City of Wenatchee Comprehensive Stormwater Plan

City of Wenatchee, Washington
August 14, 2020

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Abbreviations

°F	degree(s) Fahrenheit
AACE	American Association of Cost Engineers
AADT	annual average daily traffic
ac-ft	acre-foot/feet
AKART	all known, available, and reasonable methods of prevention, control, and treatment
AMS	antecedent moisture content
ANSI	American National Standards Institute
BMP	best management practice
CAD	computer-aided design
CAVFS	compost-amended vegetated filter strip
cfs	cubic foot/feet per second
CIP	Capital Improvement Plan
City	City of Wenatchee
CN	Curve Number
CSWP	Comprehensive Stormwater Plan
CWA	Clean Water Act
Ecology	Washington State Department of Ecology
EIM	Environmental Information Management
EPA	U.S. Environmental Protection Agency
ERU	equivalent residential unit
ESA	Endangered Species Act
FIPS	Federal Information Processing Standard
ft	foot/feet
ft^2	square foot/feet
ft/ft	foot/feet (horizontal):foot/feet (vertical) (slope)
FTE	full-time equivalent
GIS	geographic information system
GMA	Growth Management Act
GO	General Obligation
HDPE	high-density polyethylene
HDR	HDR Engineering, Inc.
HEC-HMS	Hydrologic Engineering Center's Hydrologic Modeling System
HPA	hydraulic project approval
HSG	hydrologic soil group
ID	identifier
IDDE	Illicit Discharge Detection and Elimination

IGN	Institut Géographique National
in	inch(es)
LGIP	Local Government Investment Pool
LID	low-impact development
LOS	level of service
MEP	maximum extent practicable
mi^2	square mile(s)
min	minute(s)
MS4	municipal separate storm sewer system
N/A	not applicable
NAD83	North American Datum of 1983
NAVD88	North American Vertical Datum of 1988
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
O&M	operations and maintenance
PGIS	pollution-generating impervious surfaces
Phase II Permit	Eastern Washington Phase II Municipal Stormwater Permit
PVC	polyvinyl chloride
PWTF	Public Works Trust Fund
QAPP	Quality Assurance Project Plan
RCW	Revised Code of Washington
ROW	right-of-way
SIF	system investment fee
SMAP	Stormwater Management Action Plan
SSC	Site Suitability Criteria
SWMMEW	Stormwater Management Manual for Eastern Washington
SWMP	Stormwater Management Program
SWPPP	stormwater pollution prevention plan
TESC	temporary erosion sediment control
TMDL	total maximum daily load
UIC	underground injection control
USDA	United States Department of Agriculture
USGS	United States Geological Survey
WCC	Wenatchee City Code
WDFW	Washington State Department of Fish and Wildlife
WSDOT	Washington State Department of Transportation
WSS	Web Soil Survey
WVSTAC	Wenatchee Valley Stormwater Technical Advisory Committee
USDA	United States Department of Agriculture
USGS	United States Geological Survey
WCC	Wenatchee City Code
WDFW	Washington State Department of Fish and Wildlife
WSDOT	Washington State Department of Transportation
WSS	Web Soil Survey
WVSTAC	Wenatchee Valley Stormwater Technical Advisory Committee

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1 Overview

The first stormwater mains in Wenatchee were installed more than 70 years ago. In 1994, the City of Wenatchee (City) established a stormwater utility to protect property and fund maintenance and improvements to the City's stormwater system. The first Comprehensive Stormwater Plan (CSWP) was prepared in 1999; updated in 2010; and updated again in 2020 with consultant support from HDR Engineering, Inc. (HDR), Erlandsen & Associates, and the FCS Group. This 2020 CSWP update includes planning and engineering strategies to meet stormwater capacity for the next 6 to 10 years.

To summarize, the purpose of this CSWP is to:

- Describe the City's stormwater management approach
- Examine and evaluate proposed capital projects for flood control and improving water quality
- Evaluate the Stormwater Management Program (SWMP)
- Provide best management practice (BMP) recommendations to address water quality concerns in areas developed prior to the use of stormwater regulations
- Conduct a rate study and update rates to support the capital project plan and SWMP

As in other urban planning efforts, comprehensive plans to manage stormwater runoff seek to provide the City with a forward-looking plan that maintains existing assets and promotes development.

1.1 Climate

Wenatchee's climate is relatively mild and arid. Winds prevail from the west and carry marine air across the Cascade Range, where most precipitation falls as rain or snow. Cool temperatures and light precipitation characterize winters, while summers are hot and dry. Annual precipitation between 2007 and 2019 averaged 9.08 inches (United States 2019). Average low temperatures range from 25 degrees Fahrenheit (°F) in December and January to 62°F in July. Average high temperatures range from 35°F in December to 88°F in July and August (United States 2019). Intense, short-duration summer thunderstorms characterize rainfall patterns in the summer months that contribute to flooding problems in the city. These precipitation events, which develop along the eastern slopes of the Cascade Mountains from a southwesterly flow, have caused locally heavy runoff in the Wenatchee area. Figure 1-1 shows the monthly mean precipitation depths for Wenatchee for the period 2000 through 2019.

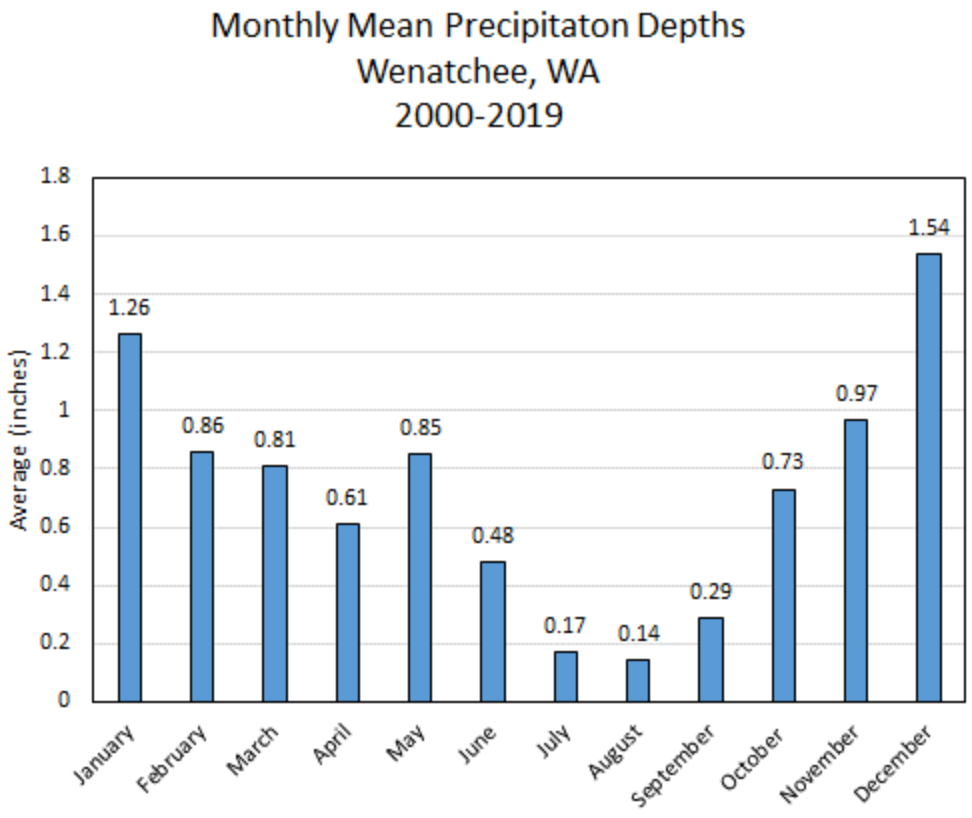

Figure 1-1. Monthly mean precipitation depths

Source: National Weather Service 2019.

1.2 Population Growth

Population growth and urban development result in increasing stormwater demands. As shown in Figure 1-2 below, the city's population has grown by 6,473 people between 2000 and 2018 (World Population Review 2020).

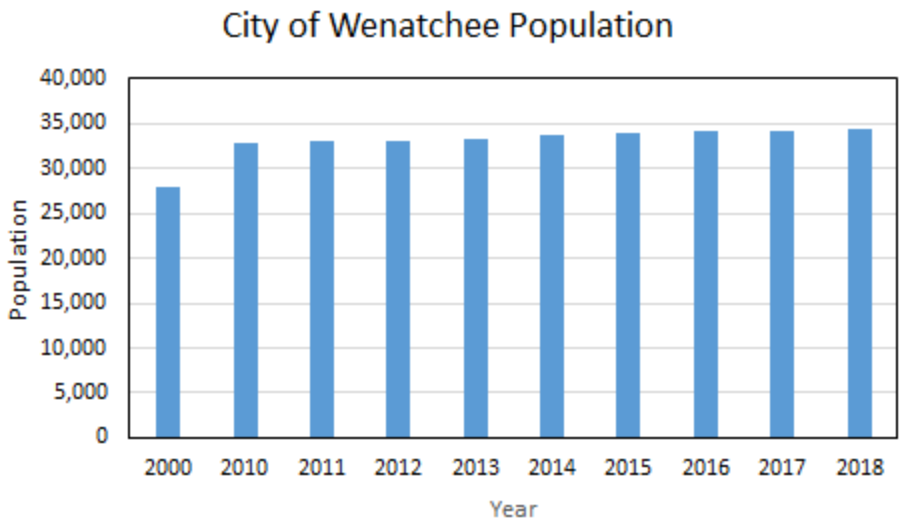

Figure 1-2. City of Wenatchee population growth between 2000 and 2018

Source: World Population Review 2020.

1.3 Regulatory Drivers

The following sections provide an overview of applicable regulations related to the City's stormwater utility.

1.3.1 Federal Clean Water Act

The federal Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters (EPA 2020). Under the CWA, the U.S. Environmental Protection Agency (EPA) has implemented pollution control programs such as setting stormwater standards for industry and has developed national water quality criteria recommendations for pollutants in surface waters. EPA has identified stormwater runoff as a major source of pollution (Ecology 2018) and has enacted regulations to offset the impacts of polluted stormwater runoff on the environment.

National Pollutant Discharge Elimination System

The CWA made it unlawful to discharge any pollutant from a point source into navigable waters, unless a permit was obtained. EPA's National Pollutant Discharge Elimination System (NPDES) permit program controls discharges. The permits regulate wastewater and stormwater discharges from municipal and industrial facilities.

Municipal Stormwater Permit

With jurisdictional authority to regulate stormwater runoff discharging from municipal stormwater systems to the waters of the nation, EPA has delegated authority to the Washington State Department of Ecology (Ecology) to implement the rules and regulations for managing stormwater in Washington State. To that end, Ecology

regulates stormwater discharges from municipalities via the Municipal Stormwater Permit, divided into Phase I for large municipalities and Phase II for small municipalities, and between eastern Washington and western Washington. The City of Wenatchee is a Phase II jurisdiction and operates its stormwater utility according to the standards and conditions in the Eastern Washington Phase II Municipal Stormwater Permit (Phase II Permit). The Phase II Permit requires the City to enforce the quantity and quality of stormwater runoff discharging from the City's municipal separate storm sewer system (MS4) to the "waters of the state." Integral Phase II Permit elements include the following:

- **S5.B.1, Public Education and Outreach:** Efforts to raise public awareness for impacts of stormwater discharges to water bodies and reduce pollutants to stormwater shall be taken, with a focus on a multimedia approach and target audiences.
- **S5.B.2, Public Involvement and Participation:** Efforts to foster public involvement and participation of SWMP and Stormwater Management Action Plan (SMAP) discussions through avenues such as advisory councils, public hearings, watershed committees, rate structure discussions, and similar activities.
- **S5.B.3, Illicit Discharge Detection and Elimination (IDDE):** Development of an ongoing program to prevent, detect, characterize, trace, record, and eliminate illicit connections and illicit discharges.
- **S5.B.4, Construction Site Stormwater Runoff Control:** Implementation of a program to reduce stormwater runoff pollutants to regulated levels relevant to new development, redevelopment, and construction site activities, inclusive of public and private projects.
- **S5.B.5, Post-Construction Stormwater Management for New Development and Redevelopment:** Implementation of a program to address post-construction stormwater runoff to the municipal stormwater system for new development and redevelopment projects.
- **S5.B.6, Municipal Operation and Maintenance:** Implementation of a program to protect water quality; reduce discharge of pollutants; and meet state all known, available, and reasonable methods of prevention, control, and treatment (AKART) requirements.

1.3.2 Endangered Species Act

The federal Endangered Species Act (ESA) aims to protect at-risk fish and wildlife species from habitat loss or fragmentation, land disturbance, and non-native species (WDFW 2020). Chinook salmon (*Oncorhynchus tshawytscha*) and steelhead (*Oncorhynchus mykiss*) are federally listed as threatened species on the middle Columbia River (WDFW 2020). For projects that may affect listed species or habitat, a Biological Assessment must be prepared along with the completion of an ESA consultation.

1.3.3 Growth Management Act

In 1990 the Growth Management Act (GMA) was adopted in Washington State, as per Chapter 36.70A of the Revised Code of Washington (RCW), requiring certain counties to develop comprehensive plans to accommodate future growth. As Wenatchee lies within Chelan County's jurisdiction, it is required to implement a full comprehensive plan and is required to designate natural resource lands and associated protection steps. These matters are identified in the Wenatchee Urban Area Comprehensive Plan (City 2019).

1.3.4 Wenatchee City Code

The Wenatchee City Code (WCC) is a collection of laws passed by the Wenatchee City Council that have the "force and effect of law" and are enforceable within the jurisdiction of the City. The following list summarizes sections of the WCC pertaining to stormwater:

- **Chapter 4.08, Stormwater Illicit Discharge Detection and Elimination:** This chapter defines what types of discharges are prohibited in the stormwater system and BMPs to protect water quality. Chapter 4.08 includes the code enforcement measures for stormwater that are referenced in other sections of the WCC.
- **Chapter 9.20, Construction and Post-Construction Stormwater:** This chapter covers the requirements for new development and redevelopment to preserve the natural landscape, implement or construct BMPs, and establish ongoing operation and maintenance (O&M) of BMPs.
- **Chapter 9.30, Land Surface Modification**: This chapter sets to minimize adverse land disturbance activities, to include a stormwater pollution prevention plan (SWPPP) (as required per WCC Chapter 9.20) or temporary erosion sediment control (TESC) plan.
- **Chapter 10.60, Off-Street Parking**: This chapter addresses parking design standards to minimize creation of impervious-surface areas to promote the protection of water quality.
- **Chapter 10.47, Residential Use Standards:** This chapter describes residential standards as applicable to housing type that includes necessary stormwater improvements associated with alley access and improvements (WCC 10.47.170).
- **Chapter 12.08, Critical Areas**: This chapter provides for the protection of the critical areas, including the protection of natural flood control and stormwater storage with the preservation of existing drainage and stream flow patterns.

1.4 Previous Studies and Comprehensive Stormwater Plans

Two previous CSWPs were referenced in the 2020 update:

- The **1999/2000 CSWP** (City 2000) included hydrologic and hydraulic modeling of the storm drainage network that identified conveyance deficiencies. The CSWP identified approximately $12 million in structural improvements needed to meet the 10-year level-of-service (LOS) goal. The 1999/2000 CSWP also identified federal funding options to address recommended structural control for the canyon drains.

- The **2010 CSWP** (City 2010) upgraded the City's storm drainage network maps, developed a geographic information system (GIS)-based model used to identify and prioritize improvements to the City's conveyance network, updated the City's Capital Improvement Plan (CIP), and identified policies to address the recurring flooding problems emanating from the canyons.

Capital projects from both CSWPs contributed to an updated, prioritized set of recommended CIP projects (see Chapter 6).

Other historical and relevant drainage information has also been documented. The studies cited in the 2010 CSWP are excerpted in Table 1-1 verbatim.

Table 1-1. Historical Drainage Studies

Study	Description
Comprehensive Storm Sewer Plan for Wenatchee Urbanizing Area. Munson, Nash, Futrell and Associates (February 1969)	This study, which was the first known drainage system study for the City of Wenatchee, focused on the city's urban system only. The U.S. Army Corps of Engineers concurrently completed a separate study of the canyon flows. The planning area was bounded by the Columbia River, Western Avenue, and Crawford Street. Major drainage system improvements were proposed, which included trunk lines in Crawford, Ferry/Russell, Washington, Fifth, Orondo, Springwater, and McKittrick. The sizing for the trunk lines did not consider runoff originating west of Western Avenue.
Flood Control of Canyons No. 1 and 2. Department of the Army, Corps of Engineers (November 1974)	Debris-laden floodwater from two canyons west of Wenatchee had historically caused heavy damage in southern and western Wenatchee. A feasibility report recommended constructing reinforced-concrete channels to carry runoff from both canyons through the Wenatchee to the Columbia River. Congress authorized federal funding for the project in December 1970. The Federal project cost was estimated at $24,440,000 (October 1977 price level). Expenditures for pre-construction planning were $544,331. Advanced engineering and design studies were deferred pending local agreements to share in project costs. This project was de-authorized January 1, 1990, under the provisions of Public Law 99-662 when the City did not come up with the local share.
Wenatchee Area Flood Hazard Report for Canyon No. 1, Canyon No. 2, and Dry Gulch. Munson Engineers (March 1980)	The report included a flood hazard analysis and was completed for the Chelan County Public Works Department. It reviewed the feasibility of using debris-control dams in the bottoms of the upstream canyons and detention/infiltration ponds immediately downslope of the canyon openings. The report might have been drafted as an alternative to the Corps' proposed project of 1974.

Table 1-1. Historical Drainage Studies

Study	Description
Phase II Wenatchee Stormwater Study. Forsgren Associates/P.A. (May 1992)	In this study, a comprehensive analysis of Wenatchee's existing drainage system was completed using SWMM to model hydrology and hydraulics. Modeling was completed using synthetic rainfall curves rather than actual recorded rainfall data. The study recommended improvements, which were forecasted to cost about $1.5 million, to upgrade the city's drainage system. In general, improvements were recommended for Columbia Street drainage pipes in vicinity of Benton Street, Miller Street drainage pipes from Springwater to the outfall, Princeton and Maple Street drainage pipes, and various other small pipes scattered throughout the urban system.
Flood Hazard Investigation of Alluvial Fans below Canyons No. 1 and No. 2 and Dry Gulch Northwest Hydraulic Consultants, Inc. (July 1996)	This report presents a chronological history of floods from Canyons No. 1 and No. 2 and relates the damage caused by the floods. No recommendations for preventing flooding are made. The investigation did recommend reducing the floodplain limits below the mouths of all three canyons based on hydrologic/hydraulic modeling of canyon runoff and expected deposition of debris. The investigation was used by the City to request and obtain a revised Flood Insurance Rate Map (FIRM) from the Federal Emergency Management Agency (FEMA).
Comprehensive Flood Hazard Management Plan, Chelan County Flood Control Zone District, Tetra Tech. (October 2017)	The Chelan County Flood Control Zone District was established by the Board of County Commissioners in 2014 following a few years of flood events from the canyons starting in 2010. This plan was completed in 2017 to provide a county-wide approach to flood control and floodplain management using structural and non-structural methods. The plan includes modeling of the floodplain in Wenatchee and other communities in Chelan County.

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2 Stormwater Utility Management

When the City of Wenatchee's stormwater utility was formed in the early 1990s, its primary objective was to collect stormwater fees to fund the construction and maintenance of pipes and inlets for flood control. With the implementation of the Phase II Permit requirements, the stormwater utility has had to evolve. This chapter sets forth the current stormwater utility objectives, provides an overview of the City's SWMP, and presents action items to support the goals of the utility.

2.1 City of Wenatchee Stormwater Utility Objectives

The City has four primary stormwater utility management objectives:

1. Protect property in the urban area from damage caused by stormwater runoff and flooding from natural drainages
2. Protect water quality through the implementation of the Wenatchee Valley SWMP
3. Provide a cost-based, equitable utility rate
4. Reduce stormwater runoff rates and volumes, reduce soil erosion and nonpoint source pollution wherever possible through stormwater management controls, and ensure that these management controls are properly maintained and pose no threat to public safety (WCC 9.20)

2.2 City of Wenatchee Stormwater Management Program

The City is one of 19 eastern Washington municipalities that are regulated by the Phase II Permit issued by Ecology under authority of EPA's NPDES program. The City's original Phase II Permit was issued in 2007 by Ecology, along with other jurisdictions in eastern Washington. The Phase II Permit is a general permit that is reissued approximately every 5 years. The City's current Phase II Permit was reissued on August 1, 2019, and expires on July 31, 2024.

