB_Hav_2	DW_Hav_2	41.71	990.20	990.00	0.4800	18.000	0.0150	0.08	6.30	0.01	0.78	0.65	0.43	0.00	Calculated
9	Link-143	Pipe	CB_Hav_1	DW_Hav_3	40.63	1000.20	1000.00	0.4900	18.000	0.0150	1.71	6.39	0.27	0.97	1.50	1.00	67.00	SURCHARGED
10	Link-144	Pipe	MH_West_Delish.1	Out-E	530.00	913.33	900.00	2.5200	12.000	0.0240	3.39	3.06	1.11	4.42	1.00	1.00	17.00	SURCHARGED
11	Link-146	Pipe	MH_1st&97	MH_2nd&97	316.01	910.47	907.31	1.0000	18.000	0.0120	14.38	11.38	1.26	8.22	1.50	1.00	9.00	SURCHARGED
12	Link-147	Pipe	MH_2nd&97	MH_3rd&97	367.78	907.31	903.63	1.0000	24.000	0.0120	16.74	24.51	0.68	6.72	2.00	1.00	9.00	SURCHARGED
13	Link-148	Pipe	MH_PT_9	MH_6th&97	340.00	924.74	915.06	2.8500	12.000	0.0120	2.24	6.51	0.34	5.21	0.70	0.70	0.00	Calculated
14	Link-149	Pipe	MH_Whit_5.1	MH_5th&97	11.00	909.89	909.70	1.7400	18.000	0.0120	11.95	15.00	0.80	6.76	1.50	1.00	11.00	SURCHARGED
15	Link-15	Pipe	CB_Ant_6	CB_Ton_6.1	330.00	947.63	928.14	5.9100	8.000	0.0130	0.00	2.94	0.00	0.00	0.00	0.00	0.00	Calculated
16	Link-150	Pipe	MH_5th&97	MH_4th&97	350.00	909.60	907.46	0.6100	24.000	0.0120	17.44	19.16	0.91	6.22	2.00	1.00	8.00	SURCHARGED
17	Link-159	Pipe	NEW 3rd Inlets	MH_3rd&97	200.00	917.00	903.73	6.6300	21.000	0.0120	37.51	44.22	0.85	16.86	1.75	1.00	6.00	SURCHARGED
18	Link-160	Pipe	CB_97_7.3	Out-B	30.00	917.80	917.00	2.6700	12.000	0.0130	6.40	5.82	1.10	8.15	1.00	1.00	12.00	SURCHARGED
19	Link-161	Pipe	CB_Whit_6s	MH_6th&97	56.00	915.30	914.95	0.6200	12.000	0.0150	2.76	2.44	1.13	3.51	1.00	1.00	6.00	SURCHARGED
20	Link-162	Pipe	MH_4th&97	MH_West_4.1	389.96	907.00	901.00	1.5400	27.000	0.0120	25.42	41.62	0.61	9.05	2.25	1.00	11.00	SURCHARGED
21	Link-163	Pipe	MH_West_3.2	MH_Locust_3	320.65	897.80	894.47	1.0400	42.000	0.0100	118.47	133.29	0.89	12.31	3.50	1.00	18.00	SURCHARGED
22	Link-164	Pipe	MH_4th&97	MH_3rd&97	393.00	907.36	904.73	0.6700	24.000	0.0150	14.63	16.04	0.91	5.22	2.00	1.00	11.00	SURCHARGED
23	Link-165	Pipe	CB_West_Del.4	Out-59	43.11	916.23	915.00	2.8600	12.000	0.0150	3.11	5.22	0.60	6.20	0.61	0.61	0.00	Calculated
24	Link-17	Pipe	CB_Ton_6.1	MH_PT_9	52.00	927.94	924.74	6.1500	8.000	0.0130	0.00	3.04	0.00	0.00	0.20	0.31	0.00	Calculated
25	Link-20	Pipe	MH_6th&97	MH_Whit_5.1	327.00	914.95	910.37	1.4000	18.000	0.0130	8.15	12.43	0.66	6.13	1.35	0.92	0.00	Calculated
26	Link-23	Pipe	CB_Ton_6.3	MH_PT_9	45.45	927.00	924.72	5.0200	8.000	0.0130	0.00	2.71	0.00	0.00	0.21	0.32	0.00	Calculated
27	Link-24	Pipe	CB_Ton_6.2	MH_PT_9	70.74	928.50	924.72	5.3400	8.000	0.0130	0.00	2.79	0.00	0.00	0.21	0.32	0.00	Calculated
28	Link-28	Pipe	CB_Whit_5.1	MH_5th&97	53.94	910.00	909.70	0.5600	12.000	0.0120	1.16	2.88	0.40	1.47	1.00	1.00	13.00	SURCHARGED
29	Link-29	Pipe	CB_Whit_5.2	MH_5th&97	47.12	910.00	909.60	0.8500	15.000	0.0120	4.78	6.45	0.74	3.89	1.25	1.00	13.00	SURCHARGED
30	Link-30	Pipe	CB_Whit_6	MH_6th&97	46.46	915.60	915.00	1.2900	8.000	0.0130	0.13	1.37	0.10	0.53	0.60	0.96	0.00	Calculated
31	Link-31	Pipe	CB_Whit_4.1	MH_4th&97	53.92	910.50	910.10	0.7400	8.000	0.0130	0.58	1.04	0.56	1.77	0.67	1.00	6.00	SURCHARGED
32	Link-32	Pipe	CB_Whit_4.3	MH_4th&97	62.67	910.60	910.10	0.8000	21.000	0.0130	14.11	14.15	1.00	6.20	1.75	1.00	3.00	SURCHARGED
33	Link-33	Pipe	CB_Whit_4.2	MH_4th&97	44.48	910.40	910.10	0.6700	18.000	0.0130	8.78	8.63	1.02	5.32	1.50	1.00	4.00	SURCHARGED
34	Link-35	Pipe	CB_Whit_3.4	MH_Whit_3.2	30.00	908.50	908.00	1.6700	8.000	0.0130	1.59	1.56	1.02	4.55	0.67	1.00	9.00	SURCHARGED
35	Link-36	Pipe	CB_Whit_3.3	CB_Whit_3.2	66.20	907.00	906.50	0.7600	12.000	0.0130	3.42	3.10	1.11	4.36	1.00	1.00	15.00	SURCHARGED
36	Link-37	Pipe	CB_Whit_3.2	MH_Whit_3.2	75.45	906.20	905.88	0.4200	18.000	0.0120	9.02	7.40	1.22	5.66	1.50	1.00	13.00	SURCHARGED
37	Link-38	Pipe	CB_Whit_3.1	MH_Whit_3.2	65.45	906.00	905.88	0.1800	12.000	0.0120	2.05	1.65	1.24	2.61	1.00	1.00	14.00	SURCHARGED
38	Link-39	Pipe	MH_3rd&97	MH_West_3.2	370.00	903.53	898.64	1.3200	30.000	0.0150	61.06	81.73	0.75	6.76	2.50	1.00	14.00	SURCHARGED
39	Link-40	Pipe	MH_Whit_3.2	MH_West_3.3	300.00	905.88	900.06	1.9400	24.000	0.0150	11.40	27.31	0.42	3.91	2.00	1.00	12.00	SURCHARGED
40	Link-41	Pipe	MH_West_3.3	MH_West_3.1	29.00	899.96	899.37	2.0300	24.000	0.0150	31.71	27.97	1.13	10.09	2.00	1.00	22.00	SURCHARGED
41	Link-43	Pipe	CB_West_3.1	MH_West_3.3	38.54	901.00	900.06	2.4400	12.000	0.0130	5.71	5.56	1.03	7.27	1.00	1.00	24.00	SURCHARGED
42	Link-44	Pipe	CB_West_3.3	CB_West_3.2	45.82	903.00	902.30	1.5300	15.000	0.0130	6.59	7.98	0.83	5.41	1.25	1.00	18.00	SURCHARGED
43	Link-45	Pipe	CB_West_3.2	MH_West_3.3	51.64	902.20	901.00	2.3200	18.000	0.0130	14.42	16.01	0.90	8.16	1.50	1.00	18.00	SURCHARGED
44	Link-46	Pipe	MH_West_4.2	MH_West_4.1	47.28	900.50	899.99	1.0900	12.000	0.0150	5.40	3.22	1.68	6.87	1.00	1.00	32.00	SURCHARGED
45	Link-47	Pipe	CB_West_4.1	MH_West_4.1	42.10	900.25	899.94	0.7500	8.000	0.0130	0.92	1.04	0.88	2.62	0.67	1.00	50.00	SURCHARGED
46	Link-49	Pipe	CB_West_4.3	MH_West_4.1	39.85	900.24	899.94	0.7600	8.000	0.0130	1.80	1.06	1.70	5.15	0.67	1.00	51.00	SURCHARGED
47	Link-51	Pipe	CB_WhitWest_4	CB_West_4.3	184.87	905.50	903.30	1.1900	8.000	0.0130	0.87	1.32	0.66	2.80	0.67	1.00	13.00	SURCHARGED
48	Link-52	Pipe	CB_West_4.2	MH_West_4.2	34.65	900.75	900.50	0.7200	8.000	0.0130	1.64	1.03	1.60	4.70	0.67	1.00	33.00	SURCHARGED
49	Link-54	Pipe	CB_Whit_Del.2	CB_Whit_Del.3	58.00	919.48	919.05	0.7400	8.000	0.0150	0.49	0.90	0.54	2.65	0.67	1.00	30.00	SURCHARGED
50	Link-55	Pipe	CB_Whit_Del.2	CB_Whit_Del.1	65.00	918.45	918.13	0.4900	8.000	0.0150	0.47	0.73	0.64	1.34	0.67	1.00	38.00	SURCHARGED
51	Link-56	Pipe	CB_Whit_Del.1	CB_West_Del.4	150.00	918.13	916.23	1.2700	8.000	0.0150	1.63	1.18	1.38	4.92	0.66	1.00	0.00	> CAPACITY
52	Link-57	Pipe	CB_West_Del.3	CB_West_Del.4	30.00	917.20	916.36	2.7700	8.000	0.0150	1.55	1.74	0.89	4.77	0.58	0.90	0.00	Calculated
53	Link-59	Pipe	CB_West_Del.3	CB_West_Del.2	61.00	917.06	916.42	1.0500	8.000	0.0150	0.82	1.01	0.81	2.82	0.67	1.00	6.00	SURCHARGED
54	Link-60	Pipe	CB_West_4.4	MH_West_4.3	37.96	900.30	900.00	0.7900	8.000	0.0130	0.16	1.07	0.14	2.10	0.18	0.27	0.00	Calculated
55	Link-61	Pipe	CB_West_4.5	MH_West_4.3	36.00	900.30	900.00	0.8300	8.000	0.0130	0.14	1.10	0.13	2.07	0.16	0.25	0.00	Calculated
56	Link-62	Pipe	CB_Locust_4.2	CB_Locust_4.1	33.71	895.85	895.60	0.7400	8.000	0.0150	0.02	0.90	0.02	1.09	0.07	0.10	0.00	Calculated

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Reported Condition
					(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
57	Link-63	Pipe	CB_Locust_4.1	MH_Locust_4	94.76	895.60	894.92	0.7200	8.000	0.0130	0.02	1.02	0.02	1.05	0.17	0.26	0.00	Calculated
58	Link-64	Pipe	MH_West_4.3	MH_Locust_4	245.00	896.14	894.95	0.4900	12.000	0.0150	0.29	2.15	0.13	1.57	0.28	0.28	0.00	Calculated
59	Link-65	Pipe	MH_Locust_4	MH_RR_4	232.00	894.92	891.84	1.3300	20.000	0.0150	1.28	13.89	0.09	3.94	0.34	0.21	0.00	Calculated
60	Link-66	Pipe	MH_RR_4	MH_RRHen_4	135.00	891.84	890.04	1.3300	20.000	0.0150	1.27	13.92	0.09	1.39	0.72	0.44	0.00	Calculated
61	Link-67	Pipe	MH_RRHen_4	MH_Hen_4	84.00	890.04	888.92	1.3300	20.000	0.0150	8.50	13.92	0.61	4.75	1.29	0.78	0.00	Calculated
62	Link-68	Pipe	CB_Hen_4.1	MH_RRHen_4	37.62	890.50	890.04	1.2200	12.000	0.0150	5.79	3.41	1.70	7.38	1.00	1.00	9.00	SURCHARGED
63	Link-69	Pipe	CB_Hen_4.2	MH_RRHen_4	33.93	890.43	890.04	1.1500	10.000	0.0150	1.96	2.04	0.96	3.59	0.83	1.00	10.00	SURCHARGED
64	Link-70	Pipe	MH_West_3/4	MH_West_3.1	100.00	899.48	899.27	0.2100	36.000	0.0100	34.94	39.73	0.88	4.94	3.00	1.00	17.00	SURCHARGED
65	Link-71	Pipe	MH_West_4.1	MH_West_3/4	220.00	899.94	899.48	0.2100	36.000	0.0100	36.01	39.48	0.91	5.09	3.00	1.00	18.00	SURCHARGED
66	Link-72	Pipe	CB_West_3.4	MH_West_3/4	18.87	900.07	899.48	3.1300	18.000	0.0150	0.93	16.10	0.06	0.53	1.50	1.00	24.00	SURCHARGED
67	Link-73	Pipe	CB_West_5.1	CB_West_5.2	58.43	906.00	905.50	0.8600	8.000	0.0150	0.00	0.97	0.00	0.00	0.00	0.00	0.00	Calculated
68	Link-74	Pipe	CB_West_6	MH_West_6	60.00	907.80	907.50	0.5000	8.000	0.0150	5.38	0.74	7.27	15.43	0.67	1.00	0.00	SURCHARGED
69	Link-76	Pipe	MH_Locust_3	Out-A	630.00	894.43	891.45	0.4700	42.000	0.0100	118.47	89.89	1.32	12.31	3.50	1.00	17.00	SURCHARGED
70	Link-77	Pipe	MH_Hen_4	Out-C	226.22	888.92	888.00	0.4100	22.000	0.0150	8.50	9.91	0.86	3.97	1.39	0.76	0.00	Calculated
71	Link-78	Pipe	CB_Locust_2.1	CB_Locust_2.2	41.32	900.00	899.70	0.7300	8.000	0.0150	0.00	0.89	0.00	0.00	0.00	0.00	0.00	Calculated
72	Link-81	Pipe	CB_West_Del.2	MH_West_Delish.2	78.00	916.56	914.79	2.2700	18.000	0.0150	2.34	13.73	0.17	4.15	1.36	0.93	0.00	Calculated
73	Link-82	Pipe	MH_West_Delish.2	MH_West_Delish.1	64.00	914.79	913.33	2.2800	18.000	0.0150	4.38	13.73	0.32	4.24	1.50	1.00	12.00	SURCHARGED
74	Link-83	Pipe	CB_West_Del.1	MH_West_Delish.2	38.64	915.00	914.79	0.5400	8.000	0.0130	2.52	0.89	2.82	7.21	0.67	1.00	14.00	SURCHARGED
75	Link-84	Pipe	MH_West_3.1	MH_West_3.2	32.44	899.27	898.77	1.5400	36.000	0.0100	62.89	107.65	0.58	9.49	3.00	1.00	17.00	SURCHARGED
76	Link-85	Pipe	CB_Locust_1.1	CB_Locust_1.2	27.00	897.33	897.22	0.4100	8.000	0.0150	2.10	0.67	3.14	6.01	0.67	1.00	30.00	SURCHARGED
77	Link-87	Pipe	CB_Locust_1.2	MH_Locust_1.1	82.00	896.76	896.56	0.2400	14.000	0.0150	2.24	2.30	0.97	2.10	1.17	1.00	29.00	SURCHARGED
78	Link-88	Pipe	CB_Locust_1.3	CB_Locust_1.4	39.36	897.50	897.02	1.2100	8.000	0.0150	0.35	1.15	0.30	1.39	0.45	0.68	0.00	Calculated
79	Link-95	Pipe	MH_Hen_1	Out-D	205.00	891.15	887.15	1.9500	18.000	0.0150	4.31	12.72	0.34	6.28	0.61	0.41	0.00	Calculated
80	Link-96	Pipe	CB_Locust_1.4	MH_Locust_1.1	87.00	897.02	896.62	0.4600	18.000	0.0150	3.04	6.17	0.49	2.33	1.04	0.69	0.00	Calculated
81	Link-97	Pipe	CB_Locust_1.4	MH_Hen_1	350.00	897.02	891.15	1.6800	18.000	0.0150	4.33	11.79	0.37	6.02	0.63	0.43	0.00	Calculated
82	Link-136	Channel	Inlet-60	Inlet-61	285.00	956.01	942.29	4.8100	36.000	0.0320	8.70	97.53	0.09	6.20	0.86	0.29	0.00	
83	Link-138	Channel	Inlet-62	Out-19	318.00	939.12	923.00	5.0700	36.000	0.0320	10.34	100.50	0.10	6.36	0.97	0.33	0.00	
84	Outlet-01	Outlet	DW_Hav_1	Out-20		980.00	980.00				0.00							
85	Outlet-02	Outlet	DW_Hav_2	Out-21		990.00	990.00				0.08							
86	Outlet-03	Outlet	DW_Hav_3	Out-22		1000.00	1000.00				1.00							

Inlet Summary

SN	Element ID	Inlet Manufacturer	Manufacturer Part Number	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Initial Water Elevation (ft)	Ponded Area (ft²)	Peak Flow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Allowable Spread (ft)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)
1	CB_97_7.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	917.80	920.00	0.00	10.00	0.05	N/A	N/A	N/A	7.00	1.26	920.08
2	CB_Ant_6	FHWA HEC-22 GENERIC	N/A	On Sag	1	947.63	952.02	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	952.09
3	CB_Bon_6	FHWA HEC-22 GENERIC	N/A	On Sag	1	969.87	973.11	0.00	10.00	4.06	N/A	N/A	N/A	7.00	18.93	973.54
4	CB_Bon_7	FHWA HEC-22 GENERIC	N/A	On Sag	1	942.30	944.31	0.00	10.00	2.34	N/A	N/A	N/A	7.00	13.02	944.63
5	CB_Hav_1	FHWA HEC-22 GENERIC	N/A	On Sag	1	1000.20	1010.00	0.00	10.00	2.20	N/A	N/A	N/A	7.00	12.49	1010.31
6	CB_Hav_2	FHWA HEC-22 GENERIC	N/A	On Sag	1	990.20	1000.00	0.00	10.00	0.08	N/A	N/A	N/A	7.00	1.36	1000.09
7	CB_Hav_3	FHWA HEC-22 GENERIC	N/A	On Sag	1	980.20	990.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	990.08
8	CB_Hen_4.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	890.43	900.70	0.00	10.00	1.85	N/A	N/A	N/A	7.00	11.10	900.98
9	CB_Locust_1.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	897.33	899.63	0.00	10.00	6.77	N/A	N/A	N/A	7.00	26.75	900.23
10	CB_Locust_1.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	896.76	900.21	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	900.29
11	CB_Locust_1.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	897.50	901.50	0.00	10.00	0.35	N/A	N/A	N/A	7.00	2.13	901.60
12	CB_Locust_2.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	900.00	903.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	903.08
13	CB_Locust_2.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	899.70	903.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	903.08
14	CB_Locust_4.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	895.60	904.50	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	904.58
15	CB_Locust_4.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	895.85	904.50	0.00	10.00	0.02	N/A	N/A	N/A	7.00	1.10	904.58
16	CB_Ton_6.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	928.04	932.67	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	932.74
17	CB_Ton_6.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	928.50	932.67	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	932.74
18	CB_Ton_6.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	927.00	932.67	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	932.74
19	CB_West_4.4	FHWA HEC-22 GENERIC	N/A	On Sag	1	900.30	907.50	0.00	10.00	0.16	N/A	N/A	N/A	7.00	1.63	907.59
20	CB_West_4.5	FHWA HEC-22 GENERIC	N/A	On Sag	1	900.30	907.50	0.00	10.00	0.14	N/A	N/A	N/A	7.00	1.57	907.59
21	CB_West_5.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	906.00	909.50	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	909.58
22	CB_West_5.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	905.50	909.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	909.08
23	CB_West_Del.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	915.00	918.50	0.00	10.00	3.01	N/A	N/A	N/A	7.00	15.43	918.87
24	CB_West_Del.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.49	920.59	0.00	10.00	1.87	N/A	N/A	N/A	7.00	11.17	920.88
25	CB_West_Del.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.71	918.21	0.00	10.00	1.85	N/A	N/A	N/A	7.00	11.09	918.49
26	CB_West_Del.4	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.23	918.16	0.00	10.00	0.01	N/A	N/A	N/A	7.00	0.99	918.24
27	CB_Whit_1/2.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	914.50	917.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	917.08
28	CB_Whit_1/2.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.00	919.00	0.00	10.00	1.54	N/A	N/A	N/A	7.00	9.77	919.25
29	CB_Whit_1/2.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	915.20	918.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	918.08
30	CB_Whit_3.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	906.00	912.00	0.00	10.00	1.40	N/A	N/A	N/A	7.00	9.14	912.24
31	CB_Whit_3.4	FHWA HEC-22 GENERIC	N/A	On Sag	1	903.73	913.50	0.00	10.00	1.03	N/A	N/A	N/A	7.00	7.41	913.71
32	CB_Whit_4.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	910.50	912.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	912.08
33	CB_Whit_6	FHWA HEC-22 GENERIC	N/A	On Sag	1	915.60	922.00	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	922.08
34	CB_Whit_Del.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	918.13	920.53	0.00	10.00	7.75	N/A	N/A	N/A	7.00	29.30	921.18
35	CB_Whit_Del.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	918.45	921.50	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.92	921.58
36	CB_Whit_Del.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	919.05	921.65	0.00	10.00	0.01	N/A	N/A	N/A	7.00	1.03	921.73
37	Inlet-60	FHWA HEC-22 GENERIC	N/A	On Sag	1	956.01	957.99	0.00	10.00	0.00	N/A	N/A	N/A	7.00	0.00	957.99
38	Inlet-61	FHWA HEC-22 GENERIC	N/A	On Sag	1	942.29	945.89	0.00	10.00	0.02	N/A	N/A	N/A	7.00	0.86	946.01
39	Inlet-62	FHWA HEC-22 GENERIC	N/A	On Sag	1	939.12	943.08	0.00	10.00	0.01	N/A	N/A	N/A	7.00	0.38	943.19

Junction Input

SN	Element ID	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Ground/Rim (Max) Offset (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Surcharge Elevation (ft)	Surcharge Depth (ft)	Ponded Area (ft²)	Minimum Pipe Cover (in)
1	CB_97_7.1	919.10	921.00	1.90	0.00	-919.10	921.00	0.00	10.00	0.00
2	CB_97_7.2	918.40	922.00	3.60	0.00	-918.40	922.00	0.00	10.00	0.00
3	CB_Hen_4.1	890.50	900.70	10.20	0.00	-890.50	900.70	0.00	10.00	0.00
4	CB_Locust_1.4	897.02	901.33	4.31	0.00	-897.02	901.33	0.00	10.00	0.00
5	CB_West_3.1	900.20	907.00	6.80	0.00	-900.20	907.00	0.00	10.00	0.00
6	CB_West_3.2	901.00	907.00	6.00	0.00	-901.00	907.00	0.00	10.00	0.00
7	CB_West_3.3	900.40	907.00	6.60	0.00	-900.40	907.00	0.00	10.00	0.00
8	CB_West_3.4	900.07	906.00	5.93	0.00	-900.07	906.00	0.00	10.00	0.00
9	CB_West_4.1	900.25	907.00	6.75	0.00	-900.25	907.00	0.00	10.00	0.00
10	CB_West_4.2	900.75	907.50	6.75	0.00	-900.75	907.50	0.00	10.00	0.00
11	CB_West_4.3	900.24	907.50	7.26	0.00	-900.24	907.50	0.00	10.00	0.00
12	CB_West_6	907.80	914.60	6.80	0.00	-907.80	914.60	0.00	240.00	0.00
13	CB_Whit_3.2	906.00	913.50	7.50	0.00	-906.00	913.50	0.00	240.00	0.00
14	CB_Whit_3.3	906.10	913.50	7.40	0.00	-906.10	913.50	0.00	240.00	0.00
15	CB_Whit_4.2	910.40	912.00	1.60	0.00	-910.40	912.00	0.00	10.00	0.00
16	CB_Whit_4.3	910.60	912.00	1.40	0.00	-910.60	912.00	0.00	10.00	0.00
17	CB_Whit_5.1	909.60	916.00	6.40	0.00	-909.60	916.00	0.00	10.00	0.00
18	CB_Whit_5.2	909.50	916.00	6.50	0.00	-909.50	916.00	0.00	10.00	0.00
19	CB_Whit_6s	915.00	919.00	4.00	0.00	-915.00	0.00	-919.00	0.00	0.00
20	CB_WhitWest_4	905.50	908.00	2.50	0.00	-905.50	908.00	0.00	10.00	0.00
21	MH_1st&97	910.47	920.00	9.53	0.00	-910.47	0.00	-920.00	0.00	0.00
22	MH_2nd&97	907.31	910.00	2.69	0.00	-907.31	910.00	0.00	100.00	0.00
23	MH_3rd&97	903.00	911.35	8.35	0.00	-903.00	0.00	-911.35	0.00	0.00
24	MH_4th&97	907.00	914.26	7.26	0.00	-907.00	914.26	0.00	100.00	0.00
25	MH_5th&97	908.80	914.44	5.64	0.00	-908.80	914.44	0.00	100.00	0.00
26	MH_6th&97	914.50	919.37	4.87	0.00	-914.50	919.37	0.00	100.00	0.00
27	MH_Bon_6	960.01	978.29	18.28	0.00	-960.01	978.29	0.00	100.00	0.00
28	MH_Hen_1	891.15	893.14	1.99	0.00	-891.15	893.14	0.00	100.00	0.00
29	MH_Hen_4	888.92	895.00	6.08	0.00	-888.92	895.00	0.00	100.00	0.00
30	MH_Locust_1.1	896.56	901.98	5.42	0.00	-896.56	901.98	0.00	100.00	0.00
31	MH_Locust_3	894.43	902.53	8.10	0.00	-894.43	902.53	0.00	100.00	0.00
32	MH_Locust_4	894.92	905.13	10.21	0.00	-894.92	905.13	0.00	100.00	0.00
33	MH_PT_9	924.71	929.23	4.52	0.00	-924.71	929.23	0.00	100.00	0.00
34	MH_RR_4	891.84	900.00	8.16	0.00	-891.84	900.00	0.00	100.00	0.00
35	MH_RRHen_4	890.04	898.00	7.96	0.00	-890.04	898.00	0.00	100.00	0.00
36	MH_West_3.1	899.27	905.00	5.73	0.00	-899.27	905.00	0.00	100.00	0.00
37	MH_West_3.2	897.80	905.00	7.20	0.00	-897.80	905.00	0.00	100.00	0.00
38	MH_West_3.3	899.96	905.00	5.04	0.00	-899.96	905.00	0.00	240.00	0.00
39	MH_West_3/4	899.48	905.00	5.52	0.00	-899.48	905.00	0.00	100.00	0.00
40	MH_West_4.1	899.50	907.46	7.96	0.00	-899.50	907.46	0.00	100.00	0.00
41	MH_West_4.2	900.50	908.00	7.50	0.00	-900.50	908.00	0.00	100.00	0.00
42	MH_West_4.3	896.14	907.71	11.57	0.00	-896.14	907.71	0.00	100.00	0.00
43	MH_West_Delish.1	913.33	919.19	5.86	0.00	-913.33	919.19	0.00	100.00	0.00
44	MH_West_Delish.2	914.79	920.00	5.21	0.00	-914.79	920.00	0.00	100.00	0.00
45	MH_Whit_3.2	905.88	909.81	3.93	0.00	-905.88	909.81	0.00	100.00	0.00
46	MH_Whit_5.1	909.50	913.99	4.49	0.00	-909.50	913.99	0.00	100.00	0.00
47	NEW 3rd Inlets	917.00	922.00	5.00	0.00	-917.00	939.00	17.00	100.00	0.00