The Phase II Permit is organized into Special Conditions and General Conditions (see Appendix A). It allows the regulated jurisdiction to discharge stormwater runoff from its MS4 to the waters of the state. Through the permit, the City is required to develop and implement a SWMP to comply with Phase II Permit requirements. In 2004, the Wenatchee Valley Stormwater Technical Advisory Committee (WVSTAC) was formed between Chelan County, Douglas County, the City of East Wenatchee, and the City of Wenatchee to develop a regional stormwater program and meet the Phase II Permit for compliance.

The SWMP includes regional, semi-regional, and local efforts. Regional efforts encompass activities with the four municipalities and Wenatchee Valley College, while semi-regional efforts include collaboration or shared funding between two or three entities, and local efforts are individually managed by the City.

As a Phase II Permit condition, each calendar year the City updates and publishes a stormwater management program plan that documents how it meets the conditions of the Phase II Permit on the City website: https://www.wenatcheewa.gov/wvstac.

2.3 Stormwater Management Program Gap Analysis

The evaluation and gap analysis of the City's SWMP is focused on Sections S5, S8, and S9. Table 2-1 provides a brief description of the sections evaluated.

Table 2-1. NPDES Permit Special Conditions and Program Components

Phase II Permit Section	Program Component
S5.A	Stormwater Management Program
S5.B	SWMP Objectives and Standards
S5.B.1	Public Education and Outreach
S5.B.2	Public Involvement and Participation
S5.B.3	Illicit Discharge Detection and Elimination (IDDE)
S5.B.4	Construction Site Stormwater Runoff Control
S5.B.5	Post-Construction Stormwater Management for New Development and Redevelopment
S5.B.6	Municipal Operations and Maintenance
S8	Monitoring and Assessment
S9	Reporting Requirements

2.3.1 Stormwater Management Program Evaluation

HDR reviewed 49 individual Phase II Permit requirements in S5 and 13 additional conditions in S8 and S9 as part of the Phase II Permit gap analysis. To assess possible SWMP gaps with respect to these requirements, HDR reviewed the City's existing SWMP, O&M manual, and the City's website, and called on City staff when additional details were needed. The information gathered was compared to the requirements of the Phase II Permit to identify program gaps. The following sections summarize the findings of the gap analysis for each subsection of S5. New Phase II Permit requirements are also discussed.

S5.B.1 Public Education and Outreach

In 2008, the WVSTAC developed the Public Education and Outreach and Public Involvement and Participation plan (see Appendix B). The program aims to educate the public, businesses, developers, engineers, and contractors on stormwater pollution prevention and stormwater BMPs.

The following initiatives are included yearly in the City's public education and outreach program:

- Provide stormwater education and outreach at one public event
- Participate in Wenatchee School District programs
- Provide stormwater education and outreach to target audience(s)

Additional education and outreach programs are implemented each year as needed with events, illicit discharge trends, and input from the Wenatchee Valley Stormwater Program Development Steering Committee.

S5.B.2 Public Involvement and Participation

The Wenatchee Valley Stormwater Program Development Steering Committee provides an opportunity for stakeholders to participate in the implementation of the SWMP. The committee includes citizens, elected officials, business owners, engineers, a real estate agent, and environmental organizations from Wenatchee, East Wenatchee, Chelan County, and Douglas County.

The following initiatives are included in the City's current public involvement and participation program:

- Host annual Wenatchee Valley Stormwater Program Steering Committee meetings
- Post Stormwater Management Program and Plan to regional website
- Provide a stormwater survey on the website and at public events
- Measure understanding and adoption of behavior for one target audience (August 21, 2021)

S5.B.3 Illicit Discharge Detection and Elimination

An IDDE program is a special condition in the Phase II Permit that requires cities and counties to implement a systematic program to address the issue of illicit stormwater discharges.

The following initiatives are included in the City's IDDE program:

- Review and update the stormwater system map as necessary
- Field assess and track 12 percent of the MS4 annually
- Collect and investigate illicit discharge reports from the community
- Train City staff on illicit discharges

To reduce illicit discharges and comply with Phase II Permit requirements, the City developed an ordinance (WCC 4.10) prohibiting illegal connections and discharges to the MS4. The ordinance also includes enforcement action.

The City's IDDE program ensures that City stormwater staff are equipped and trained to respond to illicit discharges. City records are maintained of all field assessments, complaints, spills, suspected illicit discharges, illicit connections, and investigations using

the procedures outlined in the IDDE Response Plan. In the Annual Report, the City submits data for the illicit discharges, spills, and illicit connections, including those that were found by, reported to, or investigated by the Permittee during the previous calendar year. The data include the information specified in Appendix 7 of the Phase II Permit and WQWebIDDE records are kept on training that was offered and a list of staff members who attended.

S5.B.4 Construction Site Stormwater Runoff Control

The City's permitting process requires plan review and site inspections for development and redevelopment projects. Further, the City adopted WCC 9.20 to regulate stormwater runoff associated with new development and redevelopment projects 1 acre or larger or less than 1 acre but part of a common plan of development with associated penalties for violations. BMPs for construction by public and private projects are provided in Chapter 7 of the *Stormwater Management Manual for Eastern Washington* (SWMMEW) (Ecology 2019b).

The following initiatives are included in the City's Construction Site Stormwater Runoff Control program:

- Review SWPPPs
- Conduct inspections of public and private construction sites
- Provide education and outreach on construction phase BMPs
- Train City staff in erosion and sediment control

The City provides literature relevant to erosion and sediment control, development of a SWPPP, and construction requirements directly to the development community and through fliers available on the City of Wenatchee website.

S5.B.5 Post-Construction Stormwater Management for New Development and Redevelopment

The City's permitting process requires post-construction monitoring of stormwater runoff discharging to the MS4 for new development and redevelopment projects disturbing 1 acre or greater for both public and private projects. The requirements are set forth in WCC 9.20. The City is required to comply with the design standards for construction listed under the 2019 underground injection control (UIC) BMPs as well (Ecology 2019b).

The following initiatives are included in the City's Post-Construction SWMP:

- Implement an inspection program for public and private stormwater facilities
- Provide education and outreach on post-construction phase BMPs
- Require an O&M agreement for private stormwater facilities for projects regulated under WCC 9.20

S5.B.6 Municipal Operations and Maintenance

Phase II Permit conditions stipulate that the City's O&M standards must be equal to those in the SWMMEW. Rigorous inspection schedules and maintenance standards are required, and SWPPPs are required for certain categories of municipal facilities.

The following initiatives are included in the City's municipal O&M program:

- A written O&M plan that includes appropriate pollution prevention techniques and BMPs
- Record keeping of inspections and activities
- Employee training on BMPs

S8 Monitoring and Assessment

During the last Phase II Permit cycle, the City partnered with eight other Eastern Washington Phase II Permittees to complete the Mobile Contractor Illicit Discharge Education and Outreach Effectiveness Study. The 2019 update to the Phase II Permit requires the City to coordinate with other Permittees in an urban area to plan and initiate an additional effectiveness study to determine the effectiveness of SWMP activities and BMPs. The City plans to accomplish this task through an interlocal agreement with the WVSTAC members.

S9 Reporting Requirements

The Phase II Permit requires that the City document and report to Ecology on the City's compliance with the permit. The City maintains electronic and paper records to comply with the Phase II Permit. GIS is used for mapping and the City uses three software programs to track inspections, maintenance, and stormwater reports: SmartGov, Elements, and SharePoint.

2.3.2 Gap Analysis Results and Compliance Strategies

Full details of the NPDES gap analysis are provided in Appendix C. The analysis is divided by sections of the Phase II Permit and includes a column of the description of each of the permit conditions and how the City complies with the conditions. The result of the program review was that four program improvements pertaining to the 2019 Phase II Permit requirements were identified. Requirements should be incorporated into existing SWMP elements. The gaps and recommendations are summarized in Table 2-2.

Table 2-2. Gaps and Recommendations for the City of Wenatchee per Section in the NPDES Phase II Permit

Permit Section	Gap	Compliance Strategies
S5.A.5.a	A combination of paper and electronic record keeping is used. The electronic records are in various programs and databases.	Recommend the City evaluate options to consolidate data storage for easier access and move to electronic record-keeping methods.
S5.B.3.a	Not all of the mapping requirements have been met and a description of the mapping standards is needed.	The map will need to be updated by 2/2/2023 and mapping standards will need to be documented by 8/1/2021 to the meet the new requirements.
S5.B.6.a.i	The BMPs in the O&M plan have not been updated with the 2019 version of the SWMMEW.	Update the O&M plan by 12/31/2021.
S8.A.2	New effectiveness study requirements start in 2021.	Continue coordinating with the regional partners on new effectiveness study requirements.

2.3.3 Resource Analysis

The objective of the resource analysis was to estimate full-time equivalent (FTE) resources needed to close SWMP gaps and maintain compliance with the Phase II Permit. An FTE is equivalent to the annual number of hours an employee works in 1 year, or 2,080 hours.

The analysis used time estimates to calculate the number of hours needed to close each identified SWMP gap. Some gaps have ongoing programmatic resource demands while others are considered one-time events. The one-time events were assumed to be addressed with existing resources and therefore do not contribute toward the final FTE calculation. The ongoing programs have time estimates divided into "development" time estimates and "ongoing maintenance" time estimates for the years in the planning period. Many Phase II Permit gaps exist because of new requirements scheduled to take effect on different dates within the Phase II Permit window (2019–2024); therefore, the FTE estimate is also sensitive to the implementation date.

Time estimates used in the analysis are based on the type of program work that is needed. Each Phase II Permit gap was categorized into one of the following five compliance gap categories:

- Compliance tracking
- Policy development and implementation
- Program evaluation
- SWMP documentation
- Training

These categories helped to establish basic assumptions describing the work, which became the basis for the estimated number of hours necessary to address the identified gaps. Table 2-3 shows the various assumptions used in generating the FTE.

Table 2-3. FTE Assumptions

Assumption	Value	Unit
Average hourly rate	65.00	Dollars
Hours per page	4	Hours
Annual days off	25	Days
Time span	1	Calendar year
Start date	8/1/2019	Date
End date	7/31/2024	Date
Budget start date	2020	Year

The summary of results for the FTE needed is presented in Table 2-4.

Table 2-4. FTE Summary

Budget Year	FTE
2020	1.5
2021	1.1
2022	1.9
2023	1.2
2024	1.1

HDR's gap analysis of the City's SWMP recommends adding 6.8 FTEs over the 2020–2024 period. The staffing recommendations match effective dates of new 2019 Phase II Permit requirements intended to add resources when new permit initiatives take effect. Upon further review by City staff, the staffing recommendation used in the rate study was three FTEs.

2.4 Stormwater Utility Actions Items

Through the SWMP gap analysis and development of this CSWP, the following actions were developed in support of the utility objectives:

1. Complete recommendations presented in Table 2-2 above to continue to comply with the current Phase II Permit
2. Complete implementation of a work order and asset management program for the stormwater utility
3. Implement a program to verify and update stormwater infrastructure attribute data
4. Increase video inspection frequency of stormwater mains and select a rating system for asset management

5. Participate in the Chelan County Flood Control Zone District in the development and implementation of the Chelan County Flood Hazard Mitigation Plan and basin plans as they pertain to the City of Wenatchee
6. Seek state and federal funding for flood hazard mitigation projects
7. Develop and maintain City of Wenatchee Standard Plans and Policies for the construction of stormwater infrastructure
8. Develop materials to assist new development and redevelopment project proponents in following the SWMMEW and WCC
9. Update WCC to require maintenance bonds for new stormwater infrastructure
10. Implement a CIP to address flooding and water quality issues and support new development
11. Study drainage basins and sub-basins to assess stormwater utility capacity and determine opportunities for on-site retention and water quality improvements
12. Increase stormwater utility staff to maintain compliance with regulations and meet the goals set forth in this chapter
13. Implement a new utility billing software system
14. Participate in the funding of a street tree program in coordination with the Parks and Recreation Department to maintain trees located in the City right-of-way (ROW)

3 Municipal Stormwater System

Stormwater assets require short- and long-term maintenance to increase longevity and to address issues before they result in failure. The City is responsible for stormwater infrastructure located in the public ROW, on City-owned property, and on private property where drainage easements have been dedicated to the City. This chapter describes the City's stormwater collection system and water quality facilities. A current map of the stormwater drainage system showing pipes, inlets, catch basins, ditches, culverts, and treatment BMPs can be found at: https://www.wenatcheewa.gov/government/public-works/maps.

3.1 Storm Drain Network

The City of Wenatchee has more than 90 miles of storm drain pipe covering 7.7 square miles (mi^2). The urban stormwater system discharges to surface water bodies, the Chelan County MS4, and underground infiltration structures. Receiving waters include the Columbia River; the Wenatchee River; Squilchuck Creek; and the three major canyon drainages: No. 1 Canyon, No. 2 Canyon, and Dry Gulch. **Figure** 3-1 shows an overview of the stormwater drainage system and receiving waters.

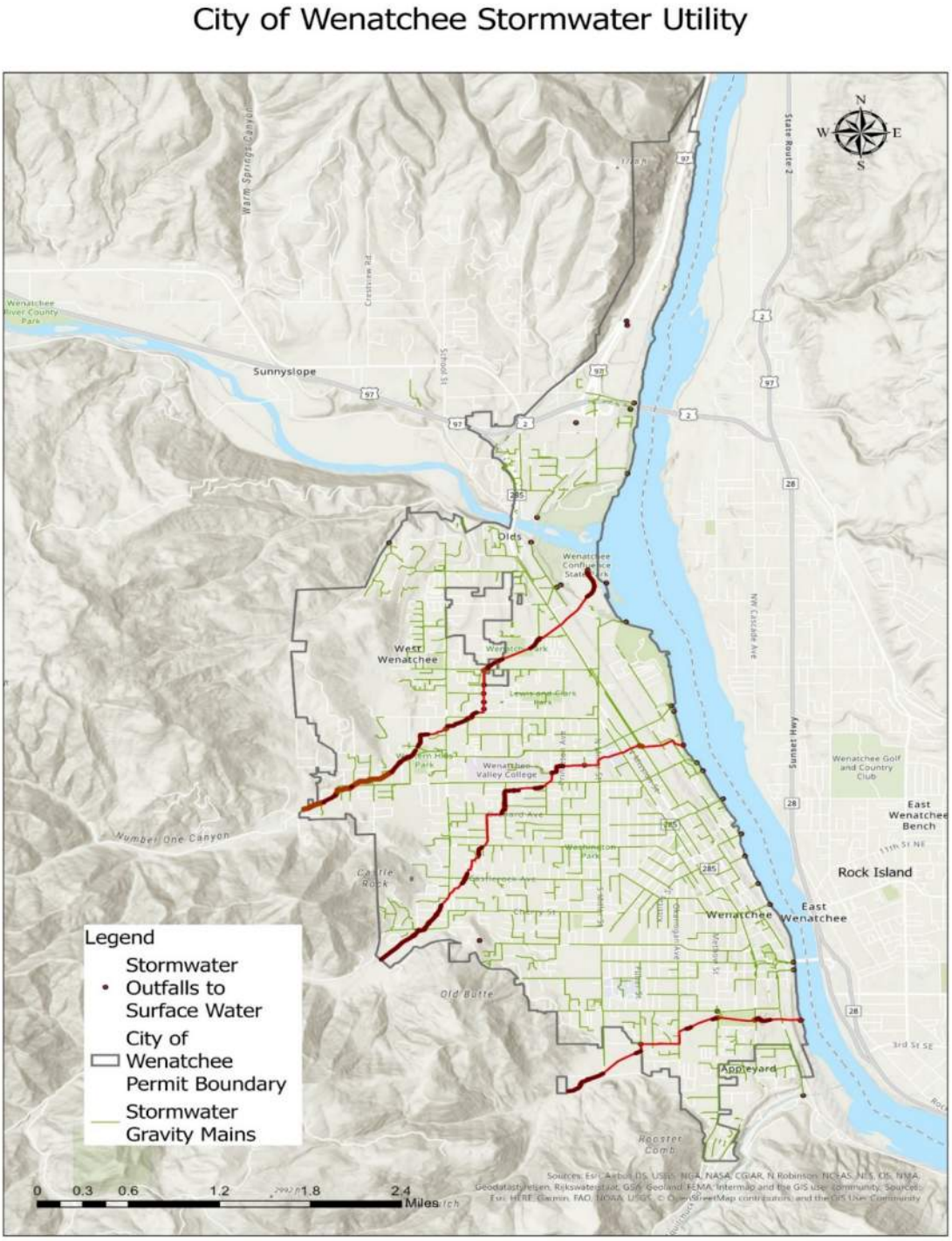

Figure 3-1. City of Wenatchee stormwater utility area

3.1.1 Storm Drainage Network

The City's urban storm drainage pipe network varies in diameter from 6 to 72 inches as shown in Table 3-1. Pipe diameters larger than 36 inches make up 7.3 percent of the

total length of pipe in the city. These larger-diameter pipes are of particular interest to understand their conditions because the consequences of the failure of these larger-diameter pipes are more severe than those for smaller-diameter pipes. Unknown pipe sizes make up 14 percent of the total pipe length in the city.

Table 3-1. Storm Drainage Pipe Length by Diameter

Pipe Diameter (in)	Length of Pipe (ft)
6	1,307
8	15,639
10	38,393
12	129,378
14	27
15	46,995
16	1,249
18	61,291
21	9,532
24	30,821
27	6,073
30	28,515
36	31,319
42	15,595
48	11,746
54	1,885
60	1,431
72	1,373
Unknown	61,958
Total	**494,527**

The pipe materials in the stormwater collection system include aluminum, corrugated metal, concrete, ductile-iron pipe, asphalt-dipped steel, high-density polyethylene (HDPE), polyethylene, and polyvinyl chloride (PVC). One section of asbestos-cement pipe was identified in the stormwater system in the 200 block of S Chelan Avenue. Approximately 9 percent of the pipe length in the network has unknown composition.

The breakout of the total length of pipe by material is summarized in Table 3-2.

Table 3-2. Storm Drainage Pipe Length by Material

Material	Length of pipe (ft)
Aluminum	3,024
Corrugated metal	65,590
Concrete	75,225
Ductile-iron pipe	531
Dipped steel	34,335
HDPE	127,871
Polyethylene	943
PVC	146,514
Unknown	40,494
Total	**454,527**

The City has been conducting video inspections of all new development and projects since 1998 and problem areas as needed. The City plans to continue video inspections on a rolling schedule to continually assess the condition of the pipes.

It is recommended that video inspections focus on older pipes that are 36 inches in diameter and greater. Obtaining a comprehensive data set that includes pipe age, pipe size, and pipe material will aid in the City's efforts to prioritize inspections and maintenance and will also aid in the future planning and design for the City to expand.

3.1.2 Canyon Drainages

The City maintains sections of the No. 1 Canyon, No. 2 Canyon, and Dry Gulch drainages where they cross public ROW and on City-owned property. These sections of the drainages must be maintained under a hydraulic project approval (HPA) from the Washington State Department of Fish and Wildlife (WDFW). While no fish have been seen in the urban sections of the drainages and flows are seasonal, the intent of the permitting is to protect water quality**.** The City is in the process of obtaining a programmatic HPA for routine maintenance in coordination with Chelan County.

3.1.2 Ditches

Since 2016 the City has annexed large areas of Chelan County located north of the Wenatchee River and into the foothills. The stormwater conveyance in these areas includes more ditches than the urban areas developed within the city. As new development or road improvements occur in these areas, the ditches will be replaced with pipes, inlets, and catch basins.

3.2 Drainage Structures

Drainage structures are split into three categories: manholes, inlets, and catch basins.

Manholes are placed in a storm drain network when there is a change in grade of pipes, alignment, or pipe size; at junctions of two or more pipes; and at periodic intervals for access and maintenance purposes. Spacing between manholes typically ranges between 300 and 500 feet. The City's goal is to place manholes appropriate distances for ease of maintenance, but not more than 450 feet apart. In a few locations throughout the system, manholes have been entirely omitted, and storm drains were designed to go from catch basin to catch basin on each side of the street.

Inlets and catch basins are two structures with a similar purpose of capturing stormwater runoff. The difference between these structures is that the catch basins are designed to capture sediment and inlets are not. Catch basins are designed with a sump below the pipe invert elevations where sediment is deposited. Spacing between catch basins/inlets is typically 350 to 450 feet on streets where the storm drainage system is completely developed. Grates on modern catch basins are rectangular, with typical dimensions of 20 by 24 inches. Patterns of slotted opening in the catch basin grates can be one-, two-, or three-row rectangular; herringbone; or of varied openings and through curb inlet.

3.3 Stormwater Treatment Best Management Practices

Stormwater BMPs include three broad categories: operational, structural, and treatment. The following section provides an overview of the treatment BMPs found in the City of Wenatchee stormwater system. Table 3-3 lists the treatment BMPs in Wenatchee.

3.3.1 Drywells and Infiltration Trenches

Drywells are excavated pits lined with perforated casings and filled with gravel that allow stormwater to pond while it infiltrates the surrounding soil. Infiltration trenches are generally at least 24 inches wide with a perforated pipe and backfilled with coarse rock aggregate. Infiltration BMPs must be protected from sediment by pretreatment; catch basins are commonly used upstream of these types of BMPs. The City maintains drywells and infiltration trenches in accordance with the current City of Wenatchee Stormwater Pollution Prevention Operations and Maintenance Plan (Appendix F of the Wenatchee Valley SWMP).

3.3.2 Detention and Retention Ponds

Several detention and retention facilities within the urban area of Wenatchee were designed and constructed to meet Phase II Permit requirements as a part of a subdivision, road improvement project, or commercial development. These facilities can function as flow control during extreme storm events by temporarily detaining excess runoff, retention facilities in areas without stormwater mains, and/or runoff treatment.

3.3.3 Bioinfiltration Swales

The City has bioinfiltration swales on Hawley Street, Stella Avenue, and Riverside Drive to treat stormwater before it is discharged into the City's drainage network. The swales function by allowing stormwater that flows off the roadway to build to a depth of 6 inches. Once the 6-inch depth is exceeded the additional flow overtops an overflow structure and is discharged into an underground infiltration system. Where stormwater mains are installed, overflows from high-flow storms are discharged into a main through overflow catch basins located within the swale.

3.3.4 Tree Boxes

The tree boxes installed by the City on Riverside Drive and Worthen Street are concrete boxes with a tree and a curb inlet to allow stormwater from the road to run into the box. There is no outlet or overflow from the tree boxes, and the City does not use media in these plantings.

Eastern Washington experiences intermittent rainfall because of the rain shadow created by the Cascade Mountains. The City has found it difficult to establish trees within tree boxes without providing supplemental irrigation.

3.3.5 Wet Vault

A wet vault is an underground structure that removes sediment by providing an opportunity for pollutants to settle. These vaults do not remove dissolved pollutants and may be less effective during high flows and cold weather conditions. Vaults also help with flow control, which was the primary purpose of the two vaults in the City's stormwater system. The vault at the intersection of Snohomish Street and S Columbia Street controls the flow to the Stevens Street outfall and the Snohomish Street outfall. The vault in the Linden Tree parking lot provides flow control to prevent the Linden Tree Pond from being overwhelmed and has baffles to collect floatable debris and a sump for sediment.

3.3.6 Water Quality Filter

The City has installed water quality filter units as part of road improvement projects on Fifth Street, Piere Street, Riverside Drive, Island View Street, and Pine Street. The units are all Contech brand but vary in the type of filter and design.

Table 3-3. Stormwater Treatment BMPs

Name/Number/Designator	Facility Type	Location/Address	Year Constructed
Linden Tree Park	Wet pond	Riverfront Park, Ninth and Walla Walla	1996
Linden Tree Wet Vault	Wet vault	Linden Tree parking lot	2009
Fifth Street Stormwater Filter	Contech StormFilter	Fifth and N Mission	2004
N Wenatchee Avenue Stormwater Facility	Bioinfiltration swale and dry pond	N Wenatchee Avenue adjacent to BNSF	1997
Walla Walla Stormwater System	Infiltration trenches, and subsurface infiltration	Walla Walla Avenue between N Miller and Ninth Street	2007
Walnut-Hawley Swales	Bioinfiltration swale and retention pond	Walnut Street from Pine to N Wenatchee Avenue	2008
Stella Street Stormwater System	Subsurface infiltration	Stella Street adjacent to the Public Services Center	2008
Broadview Pond	Dry pond	West of Maiden Lane behind 2018 Maiden Lane	1995
Riverside Drive Filter	Contech StormFilter	Riverside Drive and Island View Street	2009
Riverside Drive Tree Boxes	Tree boxes with curb Inlets	Riverside Drive from Ninth to Fifth	2009
Riverside Drive Swales	Bioinfiltration swale	Riverside Drive from Worthen to Ninth Street	2009
Piere Street Filter	Contech StormFilter	Pierre and Fifth Street	2009
Worthen Street Tree Boxes	Tree boxes with curb inlets	Worthen Street from First to Yakima	2013
Piere Street Swales	Bioinfiltration swale	Piere between Ninth and Fifth	2009
S Wenatchee Avenue Pond	Infiltration pond	S Wenatchee Avenue and Malaga-Alcoa Highway	2013
Olds Station Pond	Dry pond	Olds Station Road	2000
Columbia Swale	Biofiltration swale	North end of Confluence Park by Columbia Fruit	Unknown
George Sellar Bridge Pond	Infiltration pond	South side of bridge interchange	2013
Snohomish and S Columbia Vault	Wet vault	Intersection of Snohomish and S Columbia	Unknown

3.4 Outfalls

There are 33 separate outfalls from the City's stormwater system. Table 3-4 describes each outfall maintained by the City and the receiving water where it discharges. A portion of the City's stormwater system in south Wenatchee discharges to the Chelan County MS4. Locations and more details can be found in the GIS map referenced at the beginning of this chapter.

Table 3-4. Stormwater Outfalls

Outfall Name	Discharge Pipe Diameter (in)
Columbia River Outfalls	
Linden Tree	Weir
Ninth Street	42
First Street	36
Fifth Street	24
Peachey Street	54
Thurston Street	36
Snohomish Street	21
Walla Walla Avenue	48
Chehalis Street	12
Worthen Street	24
Hawley Street	24
Yakima Street	18
Stevens Street	27
Columbia	24
Wenatchee River Outfalls	
North Wenatchee Stormwater System	36
Broadview Pond	12
Olds Station	72
Squilchuck Creek Outfall	
Upper Squilchuck	24
No. 1 Canyon Drain Outfalls	
Central Avenue	12
Pershing Street	8
Twin Peaks	18
Woodland Street	12
Alderwood Street	12
No. 2 Canyon Drain Outfalls	
Skyline Drive	12
No. 2 Canyon Road	36
Michael Place	12

Pear Lane	8
Ringold Street	12
Princeton Avenue	8
Seventh Street	8
Ramona Street	8
Sunset Avenue	8
Piere Street	Overflow from swale

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4 Hydrologic Modeling

The City recently updated its city limits boundary to annex several underdeveloped areas on the western fringes of the previous city limits. Formal drainage infrastructure is lacking in these areas because the existing land use, typically orchard or native vegetated areas, produces limited rainfall runoff because most precipitation is lost to interception, evaporation, and soil infiltration. In anticipation of future new development in these areas, the City asked HDR to provide basin-scale hydrologic modeling services to establish future-condition flow rates and volumes that could be used for comprehensive stormwater planning in these areas.

4.1 Background

Much of the land within city limits is presently developed and served by publicly owned storm drainage infrastructure, which has been built over time as the city has expanded. The City's Public Works Department is responsible for maintaining this system. Because much of the system was built before stormwater codes and engineering standards were established, conveyance capacity problems have emerged as the city has grown and more impervious surface areas have increased runoff volumes entering the system. Flooding problems in the existing system are documented by maintenance records, prior stormwater modeling studies, and, more recently, actual flooding events. In summer 2019, three separate storms resulted in structural flooding and temporary closure of arterial roadways.

The City's Phase II Permit program now regulates development greater than 1 acre, requiring property owners to retain stormwater runoff on site up to the 10-year, 24-hour event. Runoff exceeding this threshold is allowed to be discharged to the downstream conveyance system. However, in areas where new development is anticipated (the annexed areas), there is no formalized drainage network. Existing infrastructure is present downstream of the anticipated new developments, but hydraulic pipe capacity analysis is required to determine if there is adequate capacity for the increased runoff. The lack of a formal stormwater conveyance system in the annexed areas presents a problem for the City and is the basis for this modeling task.

The purpose of this modeling task is to calculate peak flows and runoff volumes from the annexed areas in existing and future site conditions based on the city's zoning to identify options the City could undertake to reduce flooding risk.

4.2 Future Development Areas of Interest

Annexed areas are mainly underdeveloped and consist of open space (meadow, prairie, and the like) or orchards and are located within the existing three canyon drainage basins that run from the western headwaters to the east through the city. As part of this analysis, the City provided to HDR a GIS shapefile of the future zoning for identification of future development areas of interest. Future development areas of interest were identified based on the following criteria:

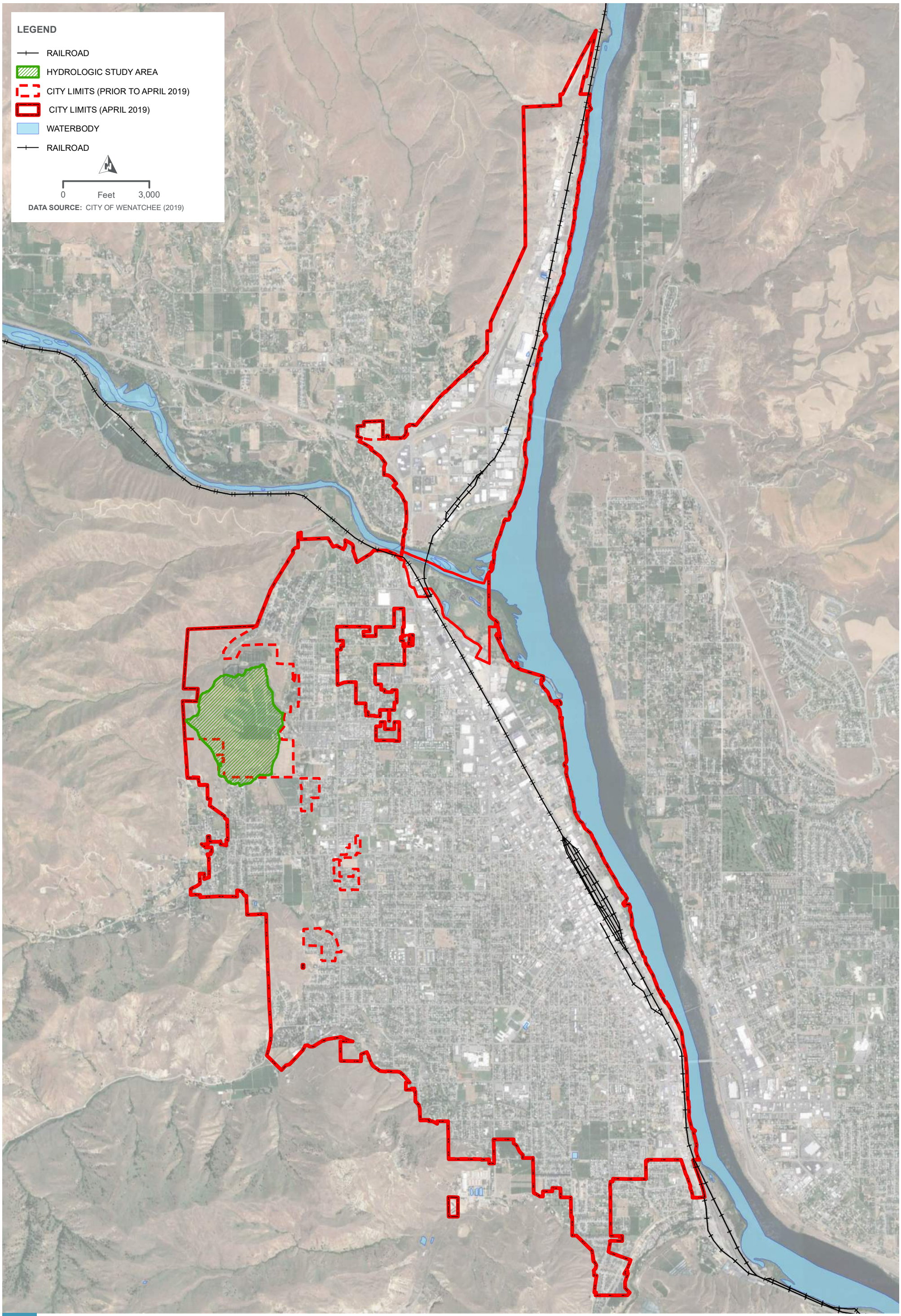
- Exist within the recently updated city limits
- Indirectly drain to one of the canyons
- Are within the limits of the future zoning shapefile provided by the City

After applying the selection criteria, a 0.32 mi^2 area of interest northwest of the city limits was identified and selected for hydrologic analysis. The location is north of the No. 1 Canyon and just to the west of the north–south irrigation canal (Figure 4-1).

4.3 Project Data

The analysis used data collected from various agencies. The data sources are presented below:

- **Terrain data:** The primary source of topographic data used in this study was obtained from the Washington LIDAR Portal hosted by the Washington State Department of Natural Resources. The data were available as a direct download in a 3-by-3-foot grid cell raster format (https://lidarportal.dnr.wa.gov/).
- **Imagery data:** The project used the default imagery viewer available within ArcGIS, Bing Maps Imagery. This provided imagery obtained from the following sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, United States Department of Agriculture (USDA), United States Geological Survey (USGS), AeroGrid, Institut Géographique National (IGN), and the GIS user community.
- **Soils data:** Soils data were obtained from the Natural Resources Conservation Service's (NRCS's) Web Soil Survey (WSS) online tool. Soils data were downloaded for the project area in GIS shapefile format (https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx).
- **Coordinate system:** The coordinate system used for the study is North American Datum of 1983 (NAD83) (2011) State Plane Coordinates, Washington North Federal Information Processing Standard (FIPS) Zone (4601) presented in feet U.S. with a vertical datum set to North American Vertical Datum of 1988 (NAVD88).



City of Wenatchee

CITY OF WENATCHEE
COMPREHENSIVE STORMWATER PLAN
FIGURE 4-1 STUDY AREA

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4.4 Hydrologic Methodology

The hydrologic methods used for this study are in accordance with national, state, and local standards. The Hydrologic Engineering Center's Hydrologic Modeling System (HEC-HMS) (Version 4.3, 2018) was used to calculate peak flows and runoff volumes for the project sub-basins. HEC-HMS allows users to simulate the complete hydrologic processes of dendritic watershed systems, and includes many traditional hydrologic analysis procedures such as event infiltration, unit hydrographs, and hydrologic routing. The following is a summary of the data sources, assumptions, and procedures used to perform the hydrologic analysis for the study.

4.4.1 Rainfall/Runoff Method

The hydrologic methodology uses the NRCS Curve Number (CN) method. This method is based on the study area's hydrologic soil group (HSG), land use, treatment, and hydrologic condition to predict the approximate amount of direct runoff from a rainfall event within a catchment. Initial abstraction must be considered when applying this method. The initial abstraction includes water retained in surface depression, water intercepted by vegetation, evaporation, and infiltration. Initial abstraction is highly variable but generally is correlated with soil and cover parameters. Refer to Technical Release 55 published by NRCS for a detailed description of the CN method. The NRCS Unit Hydrograph shown in Figure 4-2 was used to transform design rainfall intensity into a peak flow rate for the watershed.

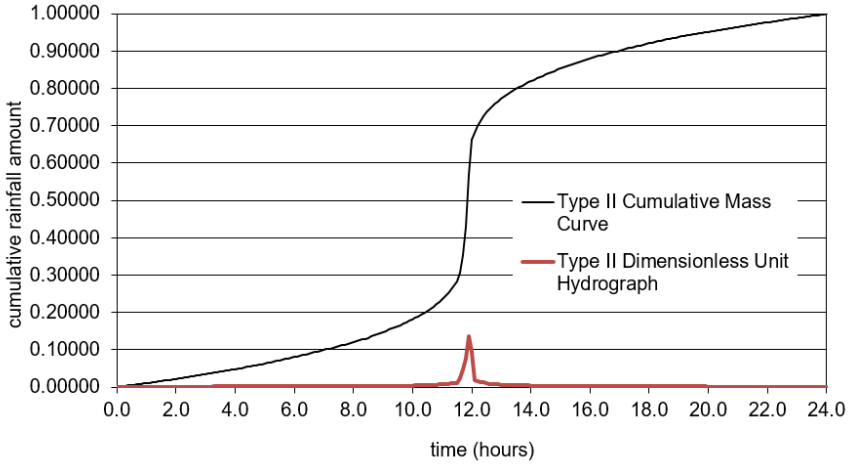

Figure 4-2. Rainfall storm distribution: Type II

4.4.2 Sub-basin Delineation

The project area was initially delineated into micro-sub-basins from the analysis terrain data using ArcHydro Tools for ArcGIS. A significant change in terrain slope exists moving from the west portion of the project area to the east. This change of slope can be defined as going from ±30 percent in the western headwater area to ±15 percent in the eastern

portion. For purposes of this analysis, it was assumed that future development would be confined to areas where terrain slope is approximately 15 percent or less. The previously created micro-sub-basins were merged into 10 project sub-basins. This resulted in five headwater basins with ±30 percent slope and five developable basins with ±15 percent slope. Aerial inspections of the terrain and existing stormwater infrastructure were also considered for the final basin delineations.

The project sub-basins varied in area from 8.3 to 38.4 acres, with an average sub-basin area of 20.5 acres. Sub-basin and outfall locations are shown in Figure 4-3 and total area for each sub-basin is included in Table 4-1.

Table 4-1. Project Sub-basin Area

Sub-basin ID	Area (acres)	Sub-basin ID	Area (acres)
WEN01A	20.5	WEN03B	8.3
WEN01B	14.1	WEN04A	38.4
WEN02A	19.2	WEN04B	22.4
WEN02B	14.7	WEN05A	22.4
WEN03A	28.8	WEN05B	16.0

Legend

- OUTFALL LOCATION
- LONGEST SLOPE WITHIN SUB BASIN
- RAILROAD
- 40' CONTOUR
- 20' CONTOUR
- ROADS
- CITY LIMITS (APRIL 2019)
- SUBBASIN EXCLUDED FROM RETENTION POND SIZING
- SUBBASIN USED IN MODELING

0 Feet 500

DATA SOURCE: CITY OF WENATCHEE (2019)

WEN05A
WEN04A
WEN05B
WEN02A
WEN04B
WEN03A
WEN03B
WEN02B
WEN02A
WEN01B
WEN01A

J_WEN05
J_WEN04
J_WEN03
J_WEN02
J_WEN01

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FIGURE 4-3 HYDROLOGY MAP

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4.4.3 Hydrologic Parameter Development

Precipitation Data

Precipitation data were obtained from Table 6.5-1, Custom 24-Hour Rainfall Depths for Use with SCS Type 1A Storm Distribution, within the City's *Comprehensive Stormwater Master Plan Update* (City 2010). The rainfall depths are listed in Table 4-2.

Table 4-2. Precipitation Data

Storm Event	Depth in Inches (1-day/24-hour)
2-year	1.10
5-year	1.50
10-year	1.80
25-year	2.04
50-year	2.40
100-year	2.60

Unit Hydrograph

The NRCS dimensionless unit hydrograph was used to define the unit hydrograph's overall shape and timing. The time of concentration calculations were based on the methodology outlined in the SWMMEW (Ecology 2019b). A weighted 60 percent lag factor was applied to the sub-basin times of concentration to account for the delay between when the runoff from the rainfall begins and when the runoff reaches its maximum peak. Applying the lag factor, the shortest lag time was determined to be 5.67 minutes, the longest was 25.23 minutes, and the average was 14.73 minutes. Table 4-3 displays the lag times for each sub-basin.

Table 4-3. Lag Times

Sub-basin ID	Lag Time (min)
WEN01A	5.67
WEN01B	9.26
WEN02A	17.67
WEN02B	11.81
WEN03A	12.58
WEN03B	18.40
WEN04A	7.80
WEN04B	25.23
WEN05A	17.32
WEN05B	21.55

NRCS Runoff Curve Number Parameters

The NRCS Runoff CN method was used to convert rainfall data and watershed characteristics into runoff volume for a single 24-hour storm event. This method is widely used and is efficient at estimating the approximate runoff from a probabilistic rainfall event.