Junction Results

SN	Element ID	Peak Inflow (cfs)	Peak Lateral Inflow (cfs)	Max HGL Elevation Attained (ft)	Max HGL Depth Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Average HGL Elevation Attained (ft)	Average HGL Depth Attained (ft)	Time of Max HGL Occurrence (days hh:mm)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	CB_97_7.1	4.18	4.18	928.37	9.27	7.37	0.00	919.54	0.44	0 12:01	0 11:57	0.04	18.00
2	CB_97_7.2	8.80	4.95	927.69	9.29	5.69	0.00	919.02	0.62	0 12:01	0 11:57	0.06	15.00
3	CB_Hen_4.1	5.79	5.79	893.33	2.83	0.00	7.37	890.81	0.31	0 12:04	0 00:00	0.00	0.00
4	CB_Locust_1.4	4.36	0.98	897.67	0.65	0.00	3.66	897.23	0.21	0 12:00	0 00:00	0.00	0.00
5	CB_West_3.1	5.84	5.84	911.90	11.70	4.90	0.00	901.59	1.39	0 12:05	0 12:01	0.03	15.00
6	CB_West_3.2	14.91	9.65	912.04	11.04	5.04	0.00	902.77	1.77	0 12:05	0 11:58	0.05	15.00
7	CB_West_3.3	6.72	6.72	912.95	12.55	5.95	0.00	903.29	2.89	0 12:05	0 11:58	0.04	16.00
8	CB_West_3.4	1.09	0.72	909.22	9.15	3.22	0.00	900.62	0.55	0 12:07	0 12:00	0.02	13.00
9	CB_West_4.1	0.35	0.00	909.88	9.63	2.88	0.00	900.93	0.68	0 12:07	0 12:01	0.01	13.00
10	CB_West_4.2	1.03	1.03	911.41	10.66	3.91	0.00	901.38	0.63	0 12:07	0 11:57	0.02	16.00
11	CB_West_4.3	2.25	0.54	909.92	9.68	2.42	0.00	900.94	0.70	0 12:07	0 11:57	0.04	14.00
12	CB_West_6	9.28	9.28	927.72	19.92	13.12	0.00	910.07	2.27	0 12:09	0 12:00	0.90	44.00
13	CB_Whit_3.2	9.01	5.58	911.47	5.47	0.00	2.03	906.59	0.59	0 12:06	0 00:00	0.00	0.00
14	CB_Whit_3.3	3.42	3.42	912.06	5.96	0.00	1.44	907.26	1.16	0 12:05	0 00:00	0.00	0.00
15	CB_Whit_4.2	8.80	8.80	912.66	2.26	0.66	0.00	910.69	0.29	0 12:04	0 12:04	0.01	7.00
16	CB_Whit_4.3	14.15	14.15	912.89	2.29	0.54	0.00	910.94	0.34	0 12:04	0 12:04	0.01	8.00
17	CB_Whit_5.1	1.14	1.14	913.95	4.35	0.00	2.05	910.18	0.58	0 12:05	0 00:00	0.00	0.00
18	CB_Whit_5.2	4.77	4.77	914.18	4.68	0.00	1.82	910.24	0.74	0 12:05	0 00:00	0.00	0.00
19	CB_Whit_6s	2.76	2.76	916.79	1.79	0.00	2.21	915.50	0.50	0 12:04	0 00:00	0.00	0.00
20	CB_WhitWest_4	0.87	0.00	909.96	4.46	1.96	0.00	905.61	0.11	0 12:07	0 11:59	0.02	11.00
21	MH_1st&97	14.38	14.38	920.00	9.53	0.00	0.00	910.84	0.37	0 11:57	0 11:57	0.00	0.00
22	MH_2nd&97	18.01	3.63	911.95	4.64	1.95	0.00	907.65	0.34	0 12:05	0 12:00	0.18	9.00
23	MH_3rd&97	66.28	0.00	911.35	8.35	0.00	0.00	904.03	1.03	0 11:59	0 11:59	0.01	0.00
24	MH_4th&97	44.25	4.12	912.18	5.18	0.00	2.08	907.46	0.46	0 12:05	0 00:00	0.00	0.00
25	MH_5th&97	17.69	0.00	913.91	5.11	0.00	0.53	909.98	1.18	0 12:05	0 00:00	0.00	0.00
26	MH_6th&97	8.19	3.59	916.20	1.70	0.00	3.17	915.18	0.68	0 12:06	0 00:00	0.00	0.00
27	MH_Bon_6	8.79	4.90	960.64	0.64	0.00	17.64	960.17	0.17	0 12:00	0 00:00	0.00	0.00
28	MH_Hen_1	4.33	0.00	891.79	0.64	0.00	1.36	891.35	0.20	0 12:01	0 00:00	0.00	0.00
29	MH_Hen_4	8.50	0.00	890.38	1.46	0.00	4.62	889.24	0.32	0 12:05	0 00:00	0.00	0.00
30	MH_Locust_1.1	3.30	1.12	898.05	1.49	0.00	3.93	897.33	0.77	0 12:00	0 00:00	0.00	0.00
31	MH_Locust_3	118.47	0.00	902.53	8.10	0.00	0.00	895.49	1.06	0 11:56	0 11:56	0.00	0.00
32	MH_Locust_4	1.30	1.03	895.27	0.35	0.00	9.86	895.02	0.10	0 12:00	0 00:00	0.00	0.00
33	MH_PT_9	2.25	2.25	925.14	0.43	0.00	4.09	924.87	0.16	0 12:05	0 00:00	0.00	0.00
34	MH_RR_4	1.28	0.00	892.18	0.34	0.00	7.82	891.93	0.09	0 12:01	0 00:00	0.00	0.00
35	MH_RRHen_4	8.57	0.00	891.16	1.12	0.00	6.84	890.29	0.25	0 12:04	0 00:00	0.00	0.00
36	MH_West_3.1	60.08	0.00	908.72	9.45	3.72	0.00	900.19	0.92	0 12:06	0 11:59	0.20	15.00
37	MH_West_3.2	120.24	3.28	907.47	9.67	2.47	0.00	898.78	0.98	0 12:06	0 11:57	0.48	13.00
38	MH_West_3.3	31.06	0.00	910.32	10.36	5.32	0.00	900.76	0.80	0 12:06	0 11:57	0.61	17.00
39	MH_West_3/4	36.47	0.00	909.22	9.74	4.22	0.00	900.48	1.00	0 12:07	0 12:00	0.34	16.00
40	MH_West_4.1	36.83	7.79	909.87	10.37	2.41	0.00	900.90	1.40	0 12:07	0 11:57	0.28	12.00
41	MH_West_4.2	4.92	4.20	911.26	10.76	3.26	0.00	901.22	0.72	0 12:07	0 12:02	0.10	14.00
42	MH_West_4.3	0.29	0.00	896.39	0.25	0.00	11.32	896.20	0.06	0 12:01	0 00:00	0.00	0.00
43	MH_West_Delish.1	4.38	0.00	919.19	5.86	0.00	0.00	913.69	0.36	0 11:58	0 11:58	0.00	0.00
44	MH_West_Delish.2	4.81	0.00	919.58	4.79	0.00	0.42	915.03	0.24	0 11:58	0 00:00	0.00	0.00
45	MH_Whit_3.2	11.90	0.00	910.96	5.08	1.15	0.00	906.20	0.32	0 12:06	0 12:03	0.08	8.00
46	MH_Whit_5.1	11.98	3.86	914.57	5.07	0.57	0.00	910.27	0.77	0 12:05	0 12:04	0.04	6.00
47	NEW 3rd Inlets	36.85	36.85	922.02	5.02	0.02	0.00	917.33	0.33	0 12:00	0 12:00	0.00	0.00

Channel Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Shape	Height (ft)	Width (ft)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate
1	Link-136	285.00	956.01	0.00	942.29	0.00	13.72	4.8100	Trapezoidal	3.000	5.000	0.0320	0.5000	0.5000	0.0000	0.00	No
2	Link-138	318.00	939.12	0.00	923.00	0.00	16.12	5.0700	Trapezoidal	3.000	5.020	0.0320	0.5000	0.5000	0.0000	0.00	No

Channel Results

SN	Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Froude Number	Reported Condition
1	Link-136	8.70	0 12:00	97.53	0.09	6.20	0.77	0.86	0.29	0.00		
2	Link-138	10.34	0 12:01	100.50	0.10	6.36	0.83	0.97	0.33	0.00		

Pipe Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Pipe Shape	Pipe Diameter or Height (in)	Pipe Width (in)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate	No. of Barrels
1	Link-102	24.00	919.10	0.00	918.40	0.00	0.70	2.9200	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
2	Link-103	100.00	918.40	0.00	917.80	0.00	0.60	0.6000	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
3	Link-135	117.16	960.01	0.00	956.01	0.00	4.00	3.4100	CIRCULAR	30.000	30.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
4	Link-137	66.96	942.29	0.00	939.12	0.00	3.17	4.7300	CIRCULAR	24.000	24.000	0.0250	0.5000	0.5000	0.0000	0.00	No	1
5	Link-139	33.71	942.30	0.00	939.12	0.00	3.18	9.4300	CIRCULAR	6.000	6.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
6	Link-14	49.74	969.87	0.00	969.51	9.50	0.36	0.7200	CIRCULAR	9.960	9.960	0.0130	0.5000	0.5000	0.0000	0.00	No	1
7	Link-141	40.78	980.20	0.00	980.00	0.00	0.20	0.4900	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
8	Link-142	41.71	990.20	0.00	990.00	0.00	0.20	0.4800	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
9	Link-143	40.63	1000.20	0.00	1000.00	0.00	0.20	0.4900	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
10	Link-144	530.00	913.33	0.00	900.00	0.00	13.33	2.5200	CIRCULAR	12.000	12.000	0.0240	0.5000	0.5000	0.0000	0.00	No	1
11	Link-146	316.01	910.47	0.00	907.31	0.00	3.16	1.0000	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
12	Link-147	367.78	907.31	0.00	903.63	0.63	3.68	1.0000	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
13	Link-148	340.00	924.74	0.03	915.06	0.56	9.68	2.8500	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
14	Link-149	11.00	909.89	0.39	909.70	0.90	0.19	1.7400	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
15	Link-15	330.00	947.63	0.00	928.14	0.10	19.49	5.9100	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
16	Link-150	350.00	909.60	0.80	907.46	0.46	2.14	0.6100	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
17	Link-159	200.00	917.00	0.00	903.73	0.73	13.27	6.6300	CIRCULAR	21.000	21.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
18	Link-160	30.00	917.80	0.00	917.00	0.00	0.80	2.6700	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
19	Link-161	56.00	915.30	0.30	914.95	0.45	0.35	0.6200	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
20	Link-162	389.96	907.00	0.00	901.00	1.50	6.00	1.5400	CIRCULAR	27.000	27.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
21	Link-163	320.65	897.80	0.00	894.47	0.04	3.33	1.0400	CIRCULAR	42.000	42.000	0.0100	0.5000	0.5000	0.0000	0.00	No	1
22	Link-164	393.00	907.36	0.36	904.73	1.73	2.63	0.6700	CIRCULAR	24.000	24.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
23	Link-165	43.11	916.23	0.00	915.00	0.00	1.23	2.8600	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
24	Link-17	52.00	927.94	-0.10	924.74	0.03	3.20	6.1500	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
25	Link-20	327.00	914.95	0.45	910.37	0.87	4.58	1.4000	CIRCULAR	18.000	18.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
26	Link-23	45.45	927.00	0.00	924.72	0.01	2.28	5.0200	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
27	Link-24	70.74	928.50	0.00	924.72	0.01	3.78	5.3400	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
28	Link-28	53.94	910.00	0.40	909.70	0.90	0.30	0.5600	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
29	Link-29	47.12	910.00	0.50	909.60	0.80	0.40	0.8500	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
30	Link-30	46.46	915.60	0.00	915.00	0.50	0.60	1.2900	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
31	Link-31	53.92	910.50	0.00	910.10	3.10	0.40	0.7400	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
32	Link-32	62.67	910.60	0.00	910.10	3.10	0.50	0.8000	CIRCULAR	21.000	21.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
33	Link-33	44.48	910.40	0.00	910.10	3.10	0.30	0.6700	CIRCULAR	18.000	18.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
34	Link-35	30.00	908.50	4.77	908.00	2.12	0.50	1.6700	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
35	Link-36	66.20	907.00	0.90	906.50	0.50	0.50	0.7600	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
36	Link-37	75.45	906.20	0.20	905.88	0.00	0.32	0.4200	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
37	Link-38	65.45	906.00	0.00	905.88	0.00	0.12	0.1800	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1
38	Link-39	370.00	903.53	0.53	898.64	0.84	4.89	1.3200	CIRCULAR	30.000	30.000	0.0150	0.5000	0.5000	0.0000	0.00	No	2
39	Link-40	300.00	905.88	0.00	900.06	0.10	5.82	1.9400	CIRCULAR	24.000	24.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
40	Link-41	29.00	899.96	0.00	899.37	0.10	0.59	2.0300	CIRCULAR	24.000	24.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
41	Link-43	38.54	901.00	0.80	900.06	0.10	0.94	2.4400	CIRCULAR	12.000	12.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
42	Link-44	45.82	903.00	2.60	902.30	1.30	0.70	1.5300	CIRCULAR	15.000	15.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
43	Link-45	51.64	902.20	1.20	901.00	1.04	1.20	2.3200	CIRCULAR	18.000	18.000	0.0130	0.5000	0.5000	0.0000	0.00	No	1
44	Link-46	47.28	900.50	0.00	899.99	0.49	0.51	1.0900	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
45	Link-47	42.10	900.25	0.00	899.94	0.44	0.31	0.7500	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
46	Link-49	39.85	900.24	0.00	899.94	0.44	0.30	0.7600	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
47	Link-51	184.87	905.50	0.00	903.30	3.06	2.20	1.1900	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
48	Link-52	34.65	900.75	0.00	900.50	0.00	0.25	0.7200	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
49	Link-54	58.00	919.48	1.03	919.05	0.00	0.43	0.7400	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
50	Link-55	65.00	918.45	0.00	918.13	0.00	0.32	0.4900	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
51	Link-56	150.00	918.13	0.00	916.23	0.00	1.90	1.2700	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
52	Link-57	30.00	917.20	0.48	916.36	0.13	0.83	2.7700	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
53	Link-59	61.00	917.06	0.35	916.42	-0.07	0.64	1.0500	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
54	Link-60	37.96	900.30	0.00	900.00	3.86	0.30	0.7900	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
55	Link-61	36.00	900.30	0.00	900.00	3.86	0.30	0.8300	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
56	Link-62	33.71	895.85	0.00	895.60	0.00	0.25	0.7400	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
57	Link-63	94.76	895.60	0.00	894.92	0.00	0.68	0.7200	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
58	Link-64	245.00	896.14	0.00	894.95	0.03	1.19	0.4900	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
59	Link-65	232.00	894.92	0.00	891.84	0.00	3.08	1.3300	CIRCULAR	20.040	20.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
60	Link-66	135.00	891.84	0.00	890.04	0.00	1.80	1.3300	CIRCULAR	20.040	20.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
61	Link-67	84.00	890.04	0.00	888.92	0.00	1.12	1.3300	CIRCULAR	20.040	20.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
62	Link-68	37.62	890.50	0.00	890.04	0.00	0.46	1.2200	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
63	Link-69	33.93	890.43	0.00	890.04	0.00	0.39	1.1500	CIRCULAR	9.960	9.960	0.0150	0.5000	0.5000	0.0000	0.00	No	1
64	Link-70	100.00	899.48	0.00	899.27	0.00	0.21	0.2100	CIRCULAR	36.000	36.000	0.0100	0.5000	0.5000	0.0000	0.00	No	1
65	Link-71	220.00	899.94	0.44	899.48	0.00	0.46	0.2100	CIRCULAR	36.000	36.000	0.0100	0.5000	0.5000	0.0000	0.00	No	1
66	Link-72	18.87	900.07	0.00	899.48	0.00	0.59	3.1300	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
67	Link-73	58.43	906.00	0.00	905.50	0.00	0.50	0.8600	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
68	Link-74	60.00	907.80	0.00	907.50	0.00	0.30	0.5000	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
69	Link-76	630.00	894.43	0.00	891.45	0.00	2.98	0.4700	CIRCULAR	42.000	42.000	0.0100	0.5000	0.5000	0.0000	0.00	No	1
70	Link-77	226.22	888.92	0.00	888.00	0.00	0.92	0.4100	CIRCULAR	21.960	21.960	0.0150	0.5000	0.5000	0.0000	0.00	No	1
71	Link-78	41.32	900.00	0.00	899.70	0.00	0.30	0.7300	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
72	Link-81	78.00	916.56	0.07	914.79	0.00	1.77	2.2700	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
73	Link-82	64.00	914.79	0.00	913.33	0.00	1.46	2.2800	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
74	Link-83	38.64	915.00	0.00	914.79	0.00	0.21	0.5400	CIRCULAR	8.040	8.040	0.0130	0.5000	0.5000	0.0000	0.00	No	1
75	Link-84	32.44	899.27	0.00	898.77	0.97	0.50	1.5400	CIRCULAR	36.000	36.000	0.0100	0.5000	0.5000	0.0000	0.00	No	1
76	Link-85	27.00	897.33	0.00	897.22	0.46	0.11	0.4100	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
77	Link-87	82.00	896.76	0.00	896.56	0.00	0.20	0.2400	CIRCULAR	14.040	14.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
78	Link-88	39.36	897.50	0.00	897.02	0.00	0.48	1.2100	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No	1
79	Link-95	205.00	891.15	0.00	887.15	0.00	4.00	1.9500	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
80	Link-96	87.00	897.02	0.00	896.62	0.06	0.40	0.4600	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
81	Link-97	350.00	897.02	0.00	891.15	0.00	5.87	1.6800	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1

Pipe Results

SN	Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Froude Number	Reported Condition
		(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)		
1	Link-102	3.95	0 12:01	6.08	0.65	5.02	0.08	1.00	1.00	20.00		SURCHARGED
2	Link-103	8.60	0 12:01	2.76	3.12	10.95	0.15	1.00	1.00	17.00		SURCHARGED
3	Link-135	8.78	0 12:00	65.64	0.13	6.76	0.29	0.77	0.31	0.00		Calculated
4	Link-137	8.68	0 12:01	25.60	0.34	6.20	0.18	0.90	0.46	0.00		Calculated
5	Link-139	1.73	0 11:56	1.72	1.00	8.80	0.06	0.50	1.00	12.00		SURCHARGED
6	Link-14	4.07	0 12:00	1.86	2.18	7.49	0.11	0.82	0.98	0.00		> CAPACITY
7	Link-141	0.00	0 00:00	6.38	0.00	0.00		0.00	0.00	0.00		Calculated
8	Link-142	0.08	0 13:20	6.30	0.01	0.78	0.89	0.65	0.43	0.00		Calculated
9	Link-143	1.71	0 12:13	6.39	0.27	0.97	0.70	1.50	1.00	67.00		SURCHARGED
10	Link-144	3.39	0 12:01	3.06	1.11	4.42	2.00	1.00	1.00	17.00		SURCHARGED
11	Link-146	14.38	0 12:00	11.38	1.26	8.22	0.64	1.50	1.00	9.00		SURCHARGED
12	Link-147	16.74	0 11:58	24.51	0.68	6.72	0.91	2.00	1.00	9.00		SURCHARGED
13	Link-148	2.24	0 12:05	6.51	0.34	5.21	1.09	0.70	0.70	0.00		Calculated
14	Link-149	11.95	0 12:01	15.00	0.80	6.76	0.03	1.50	1.00	11.00		SURCHARGED
15	Link-15	0.00	0 00:00	2.94	0.00	0.00		0.00	0.00	0.00		Calculated
16	Link-150	17.44	0 12:01	19.16	0.91	6.22	0.94	2.00	1.00	8.00		SURCHARGED
17	Link-159	37.51	0 12:00	44.22	0.85	16.86	0.20	1.75	1.00	6.00		SURCHARGED
18	Link-160	6.40	0 11:59	5.82	1.10	8.15	0.06	1.00	1.00	12.00		SURCHARGED
19	Link-161	2.76	0 12:04	2.44	1.13	3.51	0.27	1.00	1.00	6.00		SURCHARGED
20	Link-162	25.42	0 12:02	41.62	0.61	9.05	0.72	2.25	1.00	11.00		SURCHARGED
21	Link-163	118.47	0 12:07	133.29	0.89	12.31	0.43	3.50	1.00	18.00		SURCHARGED
22	Link-164	14.63	0 11:59	16.04	0.91	5.22	1.25	2.00	1.00	11.00		SURCHARGED
23	Link-165	3.11	0 12:01	5.22	0.60	6.20	0.12	0.61	0.61	0.00		Calculated
24	Link-17	0.00	0 00:00	3.04	0.00	0.00		0.20	0.31	0.00		Calculated
25	Link-20	8.15	0 12:01	12.43	0.66	6.13	0.89	1.35	0.92	0.00		Calculated
26	Link-23	0.00	0 00:00	2.71	0.00	0.00		0.21	0.32	0.00		Calculated
27	Link-24	0.00	0 00:00	2.79	0.00	0.00		0.21	0.32	0.00		Calculated
28	Link-28	1.16	0 12:01	2.88	0.40	1.47	0.61	1.00	1.00	13.00		SURCHARGED
29	Link-29	4.78	0 12:00	6.45	0.74	3.89	0.20	1.25	1.00	13.00		SURCHARGED
30	Link-30	0.13	0 12:08	1.37	0.10	0.53	1.46	0.60	0.96	0.00		Calculated
31	Link-31	0.58	0 12:05	1.04	0.56	1.77	0.51	0.67	1.00	6.00		SURCHARGED
32	Link-32	14.11	0 12:00	14.15	1.00	6.20	0.17	1.75	1.00	3.00		SURCHARGED
33	Link-33	8.78	0 12:00	8.63	1.02	5.32	0.14	1.50	1.00	4.00		SURCHARGED
34	Link-35	1.59	0 12:01	1.56	1.02	4.55	0.11	0.67	1.00	9.00		SURCHARGED
35	Link-36	3.42	0 12:00	3.10	1.11	4.36	0.25	1.00	1.00	15.00		SURCHARGED
36	Link-37	9.02	0 12:00	7.40	1.22	5.66	0.22	1.50	1.00	13.00		SURCHARGED
37	Link-38	2.05	0 12:00	1.65	1.24	2.61	0.42	1.00	1.00	14.00		SURCHARGED
38	Link-39	61.06	0 12:02	81.73	0.75	6.76	0.91	2.50	1.00	14.00		SURCHARGED
39	Link-40	11.40	0 12:01	27.31	0.42	3.91	1.28	2.00	1.00	12.00		SURCHARGED
40	Link-41	31.71	0 12:13	27.97	1.13	10.09	0.05	2.00	1.00	22.00		SURCHARGED
41	Link-43	5.71	0 12:05	5.56	1.03	7.27	0.09	1.00	1.00	24.00		SURCHARGED
42	Link-44	6.59	0 12:05	7.98	0.83	5.41	0.14	1.25	1.00	18.00		SURCHARGED
43	Link-45	14.42	0 12:03	16.01	0.90	8.16	0.11	1.50	1.00	18.00		SURCHARGED
44	Link-46	5.40	0 12:12	3.22	1.68	6.87	0.11	1.00	1.00	32.00		SURCHARGED
45	Link-47	0.92	0 12:12	1.04	0.88	2.62	0.27	0.67	1.00	50.00		SURCHARGED
46	Link-49	1.80	0 11:57	1.06	1.70	5.15	0.13	0.67	1.00	51.00		SURCHARGED
47	Link-51	0.87	0 11:59	1.32	0.66	2.80	1.10	0.67	1.00	13.00		SURCHARGED
48	Link-52	1.64	0 12:13	1.03	1.60	4.70	0.12	0.67	1.00	33.00		SURCHARGED
49	Link-54	0.49	0 12:02	0.90	0.54	2.65	0.36	0.67	1.00	30.00		SURCHARGED
50	Link-55	0.47	0 11:44	0.73	0.64	1.34	0.81	0.67	1.00	38.00		SURCHARGED
51	Link-56	1.63	0 11:59	1.18	1.38	4.92	0.51	0.66	1.00	0.00		> CAPACITY
52	Link-57	1.55	0 12:00	1.74	0.89	4.77	0.10	0.58	0.90	0.00		Calculated
53	Link-59	0.82	0 11:58	1.01	0.81	2.82	0.36	0.67	1.00	6.00		SURCHARGED
54	Link-60	0.16	0 12:00	1.07	0.14	2.10	0.30	0.18	0.27	0.00		Calculated
55	Link-61	0.14	0 12:00	1.10	0.13	2.07	0.29	0.16	0.25	0.00		Calculated
56	Link-62	0.02	0 13:27	0.90	0.02	1.09	0.52	0.07	0.10	0.00		Calculated
57	Link-63	0.02	0 13:33	1.02	0.02	1.05	1.50	0.17	0.26	0.00		Calculated
58	Link-64	0.29	0 12:01	2.15	0.13	1.57	2.60	0.28	0.28	0.00		Calculated
59	Link-65	1.28	0 12:01	13.89	0.09	3.94	0.98	0.34	0.21	0.00		Calculated
60	Link-66	1.27	0 12:01	13.92	0.09	1.39	1.62	0.72	0.44	0.00		Calculated
61	Link-67	8.50	0 12:04	13.92	0.61	4.75	0.29	1.29	0.78	0.00		Calculated
62	Link-68	5.79	0 12:05	3.41	1.70	7.38	0.08	1.00	1.00	9.00		SURCHARGED
63	Link-69	1.96	0 12:00	2.04	0.96	3.59	0.16	0.83	1.00	10.00		SURCHARGED
64	Link-70	34.94	0 11:57	39.73	0.88	4.94	0.34	3.00	1.00	17.00		SURCHARGED
65	Link-71	36.01	0 12:00	39.48	0.91	5.09	0.72	3.00	1.00	18.00		SURCHARGED
66	Link-72	0.93	0 12:13	16.10	0.06	0.53	0.59	1.50	1.00	24.00		SURCHARGED
67	Link-73	0.00	0 00:00	0.97	0.00	0.00		0.00	0.00	0.00		Calculated
68	Link-74	5.38	0 12:09	0.74	7.27	15.43	0.06	0.67	1.00	0.00		SURCHARGED
69	Link-76	118.47	0 12:07	89.89	1.32	12.31	0.85	3.50	1.00	17.00		SURCHARGED
70	Link-77	8.50	0 12:04	9.91	0.86	3.97	0.95	1.39	0.76	0.00		Calculated
71	Link-78	0.00	0 00:00	0.89	0.00	0.00		0.00	0.00	0.00		Calculated
72	Link-81	2.34	0 11:58	13.73	0.17	4.15	0.31	1.36	0.93	0.00		Calculated
73	Link-82	4.38	0 11:57	13.73	0.32	4.24	0.25	1.50	1.00	12.00		SURCHARGED
74	Link-83	2.52	0 11:57	0.89	2.82	7.21	0.09	0.67	1.00	14.00		SURCHARGED
75	Link-84	62.89	0 12:12	107.65	0.58	9.49	0.06	3.00	1.00	17.00		SURCHARGED
76	Link-85	2.10	0 12:01	0.67	3.14	6.01	0.07	0.67	1.00	30.00		SURCHARGED
77	Link-87	2.24	0 12:01	2.30	0.97	2.10	0.65	1.17	1.00	29.00		SURCHARGED
78	Link-88	0.35	0 12:00	1.15	0.30	1.39	0.47	0.45	0.68	0.00		Calculated
79	Link-95	4.31	0 12:01	12.72	0.34	6.28	0.54	0.61	0.41	0.00		Calculated
80	Link-96	3.04	0 12:00	6.17	0.49	2.33	0.62	1.04	0.69	0.00		Calculated
81	Link-97	4.33	0 12:00	11.79	0.37	6.02	0.97	0.63	0.43	0.00		Calculated

Inlet Input

SN	Element ID	Inlet Manufacturer	Manufacturer Part Number	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Inlet Depth (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Ponded Area (ft²)	Grate Clogging Factor (%)
1	CB_97_7.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	917.80	920.00	2.20	0.00	0.00	10.00	0.00
2	CB_Ant_6	FHWA HEC-22 GENERIC	N/A	On Sag	1	947.63	952.02	4.39	0.00	0.00	10.00	0.00
3	CB_Bon_6	FHWA HEC-22 GENERIC	N/A	On Sag	1	969.87	973.11	3.24	0.00	0.00	10.00	0.00
4	CB_Bon_7	FHWA HEC-22 GENERIC	N/A	On Sag	1	942.30	944.31	2.01	0.00	0.00	10.00	0.00
5	CB_Hav_1	FHWA HEC-22 GENERIC	N/A	On Sag	1	1000.20	1010.00	9.80	0.00	0.00	10.00	0.00
6	CB_Hav_2	FHWA HEC-22 GENERIC	N/A	On Sag	1	990.20	1000.00	9.80	0.00	0.00	10.00	0.00
7	CB_Hav_3	FHWA HEC-22 GENERIC	N/A	On Sag	1	980.20	990.00	9.80	0.00	0.00	10.00	0.00
8	CB_Hen_4.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	890.43	900.70	10.27	0.00	0.00	10.00	0.00
9	CB_Locust_1.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	897.33	899.63	2.30	0.00	0.00	10.00	0.00
10	CB_Locust_1.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	896.76	900.21	3.45	0.00	0.00	10.00	0.00
11	CB_Locust_1.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	897.50	901.50	4.00	0.00	0.00	10.00	0.00
12	CB_Locust_2.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	900.00	903.00	3.00	0.00	0.00	10.00	0.00
13	CB_Locust_2.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	899.70	903.00	3.30	0.00	0.00	10.00	0.00
14	CB_Locust_4.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	895.60	904.50	8.90	0.00	0.00	10.00	0.00
15	CB_Locust_4.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	895.85	904.50	8.65	0.00	0.00	10.00	0.00
16	CB_Ton_6.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	928.04	932.67	4.63	0.00	0.00	10.00	0.00
17	CB_Ton_6.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	928.50	932.67	4.17	0.00	0.00	10.00	0.00
18	CB_Ton_6.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	927.00	932.67	5.67	0.00	0.00	10.00	0.00
19	CB_West_4.4	FHWA HEC-22 GENERIC	N/A	On Sag	1	900.30	907.50	7.20	0.00	0.00	10.00	0.00
20	CB_West_4.5	FHWA HEC-22 GENERIC	N/A	On Sag	1	900.30	907.50	7.20	0.00	0.00	10.00	0.00
21	CB_West_5.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	906.00	909.50	3.50	0.00	0.00	10.00	0.00
22	CB_West_5.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	905.50	909.00	3.50	0.00	0.00	10.00	0.00
23	CB_West_Del.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	915.00	918.50	3.50	0.00	0.00	10.00	0.00
24	CB_West_Del.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.49	920.59	4.10	0.00	0.00	10.00	0.00
25	CB_West_Del.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.71	918.21	1.50	0.00	0.00	10.00	0.00
26	CB_West_Del.4	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.23	918.16	1.93	0.00	0.00	10.00	0.00
27	CB_Whit_1/2.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	914.50	917.00	2.50	0.00	0.00	10.00	0.00
28	CB_Whit_1/2.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	916.00	919.00	3.00	0.00	0.00	10.00	0.00
29	CB_Whit_1/2.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	915.20	918.00	2.80	0.00	0.00	10.00	0.00
30	CB_Whit_3.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	906.00	912.00	6.00	0.00	0.00	10.00	0.00
31	CB_Whit_3.4	FHWA HEC-22 GENERIC	N/A	On Sag	1	903.73	913.50	9.77	0.00	0.00	10.00	0.00
32	CB_Whit_4.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	910.50	912.00	1.50	0.00	0.00	10.00	0.00
33	CB_Whit_6	FHWA HEC-22 GENERIC	N/A	On Sag	1	915.60	922.00	6.40	0.00	0.00	10.00	0.00
34	CB_Whit_Del.1	FHWA HEC-22 GENERIC	N/A	On Sag	1	918.13	920.53	2.40	0.00	0.00	10.00	0.00
35	CB_Whit_Del.2	FHWA HEC-22 GENERIC	N/A	On Sag	1	918.45	921.50	3.05	0.00	0.00	10.00	0.00
36	CB_Whit_Del.3	FHWA HEC-22 GENERIC	N/A	On Sag	1	919.05	921.65	2.60	0.00	0.00	10.00	0.00
37	Inlet-60	FHWA HEC-22 GENERIC	N/A	On Sag	1	956.01	957.99	1.98	0.00	0.00	10.00	0.00
38	Inlet-61	FHWA HEC-22 GENERIC	N/A	On Sag	1	942.29	945.89	3.60	0.00	0.00	10.00	0.00
39	Inlet-62	FHWA HEC-22 GENERIC	N/A	On Sag	1	939.12	943.08	3.96	0.00	0.00	10.00	0.00