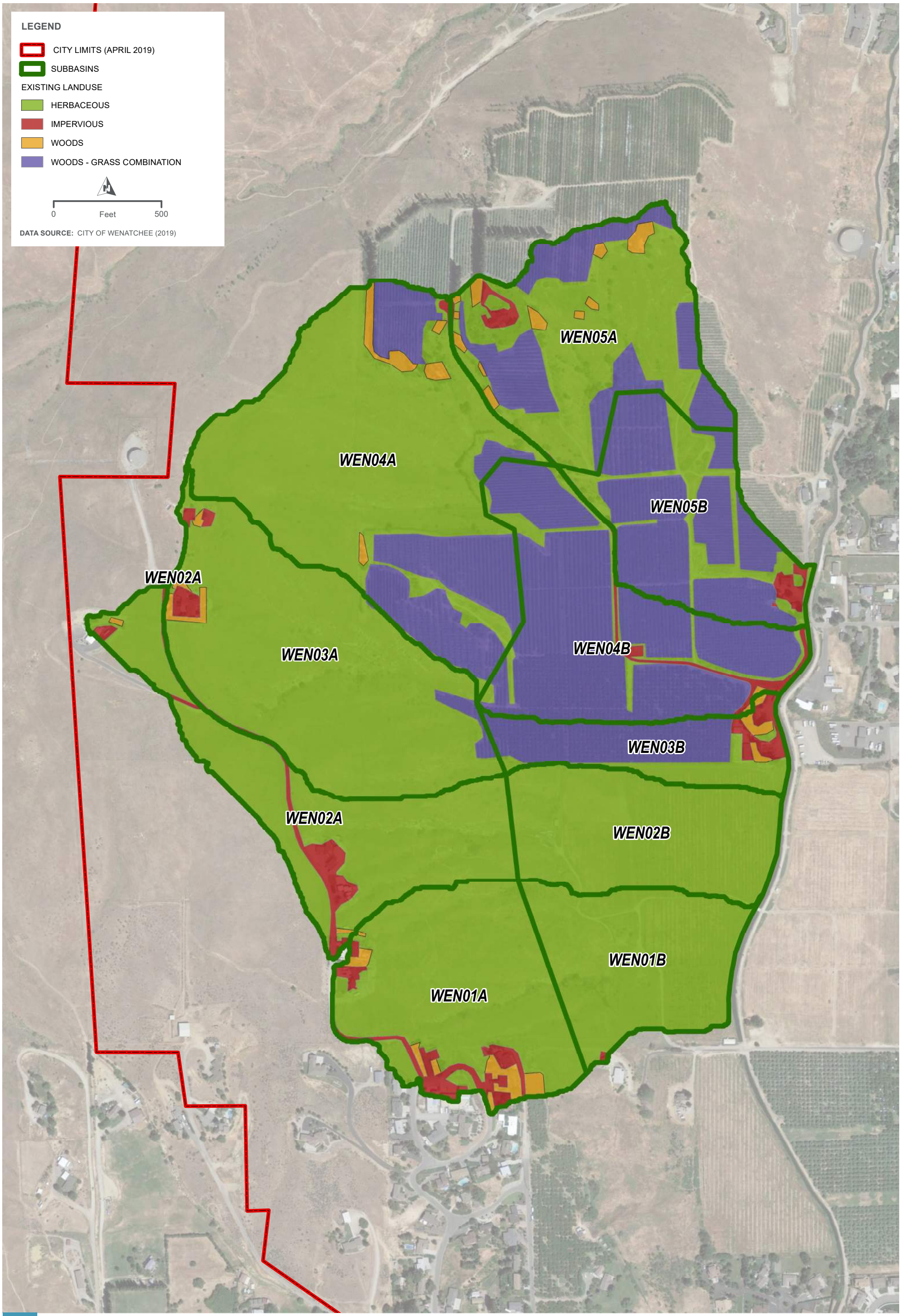
- **Land cover:** Land cover information was developed based on visual inspection of the ground surface using the aforementioned satellite imagery and was classified based on cover descriptions for CNs from USDA's *Urban Hydrology for Small Watershed TR-55 Documentation* (TR-55). The classifications were assigned a "hydrologic condition" of poor, fair, or good, based on guidance documented in TR-55 for CN calculation purposes. A land cover classification table is shown in Table 4-4 for existing and future conditions. Figure 4-4 illustrates the existing land cover designations for the project area and Figure 4-5 illustrates the proposed land cover designations consistent with the City's zoning. The proposed land cover assumes development of the annexed area.

Table 4-4. Project TR-55 Parameters

TR-55 Cover Type	Hydrologic Condition
Herbaceous	Fair
Impervious	N/A
Single family: 0.25-acre lot[a]	N/A
Woods	Fair
Woods: grass combination	Good

a. Future land cover.

- **Hydrologic soil group:** Project area-wide soil information was obtained from the NRCS WSS website. The project area is made up of approximately 30 percent Type B soils and 70 percent Type C soils. For this analysis, the future condition assumed that the existing soil classification was maintained and an urban land complex designation was not adopted. Table 4-5 presents the soil data for the project. See Figure 4-6 for the distribution of soil types.



City of Wenatchee

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COMPREHENSIVE STORMWATER PLAN

FIGURE 4-4 EXISTING LAND COVER

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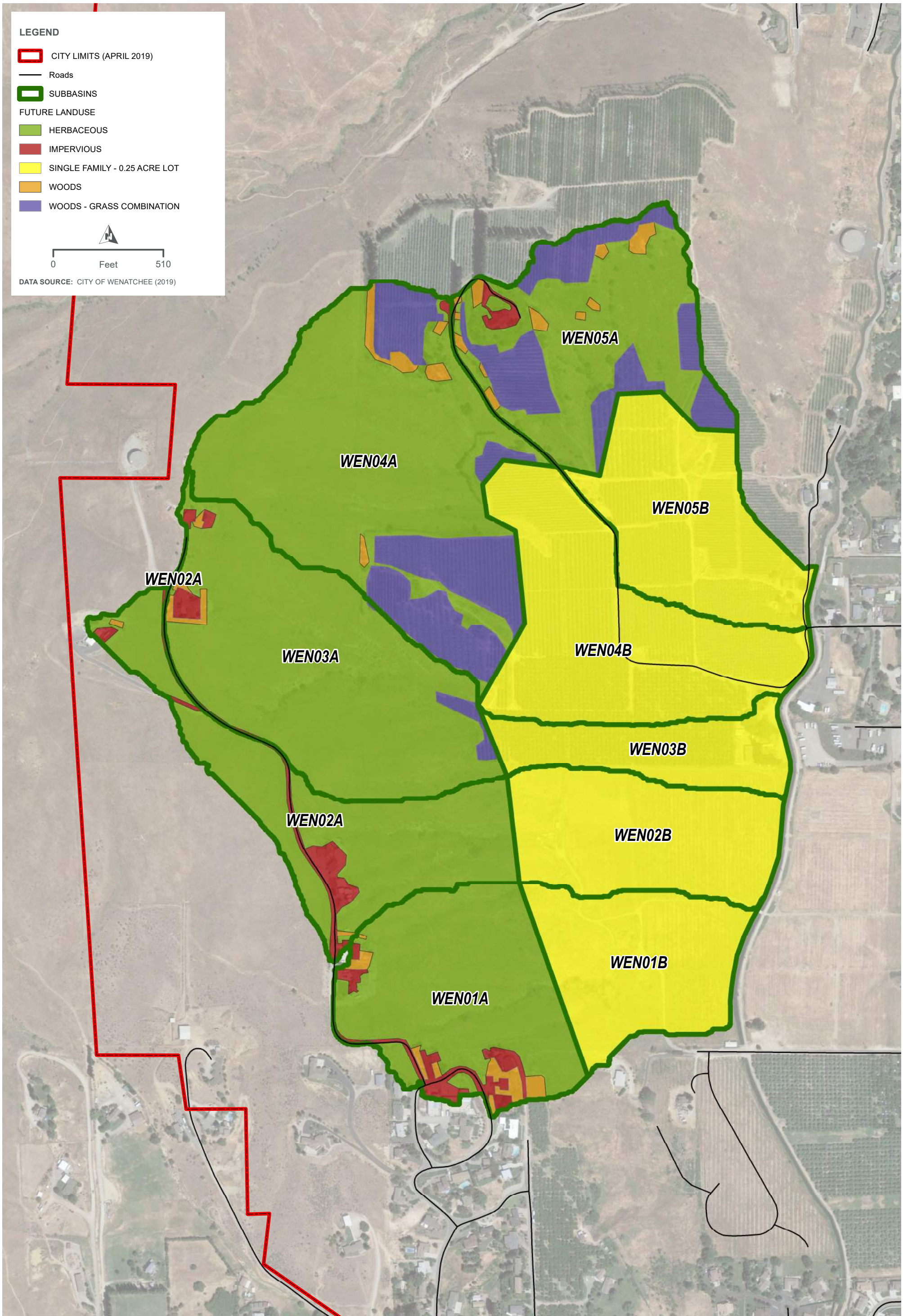

HDR

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FIGURE 4-5 EXISTING LAND COVER

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LEGEND

HYDROLOGIC SOIL RATING

- NOT RATED
- A
- B
- C
- D
- CITY LIMITS (APRIL 2019)
- WATERBODY
- RAILROAD

0 Miles 0.5

DATA SOURCE:
CITY OF WENATCHEE (2019)
NRCS (USDA) WEB SOIL SURVEY

CITY OF WENATCHEE
COMPREHENSIVE STORMWATER PLAN
FIGURE 4-6 HYDROLOGIC SOIL GROUPS

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Table 4-5. Soil Data

Map Unit Name	Map Unit Symbol	Map Unit Key	HSG
Bjork silt loam, 8%–15% slopes	BkC	73281	C
Bjork silt loam, 15%–25% slopes	BkD	73282	C
Bjork silt loam, 25%–45% slopes	BkE	73283	C
Bjork-Rock outcrop complex, 25%–65% slopes, eroded	BoF2	73285	C
Burch fine sandy loam, 8%–15% slopes	BuC	73293	B
Burch loam, 0%–3% slopes	BvA	73296	B
Burch loam, 3%–8% slopes	BvB	73297	B
Burch loam, 8%–15% slopes	BvC	73298	B
Burch loam, 15%–25% slopes	BvD	73299	B
Cowiche silt loam, 3%–8% slopes	CwB	73334	C
Cowiche silt loam, 8%–15% slopes	CwC	73335	C
Cowiche silt loam, 15%–25% slopes	CwD	73336	C
Cowiche silt loam, 45%–65% slopes	CwF	73338	C
Varelum silt loam, 15%–25% slopes	VaD	73405	C

- **Runoff Curve Number:** Area-weighted, composite CNs for each sub-basin were calculated in ArcGIS based on land cover, treatment and hydrologic condition, and HSG in accordance with Table 2-2 in the TR-55 manual and are shown in Table 4-6. An antecedent moisture content (AMC) Type II was selected to produce a conservative flow rate and runoff volume to assess the flooding and inundation limit for the study area.

Table 4-6. Curve Numbers

Sub-basin ID	Curve Number (AMC II)	
	Existing	Future
WEN01A	82	82
WEN01B	76	79
WEN02A	83	83
WEN02B	74	77
WEN03A	81	81
WEN03B	67	76
WEN04A	78	78
WEN04B	62	76
WEN05A	78	78
WEN05B	66	77

Channel Routing

The Muskingum-Cunge method was used to route hydrographs for reaches with definable channels. This method is more accurate than applying a standard hydrograph lag because it takes into account the physical characteristics of the routing channel and also allows for high-level conceptual drainage channels to be incorporated to route flow through development.

The routing reach lengths and slopes were calculated based on the terrain using ArcGIS. The existing Muskingum-Cunge channels use a 4-foot bottom width with a 100:1 side slope and a 0.06 Manning's n-value; this closely represents the terrain features present. The proposed Muskingum-Cunge channels use the same geometry; however, the n-value was lowered from 0.06 to 0.04 to represent a maintained grass-lined channel. Table 4-7 presents a summary of the Muskingum-Cunge parameters.

Table 4-7. Muskingum-Cunge Routing Reaches

Reach ID	Length (ft)	Slope (ft/ft)	Manning's n		Shape	Bottom Width (ft)	Side Slope (XH:1V)
			Existing	Future			
R_WEN01B	932	0.112	0.06	0.04	Trapezoid	4	100
R_WEN02B	1,247	0.094					
R_WEN03B	1,497	0.090					
R_WEN04B	1,886	0.077					
R_WEN05B	1,468	0.098					

4.5 Areal Reduction

Areal reduction of point rainfall is used for watersheds where cumulative drainage areas exceed 10 mi^2 or 6,400 acres. The sub-basins and corresponding outlet cumulative drainage areas were all smaller in area than 10 mi^2; therefore, no areal reduction was applied.

4.6 Retention Storage

With future development likely causing runoff volumes to increase, retention storage was simulated as a hypothetical stormwater pond for each basin in the model as a mitigation measure to meet Section S5.B.5.b.ii(b)(2) of the Phase II Permit. The City's development regulations require on-site retention of stormwater runoff up to the 10-year, 24-hour rainfall event. Volumes required to meet this requirement in the hypothetical development scenario are summarized in Table 4-8.

Table 4-8. Volume Needed to Retain 10-year Storm per NPDES

Reach ID	Volume to Retain 10-Year Storm (ac-ft)
R_WEN01B	0.578
R_WEN02B	0.773
R_WEN03B	0.928
R_WEN04B	1.169
R_WEN05B	0.910

The stage-storage curve developed for the hypothetic stormwater pond is shown in Figure 4-7.

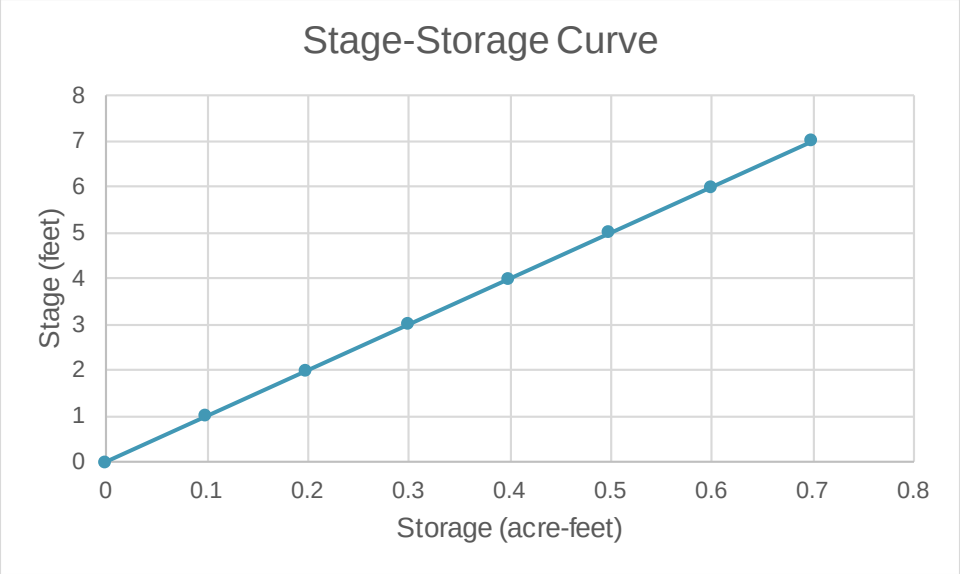

Figure 4-7. Stage-storage curve for simulated detention facility

4.7 Results

The HEC-HMS model shows that peak discharges increased at the junction outlets by an average of 124 percent and runoff volumes increased by an average of 117 percent for the 100-year event. Table 4-9 provides the upper and lower limit of the increases.

Summaries of computed sub-basin and junction peak discharges and runoff excess volumes for the 2-, 5-, 10-, 25-, 50-, and 100-year events are shown in Table 4-9 through Table 4-12.

Further analysis is needed to determine if these peak discharge and runoff volume increases would have any effect on the City's existing stormwater network.

Table 4-9. Existing vs. Future Peak Flow Rates for HEC-HMS Junctions

HEC-HMS Element	Drainage Area, mi²	Peak Flow Rates, cfs																	
		2-year			5-year			10-year			25-year			50-year			100-year		
		EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF
J_WEN01	0.0531	0.3	0.3	0.0	1.0	1.2	0.2	2.2	2.5	0.3	3.3	3.8	0.5	5.2	5.9	0.7	6.4	7.1	0.7
J_WEN02	0.0531	0.3	0.3	0.0	0.9	1.0	0.1	1.8	2.1	0.3	2.7	3.1	0.4	4.3	4.8	0.5	5.3	5.8	0.5
J_WEN03	0.0588	0.3	0.3	0.0	0.9	0.9	0.0	2.0	2.2	0.2	3.0	3.4	0.4	4.7	5.4	0.7	5.9	6.7	0.8
J_WEN04	0.0951	0.3	0.4	0.1	0.6	0.9	0.3	1.6	1.9	0.3	2.8	3.5	0.7	4.9	6.4	1.5	6.1	8.2	2.1
J_WEN05	0.0596	0.2	0.3	0.1	0.4	0.6	0.2	0.8	1.2	0.4	1.3	2.1	0.8	2.4	3.8	1.4	3.2	4.8	1.6

EX = existing, FUT = future, DIFF = difference.

Table 4-10. Existing vs. Future Runoff Volumes for HEC-HMS Junctions

HEC-HMS Element	Drainage Area, mi²	Runoff Volume, ac-ft																	
		2-year			5-year			10-year			25-year			50-year			100-year		
		EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF
J_WEN01	0.0531	0.3	0.4	0.1	0.8	0.9	0.1	1.2	1.3	0.1	1.6	1.7	0.1	2.3	2.4	0.1	2.6	2.8	0.2
J_WEN02	0.0531	0.3	0.4	0.1	0.8	0.8	0.0	1.2	1.3	0.1	1.6	1.7	0.1	2.2	2.4	0.2	2.6	2.8	0.2
J_WEN03	0.0588	0.3	0.4	0.1	0.8	0.9	0.1	1.2	1.4	0.2	1.6	1.8	0.2	2.3	2.5	0.2	2.7	2.9	0.2
J_WEN04	0.0951	0.3	0.4	0.1	0.7	1.1	0.4	1.3	1.8	0.5	1.8	2.4	0.6	2.6	3.4	0.8	3.1	4.1	1.0
J_WEN05	0.0596	0.2	0.2	0.0	0.5	0.7	0.2	0.8	1.1	0.3	1.1	1.5	0.4	1.7	2.2	0.5	2	2.6	0.6

EX = existing, FUT = future, DIFF = difference.

Table 4-11. Existing vs. Future Peak Rates for HEC-HMS Sub-basins

HEC-HMS Element	Drainage Area, mi^2	Peak Flow Rates, cfs																
		2-year			5-year			10-year			25-year			50-year			100-year		
		EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF
WEN01A	0.03	0.2	0.2	0.0	1.0	1.0	0.0	1.8	1.8	0.0	2.6	2.6	0.0	4.0	4.0	0.0	4.8	4.8	0.0
WEN01B	0.02	0.1	0.1	0.0	0.2	0.2	0.0	0.3	0.7	0.4	0.7	1.1	0.4	1.3	1.9	0.6	1.7	2.4	0.7
WEN02A	0.03	0.2	0.2	0.0	0.9	0.9	0.0	1.6	1.6	0.0	2.3	2.3	0.0	3.5	3.5	0.0	4.1	4.1	0.0
WEN02B	0.02	0.1	0.1	0.0	0.2	0.2	0.0	0.3	0.4	0.1	0.4	0.8	0.4	1.0	1.6	0.6	1.4	2.0	0.6
WEN03A	0.05	0.3	0.3	0.0	0.9	0.9	0.0	2.0	2.0	0.0	3.0	3.0	0.0	4.7	4.7	0.0	5.7	5.7	0.0
WEN03B	0.01	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.3	0.2	0.2	0.7	0.5	0.2	0.9	0.7
WEN04A	0.06	0.3	0.3	0.0	0.6	0.6	0.0	1.6	1.6	0.0	2.8	2.8	0.0	4.9	4.9	0.0	6.1	6.1	0.0
WEN04B	0.04	0.0	0.1	0.1	0.1	0.3	0.2	0.1	0.5	0.4	0.2	0.8	0.6	0.3	1.7	1.4	0.4	2.2	1.8
WEN05A	0.03	0.2	0.2	0.0	0.3	0.3	0.0	0.8	0.8	0.0	1.3	1.3	0.0	2.4	2.4	0.0	3.0	3.0	0.0
WEN05B	0.03	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.4	0.3	0.2	0.8	0.6	0.3	1.4	1.1	0.4	1.8	1.4

EX = existing, FUT = future, DIFF = difference.