Roadway & Gutter Input

SN	Element ID	Roadway Longitudinal Slope (ft/ft)	Roadway Cross Slope (ft/ft)	Roadway Manning's Roughness	Gutter Cross Slope (ft/ft)	Gutter Width (ft)	Gutter Depression (in)	Allowable Spread (ft)
1	CB_97_7.3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
2	CB_Ant_6	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
3	CB_Bon_6	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
4	CB_Bon_7	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
5	CB_Hav_1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
6	CB_Hav_2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
7	CB_Hav_3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
8	CB_Hen_4.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
9	CB_Locust_1.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
10	CB_Locust_1.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
11	CB_Locust_1.3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
12	CB_Locust_2.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
13	CB_Locust_2.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
14	CB_Locust_4.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
15	CB_Locust_4.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
16	CB_Ton_6.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
17	CB_Ton_6.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
18	CB_Ton_6.3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
19	CB_West_4.4	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
20	CB_West_4.5	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
21	CB_West_5.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
22	CB_West_5.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
23	CB_West_Del.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
24	CB_West_Del.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
25	CB_West_Del.3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
26	CB_West_Del.4	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
27	CB_Whit_1/2.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
28	CB_Whit_1/2.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
29	CB_Whit_1/2.3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
30	CB_Whit_3.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
31	CB_Whit_3.4	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
32	CB_Whit_4.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
33	CB_Whit_6	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
34	CB_Whit_Del.1	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
35	CB_Whit_Del.2	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
36	CB_Whit_Del.3	N/A	0.0200	0.0160	0.0620	1.50	0.0328	7.00
37	Inlet-60	N/A	0.0200	0.0160	0.0620	2.00	0.0656	7.00
38	Inlet-61	N/A	0.0200	0.0160	0.0620	2.00	0.0656	7.00
39	Inlet-62	N/A	0.0200	0.0160	0.0620	2.00	0.0656	7.00

Inlet Results

SN	Element ID	Peak Flow (cfs)	Peak Lateral Inflow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)	Max Gutter Water Depth during Peak Flow (ft)	Time of Max Depth Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	CB_97_7.3	0.05	0.05	N/A	N/A	N/A	1.26	920.08	0.08	0 11:57	0.24	10.00
2	CB_Ant_6	0.00	0.00	N/A	N/A	N/A	0.92	952.09	0.08	0 00:00	0.00	0.00
3	CB_Bon_6	4.06	4.06	N/A	N/A	N/A	18.93	973.54	0.44	0 11:57	0.00	1.00
4	CB_Bon_7	2.34	2.34	N/A	N/A	N/A	13.02	944.63	0.32	0 11:55	0.06	10.00
5	CB_Hav_1	2.20	2.20	N/A	N/A	N/A	12.49	1010.31	0.31	0 11:54	0.18	15.00
6	CB_Hav_2	0.08	0.08	N/A	N/A	N/A	1.36	1000.09	0.09	0 13:23	0.00	0.00
7	CB_Hav_3	0.00	0.00	N/A	N/A	N/A	0.92	990.08	0.08	0 00:00	0.00	0.00
8	CB_Hen_4.2	1.85	1.85	N/A	N/A	N/A	11.10	900.98	0.28	0 12:00	0.00	0.00
9	CB_Locust_1.1	6.77	6.77	N/A	N/A	N/A	26.75	900.23	0.59	0 11:48	1.09	25.00
10	CB_Locust_1.2	0.00	0.00	N/A	N/A	N/A	0.92	900.29	0.08	0 12:01	0.00	0.00
11	CB_Locust_1.3	0.35	0.35	N/A	N/A	N/A	2.13	901.60	0.10	0 12:00	0.00	0.00
12	CB_Locust_2.1	0.00	0.00	N/A	N/A	N/A	0.92	903.08	0.08	0 00:00	0.00	0.00
13	CB_Locust_2.2	0.00	0.00	N/A	N/A	N/A	0.92	903.08	0.08	0 00:00	0.00	0.00
14	CB_Locust_4.1	0.00	0.00	N/A	N/A	N/A	0.92	904.58	0.08	0 13:33	0.00	0.00
15	CB_Locust_4.2	0.02	0.02	N/A	N/A	N/A	1.10	904.58	0.08	0 13:26	0.00	0.00
16	CB_Ton_6.1	0.00	0.00	N/A	N/A	N/A	0.92	932.74	0.08	0 00:00	0.00	0.00
17	CB_Ton_6.2	0.00	0.00	N/A	N/A	N/A	0.92	932.74	0.08	0 00:00	0.00	0.00
18	CB_Ton_6.3	0.00	0.00	N/A	N/A	N/A	0.92	932.74	0.08	0 00:00	0.00	0.00
19	CB_West_4.4	0.16	0.16	N/A	N/A	N/A	1.63	907.59	0.09	0 12:00	0.00	0.00
20	CB_West_4.5	0.14	0.14	N/A	N/A	N/A	1.57	907.59	0.09	0 12:00	0.00	0.00
21	CB_West_5.1	0.00	0.00	N/A	N/A	N/A	0.92	909.58	0.08	0 00:00	0.00	0.00
22	CB_West_5.2	0.00	0.00	N/A	N/A	N/A	0.92	909.08	0.08	0 00:00	0.00	0.00
23	CB_West_Del.1	3.01	3.01	N/A	N/A	N/A	15.43	918.87	0.37	0 11:57	0.17	10.00
24	CB_West_Del.2	1.87	1.87	N/A	N/A	N/A	11.17	920.88	0.28	0 12:01	0.00	0.00
25	CB_West_Del.3	1.85	1.85	N/A	N/A	N/A	11.09	918.49	0.28	0 12:00	0.00	0.00
26	CB_West_Del.4	0.01	0.01	N/A	N/A	N/A	0.99	918.24	0.08	0 12:01	0.00	0.00
27	CB_Whit_1/2.1	0.00	0.00	N/A	N/A	N/A	0.92	917.08	0.08	0 00:00	0.00	0.00
28	CB_Whit_1/2.2	1.54	1.54	N/A	N/A	N/A	9.77	919.25	0.25	0 08:05	0.00	0.00
29	CB_Whit_1/2.3	0.00	0.00	N/A	N/A	N/A	0.92	918.08	0.08	0 00:00	0.00	0.00
30	CB_Whit_3.1	1.40	1.40	N/A	N/A	N/A	9.14	912.24	0.24	0 12:09	0.00	0.00
31	CB_Whit_3.4	1.03	1.03	N/A	N/A	N/A	7.41	913.71	0.21	0 12:01	0.00	0.00
32	CB_Whit_4.1	0.00	0.00	N/A	N/A	N/A	0.92	912.08	0.08	0 12:02	0.02	3.00
33	CB_Whit_6	0.00	0.00	N/A	N/A	N/A	0.92	922.08	0.08	0 12:06	0.00	0.00
34	CB_Whit_Del.1	7.75	7.75	N/A	N/A	N/A	29.30	921.18	0.64	0 11:44	1.44	30.00
35	CB_Whit_Del.2	0.00	0.00	N/A	N/A	N/A	0.92	921.58	0.08	0 11:44	0.00	1.00
36	CB_Whit_Del.3	0.01	0.01	N/A	N/A	N/A	1.03	921.73	0.08	0 11:43	0.00	3.00
37	Inlet-60	0.00	0.00	N/A	N/A	N/A	0.00	957.99	0.00	0 12:00	0.00	0.00
38	Inlet-61	0.02	0.02	N/A	N/A	N/A	0.86	946.01	0.12	0 12:01	0.00	0.00
39	Inlet-62	0.01	0.01	N/A	N/A	N/A	0.38	943.19	0.11	0 12:01	0.00	0.00

Storage Nodes

Storage Node : DW_Hav_1

Input Data

Invert Elevation (ft)	980.00
Max (Rim) Elevation (ft)	990.00
Max (Rim) Offset (ft)	10.00
Initial Water Elevation (ft)	0.00
Initial Water Depth (ft)	-980.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Output Summary Results

Peak Inflow (cfs)	0.00
Peak Lateral Inflow (cfs)	0.00
Peak Outflow (cfs)	0.00
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	980.00
Max HGL Depth Attained (ft)	0
Average HGL Elevation Attained (ft)	980.00
Average HGL Depth Attained (ft)	0
Time of Max HGL Occurrence (days hh:mm)	0 00:00
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : DW_Hav_2

Input Data

Invert Elevation (ft)	990.00
Max (Rim) Elevation (ft)	1000.00
Max (Rim) Offset (ft)	10.00
Initial Water Elevation (ft)	0.00
Initial Water Depth (ft)	-990.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Output Summary Results

Peak Inflow (cfs)	0.08
Peak Lateral Inflow (cfs)	0.00
Peak Outflow (cfs)	0.08
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	990.75
Max HGL Depth Attained (ft)	0.75
Average HGL Elevation Attained (ft)	990.35
Average HGL Depth Attained (ft)	0.35
Time of Max HGL Occurrence (days hh:mm)	0 13:23
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

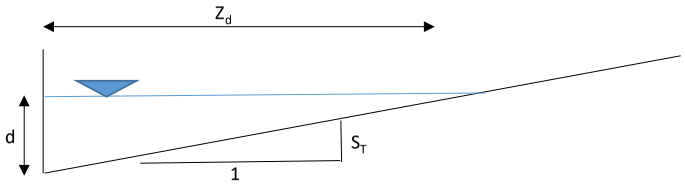
Storage Node : DW_Hav_3

Input Data

Invert Elevation (ft)	1000.00
Max (Rim) Elevation (ft)	1010.00
Max (Rim) Offset (ft)	10.00
Initial Water Elevation (ft)	0.00
Initial Water Depth (ft)	-1000.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Output Summary Results

Peak Inflow (cfs)	1.71
Peak Lateral Inflow (cfs)	0.00
Peak Outflow (cfs)	1.53
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	1010.00
Max HGL Depth Attained (ft)	10
Average HGL Elevation Attained (ft)	1001.73
Average HGL Depth Attained (ft)	1.73
Time of Max HGL Occurrence (days hh:mm)	0 11:54
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0.00
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00



Typical Gutter Section (Figure 5-4.2, WSDOT Hydraulic Manual)

Inputs

Curb Height =	0.5	(ft)
Max Design Spread (Z_{dmax}) =	7	(ft)
Grate Width (GW) =	1.67	(ft)
Grate Length (GL) =	2	(ft)
Grate Inlet Width (GW)	1.67	(ft)
Grate Inlet Length (GL)	3.52	(sf)
Grate Sag Clog Factor1 =	0.5	(-)
Grate Sag Clog Factor2 =	0.5	(-)
Constant (K_C) =	1.11	(-)
Constant (K_u) =	0.15	(-)
Mannings value for concrete (n) =	0.016	(-)
Weir Coefficient (C_W) =	3	(-)
Curb Inlet Opening Width (L) =	2.5	(ft)
Curb Inlet Depression Width (W) =	2.5	(ft)
Curb Inlet Clog Factor =	0.67	(-)

Equations

$$Q_{BP2} \_ QB_{P1} \quad ,Rs * QBP_{1}$$

$$V_{continuous} = \frac{Q - QBP_1}{(GW)[d - 0.5(GW)(St)]}$$

$$V_{side} = \left(\frac{K_c}{n}\right)(S_L{}^{0.5} S_T{}^{0.67} Z_d{}^{0.67})$$

$$Q_{BP1} = (Q + QBP_2)\left[\frac{(Z_d) - (GW)}{(Zd)}\right]^{8/3}$$

$$Q_i = (\Delta Q)|(\Delta Q - QBP1) + RS(1 - EO)|$$

$$E_O = 1 - \left(1 - \frac{GW}{Z_d}\right)^{2.67}$$

$$\Delta Q = Q + QBP_2$$

$$R_S = \frac{1}{1 + \frac{K_u V_{side}{}^{1.8}}{S_T G L^{2.3}}}$$

$$Z_d = \frac{d}{S_t}$$

$$d = \left[\frac{QS_T}{37(SL)^{0.5}}\right]^{3/8}$$

South 1st Ave @ US 97

Inlet	Q (cfs)	ΔQ (CFS)	S_T (ft/ft)	S_L (ft/ft)	d (ft)	Z_d (ft)	Q_{BP1} (cfs)	$V_{continuous}$ (ft/s)	V_{side} (ft/s)	E_o (ft/ft)	R_s (CFS/CFS)	Q_i (CFS)	Q_{BP2} (CFS)	Grate Type
Run-on	0.71													
		0.71	0.02	0.06	0.09	4.55	0.21	4.16	NA	0.70	0.00	0.50	0.21	Type 1
		0.21	0.02	0.06	0.06	2.88	0.02	2.87	4.88	0.90	0.04	0.19	0.02	Type 1
		0.02	0.02	0.06	0.02	1.20	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	

North 1st Ave @ US 97

Inlet	Q (cfs)	ΔQ (CFS)	S_T (ft/ft)	S_L (ft/ft)	d (ft)	Z_d (ft)	Q_{BP1} (cfs)	$V_{continuous}$ (ft/s)	V_{side} (ft/s)	E_o (ft/ft)	R_s (CFS/CFS)	Q_i (CFS)	Q_{BP2} (CFS)	Grate Type
Run-on	2.50													
		2.50	0.02	0.06	0.14	7.11	0.40	5.56	NA	0.84	0.00	2.10	0.40	Rotated Grate
		0.40	0.02	0.09968	0.07	3.27	0.06	4.24	N/A	0.85	0.00	0.34	0.06	Type 1

East US 97 @ 1st

Inlet	Q (cfs)	ΔQ (CFS)	S_T (ft/ft)	S_L (ft/ft)	d (ft)	Z_d (ft)	Q_{BP1} (cfs)	$V_{continuous}$ (ft/s)	V_{side} (ft/s)	E_o (ft/ft)	R_s (CFS/CFS)	Q_i (CFS)	Q_{BP2} (CFS)	Grate Type
Run-on	0.85													
		0.85	0.02	0.03	0.11	5.55	0.33	2.04	5.36	0.62	0.03	0.53	0.32	Type 1
		0.32	0.02	0.03	0.07	3.73	0.07	2.60	2.11	0.79	0.15	0.26	0.06	Type 1

West US 97 @ 1st

Inlet	Q (cfs)	ΔQ (CFS)	S_T (ft/ft)	S_L (ft/ft)	d (ft)	Z_d (ft)	Q_{BP1} (cfs)	$V_{continuous}$ (ft/s)	V_{side} (ft/s)	E_o (ft/ft)	R_s (CFS/CFS)	Q_i (CFS)	Q_{BP2} (CFS)	Grate Type
Run-on	1.37													
		1.37	0.02	0.03	0.13	6.63	0.63	3.92	NA	0.54	0.00	0.74	0.63	
		0.63	0.02	0.03	0.10	4.84	0.20	3.20	NA	0.68	0.00	0.43	0.20	Type 1
		0.20	0.02	0.03	0.06	3.17	0.03	2.27	3.68	0.86	0.06	0.18	0.03	Type 1

South 2nd @ US 97

Inlet	Q (cfs)	ΔQ (CFS)	S_T (ft/ft)	S_L (ft/ft)	d (ft)	Z_d (ft)	Q_{BP1} (cfs)	$V_{continuous}$ (ft/s)	V_{side} (ft/s)	E_o (ft/ft)	R_s (CFS/CFS)	Q_i (CFS)	Q_{BP2} (CFS)	Grate Type
Run-on	0.45													
		0.45	0.02	0.06	0.07	3.84	0.10	3.63	NA	0.78	0.00	0.35	0.10	Type 1
		0.10	0.02	0.06	0.04	2.11	0.00	2.26	3.97	0.98	0.05	0.10	0.00	Type 1

North 2nd @ US 97

Inlet	Q (cfs)	ΔQ (CFS)	S_T (ft/ft)	S_L (ft/ft)	d (ft)	Z_d (ft)	Q_{BP1} (cfs)	$V_{continuous}$ (ft/s)	V_{side} (ft/s)	E_o (ft/ft)	R_s (CFS/CFS)	Q_i (CFS)	Q_{BP2} (CFS)	Grate Type
Total	0.85													
		0.85	0.02	0.06	0.09	4.87	0.28	4.38	NA	0.67	0.00	0.57	0.28	Type 1
		0.28	0.02	0.06	0.06	3.12	0.04	3.17	NA	0.87	0.00	0.24	0.04	Type 1

East US 97 @ 2nd

Inlet	Q (cfs)	ΔQ (CFS)	S_T (ft/ft)	S_L (ft/ft)	d (ft)	Z_d (ft)	Q_{BP1} (cfs)	$V_{continuous}$ (ft/s)	V_{side} (ft/s)	E_o (ft/ft)	R_s (CFS/CFS)	Q_i (CFS)	Q_{BP2} (CFS)	Grate Type
Total	0.65													
		0.65	0.02	0.03	0.10	5.02	0.22	3.17	NA	0.66	0.00	0.43	0.22	Type 1
		0.22	0.02	0.03	0.07	3.26	0.03	2.32	3.75	0.85	0.06	0.19	0.03	Type 1

West US 97 @ 2nd

Inlet	Q (cfs)	ΔQ (CFS)	S_T (ft/ft)	S_L (ft/ft)	d (ft)	Z_d (ft)	Q_{BP1} (cfs)	$V_{continuous}$ (ft/s)	V_{side} (ft/s)	E_o (ft/ft)	R_s (CFS/CFS)	Q_i (CFS)	Q_{BP2} (CFS)	Grate Type
Total	0.75													
		0.75	0.02	0.03	0.10	5.29	0.27	3.30	NA	0.64	0.00	0.48	0.27	Type 1
		0.27	0.02	0.03	0.07	3.53	0.05	2.48	3.96	0.82	0.05	0.23	0.05	Type 1

North 3rd @ 97

Inlet	Q (cfs)	ΔQ (CFS)	S_T (ft/ft)	S_L (ft/ft)	d (ft)	Z_d (ft)	Q_{BP1} (cfs)	$V_{continuous}$ (ft/s)	V_{side} (ft/s)	E_o (ft/ft)	R_s (CFS/CFS)	Q_i (CFS)	Q_{BP2} (CFS)	Grate Type
Total	1.60													
		1.60	0.02	0.06	0.12	6.02	0.15	4.83	NA	0.90	0.00	1.45	0.15	Rotated Grate
		0.15	0.02	0.06	0.05	2.50	0.01	2.62	4.44	0.95	0.04	0.15	0.01	Type 1

South 3rd @ 97

Inlet	Q (cfs)	ΔQ (CFS)	S_T (ft/ft)	S_L (ft/ft)	d (ft)	Z_d (ft)	Q_{BP1} (cfs)	$V_{continuous}$ (ft/s)	V_{side} (ft/s)	E_o (ft/ft)	R_s (CFS/CFS)	Q_i (CFS)	Q_{BP2} (CFS)	Grate Type
Total	2.38													
		2.38	0.02	0.06	0.14	6.98	0.37	5.47	NA	0.85	0.00	2.01	0.37	Rotated Grate
		0.37	0.02	0.06	0.07	3.46	0.06	3.46	NA	0.83	0.00	0.30	0.06	Type 1

West 97 @ 4th

Inlet	Q (cfs)	ΔQ (CFS)	S_T (ft/ft)	S_L (ft/ft)	d (ft)	Z_d (ft)	Q_{BP1} (cfs)	$V_{continuous}$ (ft/s)	V_{side} (ft/s)	E_o (ft/ft)	R_s (CFS/CFS)	Q_i (CFS)	Q_{BP2} (CFS)	Grate Type
Total	0.90													
		0.90	0.02	0.03	0.11	5.67	0.35	3.48	NA	0.61	0.00	0.55	0.35	Type 1
		0.35	0.02	0.03	0.08	3.90	0.08	2.69	4.23	0.78	0.05	0.28	0.08	Type 1

East 97 @ 4th

Inlet	Q (cfs)	ΔQ (CFS)	S_T (ft/ft)	S_L (ft/ft)	d (ft)	Z_d (ft)	Q_{BP1} (cfs)	$V_{continuous}$ (ft/s)	V_{side} (ft/s)	E_o (ft/ft)	R_s (CFS/CFS)	Q_i (CFS)	Q_{BP2} (CFS)	Grate Type
Total	2.15													
		2.15	0.02	0.03	0.15	7.86	1.14	4.45	NA	0.47	0.00	1.01	1.14	Type 1
		1.14	0.02	0.03	0.12	6.03	0.48	3.79	NA	0.58	0.00	0.66	0.48	Type 1
		0.48	0.02	0.03	0.09	4.36	0.13	2.95	4.56	0.72	0.04	0.35	0.13	Type 1

North 4th @ 97

Inlet	Q (cfs)	ΔQ (CFS)	S_T (ft/ft)	S_L (ft/ft)	d (ft)	Z_d (ft)	Q_{BP1} (cfs)	$V_{continuous}$ (ft/s)	V_{side} (ft/s)	E_o (ft/ft)	R_s (CFS/CFS)	Q_i (CFS)	Q_{BP2} (CFS)	Grate Type
Total	10.44													
		10.44	0.02	0.06	0.24	12.16	4.20	8.53	NA	0.60	0.00	6.24	4.20	Rotated Grate
		4.20	0.02	0.06	0.17	8.64	1.04	6.52	NA	0.75	0.00	3.16	1.04	Rotated Grate
		1.04	0.02	0.06	0.10	5.12	0.05	4.20	NA	0.96	0.00	0.99	0.05	Rotated Grate

South 4th @ 97

Inlet	Q (cfs)	ΔQ (CFS)	S_T (ft/ft)	S_L (ft/ft)	d (ft)	Z_d (ft)	Q_{BP1} (cfs)	$V_{continuous}$ (ft/s)	V_{side} (ft/s)	E_o (ft/ft)	R_s (CFS/CFS)	Q_i (CFS)	Q_{BP2} (CFS)	Grate Type
Total	6.30													
		6.30	0.02	0.06	0.20	10.06	2.00	7.36	NA	0.68	0.00	4.30	2.00	Rotated Grate
		2.00	0.02	0.06	0.13	6.54	0.25	5.18	NA	0.87	0.00	1.74	0.25	Rotated Grate
		0.25	0.02	0.03	0.07	3.44	0.04	2.43	3.89	0.83	0.05	0.21	0.04	Type 1

West 97 @ 5th

Inlet	Q (cfs)	ΔQ (CFS)	S_T (ft/ft)	S_L (ft/ft)	d (ft)	Z_d (ft)	Q_{BP1} (cfs)	$V_{continuous}$ (ft/s)	V_{side} (ft/s)	E_o (ft/ft)	R_s (CFS/CFS)	Q_i (CFS)	Q_{BP2} (CFS)	Grate Type
Total	0.84													
		0.84	0.02	0.03	0.11	5.52	0.32	3.41	NA	0.62	0.00	0.52	0.32	Type 1

East 97 @ 5th

Inlet	(cfs)	(CFS)	(ft/ft)	(ft/ft)	(ft)	(ft)	(cfs)	(ft/s)	(ft/s)	(ft/ft)	R_s (CFS/CFS)	(CFS)	(CFS)	Type
Total	2.46													
		2.46	0.02	0.03	0.16	8.26	1.35	4.62	NA	0.45	0.00	1.11	1.35	Type 1

North 5th @ 97

Inlet	Q (cfs)	ΔQ (CFS)	S_T (ft/ft)	S_L (ft/ft)	d (ft)	Z_d (ft)	Q_{BP1} (cfs)	$V_{continuous}$ (ft/s)	V_{side} (ft/s)	E_o (ft/ft)	R_s (CFS/CFS)	Q_i (CFS)	Q_{BP2} (CFS)	Grate Type
Total	3.55													
		3.55	0.02	0.06	0.16	8.11	0.78	6.20	NA	0.78	0.00	2.77	0.78	Rotated Grate
		0.78	0.02	0.06	0.09	4.59	0.02	3.82	NA	0.98	0.00	0.76	0.02	Rotated Grate

North 5th @ 97

Inlet	Q (cfs)	ΔQ (CFS)	S_T (ft/ft)	S_L (ft/ft)	d (ft)	Z_d (ft)	Q_{BP1} (cfs)	$V_{continuous}$ (ft/s)	V_{side} (ft/s)	E_o (ft/ft)	R_s (CFS/CFS)	Q_i (CFS)	Q_{BP2} (CFS)	Grate Type
Total	3.55													
		3.55	0.02	0.06	0.16	8.11	0.78	6.20	NA	0.78	0.00	2.77	0.78	Rotated Grate
		0.78	0.02	0.06	0.09	4.59	0.02	3.82	NA	0.98	0.00	0.76	0.02	Rotated Grate

North 6th @ 97

Inlet	Q (cfs)	ΔQ (CFS)	S_T (ft/ft)	S_L (ft/ft)	d (ft)	Z_d (ft)	Q_{BP1} (cfs)	$V_{continuous}$ (ft/s)	V_{side} (ft/s)	E_o (ft/ft)	R_s (CFS/CFS)	Q_i (CFS)	Q_{BP2} (CFS)	Grate Type
Total	0.60													
		0.60	0.02	0.06	0.08	4.17	0.00	3.52	NA	0.99	0.00	0.60	0.00	Rotated Grate

		0.00	0.02	0.06	0.01	0.65	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	Type 1

South 6th @ 97

Inlet	Q (cfs)	ΔQ (CFS)	S_T (ft/ft)	S_L (ft/ft)	d (ft)	Z_d (ft)	Q_{BP1} (cfs)	$V_{continuous}$ (ft/s)	V_{side} (ft/s)	E_o (ft/ft)	R_s (CFS/CFS)	Q_i (CFS)	Q_{BP2} (CFS)	Grate Type
Total	1.24													
		1.24	0.02	0.06	0.11	5.47	0.08	4.45	NA	0.94	0.00	1.16	0.08	Rotated Grate
		0.08	0.02	0.06	0.04	1.95	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	Rotated Grate

East 97 @ 6th

Inlet	(cfs)	(CFS)	(ft/ft)	(ft/ft)	(ft)	(ft)	(cfs)	(ft/s)	(ft/s)	(ft/ft)	R_s (CFS/CFS)	(CFS)	(CFS)	Type
Total	1.81													
		1.81	0.02	0.03	0.14	7.36	0.91	4.24	NA	0.50	0.00	0.90	0.91	Type 1
		0.91	0.02	0.06	0.10	4.87	0.30	4.55	NA	0.67	0.00	0.61	0.30	Type 1
		0.30	0.02	0.06	0.06	3.20	0.04	3.24	NA	0.86	0.00	0.26	0.04	Type 1

West 97 @ 6th

Inlet	(cfs)	(CFS)	(ft/ft)	(ft/ft)	(ft)	(ft)	(cfs)	(ft/s)	(ft/s)	(ft/ft)	R_s (CFS/CFS)	(CFS)	(CFS)	Type
Total	1.81													
		1.81	0.02	0.03	0.14	7.36	0.91	4.24	NA	0.50	0.00	0.90	0.91	Type 1
		0.91	0.02	0.06	0.10	4.87	0.30	4.55	NA	0.67	0.00	0.61	0.30	Type 1
		0.30	0.02	0.06	0.06	3.20	0.04	3.24	NA	0.86	0.00	0.26	0.04	Type 1

Appendix C

Appendix C Copy of SERP Documents

State Environmental Review Process Information Packet Coversheet

To be completed by Clean Water State Revolving Fund (CWSRF) Applicants and Recipients and sent to Ecology's Project Manager and Environmental Review Coordinator

Applicant/Recipient and Project Information	
Applicant/Recipient (Organization): **City of Tonasket**	
Loan number (if known): **WQC-2018-Tonask-00124**	
Project Title: **City of Tonasket Stormwater Plan**	
Project Contact Person: **Alice Attwood**	Telephone: **509-486-2132**
Address: **PO Box 487, Tonasket, WA 98855**	
Email: **tonasket@nvinet.com**	
Brief Project Description: **The Stormwater Plan is a non-project action; it is a planning document that identifies the City's stormwater system deficiencies and corresponding improvement alternatives. The Stormwater Plan is in compliance with ECY requirements and has been prepared in general accordance with WAC Chapter 173-240.**	

Please submit all documentation listed below with this form to Ecology's Project Manager and Environmental Review Coordinator for review and approval.

ECY Environmental Review Coordinator: Liz Ellis <lell461@ecy.wa.gov>,

ECY Project Manager: Seth Benge <seth.benge@ecy.wa.gov>

Check the boxes below to indicate that the SERP packet includes documentation for the items listed. Provide comments for additional information when needed.

1. State Environmental Policy Act (SEPA), National Environmental Policy Act (NEPA) review or Tribal Environmental Policy Act[1] (TEPA) documentation included:

   a. Project description includes the entire area of effect. ☒ **See below**

      The Stormwater Plan is a non-project action; it is a planning document that identifies the City's stormwater system deficiencies and corresponding improvement alternatives. This Stormwater Plan is in compliance with ECY requirements and has been prepared in general accordance with WAC Chapter 173-240.

   Project description includes all phases, stages, and elements of the project. ☒

   b. Resource impacts accurately described. ☒
   c. SEPA checklist or TEPA/NEPA document. ☒

      Refer to SEPA Non-project Checklist

   d. The signed SEPA determination or TEPA/NEPA finding. ☒

      Refer to Signed SEPA Determination of Non-significance

   e. Documentation that the lead agency solicited public comments during SEPA, NEPA or the TEPA process (affidavit of publication or similar). ☒

      Refer to Affidavit of Publication – Threshold Determination

[1] Tribes are not subject to SEPA. Please submit a NEPA document or Tribal equivalent (TEPA). For assistance, see NEPA/TEPA Guide for American Indian and Alaska Native Communities, 2000. Mittelstaedt, G. Suagee, D. and L. H. Nelson.

f. Attach comments received during the SEPA/NEPA/TEPA process ☐

No comments received

g. If you are applying for a SEPA exemption, contact your Ecology Environmental Review Coordinator and request the SEPA certification form. ☐
h. If you are applying for a NEPA categorical exclusion, contact your Ecology Environmental Review Coordinator and request the NEPA Record of Environmental Consideration form. Tribes may also apply for NEPA categorical exclusions. ☐

Additional Information for Ecology: **The Stormwater Plan is a non-project action**

2. The Clean Water Act State Revolving Fund requires additional public outreach and community engagement beyond SEPA/NEPA/TEPA - even if for exempt projects. Provide documentation on how you met the following requirements. Tip: Start outreach during the project *Planning Phase* when reviewing alternatives.

a. Provide your public/legal advertisement of the meeting. ☒

Public Hearing was published in the local newspaper for two consecutive weeks. Refer to Affidavit of Publication

b. Provide information on ways you advertised public meetings or opportunities to provide input to the community. ☒

- **Public Hearing was published in the local newspaper for two consecutive weeks. Refer to Affidavit of Publication – Public Hearing**
- **Public Hearing was advertised on the City website. Refer to Advertisement from City Website**

- **A copy of the Draft Stormwater Plan provided via web link for review. Refer to Affidavit of Publication – Public Hearing and Advertisement from City Website**
- **Public comments were solicited at the Public Hearing on 11/23/2021. Refer to Council Meeting Minutes – 11/23/2021.**

c. For any in-person or virtual meetings, provide Ecology with a documented history of what occurred at the meeting (record, transcripts, agenda, minutes). ☒
   - Copy of any presentation ☒ **See Council Meeting Packet – 11/23/2021**
   - Documentation on how you discussed the reasonable alternatives to the audience. ☒ **See Council Meeting Minutes – 11/23/2021**
   - Documentation on how you explained the potential environmental, social and economic impacts of reasonable alternatives, and why the preferred alternative was chosen. ☒ **See Council Meeting Minutes – 11/23/2021**

d. Documentation that the public meeting covered the rate payer (when applicable) impacts of the project. ☒ **See Council Meeting Minutes – 11/23/2021**

e. Documentation that the public had an opportunity to comment on the proposal. ☒
   - Document, address and submit any comments received during or after the public meeting. Include the Ecology Environmental Review Coordinator on this correspondence. ☒ **See Council Meeting Minutes – 11/23/2021**
   - If you did not receive any comments, submit a statement stating so in the "Additional Information for Ecology" section below.

Additional Information for Ecology:

3. Ensure this project complies with current SERP Public Engagement and Environmental Justice requirements. For more information, see the current Funding Guidelines.

   a. Describe the population demographics and background of the community potentially affected by the project.

- **Low income – High Rank (9)**
- **People of color – 23% Hispanic**

Limited English proficiency – High Rank (7)

b. Describe how you ensured meaningful public engagement.

- **The Public Hearing was advertised in the local newspaper for two consecutive weeks**
- **The Public Hearing was advertised on the City website for two weeks**
- **A link to the Draft Stormwater Plan was provided in the both advertisements**

c. Describe how you engaged any identified EJ communities.

The public was provided oppoertunity to comment on the Plan at the Public Hearing

d. If mitigation is required, ensure the Ecology Environmental Review Coordinator is involved. For more information and guidance, see the current Funding Guidelines. ☐

Additional Information for Ecology:

4. Provide a completed Ecology Cultural Resources Review Form or cultural resource survey and complete an Inadvertent Discovery Plan using Ecology's template.

a. Fill out an Ecology Cultural Resources Review Form and submit to your Ecology Project Manager and Environmental Review Coordinator. ☐
b. Submit an Ecology Inadvertent Discovery Plan and submit to your Ecology Project Manager and Environmental Review Coordinator. ☐
c. If not completed, advise your Ecology Project Manager and Environmental Review Coordinator on the status of your cultural resource compliance. ☒

Additional Information for Ecology:

If you need this document in a format for the visually impaired, call the Water Quality Program at 360-407-6600. Persons with hearing loss, call 711 for Washington Relay Service. Persons with a speech disability, call 877-833-6341.

This is a non-project activity. Cultural Resources Review will be completed during the funding phase for various improvements proposed in the Stormwater Plan

5. **For Designated Equivalency Projects/Projects with external federal funds**

   a. Is this a project with federal funding from another agency?

   - Yes.☐
     Document the federal agency and contact:

   - Who is the lead agency for environmental and cultural review?

     o Ecology ☒

     Agency other than Ecology.☐
     (List):

     o Not sure ☐
     (*Contact the Ecology Environmental Review Coordinator*)

   b. Is this a CWSRF Designated Equivalency Project (DEP)? Yes .☐ No .☒

   If yes, follow the instructions below:

Identify which resources required consultation, coordination and/or permitting in order to ensure protection. Include the appropriate final documentation from each consultation or permit as an upload to EAGL's environmental and cultural review form. Include any required mitigation.

- **Tip**: Ecology has delegated non-federal authority from the EPA for coordination of Section 106 of the National Historic Preservation Act and for consultation under the Section 7(a)(2) of the Endangered Species Act on CWSRF projects, where applicable. If your project triggers one or both of these laws, ***confirm the lead agency*** prior to entering into consultation. ***This may save you time.***

Consult your Ecology Funding Guidelines for a list of commonly referenced federal laws and authorities that may be triggered for a federally funded project. *Only address those laws that are triggered by resources within your project footprint.* For example, if your project is not near

a coastal zone, do not reference the Coastal Zone Management Act. Provide the information within the context of your Packet. If a local and/or state and/or tribal law is enacted in order to protect the resource, as with the case of wetlands and floodplains, reference the appropriate authorities and authorizations. *It is more important that you explain how your project may have impacted a resource and what you did to protect it.*

a. Identify which local, state, tribal and/or federal laws and authorities applied to this project, list them, and note which page(s).

b. Upload any permits, consultation and required mitigation documents in EAGL.

Additional Information for Ecology:

6. **For all funded projects**

Whether a DEP or not, if your project triggers any environmental law, permit, required consultation, or investigation into a potential impact, you must include the outcome as part of your SERP Information Packet. Any mitigation must be reported as a condition of your loan.

If you have questions, contact the Ecology Environmental Review Coordinator, Liz Ellis at 360-628-4410 or liz.ellis@ecy.wa.gov

Resources:

For SEPA Exemptions, request a SEPA Certification (Finding of Categorical Exemption) form
For EPA NEPA Categorical Exclusions (40 CFR 6.204), request a Record of Environmental Consideration form
Combined Funding Guidance
Inadvertent Discovery Plan
Ecology Executive Order Cultural Resources Review form
Elements of Environmental Review by Phase and Loan
Ecology's Environmental Justice Webpage
EJ Tools: EJSCREEN https://ejscreen.epa.gov/mapper/ ,
Washington Tracking Network
Ecology's Water Quality Atlas
Ecology's What's in My Neighborhood

If you need this document in a format for the visually impaired, call the Water Quality Program at 360-407-6600. Persons with hearing loss, call 711 for Washington Relay Service. Persons with a speech disability, call 877-833-6341.

U.S. Census

If you need this document in a format for the visually impaired, call the Water Quality Program at 360-407-6600. Persons with hearing loss, call 711 for Washington Relay Service. Persons with a speech disability, call 877-833-6341.

CITY OF TONASKET
STORMWATER PLAN

Environmental Review Record (ERR)
December 2021

Funded by: Department of Ecology Clean Water State Revolving Fund (CWSRF)

SEPA DOCUMENTATION

- Affidavit of Publication – Threshold Determination
- ECY Register
- Determination of Non-significance
- Environmental Checklist (SEPA)

PUBLIC OUTREACH DOCUMENTATION

- Affidavit of Publication – Public Hearing
- Advertisement from City Website
- Council Meeting Minutes – 11/23/2021
- Council Meeting Packet – 11/23/2021

Okanogan Valley Gazette

Affidavit of Publication

State of Washington }
County of Okanogan } ss

Michael Gates being first duly sworn, upon oath deposes and says: that he/she is the legal representative of the Okanogan Valley Gazette a weekly newspaper. The said newspaper is a legal newspaper by order of the superior court in the county in which it is published and is now and has been for more than six months prior to the date of the first publication of the Notice hereinafter referred to, published in the English language continually as a weekly newspaper in Okanogan County, Washington and is and always has been printed in whole or part in the Okanogan Valley Gazette and is of general circulation in said County, and is a legal newspaper, in accordance with the Chapter 99 of the Laws of 1921, as amended by Chapter 213, Laws of 1941, and approved as a legal newspaper by order of the Superior Court of Okanogan County, State of Washington, by order dated June 16, 1941, and that the annexed is a true copy of OVG940910 DNS as it was published in the regular and entire issue of said paper and not as a supplement form thereof for a period of 1 issue(s), such publication commencing on 10/21/2021 and ending on 10/21/2021 and that said newspaper was regularly distributed to its subscribers during all of said period.

The amount of the fee for such publication is $60.64.

Subscribed and sworn before me on this 21st day of October, 2021.

Linda Phillips
Notary Public
State of Washington
My Appointment Expires 08/29/2025
Commission Number 4417

Notary Public in and for the State of Washington.

CITY OF TONASKET-LEGALS | 8383555
NATHAN HUTCHENS

STATE ENVIRONMENTAL POLICY ACT

Determination of NonSignificance

October 21, 2021

Proponent: City of Tonasket

Agency Contact: Alice Attwood, tonasket@nvinet.com, (509) 486-2132 Description of proposal: The proposed project is for the adoption of the City of Tonasket's Stormwater Plan dated 2021. The Stormwater Plan is a non-project action; it is a planning document that identifies the City's stormwater system deficiencies and corresponding improvement alternatives. This Stormwater Plan is in compliance with ECY requirements.Location of proposal: The Stormwater Plan identifies several alternatives that include city-wide improvements. The City of Tonasket and the potential stormwater system improvements are generally located within Township 37N, Range 27E, Section 16. The City of Tonasket has determined that this proposal will not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030(2)(c). This decision was made after review of a completed checklist and other information on file with the lead agency. This information is available to the public on request. This DNS is issued under WAC 197-11-340(2); the City of Tonasket will not act on this proposal for 14 days from the following date: Comments must be submitted by November 4, 2021. Responsible Official: Marilou Kriner

Position/title: Mayor

Phone: (509) 486-2132

Address: 209 S Whitcomb Ave, Tonasket, WA 98855 You may appeal this determination in writing to the City of Tonasket at 209 S Whitcomb Ave, Tonasket, WA 98855 no later than November 4, 2021 (14

days from the date of this publication).
Published in the Okanogan Valley Gazette-Tribune on
October 21, 2021
(OVG940910)

202105706 - Tonasket City of

Lead Agency
Tonasket City of

Contact
Alice Attwood
(509) 486-2132
tonasket@nvinet.com

County
OKANOGAN

Region
Central

SEPA #	202105706
Document Type	DNS
Date Issued	10/21/2021
Comments Due	11/04/2021
Proposal Name	City of Tonasket's Stormwater Plan dated 2021
Proposal Description	The Stormwater Plan is a non-project action; it is a planning document that identifies the City's stormwater system deficiencies and corresponding improvement alternatives. This Stormwater Plan is in compliance with ECY requirements.
Related Record	
Location	Section/Township/Range: S16 T37N R27E Other identifying information: City-wide
Applicant	City of Tonasket
Applicant Contact	
Documents	5825_NonProj DNS.pdf (65 KB) 5825_SEPA NonProject Checklist_SWP (Signed 10.12.2021).pdf (7 MB)

STATE ENVIRONMENTAL POLICY ACT

Determination of NonSignificance

October 21, 2021

Proponent: City of Tonasket

Agency Contact: Alice Attwood, tonasket@nvinet.com, (509) 486-2132

Description of proposal: The proposed project is for the adoption of the City of Tonasket's Stormwater Plan dated 2021. The Stormwater Plan is a non-project action; it is a planning document that identifies the City's stormwater system deficiencies and corresponding improvement alternatives. This Stormwater Plan is in compliance with ECY requirements.

Location of proposal: The Stormwater Plan identifies several alternatives that include city-wide improvements. The City of Tonasket and the potential stormwater system improvements are generally located within Township 37N, Range 27E, Section 16.

The City of Tonasket has determined that this proposal will not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030(2)(c). This decision was made after review of a completed checklist and other information on file with the lead agency. This information is available to the public on request.

This DNS is issued under WAC 197-11-340(2); the City of Tonasket will not act on this proposal for 14 days from the following date: Comments must be submitted by November 4, 2021.

Responsible Official:	Marilou Kriner
Position/title:	Mayor
Phone:	(509) 486-2132
Address:	209 S Whitcomb Ave, Tonasket, WA 98855

Signature Marilou Kriner Date 10/20/21

You may appeal this determination in writing to the City of Tonasket at 209 S Whitcomb Ave, Tonasket, WA 98855 no later than November 4, 2021 (14 days from the date of this publication).

SEPA ENVIRONMENTAL CHECKLIST

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals:

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [HELP]

1. Name of proposed project, if applicable:

City of Tonasket Stormwater Plan

2. Name of applicant:

City of Tonasket

3. Address and phone number of applicant and contact person:

Alice Attwood
(509) 486-2132
City of Tonasket
209 S Whitcomb Ave
Tonasket, WA 98855

4. Date checklist prepared:

09/15/2021

5. Agency requesting checklist:

Washington State Department of Ecology

6. Proposed timing or schedule (including phasing, if applicable):

Plan adoption by the end of 2021. The Plan recommends capitol improvements that would be proposed separately and dependent on project funding. The estimated schedule in the Plan for recommended improvements is as follows: Apply for funding October 2020 (which has occurred for some improvements recommended the Plan), Design in 2021/2022 and Construction in 2023/2024. Depending on funding, Construction may begin in late 2022 and go into the summer of 2023.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

Yes, the plan covers capital improvements that the City plans to implement.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

The City will complete SERP in addition to this SEPA checklist. Environmental and archaeological reviews of the capital improvements will be conducted when each project is proposed.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

No.

10. List any government approvals or permits that will be needed for your proposal, if known.

None that are known.

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

The Stormwater Plan is a non-project action; it is a planning document that identifies the City's stormwater system deficiencies and corresponding improvement alternatives. This Stormwater Plan is in compliance with ECY requirements and has been prepared in general accordance with WAC Chapter 173-240.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The Stormwater Plan identifies several alternatives that include City-wide improvements with some alternatives that are proposed just south of the municipal boundary. Several maps showing the locations of suggested improvements are attached.

The City of Tonasket and the potential stormwater system improvements are generally located within:

Township 37N, Range 27E, Section 16

B. Environmental Elements [HELP]

1. *Earth* [help]

a. General description of the site:

(circle one): **Flat**, rolling, **hilly**, steep slopes, mountainous, other _____

b. What is the steepest slope on the site (approximate percent slope)?

Approximately 25-65% (per NRCS Soils Map)

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

According to the USDA NRCS Soils Maps for the City of Tonasket, general soil types consist of Cashmont sandy loam, Pogue fine sandy loam, Pogue gravelly fine sandy loam, and Okanogan loam.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

Not applicable. Soil stability will be evaluated for each project during design.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

Not applicable. Will be evaluated for each project during design.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Not applicable. Will be evaluated for each project during design.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

Not applicable. Will be evaluated for each project during design.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

Not applicable. Will be evaluated for each project during design.

2. Air [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

Not applicable. Will be evaluated for each project during design.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

Not applicable. Will be evaluated for each project during design.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

Not applicable. Will be evaluated for each project during design.

3. Water [help]

a. Surface Water: [help]

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

The Okanogan River is in the vicinity of the recommended improvements in the Stormwater Plan. It is not anticipated that the improvements will occur within surface waters shown on the National Wetlands Index mapping.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Not applicable. Will be evaluated for each project during design.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

None.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

Not applicable to the adoption of the Plan.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

Based on the FEMA Flood Insurance Rate Map, some of the improvements listed in the Stormwater Plan occur in the 100-year floodplain. Mitigation measures will be evaluated on a case-by-case basis for each proposed improvement.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No.

b. Ground Water: [help]

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

Not applicable to the adoption of the Plan.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the

number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

Not applicable to the adoption of the Plan.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

Not applicable. Will be evaluated for each project during design.

2) Could waste materials enter ground or surface waters? If so, generally describe.

Not applicable. Will be evaluated for each project during design.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

Not applicable. Will be evaluated for each project during design.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

Not applicable. Will be evaluated for each project during design.

4. Plants [help]

a. Check the types of vegetation found on the site:

____deciduous tree: alder, maple, aspen, other
____evergreen tree: fir, cedar, pine, other
____shrubs
____grass
____pasture
____crop or grain
____ Orchards, vineyards or other permanent crops.
____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____water plants: water lily, eelgrass, milfoil, other
____other types of vegetation

Not applicable. Will be evaluated for each project during design.

b. What kind and amount of vegetation will be removed or altered?

Not applicable. Will be evaluated for each project during design.

c. List threatened and endangered species known to be on or near the site.

Not applicable. Will be evaluated for each project during design.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Not applicable. Will be evaluated for each project during design.

e. List all noxious weeds and invasive species known to be on or near the site.

Not applicable. Will be evaluated for each project during design.

5. Animals [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site.

Examples include:

birds: hawk, heron, eagle, songbirds, other:
mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other _____

Not applicable. Will be evaluated for each project during design.

b. List any threatened and endangered species known to be on or near the site.

Not applicable. Will be evaluated for each project during design.

c. Is the site part of a migration route? If so, explain.

Not applicable. Will be evaluated for each project during design.

d. Proposed measures to preserve or enhance wildlife, if any:

Not applicable. Will be evaluated for each project during design.

e. List any invasive animal species known to be on or near the site.

Not applicable. Will be evaluated for each project during design.

6. Energy and Natural Resources [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Not applicable. Will be evaluated for each project during design.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

Not applicable. Will be evaluated for each project during design.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

Not applicable. Will be evaluated for each project during design.

7. Environmental Health [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

1) Describe any known or possible contamination at the site from present or past uses.

Not applicable. Will be evaluated for each project during design.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

Not applicable. Will be evaluated for each project during design.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

Not applicable. Will be evaluated for each project during design.

4) Describe special emergency services that might be required.

Not applicable. Will be evaluated for each project during design.

5) Proposed measures to reduce or control environmental health hazards, if any:

Not applicable. Will be evaluated for each project during design.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

Not applicable. Will be evaluated for each project during design.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Not applicable. Will be evaluated for each project during design.

3) Proposed measures to reduce or control noise impacts, if any:

Not applicable. Will be evaluated for each project during design.

8. Land and Shoreline Use [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

Not applicable. Will be evaluated for each project during design.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

Not applicable. Will be evaluated for each project during design.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

Not applicable. Will be evaluated for each project during design.

c. Describe any structures on the site.

Not applicable. Will be evaluated for each project during design.

d. Will any structures be demolished? If so, what?

Not applicable. Will be evaluated for each project during design.

e. What is the current zoning classification of the site?

Not applicable. Will be evaluated for each project during design.

f. What is the current comprehensive plan designation of the site?

Not applicable. Will be evaluated for each project during design.

g. If applicable, what is the current shoreline master program designation of the site?

Not applicable. Will be evaluated for each project during design.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

Not applicable. Will be evaluated for each project during design.

i. Approximately how many people would reside or work in the completed project?

Not applicable. Will be evaluated for each project during design.

j. Approximately how many people would the completed project displace?

Not applicable. Will be evaluated for each project during design.

k. Proposed measures to avoid or reduce displacement impacts, if any:

Not applicable. Will be evaluated for each project during design.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

Not applicable. Will be evaluated for each project during design.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:

Not applicable. Will be evaluated for each project during design.

9. Housing [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

No housing proposed.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

No housing expected to be eliminated

c. Proposed measures to reduce or control housing impacts, if any:

Not applicable. Will be evaluated for each project during design.

10. Aesthetics [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

Not applicable. Will be evaluated for each project during design.

b. What views in the immediate vicinity would be altered or obstructed?

Not applicable. Will be evaluated for each project during design.

b. Proposed measures to reduce or control aesthetic impacts, if any:

Not applicable. Will be evaluated for each project during design.

11. Light and Glare [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Not applicable. Will be evaluated for each project during design.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

Not applicable. Will be evaluated for each project during design.

c. What existing off-site sources of light or glare may affect your proposal?

Not applicable. Will be evaluated for each project during design.

d. Proposed measures to reduce or control light and glare impacts, if any:

Not applicable. Will be evaluated for each project during design.

12. Recreation [help]

a. What designated and informal recreational opportunities are in the immediate vicinity?

Not applicable. Will be evaluated for each project during design.

b. Would the proposed project displace any existing recreational uses? If so, describe.

Not applicable. Will be evaluated for each project during design.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

Not applicable. Will be evaluated for each project during design.

13. Historic and cultural preservation [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe.

There are currently no historic sites within the City of Tonasket that are listed on any registers. The Washington Information System for Architectural and Archaeological Records Data (WISAARD) shows several properties that are not eligible for listing in the City of Tonasket. No eligible properties are shown on the WISAARD database within City limits.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

Not applicable. Will be evaluated for each project during design.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

Not applicable. Will be evaluated for each project during design.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

Not applicable. Will be evaluated for each project during design.

14. Transportation [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

Not applicable. Will be evaluated for each project during design.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

Not applicable. Will be evaluated for each project during design.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

Not applicable. Will be evaluated for each project during design.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

Not applicable. Will be evaluated for each project during design.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

Not applicable. Will be evaluated for each project during design.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

Not applicable. Will be evaluated for each project during design.

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

Not applicable. Will be evaluated for each project during design.

h. Proposed measures to reduce or control transportation impacts, if any:

Not applicable. Will be evaluated for each project during design.

15. Public Services [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

Not applicable. Will be evaluated for each project during design.

b. Proposed measures to reduce or control direct impacts on public services, if any.

Not applicable. Will be evaluated for each project during design.

16. Utilities [help]

a. Circle utilities currently available at the site:
electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other _____

Not applicable. Will be evaluated for each project during design.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

Not applicable. Will be evaluated for each project during design.

C. Signature [HELP]

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: Alice J. Attwood

Name of signee Alice J. Attwood

Position and Agency/Organization City Clerk-Treasurer, City of Tonasket

Date Submitted: 10-12-2021

D. Supplemental sheet for nonproject actions [HELP]

(**IT IS NOT NECESSARY** to use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

The proposal is to adopt the City of Tonasket Stormwater Plan, dated 2021, which provides a plan for continued and improved stormwater management. It is unlikely that adoption of the Stormwater Plan will increase the production, storage, or release of toxic or hazardous substances or long-term noise production. The Stormwater Plan evaluates the City of Tonasket's stormwater system by: providing an existing system analysis, evaluating improvement alternatives, developing financing options and implementation schedules. These improvements will address the existing flooding issues along the downtown corridor as well as provide stormwater runoff treatment. If the improvement projects suggested in the Stormwater Plan are implemented, noise and emissions to air would temporarily increase during construction.

Proposed measures to avoid or reduce such increases are:

A. Compliance with environmental review and implementation requirements applicable to stormwater improvement projects included in the Stormwater Plan (i.e., SEPA, NEPA and SERP if applicable)

B. Requiring proposals to comply with applicable environmental review and implementation regulations.

C. Obtaining permits for stormwater improvement projects in the Stormwater Plan from agencies with jurisdiction applicable to water quality, air quality, noise, and toxic or hazardous substances.

D. Requiring control measures during construction of stormwater improvement projects in the Stormwater Plan and requiring contractors to be responsible for implementing appropriate measures during construction in compliance with environmental regulations including those related to air emissions, noise and discharge to water and production,

storage, or release of toxic or hazardous substances (i.e. Dept. of Ecology, Dept. of Health, etc.).

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

The adoption of the Stormwater Plan will not affect plants, animals, fish or marine life. The stormwateri mprovement projects included in the Stormwater Plan could have an impact on these environmental elements.

Proposed measures to protect or conserve plants, animals, fish, or marine life are:

A. Compliance with environmental review and implementation requirements applicable to stormwater improvement projects included in the Stormwater Plan (i.e., SEPA, NEPA and SERP if applicable)

B. Requiring proposals to comply with applicable environmental review and implementation regulations.

C. Obtaining permits for stormwater improvement projects in the Stormwater Plan from agencies with jurisdiction applicable to water quality, air quality, noise, and toxic or hazardous substances.

D. Requiring control measures during construction of stormwater improvement projects in the Stormwater Plan and requiring contractors to be responsible for implementing appropriate measures during construction in compliance with environmental regulations including those related to air emissions, noise and discharge to water and production, storage, or release of toxic or hazardous substances (i.e. Dept. of Ecology, Dept. of Health, etc.).

3. How would the proposal be likely to deplete energy or natural resources?

The adoption of the Facility Plan will not affect energy or natural resources. The wastewater management projects included in the Facility Plan could have a direct impact on these environmental elements.

Proposed measures to protect or conserve energy and natural resources are:

A. Measures may include public conversation education and use of energy efficient materials when economically and otherwise feasible.

B. Compliance with environmental review and implementation requirements applicable to stormwater improvement projects included in the Stormwater Plan (i.e., SEPA, NEPA and SERP if applicable)

C. Requiring proposals to comply with applicable environmental review and implementation regulations.

D. Obtaining permits for stormwater improvement projects in the Stormwater Plan from agencies with jurisdiction applicable to water quality, air quality, noise, and toxic or hazardous substances.

E. Requiring control measures during construction of stormwater improvement projects in the Stormwater Plan and requiring contractors to be responsible for implementing appropriate measures during construction in compliance with environmental regulations including those related to air emissions, noise and discharge to water and production, storage, or release of toxic or hazardous substances (i.e. Dept. of Ecology, Dept. of Health, etc.).

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

All projects will be evaluated for potential impacts during the review process.

Proposed measures to protect such resources or to avoid or reduce impacts are:

A. Compliance with environmental review and implementation requirements applicable to stormwater improvement projects included in the Stormwater Plan (i.e., SEPA, NEPA and SERP if applicable)

B. Compliance with City of Tonasket critical areas and shoreline management regulations.

C. Requiring proposals to comply with applicable environmental review and implementation regulations.

D. Obtaining permits for stormwater improvement projects in the Stormwater Plan from agencies with jurisdiction applicable to water quality, air quality, noise, and toxic or hazardous substances.

E. Requiring control measures during construction of stormwater improvement projects

in the Stormwater Plan and requiring contractors to be responsible for implementing appropriate measures during construction in compliance with environmental regulations including those related to air emissions, noise and discharge to water and production, storage, or release of toxic or hazardous substances (i.e. Dept. of Ecology, Dept. of Health, etc.).

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

The adoption of the Stormwater Plan will not affect land and shoreline use. The stormwater improvement projects included in the Stormwater Plan could have an impact on these environmental elements.