Table 4-12. Existing vs. Future Runoff Volumes for HEC-HMS Sub-basins

HEC-HMS Element	Drainage Area, mi^2	Runoff Volume, ac-ft																	
		2-year			5-year			10-year			25-year			50-year			100-year		
		EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF
WEN01A	0.03	0.3	0.3	0.0	0.6	0.6	0.0	0.9	0.9	0.0	1.1	1.1	0.0	1.6	1.6	0.0	1.8	1.8	0.0
WEN01B	0.02	0.1	0.1	0.0	0.2	0.3	0.1	0.4	0.5	0.1	0.5	0.6	0.1	0.7	0.9	0.2	0.9	1.0	0.1
WEN02A	0.03	0.3	0.3	0.0	0.6	0.6	0.0	0.9	0.9	0.0	1.1	1.1	0.0	1.5	1.5	0.0	1.8	1.8	0.0
WEN02B	0.02	0.0	0.1	0.1	0.2	0.3	0.1	0.3	0.4	0.1	0.5	0.6	0.1	0.7	0.8	0.1	0.8	1.0	0.2
WEN03A	0.05	0.3	0.3	0.0	0.8	0.8	0.0	1.2	1.2	0.0	1.5	1.5	0.0	2.1	2.1	0.0	2.4	2.4	0.0
WEN03B	0.01	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.3	0.2	0.2	0.4	0.2	0.3	0.5	0.2
WEN04A	0.06	0.3	0.3	0.0	0.7	0.7	0.0	1.2	1.2	0.0	1.6	1.6	0.0	2.3	2.3	0.0	2.7	2.7	0.0
WEN04B	0.04	0.0	0.1	0.1	0.0	0.3	0.3	0.1	0.6	0.5	0.2	0.8	0.6	0.3	1.2	0.9	0.5	1.4	0.9
WEN05A	0.03	0.2	0.2	0.0	0.4	0.4	0.0	0.7	0.7	0.0	0.9	0.9	0.0	1.3	1.3	0.0	1.5	1.5	0.0
WEN05B	0.03	0.0	0.1	0.1	0.0	0.3	0.3	0.1	0.5	0.4	0.2	0.6	0.4	0.4	0.9	0.5	0.5	1.1	0.6

EX = existing, FUT = future, DIFF = difference.

4.8 Additional Analysis

Modeling was completed to analyze the potential downstream impacts due to future developments within the foothill basins. To address drainage issues within the foothills, a policy of retaining more runoff than required by the Phase II Permit is being discussed. The current Phase II Permit requires a minimum retention of the 10-year storm event, while setting no maximum requirement.

Two scenarios were analyzed for their effectiveness. Scenario 1 is for the retention of all runoff generated from a 100-year storm event. Scenario 2 is for the retention of all runoff from a 10-year storm event while providing attenuation capacity to match the existing and proposed 100-year peak flow rates.

Volumes needed to accomplish both scenarios are shown in Table 4-13. The volume required to accomplish Scenario 1 is, at a minimum, 50 percent larger than that needed for Scenario 2.

Table 4-13. Volume Needed to Retain 100-year Storm vs. Volume Needed to Retain 10-year Storm and Attenuate the 100-year Storm

Basin Node	Scenario 1: Volume to Retain 100-year Storm (ac-ft)	Scenario 2: Volume to Retain 10-year Storm and Attenuate 100-year Storm (ac-ft)	Percent Difference
RES_WEN01B	3.68	1.84	50
RES_WEN02B	3.68	1.84	50
RES_WEN03B	3.68	1.84	50
RES_WEN04B	5.52	2.23	60
RES_WEN05B	4.41	1.84	58

Summaries of computed junction peak discharges and runoff excess volumes for the 2-, 5-, 10-, 25-, 50-, and 100-year events are shown in Table 4-14 through Table 4-17. Peak flow rates for the two scenarios were identical. Runoff volume for Scenario 2 averaged 0.48 acre-foot (ac-ft) greater than Scenario 1.

Table 4-14. Existing vs. Retention of 100-year Peak Flow Rates

Node	Drainage Area, mi²	Peak Flow Rates, cfs																
		2-year			5-year			10-year			25-year			50-year			100-year		
		EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF
J_WEN01	0.0531	0.3	0.2	-0.1	1.0	1.0	0.0	2.2	1.8	-0.4	3.3	2.6	-0.7	5.2	4.0	-1.2	6.4	4.8	-1.6
J_WEN02	0.0531	0.3	0.2	-0.1	0.9	0.9	0.0	1.8	1.6	-0.2	2.7	2.3	-0.4	4.3	3.5	-0.8	5.3	4.1	-1.2
J_WEN03	0.0588	0.3	0.3	0.0	0.9	0.9	0.0	2.0	2.0	0.0	3.0	3.0	0.0	4.7	4.7	0.0	5.9	5.7	-0.2
J_WEN04	0.0951	0.3	0.3	0.0	0.6	0.6	0.0	1.6	1.6	0.0	2.8	2.8	0.0	4.9	4.9	0.0	6.1	6.1	0.0
J_WEN05	0.0596	0.2	0.2	0.0	0.4	0.3	-0.1	0.8	0.8	0.0	1.3	1.3	0.0	2.4	2.4	0.0	3.2	3.0	-0.2

EX = existing, FUT = future, DIFF = difference.

Table 4-15. Existing vs. Retention of 100-year and Not Exceeding 2-, 10-, and 100-year Rates, Peak Flow Rates

Node	Drainage Area, mi²	Peak Flow Rates, cfs																
		2-year			5-year			10-year			25-year			50-year			100-year		
		EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF
J_WEN01	0.0531	0.3	0.2	-0.1	1.0	1.0	0.0	2.0	1.8	-0.2	3.3	2.6	-0.7	5.2	4	-1.2	6.4	4.8	-1.6
J_WEN02	0.0531	0.3	0.2	-0.1	0.9	0.9	0.0	2.2	1.6	-0.6	2.7	2.3	-0.4	4.3	3.5	-0.8	5.3	4.1	-1.2
J_WEN03	0.0588	0.3	0.3	0.0	0.9	0.9	0.0	1.8	2.0	0.2	3.0	3.0	0.0	4.7	4.7	0.0	5.9	5.7	-0.2
J_WEN04	0.0951	0.3	0.3	0.0	0.6	0.6	0.0	1.6	1.6	0.0	2.8	2.8	0.0	4.9	4.9	0.0	6.1	6.1	0.0
J_WEN05	0.0596	0.2	0.2	0.0	0.4	0.3	-0.1	0.8	0.8	0.0	1.3	1.3	0.0	2.4	2.4	0.0	3.2	3.0	-0.2

EX = existing, FUT = future, DIFF = difference.

Table 4-16. Existing vs. Retention of 100-year Runoff Volumes

Node	Drainage Area, mi²	Runoff Volume, ac-ft																	
		2-year			5-year			10-year			25-year			50-year			100-year		
		EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF
J_WEN01	0.0531	0.3	0.3	0.0	0.8	0.6	-0.2	1.2	0.9	-0.3	1.6	1.1	-0.5	2.3	1.5	-0.8	2.6	1.8	-0.8
J_WEN02	0.0531	0.3	0.3	0.0	0.8	0.6	-0.2	1.2	0.9	-0.3	1.6	1.1	-0.5	2.2	1.5	-0.7	2.6	1.8	-0.8
J_WEN03	0.0588	0.3	0.3	0.0	0.8	0.7	-0.1	1.2	1.1	-0.1	1.6	1.5	-0.1	2.3	2.1	-0.2	2.7	2.4	-0.3
J_WEN04	0.0951	0.3	0.3	0.0	0.7	0.7	0.0	1.3	1.2	-0.1	1.8	1.6	-0.2	2.6	2.3	-0.3	3.1	2.7	-0.4
J_WEN05	0.0596	0.2	0.2	0.0	0.5	0.4	-0.1	0.8	0.7	-0.1	1.1	0.9	-0.2	1.7	1.3	-0.4	2.0	1.5	-0.5

EX = existing, FUT = future, DIFF = difference.

Table 4-17. Existing vs. Retention of 10-year and Not Exceeding 2-, 10-, and 100-year Peak Flow Rates, Runoff Volumes

Node	Drainage Area, mi²	Runoff Volume, ac-ft																	
		2-year			5-year			10-year			25-year			50-year			100-year		
		EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF	EX	FUT	DIFF
J_WEN01	0.0531	0.3	0.3	0.0	0.8	0.6	-0.2	1.2	0.9	-0.3	1.6	1.2	-0.4	2.3	1.9	-0.4	2.6	2.3	-0.3
J_WEN02	0.0531	0.3	0.3	0.0	0.8	0.6	-0.2	1.2	0.9	-0.3	1.6	1.2	-0.4	2.2	1.9	-0.3	2.6	2.3	-0.3
J_WEN03	0.0588	0.3	0.3	0.0	0.8	0.7	-0.1	1.2	1.1	-0.1	1.6	1.5	-0.1	2.3	2.1	-0.2	2.7	2.5	-0.2
J_WEN04	0.0951	0.3	0.3	0.0	0.7	0.7	0	1.3	1.2	-0.1	1.8	1.8	0.0	2.6	2.8	0.2	3.1	3.4	0.3
J_WEN05	0.0596	0.2	0.2	0.0	0.5	0.4	-0.1	0.8	0.7	-0.1	1.1	1.0	-0.1	1.7	1.7	0.0	2.0	2.1	0.1

EX = existing, FUT = future, DIFF = difference.

4.9 Conclusions and Recommendations

The following are conclusions and recommendations from the hydrologic modeling:

- The HEC-HMS model shows that peak discharges increased at the junction outlets by an average of 124 percent and runoff volumes increased by an average of 117 percent for the 100-year event.
- Two scenarios were analyzed for their effectiveness. Scenario 1 is for the retention of all runoff generated from a 100-year storm event. Scenario 2 is for the retention of all runoff from a 10-year storm event while providing attenuation capacity to match the existing and proposed 100-year peak flow rates.
- The modeling of the anticipated new development within the foothill drainages determined that there are observable differences between the two retention strategies. The study provides a baseline for the City to evaluate and establish the level of urbanization within the watershed. With proper planning, it can reduce impacts and burden to the existing drainage systems.
- There is not a significant variance in the more frequent events (2-year). Differences and variances appear in major events.
- The estimated flow increase is directly linked to the level of urbanization (CN increases based on the City's plan for urbanization in annexed locations).
- A detailed study to assess the downstream and existing stormwater systems must be conducted to avoid negative impacts caused by the additional flow from incorporating the annexed locations.
- Implementing additional stormwater management mitigation measures for a 5-year storm event can bring future increases to zero such as the 2-year storm.

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5 Stormwater Best Management Practices for New Development and Redevelopment

This chapter provides a list of preferred stormwater BMPs for new development and redevelopment in the city. The information provided in this chapter should be used only as guidance and is not a substitute for following the requirements of the WCC, the Phase II Permit (Ecology 2019a), Ecology's SWMMEW (Ecology 2019b), or any other applicable permits or design manuals. For a current guide to stormwater requirements in the city of Wenatchee, please refer to the Public Works preapproved plans and policies.

5.1 Stormwater Management Manual for Eastern Washington

The objective of the SWMMEW is to provide guidance and design criteria for site developments in eastern Washington. The SWMMEW contains eight Core Elements for managing stormwater runoff from new development and redevelopment projects of all sizes, which are shown in Table 5-1.

Table 5-1. Core Elements for Managing Stormwater

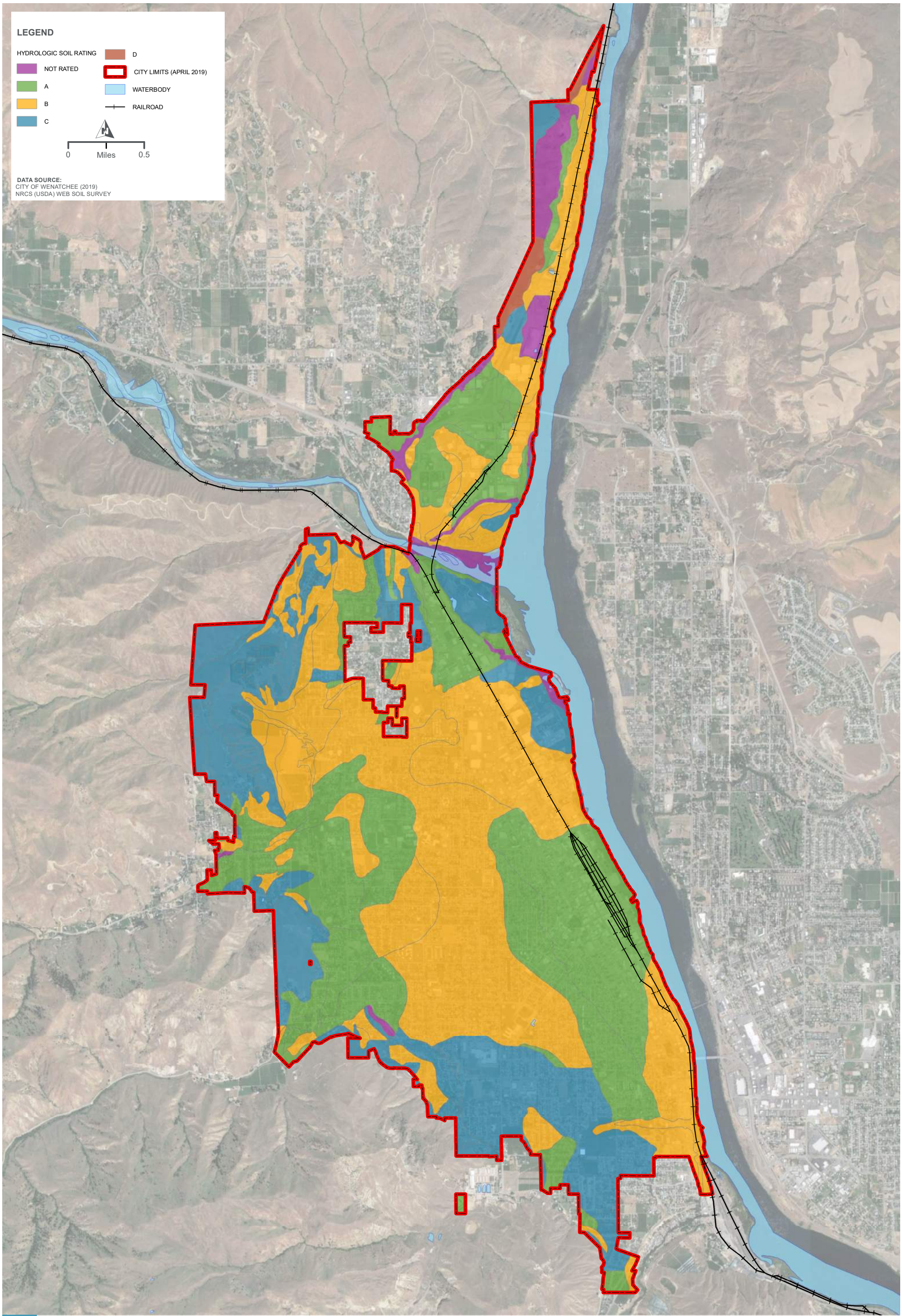
Core Element	Description
1. Preparation of a Stormwater Site Plan	Project sponsors are expected to complete a Stormwater Site Plan for any project subject to Core Elements 2 through 8.
2. Construction Stormwater Pollution Prevention	Project sponsors must produce and implement a construction SWPPP throughout construction of the project.
3. Source Control of Pollution	Following construction, project sponsors shall apply all known, available, and reasonable source control BMPs.
4. Preservation of Natural Drainage	Maintain natural drainage patterns and locate project discharges from the project site at the natural location when possible.
5. Runoff Treatment	The purpose of runoff treatment is to protect water quality of receiving waters. This is typically accomplished with the use of stormwater BMPs. There are four types of runoff treatment: basic (removal of suspended solids), metals, oil, and phosphorus treatment.
6. Flow Control	The purpose of flow control is to mitigate the effects of development on the runoff hydrograph. Typically, this involves routing runoff through BMPs that either infiltrate the stormwater or detain and release it at predevelopment rates.

Core Element	Description
7. Operation and Maintenance	Projects are required to plan for and perform appropriate maintenance and performance checks.
8. Local Requirements	All projects must also meet any additional local requirements.

Compliance with all Core Elements, including the selection of water quality treatment BMPs, is required before the City will issue a Site Development Permit. WCC 9.20.060 establishes standards and conditions for when a newly installed BMP becomes the responsibility of the City.

5.2 Assess Subsurface Conditions

Assessing subsurface conditions is the first step in evaluating whether infiltration is feasible at a site. These conditions, among others, are generally referred to as the Site Suitability Criteria (SSC), as discussed in Section 5.4.3 of the SWMMEW (Ecology 2019b). A geotechnical site characterization is generally required for any project proposing on-site stormwater disposal. As a starting point of reference, a WSS can be used as a preliminary assessment in high-level project planning. A WSS was queried for three subsurface conditions to provide guidance for this CSWP: the soil survey, saturated hydraulic conductivity, and groundwater. Additionally, two related reports were provided by the City that contained depth to water table information. These data have been added to the relevant exhibit as discrete data points. The exhibits showing these subsurface conditions are provided in Figure 5-1, Figure 5-2, and Figure 5-3.



City of Wenatchee

CITY OF WENATCHEE

COMPREHENSIVE STORMWATER PLAN

FIGURE 5-1 HYDROLOGIC SOIL GROUPS

PATH: I:\GIS\PROJECTS\CITY_OF_WENATCHEE\10148091_CITY OF WIENATCHEE_COMP_SW_PLAN\MAP_DOCS\JP_MAPS\HDR_SUBSURFACE_CONDITIONS_HSG.MXD - USER: SGRIFFIN - DATE: 3/19/2020

LEGEND

SATURATED HYDRAULIC CONDUCTIVTY (KSAT)

- 0.00 - 1.00 (IN/HR)
- 1.00 - 10.00 (IN/HR)
- 10.00 - 20.00 (IN/HR)
- 20.00 - 30.00 (IN/HR)
- 30.00 - 40.00 (IN/HR)

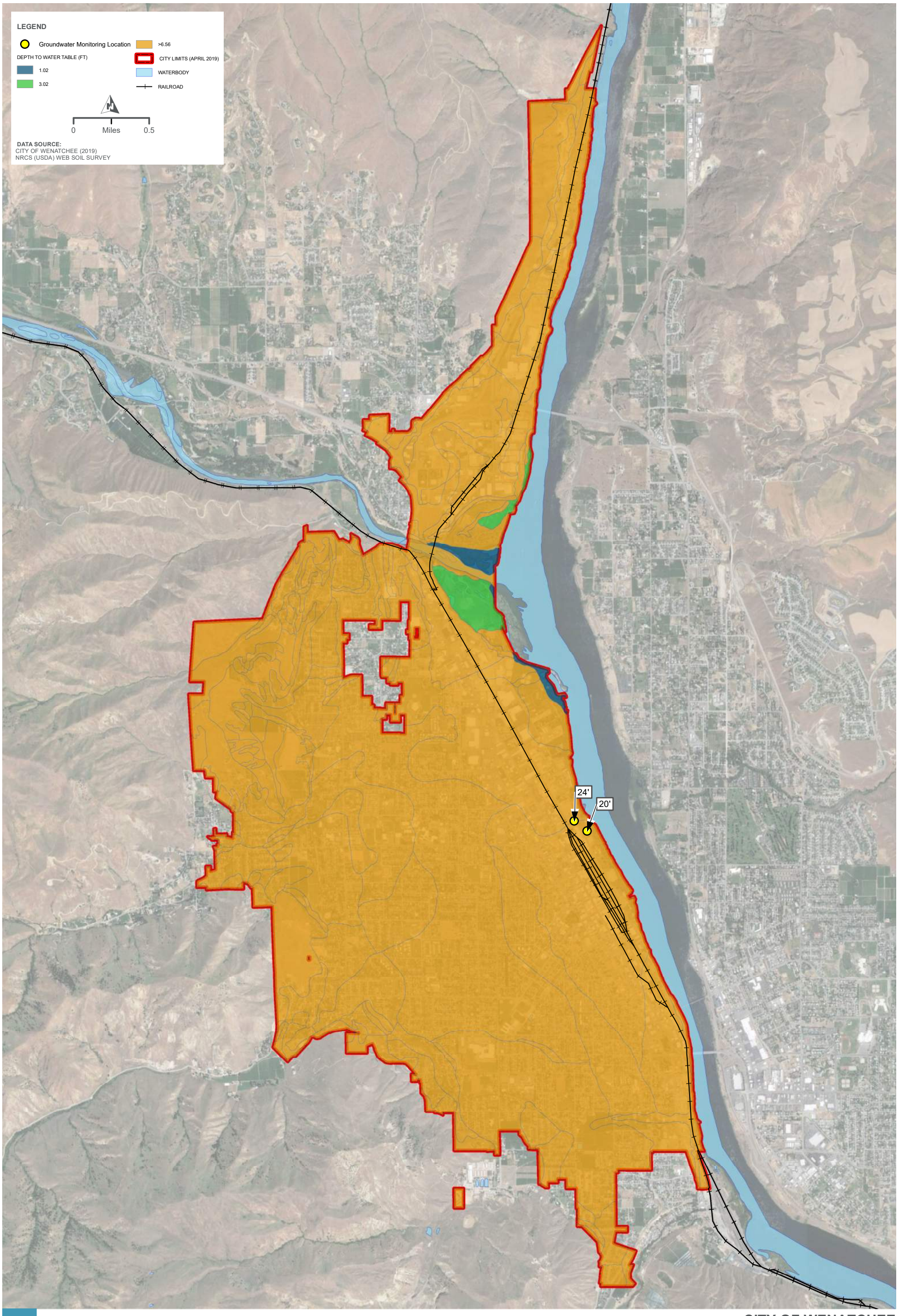
- CITY LIMITS (APRIL 2019)
- WATERBODY
- RAILROAD

0 Miles 0.5

DATA SOURCE:
CITY OF WENATCHEE (2019)
NRCS (USDA) WEB SOIL SURVEY

CITY OF WENATCHEE
COMPREHENSIVE STORMWATER PLAN
FIGURE 5-2 SATURATED HYDRAULIC CONDUCTIVITY

PATH: I:\GIS\PROJECTS\CITY_OF_WENATCHEE\10148091_CITY OF WIENATCHEE_COMP_SW_PLAN\MAP_DOCS\JP_MAPS\HDR_SUBSURFACE_CONDITIONS_SHC.MXD - USER: SGRIFFIN - DATE: 3/19/2020



City of Wenatchee

CITY OF WENATCHEE

COMPREHENSIVE STORMWATER PLAN

FIGURE 5-3 DEPTH TO WATER TABLE

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5.2.1 Depth to Water Table

According to the WSS, the depth to water table within city limits is assumed to be one of three depths: 1.02 feet, 3.02 feet, or greater than 6.56 feet. Except for a few small pockets along the rivers, the depth to groundwater is estimated to be greater than 6.56 feet throughout most of the city, which is favorable for locating infiltrating BMPs.