Proposed measures to avoid or reduce shoreline and land use impacts are:

A. Following plans, priorities, guidelines, and rules in the Comprehensive Plan and Municipal Code.

B. Required project proposals to comply with Comprehensive Plans, Municipal Code, and other applicable review and implementation regulations.

C. Compliance with environmental review and implementation requirements applicable to stormwater improvement projects included in the Stormwater Plan (i.e., SEPA, NEPA and SERP if applicable)

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

The adoption of the Stormwater Plan will not affect demands on transporation or public services and utilites. The stormwater improvement projects included in the Stormwater Plan could have an impact on these environmental elements.

Proposed measures to reduce or respond to such demand(s) are:

A. Following plans, priorities, guidelines, and rules in the Comprehensive Plan and Municipal Code.

B. Required project proposals to comply with Comprehensive Plans, Municipal Code, and other applicable review and implementation regulations.

C. Compliance with environmental review and implementation requirements applicable to stormwater improvement projects included in the Stormwater Plan (i.e., SEPA, NEPA and SERP if applicable)

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

The Washington State Department of Ecology must approve the Stormwater Plan. In addition, the City will comply with environmental review and implementation requirements applicable to stormwater system improvement projects included in the Stormwater Plan. Therefore, the proposal to adopt the City of Tonaskent Stormwater Plan to provide continued and improved storwater system management is unlikely to conflict with local, state, or federal laws or requirements for the protection of the environment.

Okanogan Valley Gazette

Affidavit of Publication

State of Washington }
County of Okanogan } ss

Michael Gates being first duly sworn, upon oath deposes and says: that he/she is the legal representative of the Okanogan Valley Gazette a weekly newspaper. The said newspaper is a legal newspaper by order of the superior court in the county in which it is published and is now and has been for more than six months prior to the date of the first publication of the Notice hereinafter referred to, published in the English language continually as a weekly newspaper in Okanogan County, Washington and is and always has been printed in whole or part in the Okanogan Valley Gazette and is of general circulation in said County, and is a legal newspaper, in accordance with the Chapter 99 of the Laws of 1921, as amended by Chapter 213, Laws of 1941, and approved as a legal newspaper by order of the Superior Court of Okanogan County, State of Washington, by order dated June 16, 1941, and that the annexed is a true copy of OVG942609 HEARING 11/23/21 as it was published in the regular and entire issue of said paper and not as a supplement form thereof for a period of 2 issue(s), such publication commencing on 11/11/2021 and ending on 11/18/2021 and that said newspaper was regularly distributed to its subscribers during all of said period.

The amount of the fee for such publication is $120.25.

Subscribed and sworn before me on this 18th day of November, 2021.

Linda Phillips
Notary Public
State of Washington
My Appointment Expires 08/29/2025
Commission Number 4417

Notary Public in and for the State of Washington.

CITY OF TONASKET-LEGALS | 83813556
ALICE ATTWOOD

Classified Proof

Public Notice
Public Hearing for the 2021 City of Tonasket Stormwater Plan

The City of Tonasket has prepared the 2021 Stormwater Plan (SWP) using funding from the State of Washington Department of Ecology (ECY) Clean Water State Revolving Funds supplemented by the City's Stormwater Utility funds. In accordance with ECY funding guidelines the City is holding a Public Hearing during the regular City Council meeting in the City Hall Council Chambers, 209 S. Whitcomb Ave, Tonasket, WA 98855, Tuesday, November 23, 2021 which commences at 7:00 pm, to give the community an opportunity to learn more about the SWP, preferred alternatives, and any potential impacts, including impacts to existing utility rates. Opportunity will be provided to the public to ask questions and provide comment on the SWP. A copy of the SWP may be found at City Hall or on this link: https://drive.google.com/drive/folders/1uRVy1Fi-JOfGKHmaEmEuLJ-eqAwmkg2K?usp=sharing for those who wish to review the SWP prior to the meeting. Those with special language, hearing or access needs should contact city hall, 509-486-2132, 24 hours prior to the meeting. This meeting may be held virtually. Zoom information will be available on the City's website, tonasketwa.gov.
Alice Attwood, City Clerk-Treasurer
Published in the Okanogan Valley Gazette-Tribune November 11, 18, 2021.
(OVG942609)

Public Hearing for the 2021 City of Tonasket Stormwater Plan

Tuesday, November 23, 2021 - 7:00pm

Add to your calendar >

Back to calendar

Public Notice

Public Hearing for the 2021 City of Tonasket Stormwater Plan

The City of Tonasket has prepared the 2021 Stormwater Plan (SWP) using funding from the State of Washington Department of Ecology (ECY) Clean Water State Revolving Funds supplemented by the City's Stormwater Utility funds. In accordance with ECY funding guidelines the City is holding a Public Hearing during the regular City Council meeting in the City Hall Council Chambers, 209 S. Whitcomb Ave, Tonasket, WA 98855, Tuesday, November 23, 2021 which commences at 7:00 pm, to give the community an opportunity to learn more about the SWP, preferred alternatives, and any potential impacts, including impacts to existing utility rates. Opportunity will be provided to the public to ask questions and provide comment on the SWP. A copy of the SWP may be found at City Hall or on this link: https://drive.google.com/drive/folders/1uRVy1Fi-JOfGKHmaEmEuLJ-egAwmkg2K... for those who wish to review the SWP prior to the meeting. Those with special language, hearing or access needs should contact city hall, 509-486-2132, 24 hours prior to the meeting. This meeting may be held virtually. Zoom information will be available on the City's website, tonasketwa.gov.

Alice Attwood

City Clerk-Treasurer

Public Works

Public Works Home

Contact Information

Phone: 509-486-4664

Fax: 509-486-1831

209 S Whitcomb Ave
PO Box 487
Tonasket, WA 98855

View Full Contact Details

Upcoming Events

Public Hearing for the 2021 City of Tonasket Stormwater Plan
11/23/2021 - 7:00pm

View the Public Works Calendar

Tonasket City Council Agenda
Tuesday, November 23, 2021
7:00 PM
VIRTUAL ZOOM MEETING ID #835 8743 0631
PHONE #1-253-215-8782
This meeting will be in person and on ZOOM

1) Call to Order

2) Pledge of Allegiance

3) Roll Call

4) Approval of Agenda **Action Item**

5) Approval of the Minutes of the previous meeting November 9, 2021 and the November 15, 2021 Special meeting. **Action Item**

6) Public Comment

7) This meeting has been advertised as a public hearing for the 2021 City of Tonasket Stormwater Plan.

8) Unfinished Business
   a) Cemetery—authorize the Mayor to proceed with selling 1 acre of property around the crematorium at the new cemetery property. **Action Item**

9) Mayor/Council/Committee Reports

10) New Business
   a) Application for a Peddlers Permit/Kaci Lorz **Action Item**
   b) Resolution 2021-13 Surplus Property **Action Item**

11) Miscellaneous and Correspondence

12) Adjournment

Council Memo
Tuesday, November 23, 2021
7:00 PM
VIRTUAL ZOOM MEETING ID #835 8743 0631
PHONE #1-253-215-8782
This meeting will be in person and on ZOOM

TO: Mayor and City Councilmembers

FROM: City Clerk-Treasurer

This meeting has been advertised as a public hearing for the 2021 City of Tonasket Stormwater Plan. Nate Hutchens and Mark Johnson, Varela Engineering, will be facilitating this hearing.

The Cemetery is on the agenda again. It is not illegal to sell the property. The property will need to be surplused and that is what Resolution 2021-13 will accomplish. **Suggested Motion: I move to authorize the Mayor to proceed with selling of one acre of property around the crematorium at the new cemetery property.**

Application for a Peddlers Permit submitted by Kaci Lorz. The background check has not been done yet but will be before Council. **Suggested Motion: I move to approve the application for a Peddlers permit submitted by Kaci Lorz.**

Resolution 2021-13 surpluses 1 acre of property around the Bergh Crematorium. **Suggested Motion: I move to approve Resolution 2021-13 which would surplus 1 acre of property around the Bergh Funeral Service Crematorium.**

Minutes of the Special Meeting of the Tonasket City Council, Monday, November 15, 2021

Present: Mayor Kriner and Councilmembers Alexander (zoom), McMillan and Weddle.

Staff: Attwood

This meeting has been advertised as a Special Meeting for the purpose of discussing and taking action on setting the wage for the position of City Superintendent/Public Works Director.

Mayor Kriner called the meeting to order at 4:30 pm.

Mayor Kriner stated the wage is currently $27.71 per hour and is asking the Council to set a range for the position from $30 - $34 per hour.

Motion to approve the range of $30.00 - $34.00 per hour effective immediately, for the City Superintendent/Public Works Director Position. M/McMillan, S/Weddle. Carried 3:0.

There being no further business the meeting was declared adjourned at 4:42 pm.

_____

Alice J. Attwood, Clerk-Treasurer

DRAFT

Minutes of the Regular Tonasket City Council Meeting, Tuesday, November 9, 2021

Present: Mayor Kriner and Councilmembers Alexander, Levine, McMillan, Ritter and Weddle.

Staff: Johnson, Danison, Hawley and Attwood

The meeting was called to order at 7:00 pm and the pledge of allegiance was given by all.

The Roll call was taken and all were in attendance.

Motion to approve the agenda; M/McMillan, S/Ritter. **Motion to add Greg Gardinier to the agenda under Unfinished Business.** M/McMillan, S/Levine. Vote on amending motion carried 5:0. Vote on original motion Carried 5:0.

Public Comment

- Mayor Kriner reported she has received a complaint from Dave Kester about skateboarders in the Lee Franks parking lot. The City has no jurisdiction on a private parking lot however the Council suggests refreshing the stencil on the sidewalks stating no skateboards or bikes allowed on the sidewalks.

Brent Timm, TranGo, was in attendance to inquire if Council will approve moving forward with their proposal for a park and ride on City property. Brent stated all funds for the project will be provided by TranGo.

Motion to approve the proposed project with TranGo and authorize them to proceed with their plans to construct a Park and Ride bus stop area on South Western Ave and to bring the final plans to the City for approval. M/Ritter, S/McMillan. Carried 5:0.

Kurt Danison Report:

- Has an estimate for the South access study and design.
- Been in discussion with Justin Haug regarding the ballfield project.
- Planning commission is working on the Transportation element in the Comprehensive Plan.
- Economic Development has a new office.

This meeting has been advertised as the Final Budget Hearing for the 2022 Budget. The Mayor opened the Public Hearing. The City Clerk went through the items requested from Department Heads and stated which ones were in the budget line items for 2022. There were questions from the Council regarding the need for a new pick up. The trees at the Cemetery were also discussed and the need to replace them and maybe it would be a good idea to replace them with the Arbor Day trees. After further discussion the Public Hearing was closed.

Unfinished Business

Motion to authorize Varela Engineering to research funding for the replacement of the sewer line on Winesap Ave. M/McMillan, S/Ritter. Carried 5:0.

Greg Gardinier was present to update the Mayor and Council on the installation of the cameras on City property. The installation is almost complete. Electrical will be needed for better coverage in the City Shop area.

Department Head Reports

Attwood

- Reported Joël Pilkinton will be moving into the position of Deputy Clerk-Treasurer when Deniece Miller retires and she has hired Gay Seydlitz as the Utility/Court Clerk.

Johnson

- Reported he has been working at the Wastewater Treatment plant.
- Has been raking leaves in parks
- Cleaning Storm drains

Hawley

- Deputy Taft continues with his training.
- Sheriff Department still looking to fill positions.
- Thank you from Councilmember Levine regarding a recent issue.

DRAFT

Mayor/Council/Committee Reports

Mayor

- Reported she has given an award to Cameron Emery for helping clean up Tonasket.
- Also gave an award to Chad Short for all of his help at the WWTP.
- Reported Darren Johnson will be stepping down as Superintendent and will be in the Assistant Superintendent position. The City will advertise for the vacant Superintendent position.

Levine

- Reported the Perfect Passage meeting went well.
- Asked the City Clerk the process on liens.
- Attended the Cemetery meeting and discussed the potential project.
- Stated the Perfect Passage meeting should have been on ZOOM—some people not happy about that. Meetings should be consistently on ZOOM.
- Has been vandalism at the Park.
- WSDOT will be short handed this year.

McMillan

- Still in union negotiations.
- Nothing to report in Public Safety.

Ritter

- Maybe it is time to look at the fines/penalties for vandalism due to what is happening in the park.

Weddle

- No report.

Alexander

- No report.

Motion to extend the Council meeting to 9:15 pm. M/Levine, S/McMillan. Carried 5:0.

New Business

Discussion on the selling of 1 acre of property at the new cemetery to Bergh Funeral Service. Councilmember Levine stated it was illegal to do so. The City Clerk stated it is not illegal and has checked with the City Attorney

Motion to table the selling of the cemetery property until the next meeting November 23, 2021. M/McMillan, S/Weddle. Carried 5:0.

Motion to approve and authorize payment for the North Central Washington Task Force Agreement for 2022 and authorize Mayor to sign the agreement. M/Levine, S/McMillan. Carried 5:0.

Miscellaneous and Correspondence

Motion to approve the consent agenda: Minutes of the previous meeting, the October Payroll $36,864.93 (11092 – 11107 and Direct Deposit run 10/27/21) and the November bills $100,738.00 (11108 – 11159 and 3 EFT's 11/8/2021). M/Levine, S/McMillan. Carried 5:0.

There being no further business the meeting was adjourned.

Alice J. Attwood, Clerk-Treasurer

Public Notice

Public Hearing for the 2021 City of Tonasket Stormwater Plan

The City of Tonasket has prepared the 2021 Stormwater Plan (SWP) using funding from the State of Washington Department of Ecology (ECY) Clean Water State Revolving Funds supplemented by the City's Stormwater Utility funds. In accordance with ECY funding guidelines the City is holding a Public Hearing during the regular City Council meeting in the City Hall Council Chambers, 209 S. Whitcomb Ave, Tonasket, WA 98855, Tuesday, November 23, 2021 which commences at 7:00 pm, to give the community an opportunity to learn more about the SWP, preferred alternatives, and any potential impacts, including impacts to existing utility rates. Opportunity will be provided to the public to ask questions and provide comment on the SWP. A copy of the SWP may be found at City Hall or on this link: https://drive.google.com/drive/folders/1uRVy1Fi-JOfGKHmaEmEuLJ-egAwmkg2K?usp=sharing for those who wish to review the SWP prior to the meeting. Those with special language, hearing or access needs should contact city hall, 509-486-2132, 24 hours prior to the meeting. This meeting may be held virtually. Zoom information will be available on the City's website, tonasketwa.gov.

Alice Attwood

City Clerk-Treasurer

Permission to park @ OK Chevy

APPLICATION FOR LICENSE
PEDDLERS, CANVASSERS AND TRANSIENT MERCHANTS
Tonasket City Municipal Code 5.12
(ORDINANCE # 346)

A. Name and date of birth of applicant/s and workers (continue on back if needed)

First Kaci | First
Last Lorz | Last
Middle Carol | Middle
Date of Birth 08-05-1987 | Date of Birth

B. Complete permanent home and local address of the applicant and, in case of transient merchants, the local address from which sales will be made:

Home: 4716 Hwy 7 Tonasket WA 98855 phone 429-5647
Fax N/A

Business " " phone " "
Fax

Washington State Business License # WDLBR813013B
Driver's License # 604 779 4164

C. A brief description of the nature of the business and the goods to be sold:

America food & baked goods & ice cream!

D. If employed, the name and address of the employer, together with credentials establishing the exact relationship: N/A

E. The length of time for which the right to do business is desired: 1 year

F. The source of supply of the goods or property proposed to be sold, or orders taken for the sale thereof, where such goods or products are located at the time said application is filed, and the proposed method of delivery: Local grocery & Meat Shop All prepaied in my buck which has been inspected & approved by O.C. Health Dept & ZDI

G. The names of at least two property owners of Okanogan County, Washington, who will certify as to the applicant's good character and business respectability; or in lieu of the names of references, such other available evidence as to the good character and business responsibility of the applicant as will enable an investigator to properly evaluate such character and business responsibility: Anette Farver
Chuck Gallup

H. A statement as to whether or not the applicant has been convicted of any crime, misdemeanor, or violation of any municipal ordinance, other than traffic violations, the nature of the offense and the punishment or penalty assessed therefore:

N/A

I. The last cities, not to exceed three, where applicant carried on business immediately preceding the date of application and the addresses from which such business was conducted in those municipalities: N/A

J. At the time of filing the application, an application fee shall be paid to the City Clerk to cover the cost of investigation of the facts stated therein.

K. In consideration of the City of Tonasket granting this permit, the undersigned does hereby agree to indemnify and hold harmless the City of Tonasket and its employees, officers, and agents against all suits and claims arising in any way connected with the activities hereby permitted, and the undersigned further agrees to defend any and all such actions at the sole cost and expense of the undersigned.

I SWEAR THE ABOVE INFORMATION I HAVE GIVEN IS ACCURATE AND TRUE.

Sworn: Kacy Kay

Date: 11-15-2021

Received by City Clerk, date: 11-17-2021

Referred to City Council, date: 11-23-2021

Council Action: _____

Vendor Release of Liability & Indemnity Agreement

Participation in this event is at your own risk. By signing this document, you, your agents, servants, or employees agree to comply with any applicable fire codes, laws, ordinances, and regulations pertinent to health, fire prevention, and public safety.

Agreement to Indemnify

You shall indemnify the City from and against any and all claims, demands, causes of action, suits or judgments including but not limited to, any claims of insurance carriers, for deaths or injuries to persons or for loss of or damage to property arising out of or in connection with you, your agents, servants, or employees. In the event of any claims made or suits filed against the City, at its option, require you to resist or defend such action or proceeding at your own cost and expense by counsel reasonably satisfactory to the City.

Sworn: Kara Lee

Date: 11-15-21

RESOLUTION NO. 2021-13

A resolution declaring certain property to be surplus to the City.

WHEREAS, the City of Tonasket, a municipal corporation of the State of Washington, is the owner of certain property as described in Exhibit "A" attached hereto and incorporated herein as set forth; and

WHEREAS, the City of Tonasket is desirous of disposing of said property described in Exhibit "A: attached pursuant to statutory authority of the State of Washington; and

WHEREAS, the said property is in excess and surplus to the present or foreseeable needs of the City of Tonasket, or is in such condition as to have no value,

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF TONASKET, WASHINGTON, that the property described in Exhibit "A", attached hereto and incorporated herein, as fully set forth is not necessary to the needs of the City of Tonasket and is surplus and excess to the foreseeable needs of said City, or is in such condition as to have not value, may be disposed of pursuant to statutory authority. The City may dispose of the surplus property in a method determined to be in the best interest of the City.

PASSED BY THE CITY COUNCIL this _____ day of _____, 2021.

APPROVED:

_____
Marylou Kriner, Mayor

ATTEST:

_____
Alice J. Attwood, Clerk-Treasurer

EXHIBIT A

1 acre (43,560 sq. ft) of property surrounding the Bergh Funeral Service Crematorium located at the City Property on Hwy 7.

tonasket@nvinet.com

Subject:	Alice Attwood's Zoom Meeting
Location:	https://us02web.zoom.us/j/83587430631
Start:	Tue 11/23/2021 7:00 PM
End:	Tue 11/23/2021 10:00 PM
Recurrence:	(none)
Meeting Status:	Meeting organizer
zmMeetingNum:	83587430631

Alice Attwood is inviting you to a scheduled Zoom meeting.

Join Zoom Meeting
https://us02web.zoom.us/j/83587430631

Meeting ID: 835 8743 0631
One tap mobile
+12532158782,,83587430631# US (Tacoma)
+16699006833,,83587430631# US (San Jose)

Dial by your location
+1 253 215 8782 US (Tacoma)
+1 669 900 6833 US (San Jose)
+1 346 248 7799 US (Houston)
+1 301 715 8592 US (Washington DC)
+1 312 626 6799 US (Chicago)
+1 929 205 6099 US (New York)
Meeting ID: 835 8743 0631
Find your local number: https://us02web.zoom.us/u/keEsw127Sm

DRAFT

Minutes of the Tuesday, November 23, 2021 Regular Tonasket City Council Meeting

Present: Mayor Kriner and Councilmembers Alexander, Levine, McMillan, Ritter and Weddle.

Staff: Attwood

The meeting was called to order at 7:00 pm and the pledge of allegiance was given by all.

Roll call was taken and all the Councilmembers were in attendance.

Motion to approve the agenda. M/Levine, S/Weddle. Carried 5:0.

Motion to approve the minutes of the previous meeting November 9, 2021 and the minutes of the special meeting November 15, 2021. M/McMillan, S/Weddle. Carried 5:0.

Public Comment

- Patti Hill inquired about the well at the airport again. The Airport Committee will be in contact with Lee Orr.

Mayor Kriner stated she would like to recognize City Clerk-Treasurer Alice Attwood with a Certificate of Appreciation and a gift card for the work she has done for the City.

This meeting has been advertised as a public hearing for the 2021 City of Tonasket Stormwater Plan. Mayor Kriner opened the public hearing. Mark Johnson, Varela Engineering, facilitated the hearing. Mark Johnson developed the Storm Water Plan for the City. It is final and has been approved by the Department of Ecology. The following are the meeting topics discussed.

- Environmental Issues
  - Potential environmental impacts of alternatives.
  - The city does not currently provide stormwater treatment. Improvement alternatives propose to retrofit stormwater treatment to improve the quality of water exiting the system. Other alternatives would reduce erosion which also increases stormwater quality
  - The existing city stormwater system is almost entirely contained in existing rights-of-way and roads as will the improvement alternatives. Construction outside of rights-of-way and disturbance of natural areas is not expected.
  - Construction practices for any proposed improvement are to mitigate erosion and runoff
- Technical Issues
  - Stormwater improvements alternatives consist of treatment alternatives in this SWP. Conveyance determined in 2014
  - Four Alternatives:
    1) Do nothing (includes no action on conveyance)
       - Least short-term cost, high maintenance and risk cost, possible action by ECY for discharges, possible liability by city for flooding
    2) Bio-infiltration swales
       - Lack of available land in area of the system and stormwater collection, cost of land, cost of construction, cost of maintenance, life cycle, could be used in localized areas
    3) Stormwater filters with media
       - Cost
    4) Hydrodynamic Separators (chosen alternative)
       - Swirl concentration and continuous separation, most cost effective
  - No land acquisition is expected to be required for the chosen improvement alternative
- Financial Issues
  - Potential social and economic impacts of the alternatives
    1) Do nothing

- Social Impacts - No impacts while not raining. Flooding of community and untreated stormwater discharge to waterways affecting recreational use for rain events
- Economic Impacts – No short-term cost, High maintenance and risk cost to the community

2) Bio-infiltration swales
   - Social impacts - Mobility and travel impacts during construction, land acquisitions in community locations, visibility to community, education on use and purpose
   - Economic impacts – land acquisition costs, maintenance costs, replacement costs
3) Stormwater filters with media
   - Social impacts - Mobility and travel impacts during construction, otherwise invisible to the public
   - Economic impacts – significant cost for initial construction and maintenance
4) Hydrodynamic separators
   - Social impacts - Mobility and travel impacts during construction, otherwise invisible to the public
   - Economic impacts – initial construction cost to retrofit and maintenance

- Discussion of the ratepayer (impacts of the project to rates)
  - This plan
  - Chosen alternatives in plan
  - First alternative funded

Questions from the public: Chris Zaferes asked about the storm drains on Division and Tonasket and other streets and the plugged drains on each street. It was stated the drains are actually bubblers and yes they need to be maintained.

There were questions about the type of mediation for the run off—hydro dynamic separators need a Vactor truck periodically and media cartridges are costly to replace, and labor intensive.

The public hearing was closed at 7:30 pm.

Unfinished Business

Motion to authorize the Mayor to proceed with selling 1 acre of property around the crematorium at the new cemetery property. M/McMillan, S/Weddle. There was discussion whether the Council wants to proceed with the selling of the property. It was stated more information is needed before a decision is made. Question—how was the cost determined? An appraisal should be done and the property surveyed. Mayor Kriner called for the vote. 5 no votes. Motion failed.

Mayor/Council/Committee Reports

Mayor

- Reported the park has been vandalized—the Skate Park in particular. The water fountain has also been vandalized. One of the pickups has also been damaged.
- There are also some other issues happening around town.
- The surveillance cameras are installed.
- Retails stores experiencing theft.
- Mayor has been meeting with Mayor Elect Maldanado.

Alexander

- No report.

Levine

- Met at the Cemetery with the Mayor and Councilmember Alexander
- Winterfest is coming soon.
- Everyone have a great Thanksgiving!

McMillan

- His Committees are pretty quiet.

Ritter

- Met with Darren discussing options to clean up the paint at the Skate Park.
- Should we put another camera at the Park. It was stated this is being done.

Weddle

- Should we invite Ed Koontz to Council to find out how the neighborhood watch program is going?

New Business

Motion to approve the Peddlers Permit Application submitted by Kaci Lorz. M/Ritter, S/Levine. Carried 5:0.

Motion to table Resolution 2021-13. M/Levine, S/McMillan. Carried 5:0.

Miscellaneous and Correspondence - None

There being no further business the meeting was adjourned at 8:13 pm.

_____

Alice J. Attwood, Clerk-Treasurer

Appendix 6A

Appendix 6A Copy of Stormwater Utility Ordinance No. 792
Stormwater Utility Rate Table

ORDINANCE NO. 792

AN ORDINANCE adopting a Storm Drainage and Surface Water Utility and creating a new Chapter 12.30 to the Tonasket Municipal Code.

The City Council of the City of Tonasket, Washington, do ordain as follows:

Section 1. There is hereby adopted a new Chapter 12.30 to the Tonasket Municipal Code entitled Storm Drainage and Surface Water Utility as set forth in Attachment A attached hereto and incorporated herein as though fully set forth.

Section 2. This ordinance shall become effective on September 1, 2018 after its passage by the Council, approval by the Mayor, and publication as provided by law.

Passed by the City Council this 26th day of June, 2018.

APPROVED:

Dennis Brown

Dennis Brown, Mayor

ATTEST:

Alice J. Attwood

Alice J. Attwood, City Clerk-Treasurer

APPROVED AS TO FORM:

Michael D. Howe, City Attorney

I certify the above Ordinance or Summary of No. 792 has been published according to law in the Gazette-Tribune on July 5, 2018

Alice J. Attwood

City Clerk

Chapter 12.30
STORM DRAINAGE AND SURFACE WATER UTILITY

Sections:

Article I. General Provisions

12.30.010 Fund created.
12.30.020 Definitions.
12.30.030 Storm-Water Rates
12.30.040 Property Exempt from Storm-Water Fee
12.30.050 Applicability of Charges

Article II. Illicit Connections and Discharges

12.30.080 Applicability.
12.30.090 Responsibility for administration.
12.30.100 Ultimate responsibility.
12.30.110 Discharge requirements and prohibitions.
12.30.120 Suspension of municipal separate storm sewer access.
12.30.130 Industrial or construction activity discharges.
12.30.140 Monitoring of discharges.
12.30.150 Watercourse protection.
12.30.160 Notification of spills.
12.30.170 Enforcement.
12.30.180 Appeal of notice of violation.
12.30.190 Enforcement measures after an appeal.
12.30.200 Cost of abatement of the violation.
12.30.210 Penalties.
12.30.220 Injunctive relief.
12.30.230 Compensatory action.
12.30.240 Violations deemed a public nuisance.
12.30.250 Remedies not exclusive.
12.30.260 Severability.

Article I. General Provisions

12.30.010 Fund created.

There is hereby created Fund No. 430 to be known as the "storm drainage and surface water utility," from which the expenditures for operation, maintenance and improvement of the runoff drainage systems of the City of Tonasket shall be paid, which fund shall have ownership of the present system and any future improvements to the system, and shall obtain revenues from charges made monthly to real property owners in the City of Tonasket, and from other sources as appropriate to balance the budget of the fund.

12.30.020 Definitions.

(a) "Beneficiaries of drainage service" includes all developed real properties within the City of Tonasket which benefit by the provision, maintenance, operation and improvement of the storm and surface water control system by the City of Tonasket, regardless of how that system may be constituted. Such benefits may include, but are not limited to, the provision of adequate systems of collection, conveyance, detention, treatment, and release of storm-water, the reduction of hazard to property and life resulting from storm-water runoff, improvement in the general health and welfare through reduction of undesirable storm-water conditions, improvements in the water quality in the storm-water and surface water system and its receiving waters, and the limitation of potentially harmful land uses and land alteration activities which might otherwise negatively impact the storm-water and surface water system.

(b) "Contributors of drainage waters" includes all developed real properties within the city from which flows storm-waters or surface waters, or waters provided by the municipal or other sources which exit the property as surface flows and/or enter the storm and surface water utility system of the City of Tonasket.

(c) "Impervious surfaces" means those hard surfaced areas which either prevent or retard the entry of water into the soil mantle, as it entered under natural conditions pre-existent to development, and/or cause the water to run off the surface in greater quantities or at an increased rate of flow from that present under natural conditions pre-existent to development. Common impervious surfaces include, but are not limited to, rooftops, and hardscapes such as concrete or asphalt sidewalks and paving, walkways, patio areas, driveways, parking lots or storage areas and gravel, oiled macadam or other surfaces which similarly impact the natural infiltration or runoff patterns which existed prior to development.

(d) "Best management practices (BMPs)" means schedules of activities, prohibitions of practices, general good housekeeping practices, pollution prevention, educational practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants directly or indirectly to storm-water, receiving waters, or to the storm sewer system. BMPs also include treatment

practices, operating procedures, and practices to control site runoff, spillage or leaks, sludge or water disposal, or drainage from raw materials storage.