5.2.2 Saturated Hydraulic Conductivity

According to WSS, the saturated hydraulic conductivity of soils within city limits ranges from 0 inch per hour to 40 inches per hour. The data set was sorted into five categories in ranges of 10 inches per hour to summarize the data and help visualize on the exhibit. As with the depth to water table data, most of the project area falls into one category, which is the 1 inch to 10 inches per hour rate. Underlying soils with a saturated hydraulic conductivity of greater than 1 inch per hour are likely to meet the site suitability criteria for the long-term infiltration rate.

5.2.3 Hydrologic Soil Group

According to the WSS, HSG classifications within city limits ranged from A to D, with some areas "not rated." HSG classifications are broad qualitative categories assigned to soils based on their direct runoff potential from rainfall. They are commonly used in hydrologic models to calculate runoff hydrographs. In general, saturated hydraulic conductivities for each HSG are as follows:

- **Group A:** exceeds 5.67 inches per hour
- **Group B:** between 5.67 and 1.42 inches per hour
- **Group C:** between 1.42 and 0.14 inch per hour
- **Group D:** less than 0.14 inch per hour

5.3 Development of Preferred BMPs List

Core Element 5 and Core Element 6 provide the list of BMP options that meet water quality and flow control development regulations.

5.3.1 Runoff Treatment (Core Element 5) Requirements

The objective of Core Element 5 is to reduce pollutant loads to receiving waters caused by development. Runoff treatment is required for any project that creates greater than or equal to 5,000 square feet (ft^2) of new pollution-generating impervious surfaces (PGIS) and/or replaced PGIS.

As mentioned in Table 5-1, runoff treatment includes basic (sediment), metals, oil, and phosphorus. Basic treatment is required for any project that meets the criteria above and discharges to surface waters.

Oil control is required where annual average daily traffic (AADT) exceeds 30,000 vehicles per day and for all high-use sites. High-use sites include, but are not necessarily limited to, parking areas with more than 100 trip ends per 1,000 ft^2 of floor area and any parking area receiving more than 300 total trip ends per day. In addition to the factors mentioned above, other factors that may influence treatment requirements include, but may not be limited to, proximity to drinking water wells, use of drywells, and other local requirements.

5.3.2 Flow Control (Core Element 6) Requirements

The purpose of flow control is to mitigate the effects from development on the runoff hydrograph. Because urban development results in fewer vegetative surfaces and more impervious surfaces (e.g., roofs, streets, parking lots, and the like), evapotranspiration[1] rates and infiltration of rainwater into the soil are significantly reduced. Consequently, when the landscape transforms from a natural state to an urbanized one, stormwater runoff volumes and peak flow rates increase. Left unchecked, these effects cause erosion and localized flooding, which highlights the reason for flow control BMPs.

In Wenatchee, infiltration is the preferred method of flow control as it mimics the natural condition that existed prior to development. Infiltration helps to maintain stream base flow, which is needed to maintain aquatic habitats through the long dry summers found in central Washington.

The City requires, as part of its Phase II Permit, retention of all stormwater on site up to the 10-year, 24-hour event for new development and redevelopment projects disturbing greater than 1 acre or part of a larger common plan of development that is greater than 1 acre. In this context, retention means that stormwater runoff from a private property must be "retained" on site. The intent with this regulation is to promote stormwater designs that infiltrate runoff and mimic natural conditions. Several detention and retention BMPs have been added to the preferred list for projects where stormwater disposal by infiltration may not be feasible. Retention ponds "retain" all of the water and dispose of it through evaporation or infiltration, whereas detention ponds temporarily store the water and eventually release it to the downstream system.

5.3.3 Climate Considerations

The climate in Wenatchee, typical of central Washington, is characterized by hot dry summers and cold winters. The hot dry summers lead to difficult plant growing conditions and high evaporation rates, making surface water BMPs such as wet ponds and constructed wetlands impractical. The cold winters lead to freezing conditions, which inhibits vegetative growth but also requires design adaptations to prevent damage to facilities such as buried pipes impacted by below-freezing temperatures. Furthermore, infiltration into the ground may be limited when the ground is frozen. All of these factors went into selection of the preferred BMPs herein. See Tables 5.6 and 5.8 in the SWMMEW (Ecology 2019b) for more information.

[1] Evapotranspiration is the process by which water is transferred from the land to the atmosphere by evaporation from the soil and other surfaces and by transpiration from plants.

5.4 Preferred BMPs

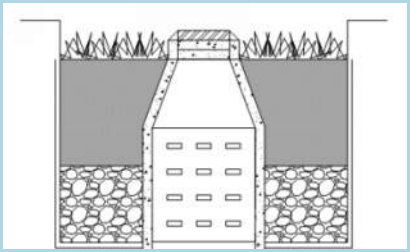
A shortlist of preferred BMPs was selected from those outlined in the SWMMEW (Ecology 2019b). This list was created to address the water quality considerations listed above. Each BMP selected should be able to mitigate the specific pollutant concerns and reach water quality goals for each site based on this selection process. Runoff treatment BMPs are Bioinfiltration ponds, Bioretention, Soil Cell Systems, Infiltration Trench, Permeable Pavement, Drywells, Compost-Amended Vegetated Filter Strips (CAVFSs), Sand Filter Vaults, Large Extended Detention Dry Ponds, and Detention Tanks/Vaults.

Flow control BMPs are Bioinfiltration Ponds, Bioretention, Soil Cell Systems, Infiltration Trench, Permeable Pavement, and Large Extended Detention Dry Ponds. Pretreatment extends the serviceable life of infiltration BMPs and may be required for the project. Pretreatment is a BMP that dissipates flow energy, thereby causing suspended sediments to settle out. Fine sediment particles, often held in suspension of flowing water, readily clog infiltration facilities. Pretreatment is often accomplished by routing runoff through a flat chamber or vault, thus creating residence time for the stormwater and allowing soil particles to settle. Underdrains can be added to some of the infiltration BMPs listed where infiltration into the subgrade is not possible but infiltration through a water quality treatment media provides partial flow control or just runoff treatment. Details of each BMP are provided in Table 5-2.

Table 5-2. BMP Details

BMP Name	BMP Description	BMP Highlights
F6.21/T5.30: Bioinfiltration Pond  **Picture source: WSDOT 2014**	Bioinfiltration ponds combine grasses or other vegetation and soils to remove stormwater pollutants by filtration, sorption, and uptake by vegetation. Runoff typically enters the BMP through curb cuts. The pond depth is less than 1.5 feet and the maximum ponding depth is 6 inches for the water quality event. This BMP may include a drywell, set 6 inches above the bottom of the pond, which acts as an overflow during rainfall events that exceed the water quality event. The swale bottom is sloped at ≤1% with max 3:1 side slopes. This BMP is sized using a single event model and the 6-month, 24-hour event. (SWMMEW pg. 338, 339) **Ideal application:** in suitable underlying soils this is a nearly universal BMP	**Ecology-Approved Function** ☑ Flow control: ☑ Infiltration ☑ Drywell ☑ Runoff treatment: ☑ Basic ☑ Metals ☑ Oils ☑ Phosphorus* * With appropriate pretreatment
F6.23/T5.31: Bioretention  **Picture source: City of Spokane**	Bioretention areas are shallow landscaped depressions that use treatment soil mix and plants to provide runoff treatment and flow control. Runoff typically enters the BMP through curb cuts and they typically have overflows that drain back to the street or to the storm sewer. Treated stormwater either infiltrates into the subgrade or is conveyed to a storm sewer through an underdrain. (SWMMEW, pg. 343) **Ideal application:** adjacent to urban streets, under sidewalks, and under infiltration BMPs to increase storage	**Ecology-Approved Function** ☑ Flow control: ☑ Infiltration ☑ Infiltration w/underdrain ☑ Runoff treatment: ☑ Basic ☑ Metals ☑ Oils ☐ Phosphorus

BMP Name	BMP Description	BMP Highlights
F6.23/T5.31: Soil Cell Systems (e.g., Silva Cell, etc.)  **Picture source: HDR**	Silva Cell is approved by Ecology as functionally equivalent to a bioretention cell and should be designed using the same methods. The cells can be configured to provide storage for infiltration or detention and release to storm sewers or infiltration into the ground. This BMP provides large volumes underground for stormwater management through absorption, evapotranspiration, and interception (Deeproot 2018). Treatment occurs as runoff flows through the treatment soil mix and flow rates are reduced through infiltration. **Ideal application:** adjacent to urban streets, under sidewalks, and under infiltration BMPs to increase storage	**Ecology-Approved Function** ☑ Flow control: ☑ Infiltration ☑ Infiltration w/ underdrain ☑ Runoff treatment: ☑ Basic ☑ Metals ☑ Oils ☐ Phosphorus
F6.22/T5.20: Infiltration Trench  **Picture source: SuDS Wales 2018**	Infiltration trenches are long, narrow, stone-filled trenches used for collection, temporary storage, and infiltration of stormwater runoff. This BMP is often located beneath parking areas or adjacent to linear contributing areas such as roads. Infiltration trenches are best suited for locations without curbs, which allows runoff to sheet flow into the BMP. A vegetated filter strip upstream of the BMP provides pretreatment, which reduces the BMP maintenance cycle. (SWMMEW, pg. 338) **Ideal application:** parking lot islands downstream of pretreatment such as a compost-amended vegetated filter strip	**Ecology Approved Function** ☑ Flow control: ☑ Infiltration ☑ Infiltration w/ underdrain ☑ Runoff treatment: ☑ Basic ☑ Metals ☐ Oils ☐ Phosphorus ** Treatment credit where underlying soils meet treatment criteria*

BMP Name	BMP Description	BMP Highlights
F6.24/T5.32: Permeable Pavement  **Picture source: *The Spokesman Review* 2016**	Permeable concrete or asphalt surfaces are an open graded pavement mix placed in a manner that results in a high degree of interstitial spaces within the cemented aggregate. This allows runoff to infiltrate through the pavement and into the subgrade. An underdrain can be installed under the pavement to convey runoff to a storm sewer system if needed. (SWMMEW, pg. 612) **Ideal application:** pedestrian paths and light to medium-load roadways and parking lots	**Ecology-Approved Function** ☑ Flow control: ☑ Infiltration ☑ Infiltration w/ underdrain ☑ Runoff treatment*: ☑ Basic ☑ Metals ☐ Oils ☐ Phosphorus ** Treatment credit where underlying soils meet treatment criteria*
F6.20: Drywell  **Picture source: HDR**	Drywells are used to enhance infiltration of runoff into the subgrade. They are commonly used in conjunction with bioinfiltration ponds to reduce the depth of the pond and to reduce the risk of flooding in winter when frozen ground limits infiltration through the pond bottom. Feasibility of using a drywell and drywell flow rates are dependent on subgrade soil conditions and should be evaluated by a qualified professional. Per the Spokane Regional Stormwater Manual (Spokane County et al. 2008), drywells are not suitable in underlying soils with a fines content of greater than 12%. Drywells are subject to UIC regulations and must be registered with the state of Washington. See Section 5.6 of the SWMMEW (Ecology 2019b) for further guidance. (SWMMEW, pg. 596) **Ideal application:** in conjunction with bioinfiltration ponds and other infiltration facilities to reduce pond bottom area and effectiveness in cold weather	**Ecology-Approved Function** ☑ Flow control: ☑ Drywell ☐ Runoff treatment: ☐ Basic ☐ Metals ☐ Oils ☐ Phosphorus

BMP Name	BMP Description	BMP Highlights
T5.60: Compost-Amended Vegetated Filter Strip (CAVFS)  **Picture Source: WSDOT**	Vegetated filter strips are typically long, narrow flat strips of grass that receive sheet flow from upstream parallel paved surfaces. The compost-amended type enhances treatment by adding soil amendments that improve infiltration and plant health. (SWMMEW, pg. 398) **Ideal application:** rural uncurbed roadways and parking lots for pre-treatment upstream of an infiltration BMP	**Ecology-Approved Function** ☐ Flow control ☑ Runoff treatment: ☑ Basic ☑ Metals ☑ Oils ☐ Phosphorus
T5.82: Sand Filter Vault  **Picture source: Oldcastle Infrastructure**	Sand filter vaults are ideal for basic treatment at space-limited sites. Containing the sand filter in a vault below grade is preferable in cold climates for year-round function. Typical configuration contains a pretreatment cell for sediment storage and oil/floatables removal. This BMP can be used in a treatment train to treat for phosphorus or metals if needed. (SWMMEW, pg. 466) **Ideal application:** downtown retrofit project requiring only basic treatment and no flow control	**Ecology-Approved Function** ☐ Flow control ☑ Runoff treatment: ☑ Basic ☑ Metals* ☐ Oils ☑ Phosphorus* * *When used in a treatment train*

BMP Name	BMP Description	BMP Highlights
F6.10/T5.74: Large Extended Detention Dry Pond  **Picture source: City of Wenatchee**	Detention ponds are primarily a flow control BMP and are needed where stormwater disposal via infiltration is not feasible at the site. Further, the pond may need to be lined where recommended by the geotechnical engineer. Because of Wenatchee's arid climate, large extended detention dry ponds are preferred over wet ponds. Other considerations include locating a dry forebay at the main pond inlet for pretreatment, providing a bypass for large storms, and designing a detention time of >24 hours to improve water quality performance. (SWMMEW, pg. 454, 537) **Ideal application:** for use in all but the most urbanized sections of the city where infiltration is not feasible, to increase storage in the system	**Ecology-Approved Function** ☑ Flow control: ☑ Detention ☑ Runoff treatment: ☑ Basic ☐ Metals ☐ Oils ☐ Phosphorus
F6.11/F6.12: Detention Tank/Vault  **Picture source: Contech 2018**	Detention tanks and vaults are used for flow control in more urban settings where space is limited. Tanks provide flow control benefits by capturing, storing, and potentially allowing reuse, which slows the release of stormwater runoff. They may be installed below or above ground. Typical below-ground tank installations consist of large-diameter (>36-inch) corrugated metal or plastic pipe. Detention vaults may be precast or cast-in-place concrete. This BMP does not provide treatment; a runoff treatment BMP, such as a biofiltration swale or vegetated filter strip, should be located upstream of the tank/vault. (SWMMEW, pg. 550) **Ideal application:** for use in urbanized sections of the City where infiltration is not feasible, to increase storage in the system	**Ecology-Approved Function** ☑ Flow control: ☑ Detention ☐ Runoff treatment: ☐ Basic ☐ Metals ☐ Oils ☐ Phosphorus

6 Capital Improvement Plan

A major component of comprehensive planning is the development of an updated CIP projects list. The updated CIP includes projects that rehabilitate infrastructure, reduce O&M cost, provide flood protection, and improve water quality.

6.1 Project Identification

The stormwater CIP is designed to use engineering methods to address persistent drainage problems that cannot be solved by maintenance practices alone.

CIP projects identified but not completed from the 1999 and 2010 CSWPs were pulled forward for inclusion in the 2020 CIP list along with new projects. Table 6-1 shows the complete list of CIP projects.

The CIP projects aim to add funding to:

- Address areas of flooding
- Improve water quality
- Replace and upsize aging infrastructure
- Extend the stormwater system to support future development

An ongoing CIP fund for conducting CIP studies to identify preferred alternatives for a given CIP project is also included.

6.1.1 Project Prioritization

During a workshop held on October 15, 2019, HDR and City staff reviewed each CIP project and prioritized them into one of three categories, as follows:

- **Priority 1** projects have the most urgent need of completion and are planned to be implemented in the years 2020 through 2026.
- **Priority 2** projects can be delayed for the interim period and will be scheduled for implementation in the years 2027 through 2033.
- **Priority 3** projects are scheduled for years beyond 2033 and will likely be revisited in a future CSWP update.

Priorities were assigned based on project urgency while maintaining a realistic workload able to be complete within each planning period.

Priority 1 projects:

- Resolve relatively more frequent localized flooding issues
- Coordinate opportunities with the Roads Department or other departments
- Are currently in design
- Disconnect the urban drainage system from canyon drains

Priority 2 projects:

- Resolve localized flooding issues
- Improve downstream conveyance

Priority 3 criteria:

- Development-driven projects
- Projects with poorly defined project limits
- Those based on changed conditions that originally supported the needs of the original project

6.1.2 Project Implementation

Following identification, a CIP Implementation Plan was developed to document revenue needs to support long-term CIP design and construction (see Chapter 7). The CIP Implementation Plan is focused on all projects identified in the CIP project list.

Project summary sheets for the Priority 1 projects are shown below.

6.2 Cost Estimates

Cost estimates for the 2020 CIP projects were derived differently for projects depending on the sources of information for each project. Projects brought forward from the 2010 CSWP were updated using project details made available to HDR and 30 percent cost estimates were derived based on Washington State Department of Transportation (WSDOT) standard plan division classes. Those cost details are included in the summary sheets in Section 6.3. Projects from the 1999 CSWP were derived by applying a 150 percent escalation.

This probable opinion of cost is considered a Class IV estimate. The American Association of Cost Engineers (AACE) and the American National Standards Institute (ANSI) both define the expected range of accuracy of a Class IV estimate to be between plus 20–50 percent and minus 15–30 percent. It must be clearly understood that this is a very preliminary estimate and has been prepared only for guidance in project evaluation purposes from information presented to the estimator at the time of the estimate.

The probable opinions of cost (estimates) shown, and any resulting conclusions on project financial or economic feasibility or funding requirements, have been prepared for guidance in project evaluation and implementation from the information available at the time the opinion was prepared. The final costs of the project and resulting feasibility will depend on actual labor and materials costs, competitive market conditions, actual site conditions, final project scope, implementation schedule, continuity of personnel and engineering, and other variable factors. As a result, the final project costs will vary from the opinions of cost presented herein.

The estimate assumes that the site will have access and approvals for the scope of work described. No cost has been included for environmental mitigation or restorations. Costs shown are current August 2019 anticipated construction costs and **no** escalation, cost of capital, construction management, or O&M costs have been included. Because of these factors, project feasibility, benefit/cost ratios, risks, and funding needs must be carefully

reviewed prior to making specific financial decisions or establishing project budgets to help ensure proper project evaluation and adequate funding.