(e) "Construction activity" means clearing, grading, excavation, and any other activity that results in a land disturbance. Such activities may include, but are not limited to, road building, construction of residential homes, office buildings, commercial establishments, parking lots and other impervious surfaces, industrial facilities, and demolition activity.

(f) "Illegal discharge" means any discharge to a municipal separate storm sewer that is not composed entirely of storm-water except discharges pursuant to an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from emergency firefighting activities.

(g) Illicit Connections. An "illicit connection" is defined as the following: Any drain or conveyance, whether on the surface or sub-surface, which allows an illegal discharge to enter the storm sewer system including, but not limited to, any conveyances which allow any non-storm-water discharge including sewage, process wastewater, wash water, any connections to the storm sewer system from indoor drains and sinks, and any drain or conveyance connected from a commercial or industrial land use to the storm drain system that has not been documented in plans, maps, or equivalent records and approved by the city.

(h) "Industrial activity" means activities subject to NPDES industrial permits as defined in 40 CFR 122.26(b)(14).

(i) Municipal Separate Storm Sewer System (MS4). Also known as "storm sewer system." City-owned facilities including, but not limited to, any roads with drainage systems, municipal streets, gutters, curbs, inlets, piped storm drains, pumping facilities, retention and detention basins, natural and human-made or altered drainage channels, reservoirs, and other drainage structures: (1) designed or used for collecting or conveying storm-water; (2) which is not a combined sewer; and (3) which is not part of a publicly owned treatment works (POTW) as defined at 40 CFR 122.2.

(j) "NPDES permit" means a National Pollutant Discharge Elimination System (NPDES) permit issued by the United States Environmental Protection Agency (EPA) or the Washington Department of Ecology that authorizes the discharge of pollutants to waters of the U.S.

(k) "Non-storm-water discharge" means any discharge to the storm sewer system that is not composed entirely of storm-water.

(l) "Permittee" means any individual, association, organization, partnership, firm, corporation, or other entity recognized by law and acting as either the owner or as the owner's agent.

(m) "Pollutant" means anything that causes or contributes to pollution. Pollutants may include, but are not limited to, paints, varnishes, and solvents; oil and other automotive fluids; nonhazardous liquid and solid wastes and yard wastes; refuse, rubbish, garbage, litter, or other discarded or abandoned objects, articles, and accumulations, so that same may cause or contribute to pollution; floatables; pesticides, herbicides, and fertilizers; hazardous substances and wastes; sewage, fecal coliform, and pathogens; dissolved and particulate metals; animal wastes; wastes and residues that result from constructing a building or structure; and noxious or offensive matter of any kind.

(n) "Premises" means any building, lot, parcel of land, or portion of land whether improved or unimproved, including adjacent sidewalks and parking strips.

(o) "Storm-water" means any surface flow, runoff, or drainage consisting entirely of water from any form of natural precipitation, and resulting from such precipitation.

(p) "Storm-water pollution prevention plan (SWPPP)" means a document which describes the best management practices and activities to be implemented by a person or business to identify sources of pollution or contamination at a site, and the actions to eliminate or reduce pollutant discharges to storm-water, the storm sewer system, and/or receiving waters to the maximum extent practicable. The term "storm-water pollution prevention plan" is interchangeable with the term "storm-water management plan."

(q) "Wastewater" means any water or other liquid, other than uncontaminated storm-water, discharged from a facility.

(r) "WDOE" means the Washington State Department of Ecology.

12.30.030 Storm-Water Rates

(a) Residential properties shall be assessed a rate in accordance with the adopted fee schedule for each living unit.

(b) Non-residential properties shall be assessed a rate in accordance with the adopted fee schedule.

(c) Undeveloped property shall not be charged a storm-water fee.

12.30.040 Property Exempt from Storm-water Fee.

The following categories of property are exempt from a storm-water fee.

(a) Undeveloped property.

(b) City street rights-of-way, dedicated rights-of-way, deeds and easements for street purposes.

(c) State of Washington highway rights-of-way.

(d) Railroad rights-of-way so long as the railroad agrees to own, construct, maintain, operate and preserve all drainage facilities contained within said rights-of-way 1) as required by the storm-water utility, 2) in conformance with all utility standards for maintenance, construction, and improvement established by the storm-water utility, and 3) at no cost to the storm-water utility.

(e)

12.30.050 Applicability of charges.

The charges herein established shall apply to operations, maintenance and improvements of the system on and after January 1, 2018.

12.30.060 Severability.

If any provision of this article or its application to any person or circumstance is held invalid, the remainder of the chapter or the application of the provision to other persons or circumstances is not affected.

Article II. Illicit Connections and Discharges

12.30.070 Applicability.

This article shall apply to all activities that may potentially affect the municipal separate storm sewer system, any private storm drain system or any body of water within the City of Tonasket. Additionally, permanent and temporary storm-water management controls and facilities, constructed as part of any activities listed in this section, which are located within the Tonasket city limits, are also subject to this article. The storm-water management standards shall apply to industrial, commercial, institutional, and multifamily residential development, as well as subdivision projects with private access.

12.30.080 Responsibility for administration.

The city shall administer, implement, and enforce the provisions of this article.

12.30.090 Ultimate responsibility.

The standards set forth herein and promulgated pursuant to this article are minimum standards; therefore, this article does not intend nor imply that compliance by any person will ensure that there will be no contamination, pollution, or unauthorized discharge of pollutants.

12.30.100 Discharge requirements and prohibitions.

(a) Requirements for Discharges. Planned discharges from potable water sources, including water line flushing, hyper-chlorinated water line flushing, fire hydrant flushing, and pipeline hydrostatic test water shall be dechlorinated to a concentration of .01 ppm or less, pH-adjusted if necessary, and volumetrically and velocity controlled to prevent re-suspension of sediments in the MS4. Discharges from lawn watering and other irrigation runoff shall be minimized through, at a minimum, public education activities and water conservation efforts. Dechlorinated swimming pool discharges shall be dechlorinated to a concentration of .01 ppm or less, pH-adjusted if necessary, and volumetrically and velocity controlled to prevent re-suspension of sediments in the MS4. Swimming pool cleaning wastewater and filter backwash shall not be discharged to the MS4. Street and sidewalk wash water, water used to control dust, and routing external building wash down that does not use detergents shall be reduced, at a minimum, by public education activities and/or water conservation efforts. To avoid washing pollutants into the MS4, permittees shall minimize the amount of street wash and dust control water used. At active construction sites, street sweeping shall be performed prior to washing the street. Other non-storm-water discharges shall be in compliance with the requirements of the City of Tonasket storm-water management plan, which addresses control of such discharges.

(b) Prohibition of Illegal Discharges. No person shall discharge or cause to be discharged into the municipal separate storm sewer or watercourses, any materials including, but not limited to, pollutants or waters containing any pollutants that cause or contribute to a violation of applicable water quality standards, other than storm-water. The commencement, conduct, or continuance of any illegal discharge to the storm sewer system is prohibited except as described as follows:

(1) The following discharges are exempt from discharge prohibitions established by this article: water line flushing or other potable water sources, landscape irrigation or lawn watering, diverted stream flows, rising ground water, ground water infiltration to storm drains, uncontaminated pumped ground water, foundation or footing drains (not including active groundwater dewatering systems), crawl space pumps, air conditioning condensation, springs, noncommercial washing of vehicles, natural riparian habitat or wetland flows, swimming pools (if dechlorinated, typically containing less than one milligram per liter chlorine before dechlorination), firefighting activities, excess irrigation waters, and any other water source not containing pollutants.

(2) Discharges authorized by a current NPDES permit issued by WDOE or EPA.

(3) Discharges specified in writing by the authorized enforcement agency as being necessary to protect public health and safety.

(4) Dye testing is an allowable discharge but requires a verbal notification to the authorized enforcement agency prior to the time of the test.

(5) The prohibition shall not apply to any non-storm-water discharge authorized by an order issued to the discharger by WDOE and approved by the city; provided, that the discharger is in full compliance with all requirements of the order and other applicable laws and regulations.

(c) Prohibition of Illicit Connections. The construction, use, maintenance or continued existence of illicit connections to the municipal separate storm sewer system is prohibited. This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection. A person is considered to be in violation of this article if the person connects a line conveying sewage to the storm sewer system or allows such a connection to continue.

12.30.110 Suspension of municipal separate storm sewer access.

(a) Suspension Due to Illicit Discharges in Emergency Situations. The city may, without prior notice, suspend storm sewer system discharge access to a person when such suspension is necessary to stop an actual or threatened discharge that presents or may present imminent and substantial danger to the environment, or to the health or welfare of persons, or to the storm sewer system, or to waters of the U.S. If the violator fails to comply with a suspension order issued in an emergency, the city may take such steps as deemed necessary to prevent or minimize damage to the storm sewer system or waters of the U.S., or to minimize danger to persons.

(b) Suspension Due to the Detection of Illicit Discharge. Any person discharging to the storm sewer system in violation of this article may have their storm sewer system access terminated if such termination would abate or reduce an illicit discharge. The city will notify a violator of the proposed termination of their storm sewer system access. The violator may petition the city for a reconsideration and hearing. A person commits an offense if the person reinstates storm sewer system access to premises terminated pursuant to this section, without the prior approval of the city.

12.30.120 Industrial or construction activity discharges.

Any person subject to an industrial or construction activity authorized through a NPDES permit shall comply with all provisions of such permit. Proof of compliance with said permit may be required in a form acceptable to the city prior to the allowing of discharges to the storm sewer system.

12.30.130 Monitoring of discharges.

(a) Applicability. This section applies to all facilities that have storm-water discharges associated with industrial and construction activities.

(b) Access to Facilities.

(1) The city shall be permitted to enter and inspect facilities subject to regulation under this article as often as may be necessary to determine compliance with this article. If a discharger has security measures in force that require proper identification and clearance before entry into its premises, the discharger shall make the necessary arrangements to allow access to representatives of the city.

(2) Facility operators shall allow the city ready access to all parts of the premises for the purposes of inspection, sampling, examination and copying of records that must be kept under conditions of an NPDES permit to discharge to the storm sewer system, and the performance of any additional duties as defined by state and federal law.

(3) The city shall have the right to set up on any permitted facility such devices as are necessary in the opinion of the city to conduct monitoring and/or sampling of the facility's discharge to the storm sewer system.

(4) The city has the right to require the discharger to install monitoring equipment as necessary. The facility's sampling and monitoring equipment shall be maintained at all times in a safe and proper operating condition by the discharger at its own expense. All devices used to measure storm-water flow and quality shall be calibrated to ensure their accuracy.

(5) Any temporary or permanent obstruction to safe and easy access to the facility to be inspected and/or sampled shall be promptly removed by the operator at the written or oral request of the city and shall not be replaced. The costs of clearing such access shall be borne by the operator.

(6) Unreasonable delays in allowing the city access to a permitted facility are a violation of this article. A person who is the operator of a facility with a NPDES permit to discharge to the storm sewer system commits an offense if the person denies the city reasonable access to the permitted facility for the purpose of conducting any activity authorized or required by this article.

(7) If the city has been refused access to any part of the premises from which discharges to the storm sewer system occur, and he/she is able to demonstrate probable cause to believe that there may be a violation of this article, or that there is a need to inspect and/or sample as part of a routine inspection and sampling program designed to verify compliance with this article or any order issued hereunder, or to protect the overall public health, safety, and welfare of the community, then the city may seek issuance of a search warrant from any court of competent jurisdiction.

12.30.140 Watercourse protection.

Every person owning property through which a watercourse passes, or such person's lessee, shall keep and maintain that part of the watercourse within the property free of trash, debris, excessive vegetation, and other obstacles that would pollute, contaminate, or significantly retard the flow of water through the watercourse, in compliance with the Tonasket Shoreline Master Program and Critical areas regulations. In addition, the owner or lessee shall maintain existing privately-owned structures within or adjacent to a watercourse, so that such structures will not become a hazard to the use, function, or physical integrity of the watercourse.

12.30.150 Notification of spills.

Notwithstanding other requirements of law, as soon as any person responsible for a facility or operation, or responsible for emergency response for a facility or operation has information of any known or suspected release of materials which are resulting or may result in illegal discharges or pollutants discharging into the storm sewer system or waters of the U.S., said person shall take all necessary steps to ensure the discovery, containment, and cleanup of such releases. In the event of such a release of hazardous materials, said person shall immediately notify emergency response agencies of the occurrence via emergency dispatch services. In the event of a release of non-hazardous materials, said person shall notify the city in person or by phone or facsimile no later than the next business day. Notifications in person or by phone shall be confirmed by written notice addressed and mailed to the city within three business days of the phone notice. If the discharge of prohibited materials emanates from a commercial or industrial establishment, the owner or operator of such establishment shall also retain an on-site written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least three years.

12.30.160 Enforcement.

(a) Whenever the city finds that a person has violated a prohibition or failed to meet a requirement of this article, the city may order compliance by written notice of violation to the responsible person. Such notice may require without limitation:

(1) The performance of monitoring, analyses and reporting;

(2) The elimination of illicit connections or discharges;

(3) That violating discharges, practices or operations shall cease and desist;

(4) The abatement or remediation of storm-water pollution or contamination hazards and the restoration of any affected property;

(5) Payment of a fine to cover administrative and remediation costs; and

(6) The implementation of source control or treatment BMPs.

(b) If abatement of a violation and/or restoration of affected property is required, the notice shall set forth a deadline within which such remediation or restoration must be completed. Said notice shall further advise that, should the violator fail to remediate or restore within the established deadline, the work will be done by a designated governmental agency or a contractor and the expense thereof shall be charged to the violator.

12.30.170 Appeal of notice of violation.

Any person receiving a notice of violation may appeal the determination to the authorized enforcement agency. The notice of appeal must be received within ten days from the date of the notice of violation. Hearing on the appeal before the city or its designee shall take place within ten days from the date of receipt of the notice of appeal. The decision of the city shall be final.

12.30.180 Enforcement measures after an appeal.

If the violation has not been corrected pursuant to the requirements set forth in the notice of violation, or, in the event of an appeal, within ten days of the decision of the city, then representatives of the city shall enter upon the subject private property and are authorized to take any and all measures necessary to abate the violation and/or restore the property. It shall be unlawful for any person, owner, agent, or person in possession of any premises to refuse to allow the city or designated contractor to enter upon the premises for the purposes set forth above.

12.30.190 Cost of abatement of the violation.

Within thirty days after abatement of the violation, the owner of the property will be notified of the cost of abatement, including administrative costs. The property owner may file a written protest objecting to the amount of the assessment within ten days. If the amount due is not paid in a timely manner as determined by the decision of the city or by the expiration of the time in which to file an appeal, the charges shall become a special assessment against the property and shall constitute a lien on the property for the amount of the assessment. Any person violating any of the provisions of this article shall

become liable to the city by reason of such violation. The liability shall be paid in not more than twelve equal payments. Interest at the highest legal rate shall be assessed on the balance beginning on the thirty-first day following discovery of the violation.

12.30.200 Penalties.

Failure to perform any act required or other performance of any act prohibited by this chapter is designated as a civil infraction and shall not be classified as a criminal offense. Any person, firm or corporation found to have committed a civil infraction shall be assessed a monetary penalty as follows:

(1) For a first violation, the offender shall be subject to a civil penalty of one hundred dollars;

(2) For a second violation, the offender shall be subject to a civil penalty of five hundred dollars;

(3) For a third violation, the offender shall be subject to a civil penalty of one thousand dollars;

(4) For a fourth violation, the offender shall be subject to a civil penalty of one thousand dollars and/or removal of and discontinuance of city water and sewer utility services.

12.30.210 Injunctive relief.

It shall be unlawful for any person to violate any provision or fail to comply with any of the requirements of this article. If a person has violated or continues to violate the provisions of this article, the city may petition for a preliminary or permanent injunction restraining the person from activities which would create further violations or compelling the person to perform abatement or remediation of the violation.

12.30.220 Compensatory action.

In lieu of enforcement proceedings, penalties, and remedies authorized by this article, the city may impose upon a violator alternative compensatory actions, such as storm drain stenciling, attendance at compliance workshops, creek cleanup, etc.

12.30.230 Violations deemed a public nuisance.

In addition to the enforcement processes and penalties provided, any condition caused or permitted to exist in violation of any of the provisions of this article is a threat to public health, safety, and welfare, and is declared and deemed a nuisance, and may be summarily abated or restored at the violator's expense, and/or a civil action to abate, enjoin, or otherwise compel the cessation of such nuisance may be taken.

12.30.240 Remedies not exclusive.

The remedies listed in this article are not exclusive of any other remedies available under any applicable federal, state or local law and it is within the discretion of the city to seek cumulative remedies.

12.30.250 Severability.

The provisions and sections of this article are hereby declared to be severable. If any provision, clause, sentence or paragraph of this article or the application thereof to any person, establishment, or circumstances shall be held invalid, such invalidity shall not affect the other provisions or application of this article.

"Exhibit A"
Rates and Fees for Services

SWIM POOL RATES

16 and Under – per session	$2.00
16 and Under-10 Swim Pass	$20.00
17 and Over - per session	$4.50
17 and Over Swim – 10 Swim Pass	$45.00
Single Season Pass 16 and under	$60.00
Single Season Pass 17 and Over	$100.00
Family Season Pass First Four People Additional Family Members $25.00 each	$150.00
Swim Team Usage Fee – per season	$100.00
Pool Rental Fees - 2 hours (minimum) (up to 3 Lifeguards)	$155.00
3 hours (up to 3 Lifeguards)	$210.00
4 hours (up to 3 Lifeguards)	$255.00
$15.00 per hour for additional guards over 3.	
Swim Lessons – per session	$45.00

STORM WATER UTILITY FEES

Storm Water Utility Fee-----Residential	$1.50 per residential unit per month
Storm Water Utility Fees---Business	$3.00 per business unit per month

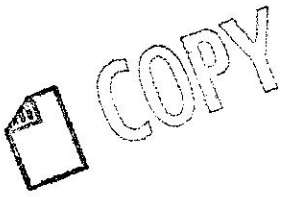
Appendix 7A

Appendix 7A Copy of 2020 Department of Ecology funding offer final list

Copy of "Preliminary Stormwater Report for US 97/Whitcomb Avenue Project", October 2019

Applicant	Application Number	Project Title	Score	Rank	Project Category	CWSRF Standard Loan	CWSRF FP Loan	Loan Term	Loan Interest Rate	SFAP Grant	Centennial Grant	Section 319 Grant	Total Funding
Tacoma city of - Environmental Services Department	WQC-2021-TacoES-00090	City of Tacoma Watershed Prioritization Planning Project	823.0	51	Stormwater Facility	$0	$0	0	0.0%	$340,370	$0	$0	$340,370
Tacoma city of - Environmental Services Department	WQC-2021-TacoES-00091	Enhanced Street Sweeping Project	758.0	102	Stormwater Activity	$0	$0	0	0.0%	$777,888	$0	$0	$777,888
Tacoma city of - Environmental Services Department	WQC-2021-TacoES-00092	Enhanced Maintenance – Line Cleaning	816.0	57	Stormwater Activity	$0	$0	0	0.0%	$278,573	$0	$0	$278,573
Tekoa city of	WQC-2021-CiTeko-00177	Influent Lift Station Replacement	905.5	4	Wastewater Facility	$477,500	$22,500	30	2.7%	$0	$0	$0	$500,000
The Watershed Alliance	WQC-2021-Waters-00002	IMPROVING SHADE AND TEMPERATURE DEFICITS - MIDDLE EAST FORK LEWIS RIVER	839.0	42	Nonpoint Source Activity	$0	$0	0	0.0%	$0	$0	$162,341	$162,341
Thurston County - Public Works Department	WQC-2021-ThCoPW-00163	Woodard Creek Site #1 Water Quality Retrofit	793.5	80	Stormwater Facility	$0	$0	0	0.0%	$583,263	$0	$0	$583,263
Tonasket city of	WQC-2021-Tonask-00094	Perfect Passage (SR 97) Stormwater Treatment Improvements	764.0	99	Stormwater Facility	$338,000	$0	20	2.0%	$1,149,200	$0	$0	$1,487,200
Tukwila city of - Public Works	WQC-2021-Tukwil-00101	Riverton Creek Flapgate Removal	797.5	75	Nonpoint Source Activity	$0	$0	0	0.0%	$0	$0	$0	$0
Tumwater city of	WQC-2021-Tumwat-00012	Tumwater Valley Regional Facility Design	595.0	141	Stormwater Facility	$0	$0	5	0.0%	$0	$0	$0	$0
Tumwater city of	WQC-2021-Tumwat-00013	East Linwood Basin Design and Permitting	768.0	97	Stormwater Facility	$0	$0	0	0.0%	$127,290	$0	$0	$127,290
Tumwater city of	WQC-2021-Tumwat-00014	Pioneer Park Restoration Design and Permitting	728.5	109	Nonpoint Source Activity	$0	$0	0	0.0%	$0	$0	$0	$0
Twisp town of - Public Works	WQC-2021-TwisPW-00030	Collection System, Lift Station, & Biosolids Improvements	901.5	5	Wastewater Facility - Hardship	$2,172,559	$206,125	30	2.4%	$0	$1,076,316	$0	$3,455,000
Union Gap city of	WQC-2021-UniGap-00079	Union Gap Stormwater Improvements	671.0	126	Stormwater Facility	$631,275	$0	20	2.0%	$0	$0	$0	$631,275
Vancouver city of	WQC-2021-Vancou-00080	SE Columbia Way to Columbia	863.5	27	Stormwater Facility	$0	$0	0	0.0%	$1,385,116	$0	$0	$1,385,116

CITY OF TONASKET



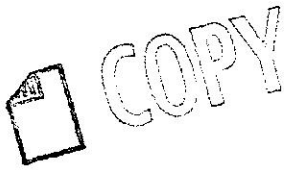
Preliminary Stormwater Report For US 97/Whitcomb Avenue Project

OCTOBER 2019

VARELA & ASSOCIATES, INC.
ENGINEERING AND MANAGEMENT
PLANNING • DESIGN • MANAGEMENT • INSPECTION

CITY OF TONASKET

Preliminary Stormwater Report For US 97/Whitcomb Avenue Project



OCTOBER 2019

VARELA & ASSOCIATES, INC.
ENGINEERING AND MANAGEMENT
PLANNING • DESIGN • MANAGEMENT • INSPECTION

CITY OF TONASKET

PRELIMINARY STORMWATER REPORT

FOR

US 97/WHITCOMB AVE DOWNTOWN CORRIDOR REDEVELOPMENT PROJECT

TABLE OF CONTENTS

INTRODUCTION 2

BASIN DESCRIPTION 2

SITE DESCRIPTION 3

CORE ELEMENT ANALYSIS 4

ALTERNATIVES CONSIDERED 4

DESIGN ANALYSIS 5

QUANTIFY THE WATER QUALITY BENEFIT 6

OPINION OF PROBABLE COST 7

PROPOSED SCHEDULE 8

Attachments

-Vicinity Map
-Basin Map
-Land Use
-Zoning Map
-Comprehensive Plan Map
-Basin Soils
-Wetlands
-Existing Stormwater Features
-Proposed Stormwater Features and Project Limits
-Project Site Soils
-Hydraulic Profiles
-Engineer's Opinion of Probable Construction Costs
-Preliminary Schedule

INTRODUCTION

This preliminary report for the US 97/Whitcomb Ave Downtown Corridor Redevelopment Project was prepared based on ongoing work associated with completion of a Stormwater Master Plan. Information contained herein may change as the Stormwater Master Plan is completed.

The US-97 drainage basin includes approximately 60 acres east of US-97 between Fifth Street, Division Street, and Joseph Avenue. Stormwater from the US-97 drainage basin enters the City's existing stormwater collection system along US-97. Stormwater is collected via a series of catch basins before being piped approximately 1,500 feet west to several outfalls which discharge untreated stormwater to the Okanogan River.

During storm events, it is not uncommon for the City's downtown core to flood at the intersection of US-97 and Third Street. Flooding is caused by the inadequately sized stormwater utilities in US-97. Floodwater enters into the natural drainage ways west of US-97 before discharging to the Okanogan River. These circumstances have contributed to the high sedimentation levels in the Okanogan River and the 303(d) List Category 2 designation for turbidity in the river immediately adjacent to Tonasket's urban core.

The proposed improvements are located in Tonasket, WA, along US-97 from 1st Street to 6th Street. The goals of the project are to eliminate excessive overflow from the Tonasket stormwater system and to provide pretreatment to the runoff prior to discharge. The proposed improvements to achieve this goal are to increase the size of pipe used along US-97 while introducing additional stormwater infrastructure to help meet the necessary flow capacity and provide pretreatment to the stormwater. A vicinity map is attached.

Attachment – Vicinity Map

BASIN DESCRIPTION

The drainage basin for the proposed US 97 collection system and pre-treatment improvements is approximately 60 acres of land and is bound by road centerlines and the back of curbs of Division Street, 5th Street, Joseph Avenue and US 97. The drainage pattern for the basin area is best described by streets parallel and perpendicular to US 97. Joseph Avenue drains to low spots at both 2nd Street and Division Street, which then move WNW toward US-97. Antwine Avenue and Tonasket Avenue have their lows at 4th Street, congregating there before draining WNW toward US 97. Storm drainage at US 97 gathers at the low in 3rd Street before draining toward the Okanogan River. A map exhibit displaying the drainage routing of the US 97 basin is attached.

Attachment – Drainage Basin

Current and future land use for the drainage basin is comprised of both rural and city with zoning designations being primarily single and multi-family residential and public, with retail commercial along US-97. Land uses will not be affected by this project. Of the approximately 60 acres of area in the drainage basin, the majority of the soils are a Pogue fine sandy loam (8-15% slopes). The rest of the soils are a mixture of Cashmont sandy loam (3-15% slopes), Pogue fine sandy loam (3-8% slope) and extremely stony Pogue gravelly fine sandy loam (25-65% slopes). There are no significant water bodies within the drainage basin; however, Okanogan River, Siwash Creek, and Bonaparte Creek are

nearby to the northwest, northeast, and southwest respectively. There is a small wetland located in the northeast section of the drainage basin. The wetland is classified as a riverine (a channelized body of water) that is present typically only during the growing season. Maps displaying the land use, zoning, soils, and wetlands are attached.

Attachment – Land Use

Attachment – Zoning

Attachment – Basin Soils

Attachment – Wetlands

SITE DESCRIPTION

The limits of the proposed improvements are as shown in the APE map, which extends along US 97 from 1st Street to 6th Street and the immediate vicinity. The Threshold Discharge Area (TDA) includes the three outfalls that are discharged to the Okanogan River in line with 1st Street, 3rd Street, and on the East side of the 4th Street bridge. These three discharges combine downstream within a quarter mile defining the outfalls under a single TDA. Current land uses of the project site include Public (PU), Retail Commercial (C1), Service Commercial (C2), and Multi-Family Residential (R2).

At the project site, the existing stormwater features include several catch basins and a manhole at each intersection on US 97 from 6th Street to 3rd Street. These junctions are connected by 18" piping that is may be undersized for the design flow, but apparent inadequate number of inlets may be a cause for higher-than-normal flood frequencies. The piping leads to 3rd Street where it is routed towards the Okanogan River through two separate lines. One goes directly down 3rd Street and discharges to the river from the 3rd Street outfall, while the other flows southwest to 4th Street before moving toward the river and discharging at the 4th Street bridge outfall. Currently, no level of treatment is provided to the stormwater prior to its discharge. A map of the existing stormwater features is attached.

Attachment – Existing Stormwater Features

The proposed improvements replace the undersized piping along US 97 with a more adequate size and add infrastructure to provide pretreatment to the stormwater prior to entering the collection system. The improvements include new infrastructure that extends past 3rd Street, up US 97 to Delicious Street. The proposed improvement elements will connect in to the existing connections at the 3rd Street and US 97 intersection and continue on the same two paths to discharge at the 3rd Street and the 4th Street Bridge outfalls. The total area of the proposed improvements is 4.5 acres with approximately 3,000 LF of storm sewer: 1,200 LF of new infrastructure and 1,800 LF of replacement piping. There will be no change to the impervious area in the project site. A map of the proposed stormwater features is attached.

Attachment – Proposed Stormwater Features

The project site is characterized by the vegetation, wetlands, and soils in the vicinity of the project. Vegetation in the project site includes minor grass and trees associated with businesses and residences along US-97. The proposed improvements will not affect this vegetation. There are no wetlands in the immediate vicinity of the proposed improvements; however, there are several located approximately 500 feet from the APE. The soils located in the project site are comprised primarily of sandy loam

(90%) with the rest as fine sandy loam (10%) with classifications of Cashmont sandy loam (3-8% and 8-15% slopes), Cashmere fine sandy loams (3-8% slopes), and Pogue fine sandy loams (8-15% slopes). A map and description of the soils is attached.

Attachment – Project Site Soils

The proposed improvements are to be constructed in existing US 97/Whitcomb Avenue right-of-way, which is a local high use downtown corridor. This local high use location is the reason for the phasing of the project, so that a level of access to local businesses can be reasonably maintained during construction. This location also provides for multiple access locations through side streets and parallel roads which will allowed continued public access to local businesses during construction.