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Table 6-1. Proposed CIP Project List

Project	Priority	Description	2019 Opinion of Probable Cost	Design Year	Construction Year
Peachey Street Outfall	1	Water quality retrofit at four locations within the Peachey Street Basin.	$1,095,000	2019	2020
Tacoma	1	Drainage improvements to provide a collection system and catch basins along Tacoma from McKittrick.	$542,000	2019	2021
Maple Street	1	Drainage improvements to provide a collection system and catch basins along Maple Street from Benoy Avenue to Canal.	$507,000	2020	2021
North Columbia	1	New stormwater system for a new section of N Columbia accessed from McKittrick Street.	$500,000	2021	2021
Walla Walla Ave. Retrofit	1	Removal of existing rock swales and installation of new catch basins and sidewalk.	$264,000	2021	2022
North Wenatchee Facility (Phase II)	1	Install water quality filter vault on stormwater main before the North Wenatchee Stormwater Facility.	$246,000	2020	2022
Roosevelt Drainage Improvements	1	Drainage improvements to provide collection of stormwater along Roosevelt Avenue from the Kiwanis Methow Park Alley to Kittitas Street.	$110,500	2021	2022
Snohomish Outfall	1	Drainage improvements to provide collection of stormwater at Marr and Snohomish and repair the erosion caused by past flood events.	$395,000	2021	2022
Springwater	1	Drainage improvements to provide a collection system and catch basins along Springwater Street from Western Avenue to Canal.	$1,256,200	2021	2022
Pershing/Springwater	1	Drainage improvements requiring the installation of a new parallel storm pipe to separate the canyon's flows from the urban area flows. All flows to be conveyed into the Maple Street system.	1,095,000	2021	2023
Crescent Street	1	Drainage improvements to capture stormwater on Crescent and route to S Wenatchee Avenue.	$200,000	2022	2023
N Columbia (First to Palouse)	1	Drainage improvements to either side of two deficient locations along Columbia Street requiring the installation of new and/or parallel pipes.	$210,000	2022	2023
Russell	1	Drainage improvements to address structural condition of existing pipes and catch basins.	$1,020,600	2022	2024
Orchard	1	Drainage improvements to provide a collection system and catch basins along Orchard Avenue from Western heading west to Second Street.	$412,000	2023	2024
Upper Squilchuck Road Extension	1	Drainage improvements to provide a collection system and catch basins from Saddlehorn Lane to Saddlehorn Avenue along Squilchuck Road.	$150,000	2023	2024
Millerdale Street	1	Drainage improvements to Millerdale Street requiring the installation of new and/or parallel pipes.	$340,200	2023	2024
North Wenatchee Facility (Phase III)	1	Stormwater facilities access is to be moved out of BNSF ROW and is to be improved by replacing the open ditch with a closed piping system. This will allow maintenance to be completed through existing manhole structures.	$516,000	2024	2025
Cashmere	1	Installation of new pipes in Cashmere Street to provide means for collection of runoff and disconnect storm from sewer system.	$172,620	2024	2025
Ringold/Seventh/Princeton	1	The existing storm drainage system is discharging into the canyon drainage system. Improvements require installation of a new storm drainage pipe on Ringold Street and redirect to the Fifth Street drainage system.	$628,000	2024	2025
CIP Studied	1	Basin analysis and hydraulic modeling for upcoming CIPs, when necessary.	$100,000	N/A	Every Other Year
Ohme Garden Road	2	Maintenance improvements including pipes and catch basins sized for a 25-year event.	$1,440,195	2025	2027
Canyon Drainage	2	Drainage improvements to the No. 1 Canyon drain requiring new pipe installation, collection system, and catch basin improvements.	$1,800,000	2026	2028
Loves Court	2	New conveyance to disconnect storm from sewer and/or an infiltration system to alleviate drainage problems in Love's Court.	$256,200	2027	2028
Lavern	2	Drainage improvements to provide a collection system and catch basins along Lavern Place through a utility easement to Red Apple Road. Disconnect storm from sewer.	$248,000	2028	2029

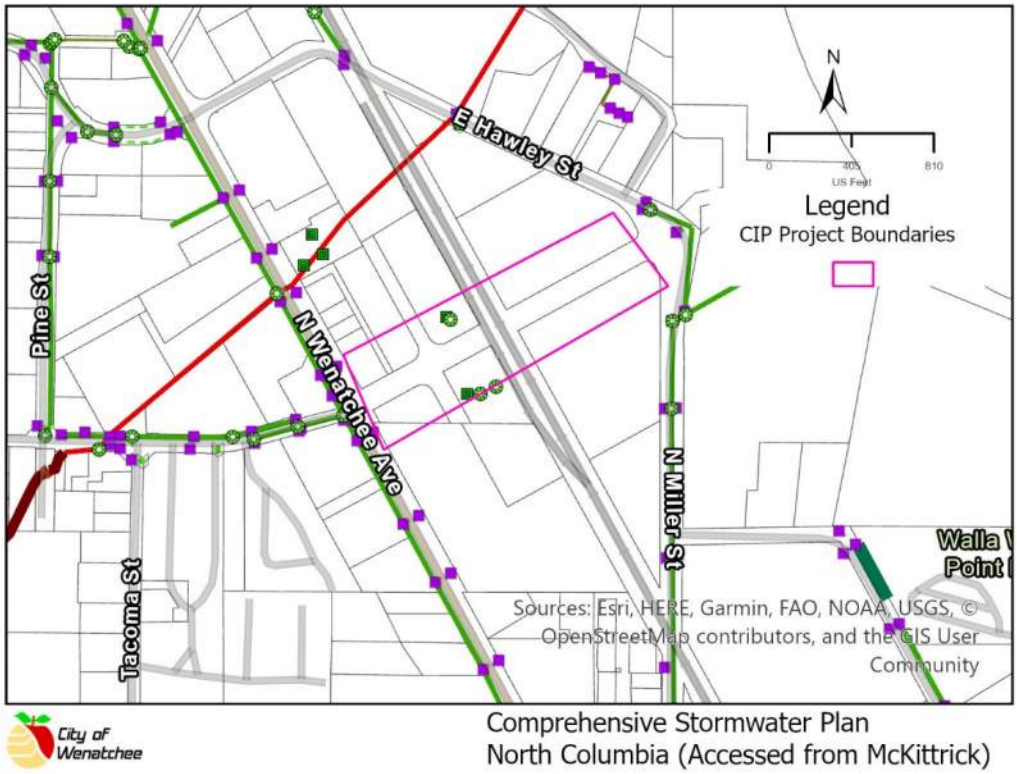
Project	Priority	Description	2019 Opinion of Probable Cost	Design Year	Construction Year
Vista Place	2	Drainage improvements to provide a collection system and catch basins along Vista Place, Leanne Place, Gellatly Street to Millerdale Avenue. Disconnect storm from sewer.	$285,000	2028	2029
Ramona and Sunset	2	Drainage improvements to provide a collection system and catch basins along Ramona and Sunset Avenue from Ninth Street to Fifth Street. Disconnect stormwater from the No. 2 Canyon drain.	$985,000	2028	2029
Kenaston and Linville	2	Drainage improvements to provide a collection system and catch basins in section of Kenaston Drive, Wellington Place, Grandview Avenue, and Linville between Western and Castle Rock Heights. Disconnect stormwater from the No. 2 Canyon drain.	$743,000	2029	2030
Western Avenue	2	Drainage improvements to reconstruct the existing collection system for increased flows.	$1,604,000	2029	2031
South Hills Drive	2	Drainage improvements to provide a collection system and catch basins along South Hills Drive from Red Apple Road to Crawford Avenue.	$757,000	2029	2031
Fifth Street	2	Drainage improvements requiring the replacement of storm pipe and catch basins to provide protection to the downtown area.	$931,770	2029	2031
Miller	2	Drainage improvements requiring the installation of new pipe along Miller Street with added catch basins to increase the inlet capacities.	$499,800	2031	2032
Michael Place	2	The existing storm drainage system is discharging into the No. 2 Canyon drain. Improvements require installation of a new storm drainage pipe on Michael Place that would discharge at the Second Street intersection.	$138,600	2031	2032
Canal/Marie/Marilyn	2	Storm system improvements to extend coverage into the Canal Boulevard area.	$344,400	2031	2033
S Chelan	2	Stormwater main is in poor condition and needs to be replaced.	$200,000	2031	2033
Day Road	3	Drainage improvements to provide a collection system and catch basins in the Day Road and Lester Road area.	$987,000	2032	2034
Filbeck/Seattle	3	Drainage improvements to provide a collection system and catch basins at Filbeck Place near Lewis and Clark Park and along Seattle Street from Amherst to Filbeck to alleviate local drainage issues.	$693,000	2032	2034
Cedarwood Lane	3	The existing storm drainage system is discharging into the canyon drainage system. The discharging pipe from this area will be redirected into the urban collection system and convey flows to the Fifth Street drainage system.	$138,600	2033	2034
Miller	3	Drainage improvements to upsize the aged drainage system from N Miller Street to Maple Street. Consists of replacing pipe and a crossing under BNSF tracks as well as adjacent to the regional water main.	$3,393,000	2034	2035
Skyline Drive	3	Drainage improvements to provide a collection system and catch basins along Skyline Drive from No. 2 Canyon to Red Apple Road.	$2,097,000	2034	2036
Walnut	3	Drainage improvements to provide a collection system and catch basins along Walnut Street from Wenatchee Avenue to Western Avenue.	$1,311,000	2035	2037
Avenda	3	Drainage improvements to provide a collection system and catch basins along Avenda Way from midpoint to Wenatchee River.	$221,000	2036	2037
Poplar	3	New drainage extension serving Poplar and Pershing Street north of Maple.	$241,500	2036	2037
S Miller	3	Drainage improvements requiring new or parallel pipe to transfer all flows at Stevens to Russell. The existing inlet will be left in place as an overflow.	$283,500	2036	2037
Jennings St./Ione and Maxine	3	Drainage improvements to provide a collection system and catch basins along Jennings Street to Woodware Drive in the Ione Street and Maxine Avenue area.	$1,234,000	2036	2038
Methow	3	Drainage improvements to provide a collection system and catch basins along Method Avenue from Crawford to Ridgeview Drive.	$690,000	2036	2038
McKittrick and Pine	3	Drainage improvements to provide a collection system and catch basins along McKittrick Street from Wenatchee Avenue to Western Avenue.	$2,346,000	2037	2039
Horse Lake Road	3	Drainage improvements to provide a collection system and catch basins along Horse Lake Road from city limits to Honeysett Road.	$1,810,000	2038	2040

6.3 CIP Project Summary Sheets

The Priority 1 CIP projects are summarized below. The summary sheets include the 2020 CIP project identification number, a cross-reference to the project's identification in the previous CSWP, description, proposed solution, a benefits statement, vicinity map, and the 2019 cost.

6.3.1 North Columbia (Accessed from McKittrick)

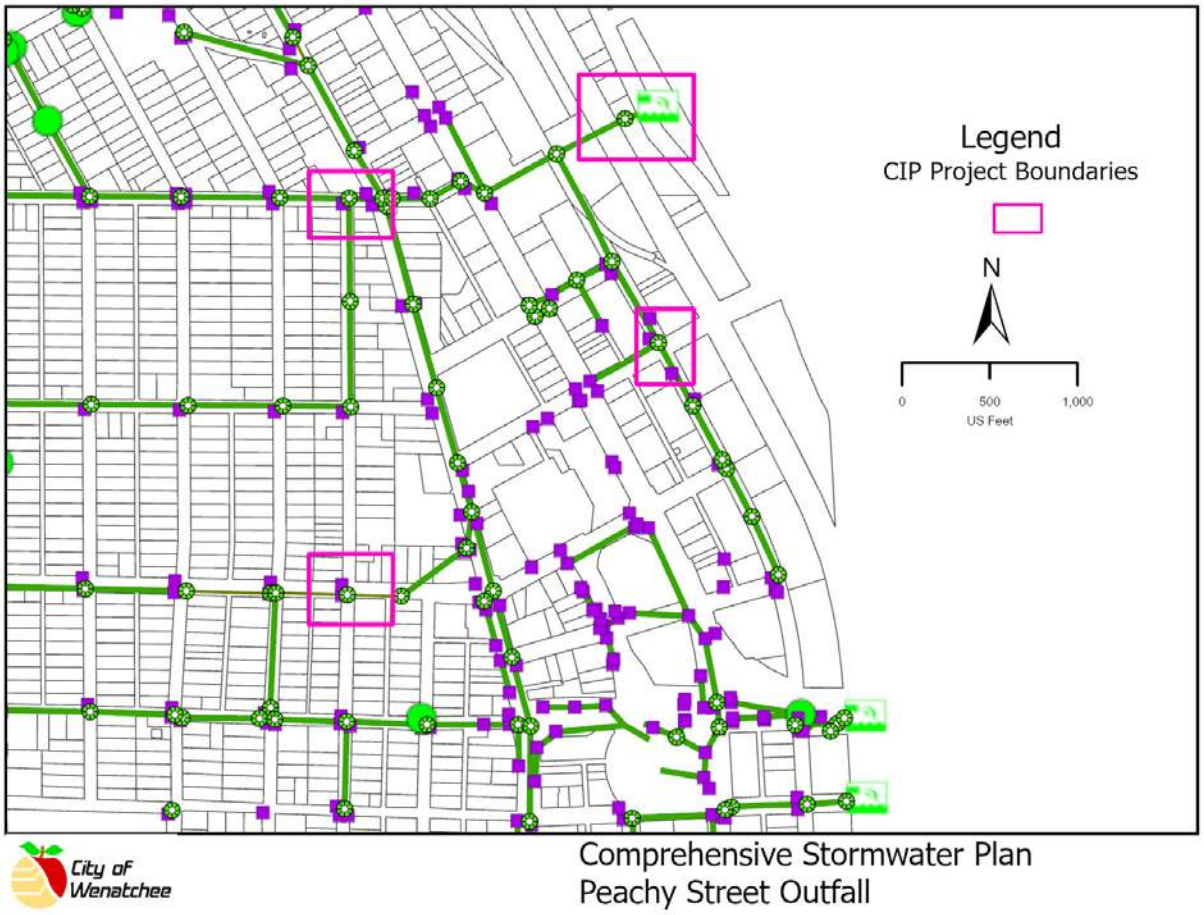
Problem description:	New road
Project solution:	Stormwater lift station, water quality, road drainage infrastructure, and force main
Project benefit:	Stormwater system for new road to support development
Estimated project cost 2019:	$500,000



6.3.2 Peachy Street Outfall

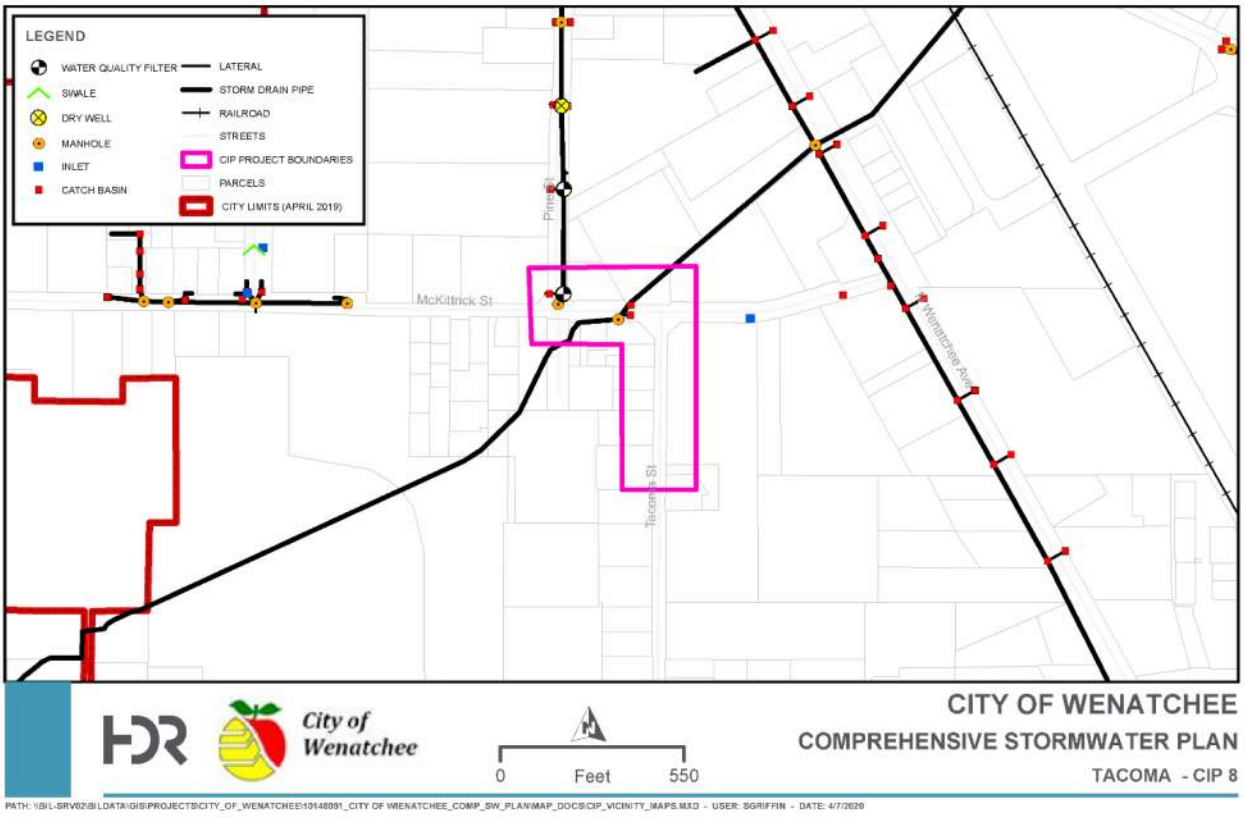
Problem description:	High concentration of heavy metals and sediment loading upstream of the City's Peachy Street outfall
Project solution:	Water quality retrofit at four locations within the Peachey Street Basin
Project benefit:	Improved water quality
Estimated project cost 2019:	$1,095,000

Note: Cost estimate obtained from 2010 CSWP escalated to 2019-dollar values.