CORE ELEMENT ANALYSIS

Core element analysis will be prepared as part of the Stormwater Master Plan and final design. The City of Tonasket is not a Stormwater NPDES permit holder. The improvements proposed are preliminarily considered retrofit for design purposes. The City code identifies the "Eastern Washington Stormwater Management Manual" as guide for stormwater design for Planned Development and Critical Areas.

ALTERNATIVES CONSIDERED

Four alternatives were considered for addressing the annual flooding in the downtown area of Tonasket and the untreated discharge to the Okanogan River: the "Do-Nothing" alternative, basic treatment through swales, basic treatment through stormwater filtration with pollutant absorbing media filled cartridges, and pretreatment using hydrodynamic separators.

The "Do-Nothing" alternative would continue use of the existing stormwater facilities in their existing condition. In the immediate time-frame, the "Do-Nothing" alternative has the least financial impact on the community. The undersized storm pipe in US 97 is not able to adequately convey stormwater to the outfalls and discharges untreated stormwater into the Okanogan River. The result is annual flooding in the downtown corridor and the constant degradation of water quality in the Okanogan River due to the discharge of untreated water. Flooding in the downtown corridor damages the buildings and businesses in the area, resulting in costs for repairs. Water quality will continue to diminish and O&M costs are expected to increase if the "Do-Nothing" alternative is selected.

One alternative for basic treatment that was considered was to construct swales along US 97. Basic treatment through swales is not feasible due to a lack of land in the project area available to construct swales. The land in the vicinity of US 97 in the project area goes from road to sidewalk to building.

The other alternative considered was to use stormwater filters with pollutant absorbing media filled cartridges coupled with the replacement of existing stormwater pipes in US 97. The storm filters would provide basic treatment to the stormwater by trapping particulates and pollutants as the stormwater passes through vaults of the media filled cartridges. The vaults used in cost estimations are 8 feet wide by 18 feet long, resulting in a total vault area of 2,880 square feet for the entire project. To prevent the annual flooding due to undersized pipes, the alternative would include the replacement of existing storm pipes in US 97 with larger sized piping that can better handle the runoff as the City continues to grow. While the US 97 stormwater collection system improvements are a necessity, achieving

treatment for the runoff with the cartridges is cost prohibitive. Based on a previous project that utilized a ConTech StormFilter vault and cartridge setup for basic treatment, the cost per 8'x18' vault is approximately $51,000. An analysis was done using a treatment design flow of 29 cubic feet per second, a maximum cartridge flow rate of 15 gallons per minute, and a maximum number of cartridges per vault of 44. The analysis shows that a total of 20 vaults would be required, so the capital cost for the vaults and cartridges alone is approximately $1,000,000. On top of the capital cost are the O&M costs to replace media and cartridges as they begin to degrade. With a high capital cost and increased O&M costs for the City, this alternative is not financially feasible.

The selected alternative is to use hydrodynamic separators to provide pretreatment to the stormwater, upsize the existing collection system in US 97 and provide additional stormwater infrastructure in US-97 north of 3rd Street to accommodate increasing runoff as the City expands. Hydrodynamic separators use swirl concentration and continuous deflective separation (CDS) to screen, separate and trap trash, debris, sediment, and hydrocarbons from stormwater runoff. To prevent flooding and ensure the stormwater enters the collection system for pretreatment by hydrodynamic separator, collection system improvements are a necessity. The existing storm pipes along US 97 from 5th Street to 3rd Street are undersized, resulting in annual flooding. The most effective solution to the flooding is to increase the size of the storm piping in this area to better handle the current runoff as well as provide additional infrastructure for the growth of the City. By supplementing the replacements with additional stormwater infrastructure continuing north along US 97, a reduction in flooding and improved quality of discharge to the Okanogan River will be achieved. An analysis of the design, water quality benefit and associated costs for this alternative are included in subsequent sections of this report.

DESIGN ANALYSIS

The selected alternative includes comprehensive stormwater facility improvements that are to be constructed in three phases. Phase 1 includes the stormwater pretreatment improvements, the replacement of undersized piping and other stormwater facilities between 3rd Street and 4th Street and the construction of new stormwater facilities from 3rd Street to 1st Street. This includes approximately 1,900 linear feet of storm piping and 3 hydrodynamic separators for pretreatment. Phase 2 includes the replacement of storm facilities between 4th Street and 6th Street totaling another 1,200 linear feet of replacement storm sewer piping. Phase 3 includes the construction of new stormwater facilities along US-97 extending just past 1st Street towards Division Street. The new stormwater facilities include 115 linear feet of storm sewer pipe, 3 catch basins, 1 grate inlet and 2 manhole adjustments with catch basins included. Plans are to be developed later displaying the allocation of improvements into the separate phases.

The proposed improvements result in a stormwater system with the capacity adequate for a 6-month storm. The hydraulic profiles for the two stretches of stormwater piping improvements are attached. The profiles indicate adequate capacity in the improved sections; however, the storm sewer as it approaches the outfall is near capacity and close to overflowing. The capacity in the remaining sections will be evaluated and improvements proposed in the final Stormwater Master Plan.

The overall basin has a runoff flow is estimated at 29 cubic feet per second using a 6-month storm for water quality design. This design flow was used when sizing the hydrodynamic separators. This flow was split up into several sub-basins that enter the separators. The resulting stormwater flow to be pretreated by all three separators is approximately 20 cfs, or Treatment Ratio of 60 to 70%. Below is a figure identifying design flow rates of the preliminarily specified vendor product.

	CDS MODEL	Treatment Flow Rates[1] 75 microns (cfs)/(L/s)	125 microns[2] (cfs)/(L/s)	Trash & Debris (cfs)/(L/s)	Estimated Maximum Peak Conveyance Flow[3] (cfs)/(L/s)	Minimum Sump Storage Capacity[4] (yd^3)/(m^3)	Minimum Oil Storage Capacity[4] (gal)/(L)
PRECAST	CDS2015-4	0.5 (14.2)	0.7 (19.8)	1.0 (28.3)	10 (283)	0.9 (0.7)	61 (232)
	CDS2015-5	0.5 (14.2)	0.7(19.8)	1.0 (28.3)	10 (283)	1.5 (1.1)	83 (313)
	CDS2020-5	0.7 (19.8)	1.1 (31.2)	1.5 (42.5)	14 (396)	1.5 (1.1)	99 (376)
	CDS2025-5	1.1 (31.2)	1.6 (45.3)	2.2 (62.3)	14 (396)	1.5 (1.1)	116 (439)
	CDS3020-6	1.4 (39.6)	2.0 (56.6)	2.8 (79.3)	20 (566)	2.1 (1.6)	184 (696)
	CDS3025-6	1.7 (48.1)	2.5 (70.8)	3.5 (99.2)	20 (566)	2.1 (1.6)	210 (795)
	CDS3030-6	2.0 (56.6)	3.0 (85.0)	4.2 (118.9)	20 (566)	2.1 (1.6)	236 (895)
	CDS3035-6	2.6 (73.6)	3.8 (106.2)	5.3 (150.0)	20 (566)	2.1 (1.6)	263 (994)
	CDS4030-8	3.1 (87.7)	4.5 (127.4)	6.3 (178.3)	30 (850)	5.6 (4.3)	426 (1612)
	CDS4040-8	4.1 (116.1)	6.0 (169.9)	8.4 (237.8)	30 (850)	5.6 (4.3)	520 (1970)
	CDS4045-8	5.1 (144.4)	7.5 (212.4)	10.5 (297.2)	30 (850)	5.6 (4.3)	568 (2149)
	CDS5640-10	6.1 (172.7)	9.0 (254.9)	12.6 (356.7)	50 (1416)	8.7 (6.7)	758 (2869)
	CDS5653-10	9.5 (268.9)	14.0 (396.5)	19.6 (554.8)	50 (1416)	8.7 (6.7)	965 (3652)
	CDS5668-10	12.9 (365.1)	19.0 (538.1)	26.6 (752.9)	50 (1416)	8.7 (6.7)	1172 (4435)
	CDS5678-10	17.0 (481.2)	25.0 (708.0)	35.0 (990.7)	50 (1416)	8.7 (6.7)	1309 (4956)
	CDS9280-12	27.2 (770.2)	40.0 (1132.7)	56.0 (1585.7)	Offline	16.8 (12.8)	N/A
	CDS9290-12	35.4 (1002.4)	52.0 (1472.5)	72 (2038.8)		16.8 (12.8)	
	CDS92100-12	42.8 (1212.0)	63.0 (1783.9)	88 (2491.9)		16.8 (12.8)	
CAST-IN-PLACE	CDS150134-22	100.7 (2851.5)	148.0 (4190.9)	270 (7645.6)		56.3 (43.0)	
	CDS200164-26	183.6 (5199.0)	270.0 (7645.6)	378.0 (10703.8)		78.7 (60.2)	
	CDS240160-32	204 (5776.6)	300.0 (8495.1)	420.0 (11893.0)		119.1 (91.1)	
	Additional Cast-in-Place models available upon request.						

1. Alternative PSD/D_{50} sizing is available upon request.
2. 125 micron flows are based on the CDS Washington State Department of Ecology approval for 80% removal of a particle size distribution (PSD) having a mean particle size (D_{50}) of 125 microns.
3. Estimated maximum peak conveyance flow is calculated using conservative values and may be exceeded on sites with lower inflow velocities and sufficient head over the weir.
4. Sump and oil capacities can be customized to meet site needs.

More detailed calculations and descriptions of the chosen alternative(s) are to be prepared and included in the final Stormwater Master Plan. Other pre-treatment devices may be considered as final design is developed.

QUANTIFY THE WATER QUALITY BENEFIT

The water quality benefit will be achieved at the conclusion of the three phases of construction. Stormwater pre-treatment devices, preliminarily specified to be hydrodynamic separators, are to be installed in the first phase of the overall project and are to provide pretreatment for the runoff from the US-97 drainage basin. The treatment ratio of the pretreatment units is estimated at approximately 60 to 70% of the total runoff, if there were a water quality requirement in the City for improvements in the public rights-of-way. The following phases increase the capability of the stormwater collection system to collect the runoff from the US-97 drainage basin. By improving the collection system, the proposed improvements will prevent the annual flooding which results in untreated flow over the ground, and discharge into the Okanogan River and the Bonaparte and Siwash Creeks.

OPINION OF PROBABLE COST

Table 1 summarizes the project costs split into the three separate phases. A detailed breakdown of costs in each phase is attached.

Table 1 - Cost Summary

Description	Est. Quant.	Units	Unit Price	Amount
Phase 1				
Mobilization (10% of Total Project Construction)	-	LS	-	$41,000
Stormwater Facilities Construction	-	See SS	-	$567,000
Phase 2				
Mobilization (10% of Total Project Construction)	-	LS	-	$10,000
Stormwater Facilities Construction	-	See SS	-	$263,000
Phase 3				
Mobilization (10% of Total Project Construction)	-	LS	-	$3,000
Stormwater Facilities Construction	-	See SS	-	$37,000
			Construction Subtotal	$921,000
			Contingency 15%	$138,000
			Subtotal	$1,059,000
			Eng, Inspection, Admin (30%)	$318,000
			Environmental, Cultural and Historical Approval Allowance	$9,000
			ECY Admin	$9,000
			ESTIMATED PROJECT COST (rounded to nearest $1K)	$1,395,000

(1) *See Detailed Engineers Estimates by Phase.*

The project is to provide a direct water quality benefit due to the proposed improvements.

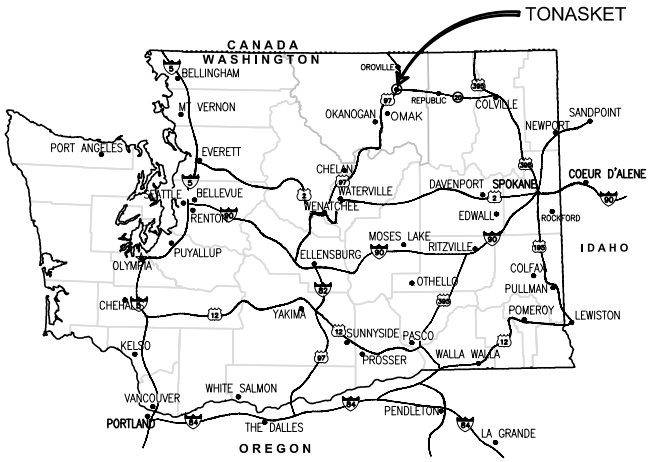
PROPOSED SCHEDULE

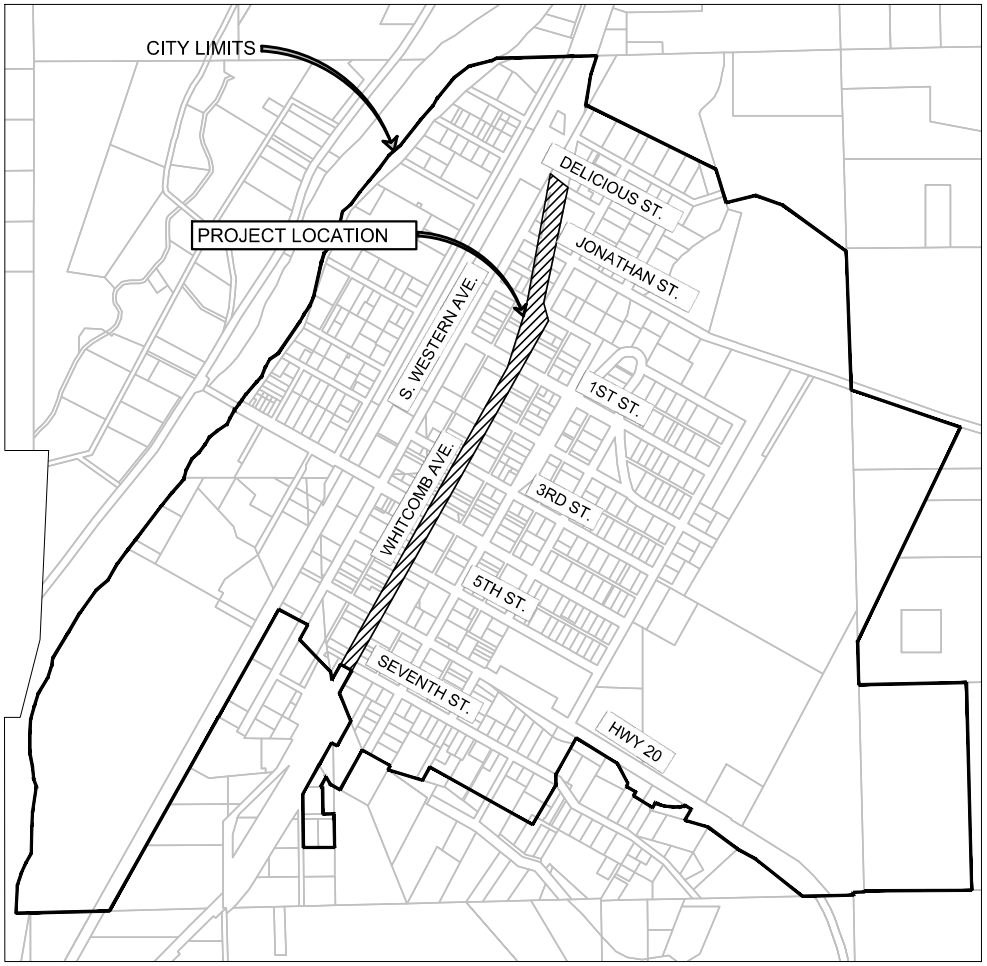
The proposed Schedule of deliverables and deadlines is attached.

Attachment – Schedule

ATTACHMENTS

-Vicinity Map
-Basin Map
-Land Use
-Zoning Map
-Comprehensive Plan Map
-Basin Soils
-Wetlands
-Existing Stormwater Features
-Proposed Stormwater Features and Project Limits
-Project Site Soils
-Hydraulic Profiles
-Engineer's Opinion of Probable Construction Costs
-Preliminary Schedule





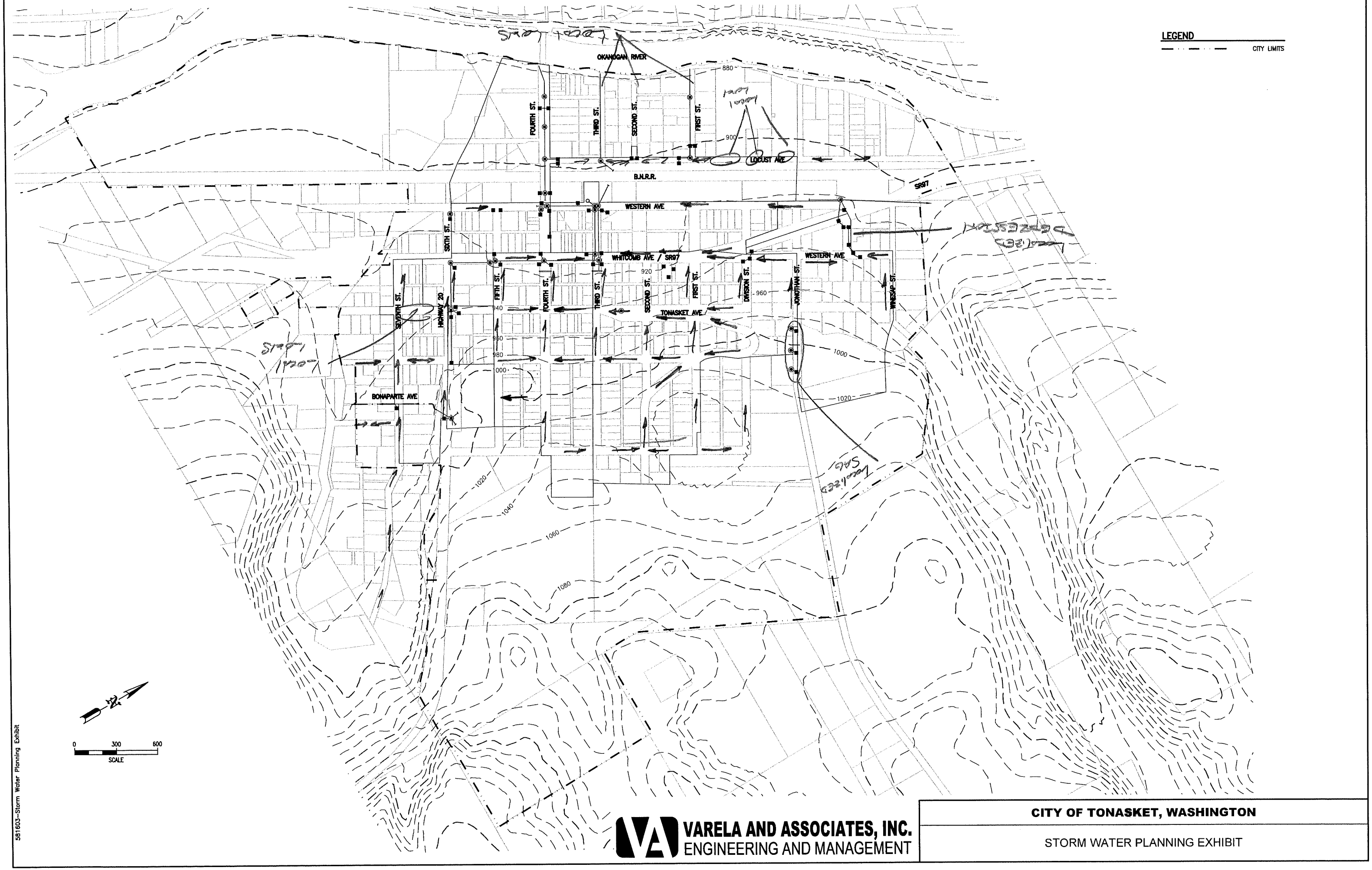
582503 Stormwater Plan

SCALE:	N.T.S.
DESIGNED:	–
DRAWN:	DLT
CHECKED:	
APPROVED:	
PROJ. NO.:	58
DATE:	10/3/2019

VARELA AND ASSOCIATES, INC.
ENGINEERING AND MANAGEMENT

CITY OF TONASKET, WASHINGTON

VICINITY MAP

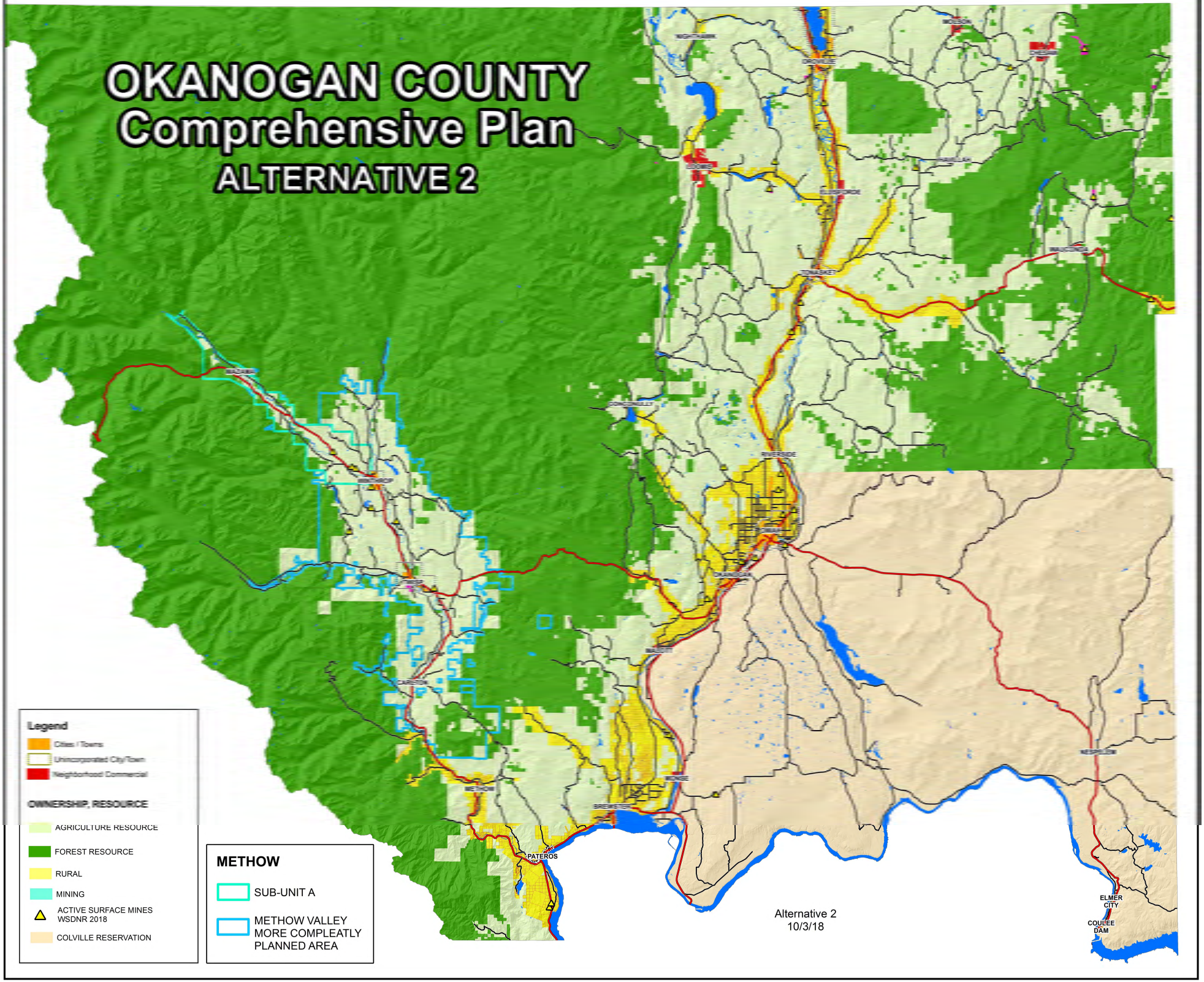


581603-Storm Water Planning Exhibit

VARELA AND ASSOCIATES, INC.
ENGINEERING AND MANAGEMENT

CITY OF TONASKET, WASHINGTON

STORM WATER PLANNING EXHIBIT


OKANOGAN COUNTY
Comprehensive Plan
ALTERNATIVE 2
Legend
Cities / Towns
Unincorporated City/Town
Neighborhood Commercial
OWNERSHIP, RESOURCE
AGRICULTURE RESOURCE
FOREST RESOURCE
RURAL
MINING
ACTIVE SURFACE MINES WSDNR 2018
COLVILLE RESERVATION
METHOW
SUB-UNIT A
METHOW VALLEY MORE COMPLEATLY PLANNED AREA
PATEROS
ELMER CITY
COULEE DAM
Alternative 2
10/3/18

Urban Growth Boundary

City Limits

City Limits

City Limits

City Limits

NELSON RD
WINESAP ST W
DELICIOUS ST W
ZACHMANS CR CT
WINESAP ST E
DELICIOUS ST E
WESTERN AVE N
TONASKET AVE N
JONATHAN ST E
WHITCOMB AVE N
DIVISION ST W
1ST ST W
2ND ST W
LOCUST WAY S
HENDERSON WAY
WESTERN AVE S
STATE ST
JOSEPH AVE S
1ST ST E
TONASKET AVE S
3RD ST E
2ND ST E
RIVERVIEW TR CT
4TH ST W
3RD ST W
6TH ST W
5TH ST W
5TH ST E
4TH ST E
RAILROAD AVE S
ANN WINE AVE S
TONASKET SHOP RD
NORTH STATE FRONTAGE RD
MCLAUGHLIN AVE
BRETZ RD
MILL DR
LILAC LN
CONNITE LN
LONGENECKER RD

Zoning Districts

- C1
- C2
- M1
- MU
- PU
- R1
- R2
- RR

Adopted _____
Ordinance No. _____

_____
Patrick Plumb, Mayor

_____
Alice Attwood, City Clerk

Prepared 5/29/14
Revised 6/6/15
Approved by Planning Commission 11/17/15
Editied January 19, 2016
Highlands Associates

N

MAP III-2

Airport Inset

Tonasket Cemetary
Public Use

Urban Growth Boundary

City Limits

City Limits

Urban Growth Boundary

Urban Growth Boundary

City Limits

Urban Growth Boundary

TONASKET AIRPORT RD
TONASKET AIRPOR
TONASKET TERRACE RD
NELSON RD
WEBER RD
FRONTAGE RD
TEMBY RD
NORTH DIVISION ST
DIVISION ST
SOUTH DIVISION ST
US 97
NELSON RD
DELICIOUS ST W
WINESAP ST W
WINESAP ST E
DREW RD
ZACHMAN CIR CT
1ST ST W
2ND ST W
3RD ST W
4TH ST W
5TH ST W
6TH ST W
7TH ST W
DELICIOUS ST E
TONASKET AVE N
JONATHAN ST E
DIVISION ST W
STARKEY ST
JOSEPH AVE S
1ST ST E
2ND ST E
4TH ST E
To Havillah
STANTON LOOP RD
WESTERN AVE S
TONASKET AVE S
RIVERVIEW TR CT
PARK RD
WEBER RD
WELLER RD
M PINE CREEK RD
RAILROAD AVE S
OAKES TR CT
JOHN OAKES RD
SR 20
To Republic
AMERICAN AVE S
TONASKET SHOP RD
MCLAUGHLIN AVE
NORTH STAR FRONTAGE RD
BRETZ RD
MILL DR
LILAC LN
CONNITE LN
CLARKSON MILL RD
LONGANECKER RD
US 97

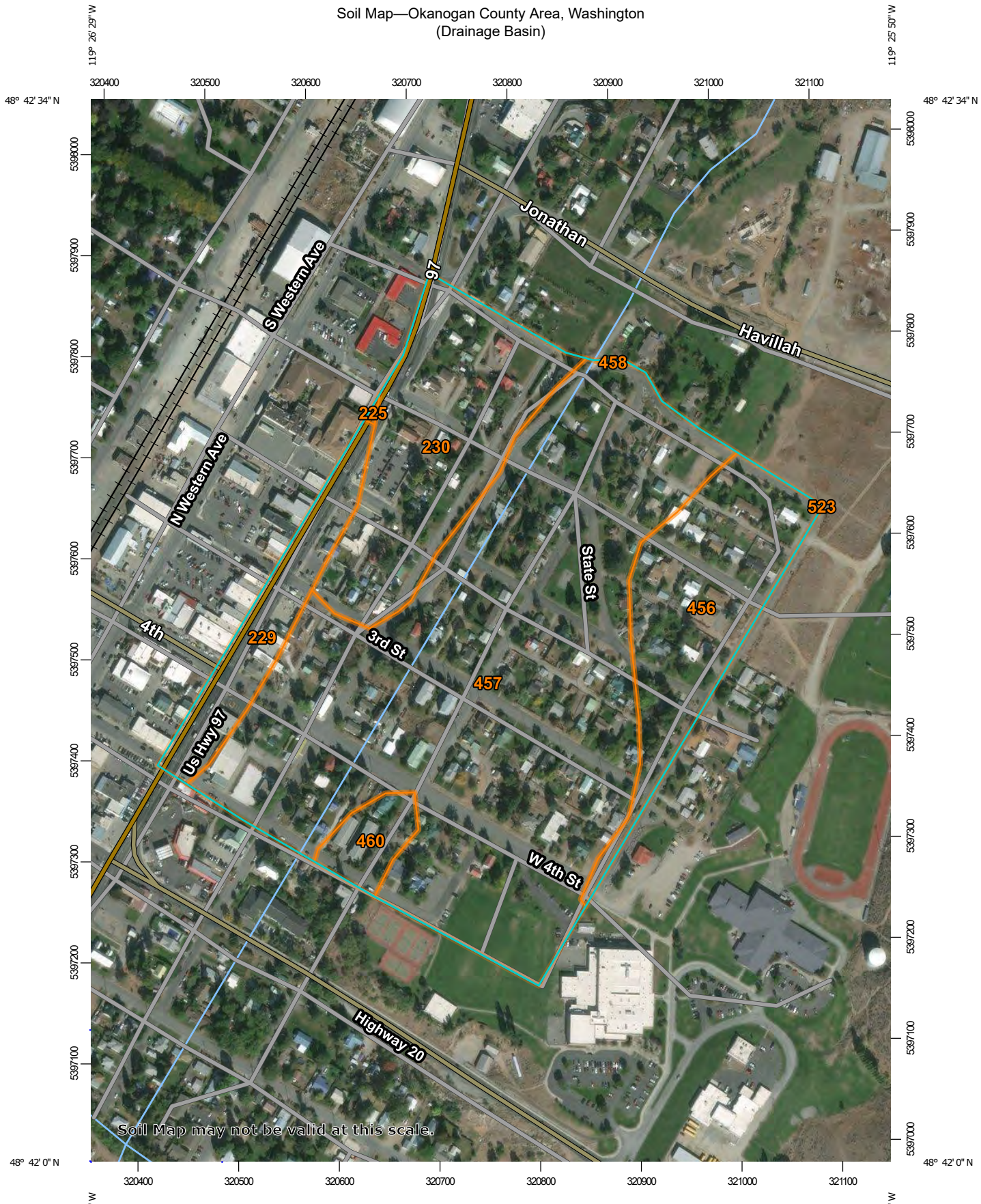
Prepared 6/15/11
Revised 1/15/13
Revised 11/26/13
Revised 7/6/15
Planning Commission approval 11/17/15
Edited 1/19/16
Highlands Associates

Legend

- Industrial
- Mixed Use
- Multi-Family Residential
- Public
- Retail Commercial
- Rural Residential
- Service Commercial
- Single Family Residentia
- Single Family/Multi-Fami
- Tourist Commercial
- Airport Industrial
- Airport Protection Overlay

N

Soil Map—Okanogan County Area, Washington
(Drainage Basin)



Map Scale: 1:5,120 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Okanogan County Area, Washington
Survey Area Data: Version 15, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 15, 2010—Sep 20, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
225	Cashmere fine sandy loam, 3 to 8 percent slopes	0.0	0.1%
229	Cashmont sandy loam, 3 to 8 percent slopes	4.0	6.5%
230	Cashmont sandy loam, 8 to 15 percent slopes	10.1	16.5%
456	Pogue fine sandy loam, 3 to 8 percent slopes	8.2	13.5%
457	Pogue fine sandy loam, 8 to 15 percent slopes	37.2	61.0%
458	Pogue fine sandy loam, 10 to 25 percent slopes	0.0	0.0%
460	Pogue gravelly fine sandy loam, 25 to 65 percent slopes, extremely stony	1.5	2.5%
523	Tonasket silt loam, 3 to 8 percent slopes	0.0	0.0%
Totals for Area of Interest		**61.0**	**100.0%**

U.S. Fish and Wildlife Service
National Wetlands Inventory

Tonasket, WA

October 2, 2019

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

LEGEND

CITY LIMITS

880

900

920

940

960

960

980

1000

1000

1020

1020

1040

1060

1080

0 300 600

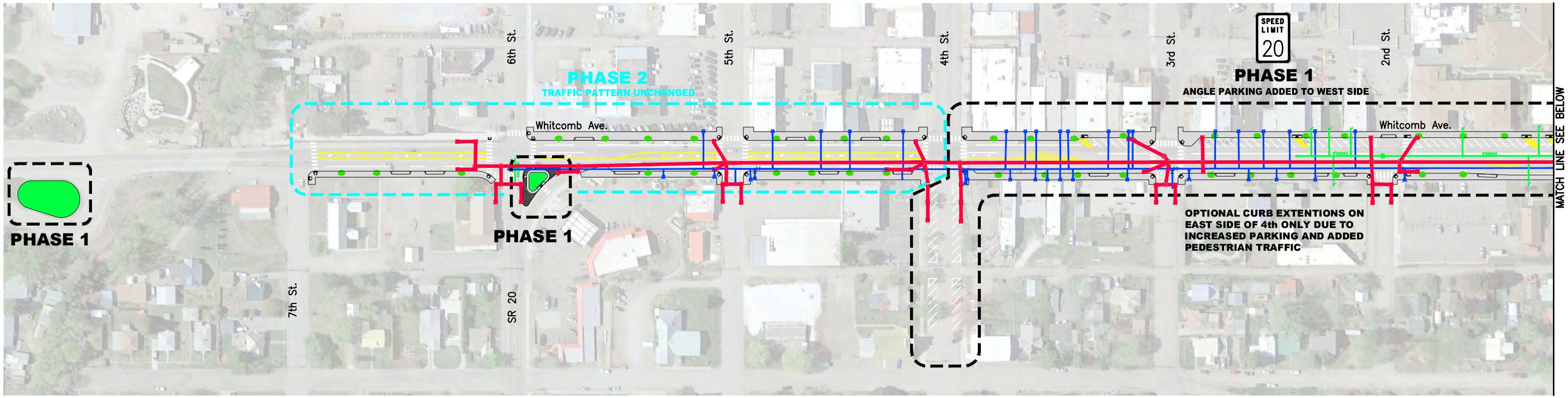
SCALE

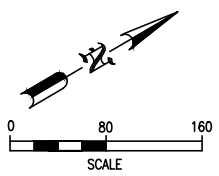
581603--Storm Water Planning Exhibit

VARELA AND ASSOCIATES, INC.
ENGINEERING AND MANAGEMENT

CITY OF TONASKET, WASHINGTON

STORM WATER PLANNING EXHIBIT





LEGEND

- PROPOSED STORMDRAIN SYSTEM IMPROVEMENTS
- PROPOSED WATER SYSTEM IMPROVEMENTS
- PROPOSED SEWER SYSTEM IMPROVEMENTS
- PROPOSED SIDEWALK IMPROVEMENTS

582209-Exhibit

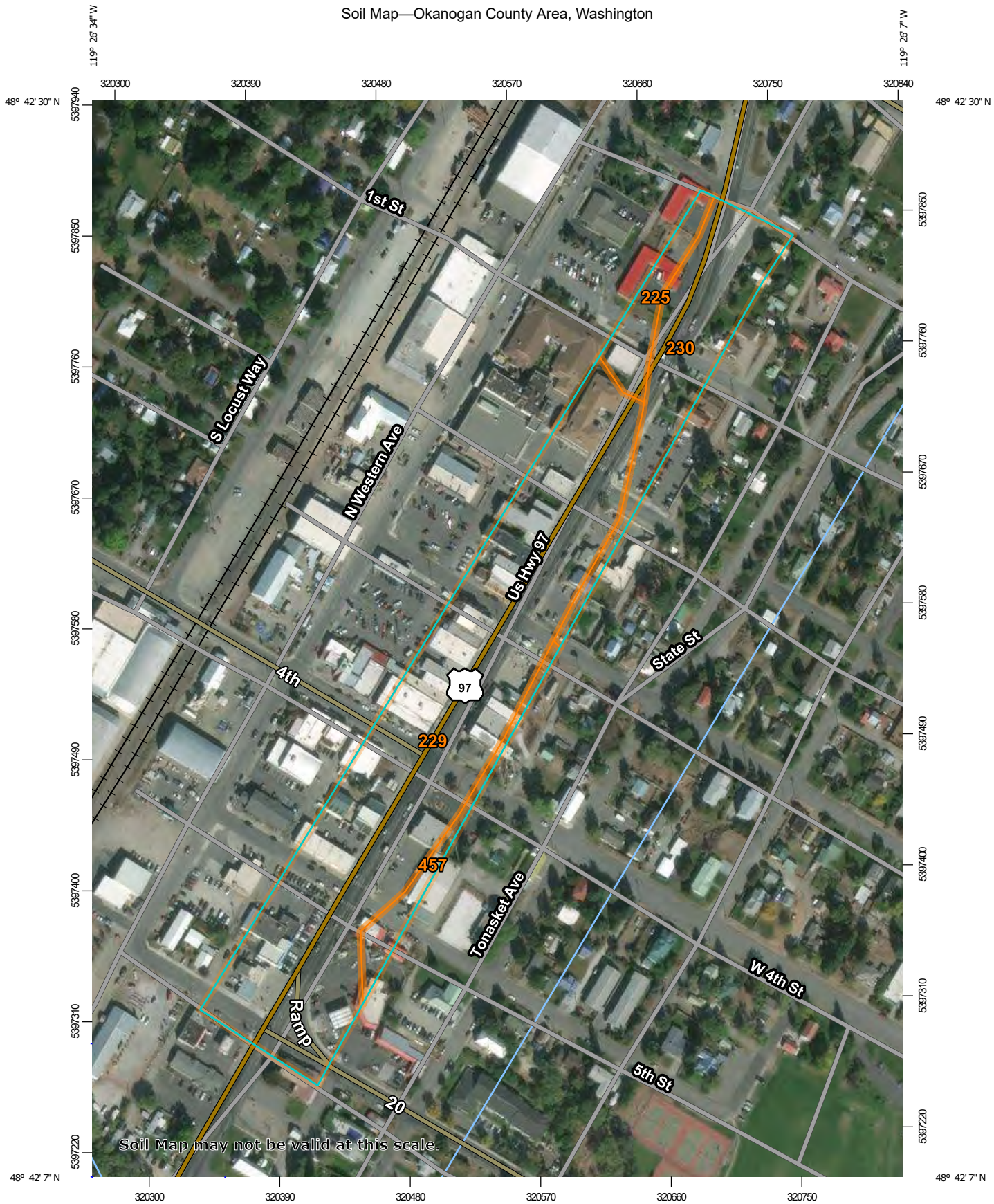
SCALE:	AS SHOWN
DESIGNED:	–
DRAWN:	JSM/TVP
CHECKED:	
APPROVED:	
PROJ. NO.:	58-22-09
DATE:	10/01/19

VARELA AND ASSOCIATES, INC.
ENGINEERING AND MANAGEMENT

CITY OF TONASKET, WASHINGTON

2019 ECOLOGY FUNDING APPLICATION FOR PERFECT PASSAGE
(SR 97) STORMWATER TREATMENT IMPROVEMENTS

FIGURE
1



Map Scale: 1:3,600 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Okanogan County Area, Washington
Survey Area Data: Version 14, Sep 10, 2018

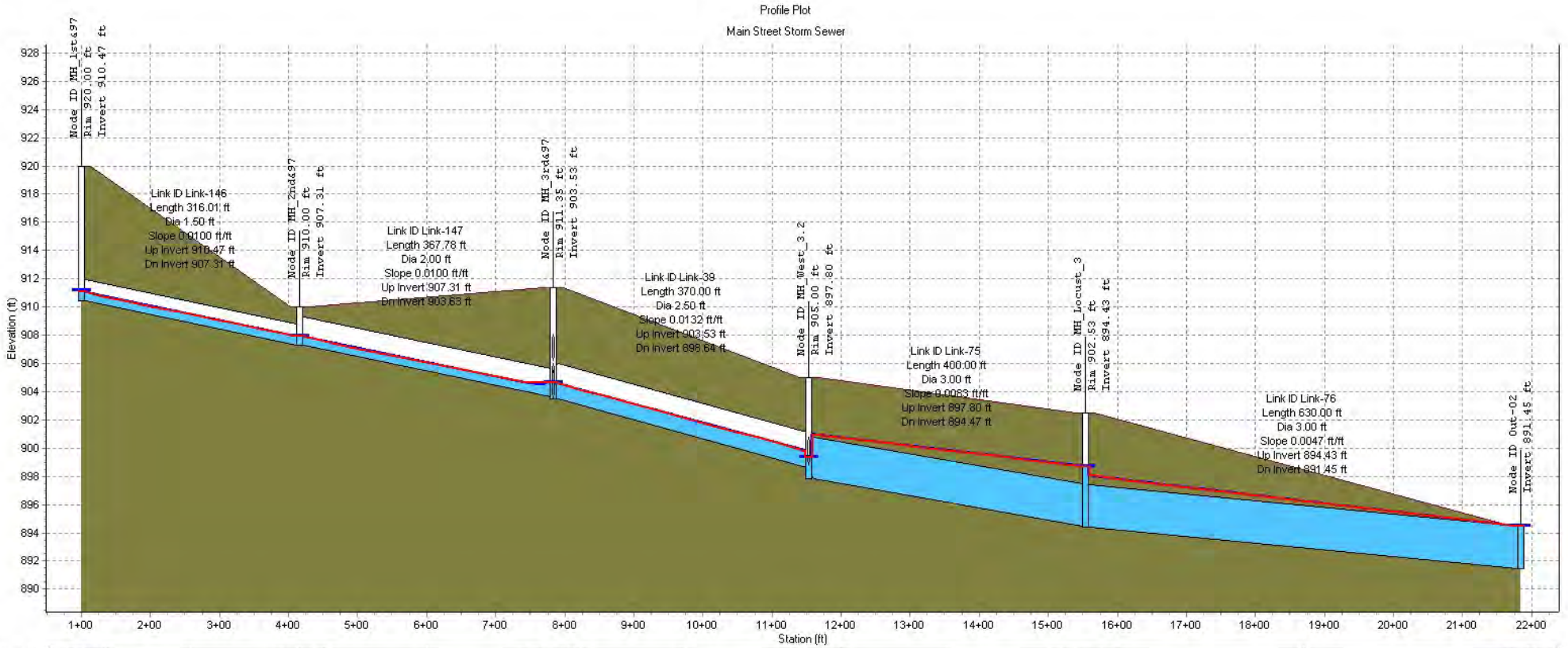
Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 15, 2010—Sep 20, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

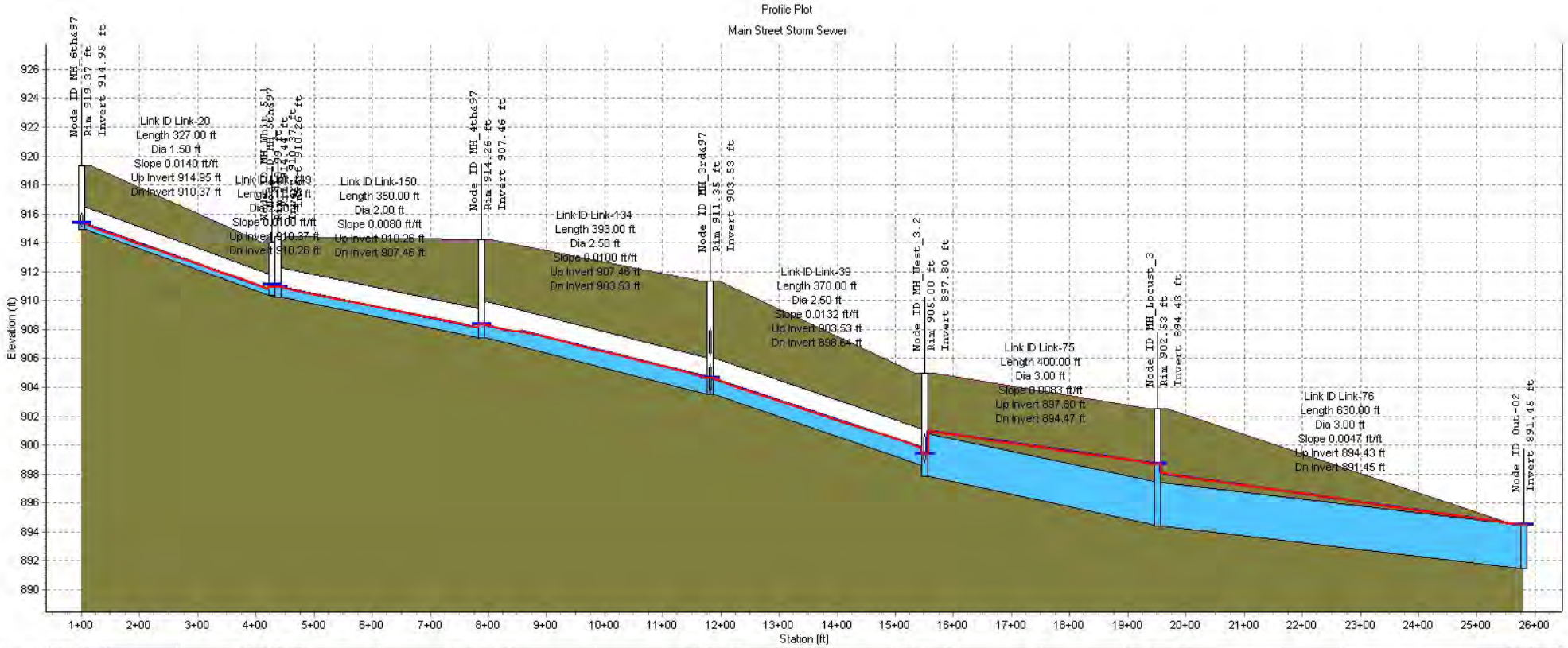
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
225	Cashmere fine sandy loam, 3 to 8 percent slopes	0.7	5.4%
229	Cashmont sandy loam, 3 to 8 percent slopes	9.8	72.5%
230	Cashmont sandy loam, 8 to 15 percent slopes	2.4	17.6%
457	Pogue fine sandy loam, 8 to 15 percent slopes	0.6	4.5%
Totals for Area of Interest		**13.5**	**100.0%**



Node ID:	MH_1st&97	MH_2nd&97	MH_3rd&97	MH_West_3.2	MH_Locust_3	Out-02
Rim (ft):	920.00	910.00	911.35	905.00	902.53	
Invert (ft):	910.47	907.31	903.53	897.80	894.43	891.45
Min Pipe Cover (ft):	8.03	0.69	3.24	3.86	5.06	
Max HGL (ft):	911.16	907.95	904.69	899.37	902.53	894.45

Link ID:	Link-146	Link-147	Link-39	Link-75	Link-76
Length (ft):	316.01	367.78	370.00	400.00	630.00
Dia (ft):	1.50	2.00	2.50	3.00	3.00
Slope (ft/ft):	0.0100	0.0100	0.0132	0.0083	0.0047
Up Invert (ft):	910.47	907.31	903.53	897.80	894.43
Dn Invert (ft):	907.31	903.63	898.64	894.47	891.45
Max Q (cfs):	4.41	5.48	32.38	45.74	43.96
Max Vel (ft/s):	5.86	4.39	7.53	4.50	6.22
Max Depth (ft):	0.66	0.81	1.09	2.29	3.00



Node ID:	MH_6th&97	MH_West_3.2	MH_4th&97	MH_3rd&97	MH_West_3.2	MH_Locust_3	Out-02
Rim (ft):	919.37	914.26	914.26	911.35	905.00	902.53	
Invert (ft):	914.95	910.26	907.46	903.53	897.80	894.43	891.45
Min Pipe Cover (ft):	2.92	3.28	4.30	3.24	3.86	5.06	
Max HGL (ft):	915.38	911.86	908.39	904.69	899.37	902.53	894.45

Link ID:	Link-20	Link-149	Link-150	Link-134	Link-39	Link-75	Link-76
Length (ft):	327.00	11.00	350.00	393.00	370.00	400.00	630.00
Dia (ft):	1.50	2.00	2.00	2.50	2.50	3.00	3.00
Slope (ft/ft):	0.0140	0.0100	0.0080	0.0100	0.0132	0.0083	0.0047
Up Invert (ft):	914.95	910.37	910.26	907.46	903.53	897.80	894.43
Dn Invert (ft):	910.37	910.26	907.46	903.53	898.64	894.47	891.45
Max Q (cfs):	2.36	2.50	5.59	12.17	32.38	45.74	43.96
Max Vel (ft/s):	3.93	2.54	4.67	6.31	7.53	4.50	6.22
Max Depth (ft):	0.55	0.68	0.79	1.00	1.09	2.29	3.00

US97 RECONSTRUCTION PROJECT - CAPITAL IMPROVEMENTS PLANNING - PHASE 1 - STORMWATER ONLY

NO.	DIV	ITEM	QNTY	UNIT	PRICE	EXTENDED
		SCHEDULE A (STREET AND STORMWATER IMPROVEMENTS)				
1	1-05	ROADWAY SURVEYING *	0.18	LS	$20,000.00	$3,607.00
2	1-05	RECORD DRAWINGS *	0.18	LS	$1,500.00	$271.00
3	1-07	SPCC PLAN *	0.18	LS	$500.00	$90.00
4	1-10	MOBILIZATION (10% of $2,293,975.00) *	0.18	LS	$229,398.00	$41,377.00
5	1-10	PROJECT TEMPORARY TRAFFIC CONTROL (7%of $2,293,975.00) *	0.18	LS	$160,578.00	$28,964.00
18	7-04	SCHEDULE A STORM SEWER PIPE, 12" DIAM.	750.00	LF	$45.00	$33,750.00
19	7-04	SCHEDULE A STORM SEWER PIPE, 18" DIAM.	360.00	LF	$65.00	$23,400.00
20	7-04	PVC STORM SEWER PIPE, 24" DIAM.	450.00	LF	$95.00	$42,750.00
21	7-04	PVC STORM SEWER PIPE, 30" DIAM.	350.00	LF	$125.00	$43,750.00
22	7-05	CATCH BASIN TYPE 1 (SDCB)	23.00	EA	$2,000.00	$46,000.00
23	7-05	CATCH BASIN TYPE 2 (SDMH)	9.00	EA	$3,500.00	$31,500.00
24	7-05	GRATE INLET (SD INLET)	23.00	EA	$1,500.00	$34,500.00
25	7-05	ADJUST MANHOLE (SDCB's INCLUDED)	3.00	EA	$850.00	$2,550.00
26	7-12	ADJUST VALVE BOX	0.00	EA	$600.00	$0.00
27	8-01	INLET PROTECTION	50.00	EA	$100.00	$5,000.00
28	8-01	SILT FENCE	65.00	LF	$8.00	$520.00
29	8-01	SEEDING, FERTILIZING, & MULCHING	0.00	AC	$5,000.00	$0.00
30	8-01	CDS 4040-8 TREATMENT DEVICE	2.00	EA	$86,000.00	$172,000.00
31	8-01	CDS 4045-8 TREATMENT DEVICE	1.00	EA	$98,000.00	$98,000.00
					TOTAL	$608,029.00
					CONTINGENCY (15%)	$ 91,204.35
					PHASE 1 STORMWATER CONSTRUCTION SUBTOTAL	$699,233.35
					Engineering, Inspection, Administration (30%)	$209,770.01
					Environmental/Cultural/Historical permits and approvals (stormwater portion)	$9,000.00
					PROJECT SUBTOTAL (STORMWATER PORTION)	$918,003.36
					Ecology Administration	$3,000.00
					PHASE 1 STORMWATER TOTAL	**$921,003.36**

* The stormwater construction portion of these Cost Opinions for overall construction items assumed to be 18% attributed to the stormwater portion.

US97 RECONSTRUCTION PROJECT - CAPITAL IMPROVEMENTS PLANNING - PHASE 2 - STORMWATER ONLY

NO.	DIV	ITEM	QNTY	UNIT	PRICE	EXTENDED
		SCHEDULE A (STREET AND STORMWATER IMPROVEMENTS)				
1	1-05	ROADWAY SURVEYING *	0.07	LS	$10,000.00	$ 657.00
2	1-05	RECORD DRAWINGS *	0.07	LS	$1,500.00	$ 99.00
3	1-07	SPCC PLAN *	0.07	LS	$500.00	$ 33.00
4	1-10	MOBILIZATION (10% of $1,488,770.00) *	0.07	LS	$148,877.00	$ 9,789.00
5	1-10	PROJECT TEMPORARY TRAFFIC CONTROL (7% of $1,488,770.00) *	0.07	LS	$104,214.00	$ 6,852.00
19	7-04	SCHEDULE A STORM SEWER PIPE, 12" DIAM.	750.00	LF	$60.00	$ 45,000.00
20	7-04	SCHEDULE A STORM SEWER PIPE, 18" DIAM.	75.00	LF	$110.00	$ 8,250.00
21	7-04	PVC STORM SEWER PIPE, 24" DIAM.	375.00	LF	$95.00	$ 35,625.00
22	7-05	CATCH BASIN TYPE 1 (SDCB)	23.00	EA	$3,000.00	$ 69,000.00
23	7-05	CATCH BASIN TYPE 2 (SDMH)	7.00	EA	$5,000.00	$ 35,000.00
24	7-05	GRATE INLET (SD INLET)	23.00	EA	$2,000.00	$ 46,000.00
25	7-05	ADJUST MANHOLE (5 SDMH's & 3 SDCB's INCLUDED)	8.00	EA	$600.00	$ 4,800.00
26	7-05	CONNECT 12" PIPE TO EXISTING STRUCTURE	2.00	EA	$1,800.00	$ 3,600.00
27	7-05	CONNECT 18" PIPE TO EXISTING STRUCTURE	3.00	EA	$2,000.00	$ 6,000.00
29	8-01	INLET PROTECTION	17.00	EA	$100.00	$ 1,700.00
					TOTAL	$ 272,405.00
					CONTINGENCY (15%)	$ 40,860.75
					PHASE 2 STORMWATER CONSTRUCTION SUBTOTAL	$ 313,265.75
					Engineering, Inspection, Administration (30%)	$93,979.73
					Environmental/Cultural/Historical permits and approvals (stormwater portion)	$0.00
					PROJECT SUBTOTAL (STORMWATER PORTION)	$407,245.48
					Ecology Administration	$3,000.00
					PHASE 2 STORMWATER TOTAL	**$410,245.48**

* The stormwater construction portion of these Cost Opinions for overall construction items assumed to be 7% attributed to the stormwater portion.

US97 RECONSTRUCTION PROJECT - CAPITAL IMPROVEMENTS PLANNING - PHASE 3 - STORMWATER ONLY

NO.	DIV	ITEM	QNTY	UNIT	PRICE	EXTENDED
		SCHEDULE A (STREET AND STORMWATER IMPROVEMENTS)				
1	1-05	ROADWAY SURVEYING *	0.05	LS	$10,000.00	$ 548.00
2	1-05	RECORD DRAWINGS *	0.05	LS	$1,500.00	$ 82.00
3	1-07	SPCC PLAN *	0.05	LS	$500.00	$ 27.00
4	1-10	MOBILIZATION (10% of $550,265.00) *	0.05	LS	$55,027.00	$ 3,014.00
5	1-10	PROJECT TEMPORARY TRAFFIC CONTROL (7% of $550,265.00) *	0.05	LS	$38,519.00	$ 2,110.00
17	7-04	SCHEDULE A STORM SEWER PIPE, 12" DIAM.	115.00	LF	$70.00	$ 8,050.00
18	7-05	CATCH BASIN TYPE 1 (SDCB)	3.00	EA	$3,500.00	$ 10,500.00
19	7-05	GRATE INLET (SD INLET)	1.00	EA	$2,500.00	$ 2,500.00
20	7-05	ADJUST MANHOLE (2 SDCB's INCLUDED)	2.00	EA	$850.00	$ 1,700.00
21	7-05	CONNECT 12" PIPE TO EXISTING STRUCTURE	2.00	EA	$2,000.00	$ 4,000.00
22	7-12	ADJUST VALVE BOX		EA	$600.00	$ -
23	8-01	INLET PROTECTION	6.00	EA	$100.00	$ 600.00
24	8-01	SILT FENCE	270.00	LF	$8.00	$ 2,160.00
25	8-01	SEEDING, FERTILIZING, & MULCHING	1.00	AC	$5,000.00	$ 5,000.00
					TOTAL	$ 40,291.00
					CONTINGENCY (15%)	$ 6,043.65
					PHASE 3 STORMWATER SUBTOTAL	$ 46,334.65
					Engineering, Inspection, Administration (30%)	$13,900.40
					Environmental/Cultural/Historical permits and approvals (stormwater portion)	$0.00
					PROJECT SUBTOTAL (STORMWATER PORTION)	$60,235.05
					Ecology Administration	$3,000.00
					PHASE 3 STORMWATER TOTAL	**$63,235.05**

* The stormwater construction portion of these Cost Opinions for overall construction items assumed to be 7% attributed to the stormwater portion.

Project Schedule

For City of Tonasket

Perfect Passage (SR 97) Stormwater Treatment Improvements

Tasks	Responsible Party	Start Date	End Date
Draft offer list from ECY	City, ECY	01/01/2020	01/31/2020
Tonasket/ECY agreement negotiated and executed	City, ECY	07/01/2020	09/30/2020
Complete cultural/historical resources review	City, Engineer	11/01/2020	02/28/2021
Complete NEPA/SEPA environmental review	City, Engineer	11/01/2020	02/28/2021
Tonasket/Varela complete Perfect Passage stormwater design/prepare 90% design report.	Engineer	11/01/2020	02/28/2021
Tonasket/Varela complete Perfect Passage 90% stormwater plans, all phases, Engineers Estimate.	Engineer	11/01/2020	02/28/2021
City, DOE review	City, DOE	02/01/2021	03/01/2021
Final Bid Package, Award, and Construct Phase 1	City, Engineer, Contractor	04/01/2021	08/31/2021
Final Bid Package, Award, and Construct Phase 2	City, Engineer, Contractor	04/01/2022	08/31/2022
Final Bid Package, Award, and Construct Phase 3	City, Engineer, Contractor	04/01/2023	08/31/2023