6.3.3 Tacoma (McKittrick to Maple)

Problem description:	There is no collection or conveyance system in the project area.
Project solution:	This project will install a new collection and conveyance system in both Tacoma and Pine Avenues. Installation of catch basins will be included in the project.
Project benefit:	Improved localized drainage, reduced flood risk
Estimated project cost 2019:	$542,000



Project Cost Estimate

City of Wenatchee **Date:** August 2019

Stormwater Comprehensive Plan **Project no.:** CIP 8

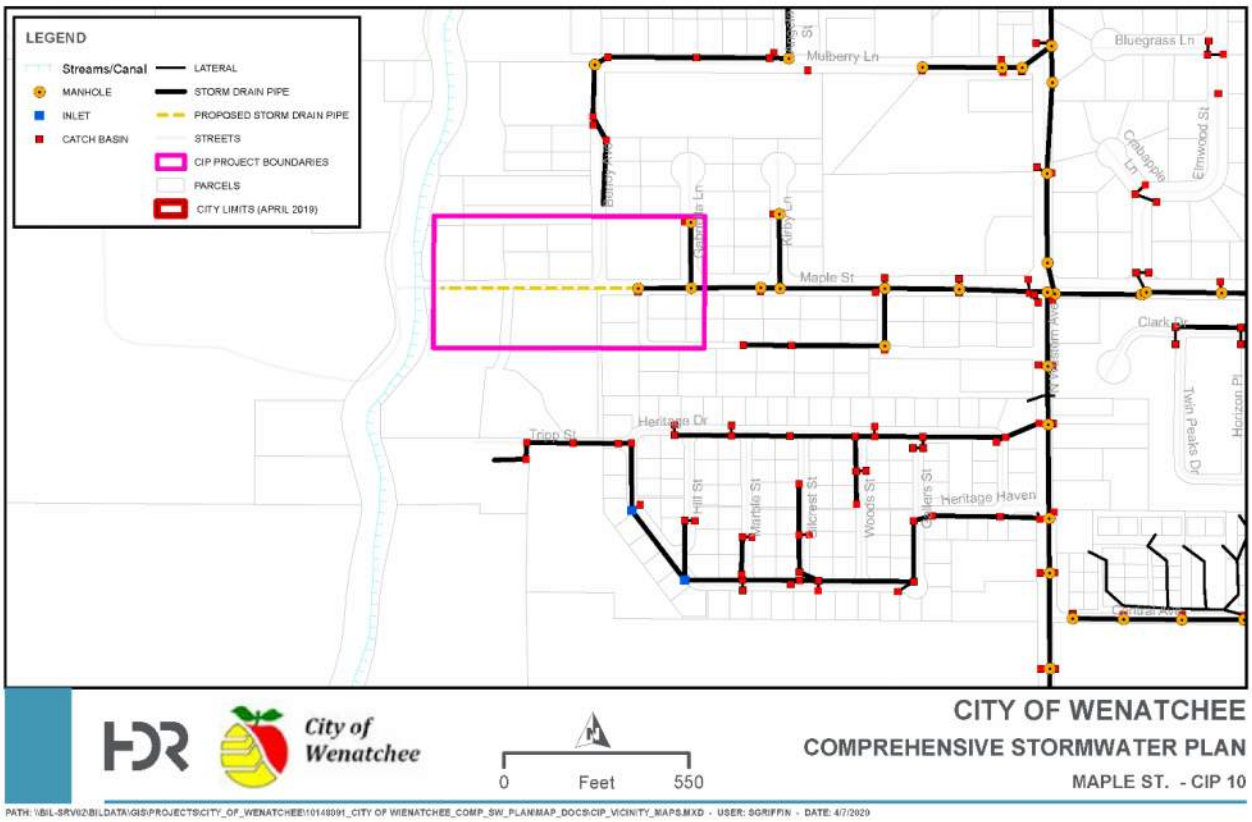
Tacoma Street **Estimate by:** Erlandsen/HDR

Engineers Estimate

NO.	DESCRIPTION OF ITEM	UNIT	QUANTITY	UNIT PRICE	ESTIMATE
DIVISION 1 -GENERAL REQUIREMENTS					
1	Mobilization	LS	1	$64,000	$64,000
2	Temporary Traffic Control	LS	1	$34,000	$34,000
3	Construction Signs Class A	LS	1	$3,000	$3,000
4	Record Drawings	LS	1	$5,000	$5,000
5	SPCC Plan	LS	1	$500	$500
DIVISION 2 -EARTHWORK					
6	Sawcutting Existing Asphalt	LF	2,500	$4	$10,000
7	Structure Excavation Class B Incl. Haul	CY	800	$10	$8,000
8	Select Borrow incl. Haul	TON	1,000	$10	$10,000
9	Removal of Structures and Obstructions	LS	1	$30,000	$30,000
DIVISION 4 -BASES					
10	Crushed Surfacing Top Course	TON	1,985	$55	$109,175
DIVISION 5 -SURFACE TREATMENTS AND PAVEMENTS					
11	HMA Cl. 1/2 In. PG 64-28	TON	675	$120	$81,000
DIVISION 7 -DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS					
12	Catch Basin Type 1	EA	16	$1,750	$28,000
13	Catch Basin Type 2 48 in. Diam.	EA	8	$7,000	$56,000
14	Corrugated Polyethylene Storm Sewer Pipe (CPSS) Pipe 12 in. Diam.	LF	2,430	$60	$145,800
15	Connecting to Existing System	EA	4	$2,500	$10,000
16	Shoring	LF	2,430	$5	$12,150
DIVISION 8 -MISC. CONSTRUCTION					
17	Erosion Control/SWPPP	LS	1	$750	$750
18	Permanent Signing	LS	1	$10,000	$10,000
DIVISION 9 -MATERIALS					
19	Monument Case and Cover	EA	6	$2,100	$12,600
	Estimated Construction Subtotal				$629,975
	Sales Tax (8.4%)				None
	Contingency (25%)				$157,494
	Estimated Construction Total				$787,469
	Engineering /Cultural/Environmental (25%)				$196,867
				APPROXIMATE TOTAL	**$985,000**

6.3.4 Maple Street

Problem description:	There is no collection or conveyance system in the project area.
Project solution:	This project will install a new collection and conveyance system in Maple Street. Installation of catch basins will be included in the project.
Project benefit:	Improved localized drainage, reduced flood risk, and preparation for new development
Estimated project cost 2019:	$507,000



Project Cost Estimate

City of Wenatchee **Date:** August 2019

Stormwater Comprehensive Plan **Project no.:** CIP 10

Maple Street Improvements **Estimate by:** Erlandsen/HDR

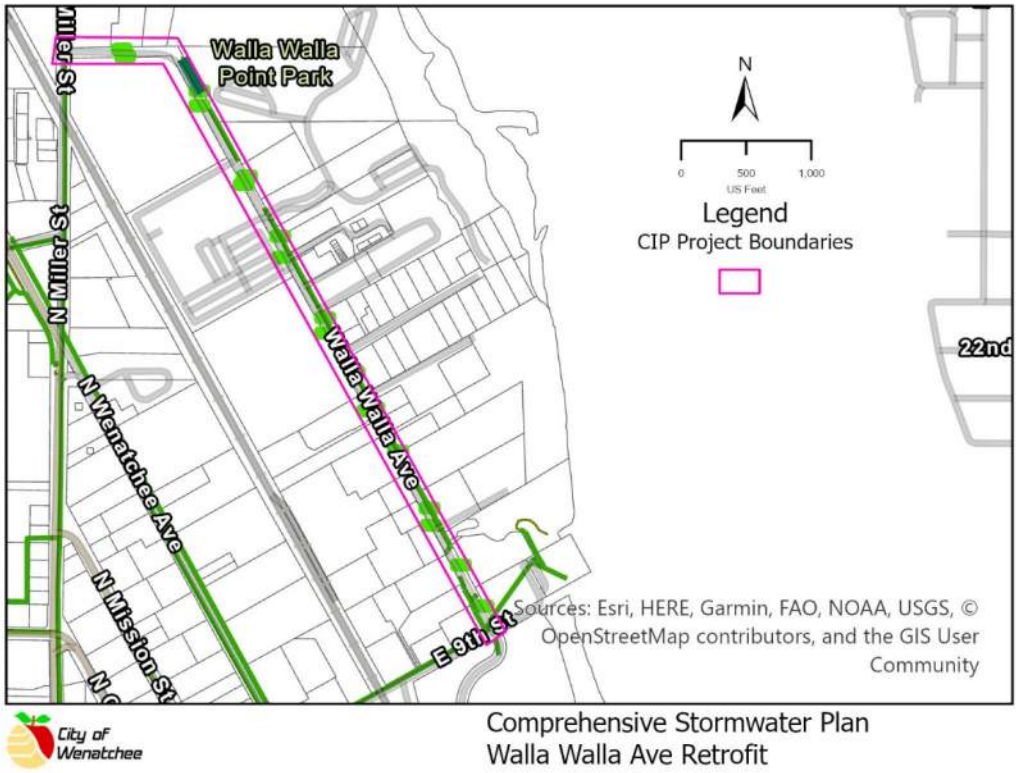
Engineers Estimate

NO.	*DESCRIPTION OF ITEM*	*UNIT*	*QUANTITY*	*UNIT PRICE*	*ESTIMATE*
DIVISION 1 -GENERAL REQUIREMENTS					
1	Mobilization	LS	1	$33,000	$33,000
2	Temporary Traffic Control	LS	1	$11,000	$11,000
3	Construction Signs Class A	LS	1	$3,000	$3,000
4	Record Drawings	LS	1	$5,000	$5,000
5	SPCC Plan	LS	1	$500	$500
6	Canal Crossing	LS	1	$132,000	$132,000
DIVISION 2 -EARTHWORK					
6	Sawcutting Existing Asphalt	LF	700	$4	$2,625
7	Structure Excavation Class B Incl. Haul	CY	200	$10	$2,000
8	Select Borrow incl. Haul	TON	250	$10	$2,500
9	Removal of Structures and Obstructions	LS	1	$10,000	$10,000
DIVISION 4 -BASES					
10	Crushed Surfacing Top Course	TON	505	$55	$27,775
DIVISION 5 -SURFACE TREATMENTS AND PAVEMENTS					
11	HMA Cl. 1/2 In. PG 64-28	TON	175	$120	$21,000
DIVISION 7 -DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS					
12	Catch Basin Type 1	EA	4	$1,750	$7,000
13	Catch Basin Type 2 48 in. Diam.	EA	2	$7,000	$14,000
14	Corrugated Polyethylene Storm Sewer Pipe (CPSS) Pipe 12 in. Diam.	LF	614	$60	$36,840
15	Connecting to Existing System	EA	1	$2,500	$2,500
16	Shoring	LF	614	$5	$3,070
DIVISION 8 -MISC. CONSTRUCTION					
17	Erosion Control/SWPPP	LS	1	$750	$750
18	Permanent Signing	LS	1	$3,000	$3,000
3					
19	Monument Case and Cover	EA	3	$2,100	$6,300
	Estimated Construction Subtotal				$323,860
	Sales Tax (8.4%)				None
	Contingency (25%)				$80,965
	Estimated Construction Total				$404,825
	Engineering /Cultural/Environmental (25%)				$101,206
				APPROXIMATE TOTAL	**$507,000**

6.3.5 Walla Walla Avenue Retrofit

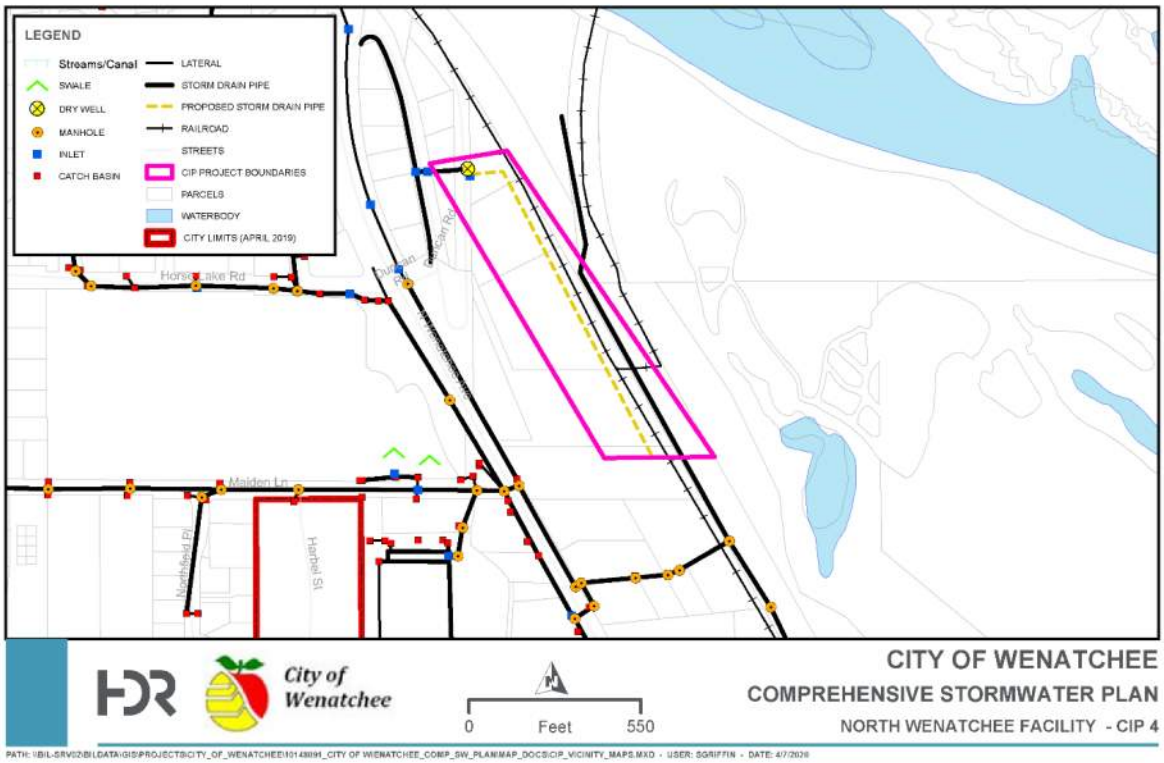
Problem description:	The rock swales and curb cuts have been challenging and expensive to maintain. As a result, the road is frequently flooded.
Project solution:	Remove the rock swales and curb cuts and add in catch basins ahead of the infiltration trenches
Project benefit:	Improves water quality and maintenance; significant reduction in annual maintenance costs
Estimated project cost 2019:	$1,050,000

Note: Cost estimate obtained from 2010 CSWP escalated to 2019-dollar values using 1.4 construction index.



6.3.7 North Wenatchee Facility, Phase II and Phase III

Problem description:	The collection system in the area directly south of the Wenatchee River discharges to an open ditch that is located adjacent to the BNSF railway tracks. This open conveyance is located in the BNSF ROW and is difficult to maintain because of access. No easement or license agreement exists.
Project solution:	The project will replace the open ditch with a closed pipe system that will improve maintenance access, eliminate the outfall to the Wenatchee River, and add water quality treatment. All flows drain to a 24-inch-diameter culvert under the BNSF tracks.
Project benefit:	Clarifies drainage responsibilities, eliminates an outfall, and improves water quality and maintenance access
Estimated project cost 2019:	Phase II: $246,000 Phase III: $516,000



Project Cost Estimate

City of Wenatchee **Date:** August 2019

Stormwater Comprehensive Plan **Project no.:** CIP 4

North Wenatchee Facility **Estimate by:** Erlandsen/HDR

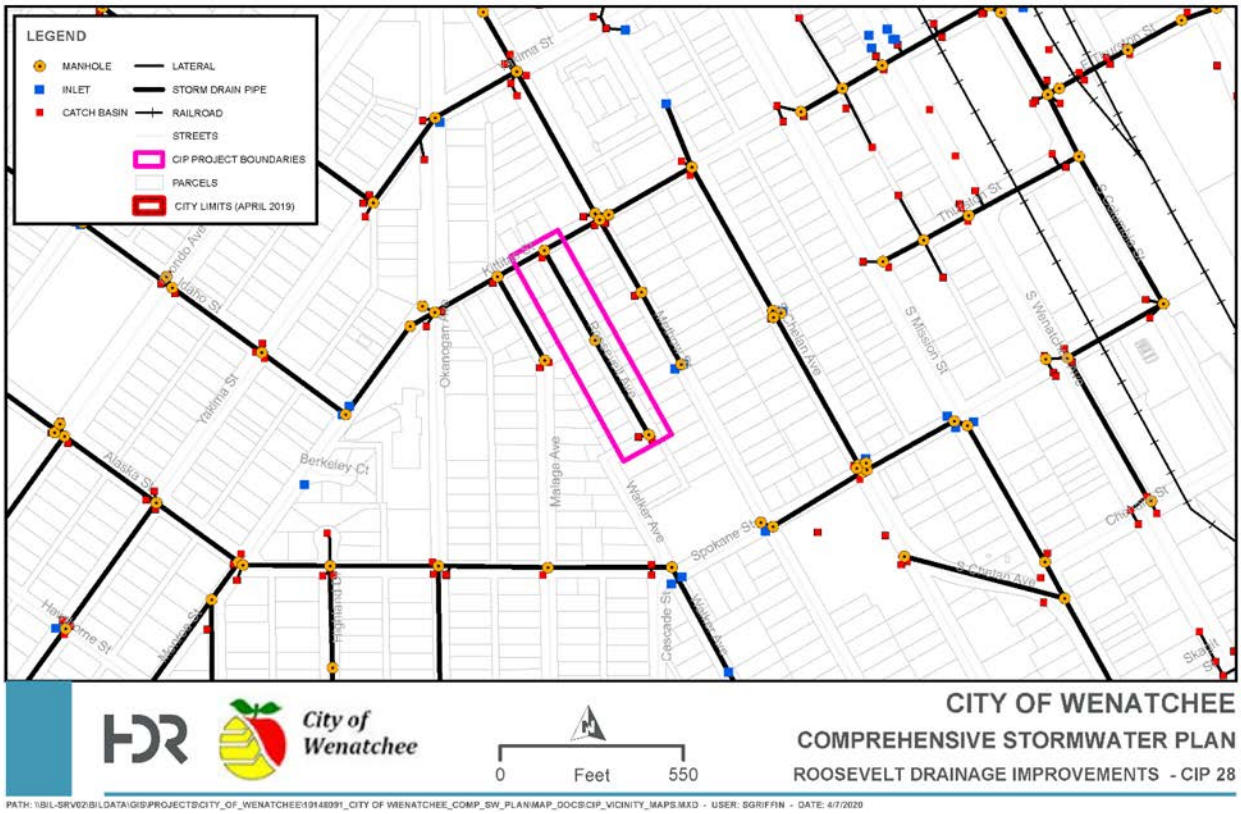
Engineers Estimate

NO.	*DESCRIPTION OF ITEM*	*UNIT*	*QUANTITY*	*UNIT PRICE*	*ESTIMATE*
DIVISION 1 -GENERAL REQUIREMENTS					
1	Mobilization	LS	1	$50,000	$50,000
2	Temporary Traffic Control	LS	1	$11,000	$11,000
3	Construction Signs Class A	LS	1	$3,000	$3,000
4	Record Drawings	LS	1	$5,000	$5,000
5	SPCC Plan	LS	1	$500	$500
6	BNSF Easement	LS	1	$108,000	$108,000
DIVISION 2 -EARTHWORK					
7	Select Borrow incl. Haul	TON	800	$10	$8,000
8	Common Borrow incl. Haul	TON	400	$5	$2,000
9	Removal of Structures and Obstructions	LS	1	$10,000	$10,000
DIVISION 4 -BASES					
10	Crushed Surfacing Top Course	TON	1,500	$55	$82,500
DIVISION 7 -DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS					
11	Catch Basin Type 2 60 in. Diam.	EA	3	$10,500	$31,500
12	Corrugated Polyethylene Storm Sewer Pipe (CPSS) Pipe 36 in. Diam.	LF	800	$200	$160,000
13	Connecting to Existing System	EA	2	$2,500	$5,000
14	Shoring	LF	800	$5	$4,000
DIVISION 8 -MISC. CONSTRUCTION					
15	Erosion Control/SWPPP	LS	1	$750	$750
16	Permanent Signing	LS	1	$2,000	$2,000
DIVISION 9 -MATERIALS					
17	Monument Case and Cover	EA	2	$2,100	$4,200
	Estimated Construction Subtotal				$487,450
	Sales Tax (8.4%)				None
	Contingency (25%)				$121,863
	Estimated Construction Total				$609,313
	Engineering /Cultural/Environmental (25%)				$152,328
				APPROXIMATE TOTAL	**$762,000**

6.3.8 Roosevelt Avenue Drainage Improvements

Problem description:	Storm lines are connected to sanitary sewer.
Project solution:	Drainage improvements to provide storm main, curb and gutter, and catch basins along Roosevelt Avenue from the Kiwanis Methow Park Alley to Kittitas Street
Project benefit:	Improved drainage and reduce flood risk
Estimated project cost 2019:	$110,000

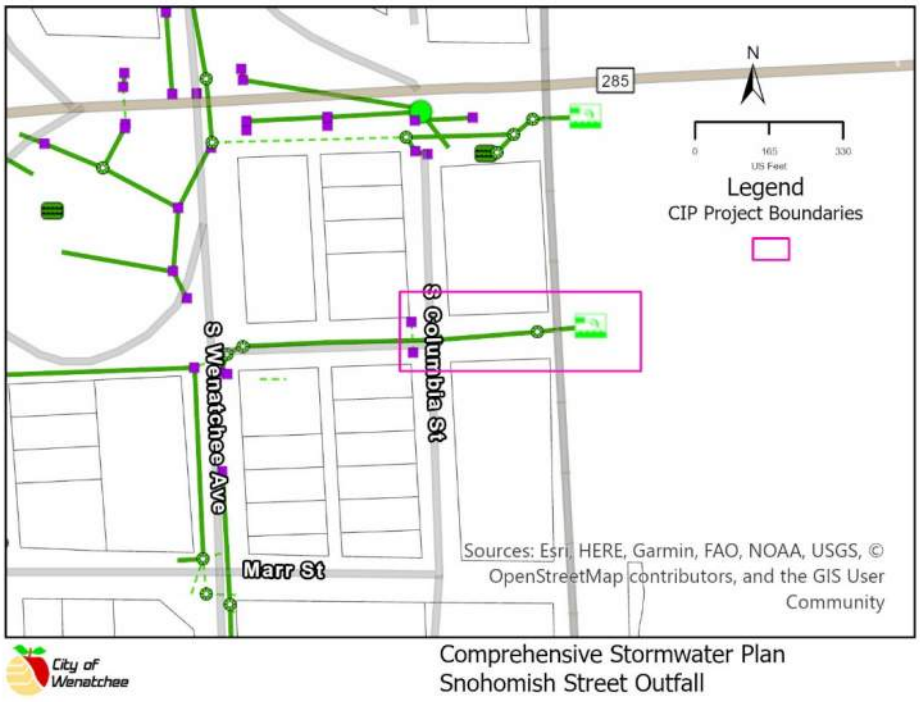
Note: Cost escalated from original plan to 2019-dollar values.



6.3.9 Snohomish Street Outfall

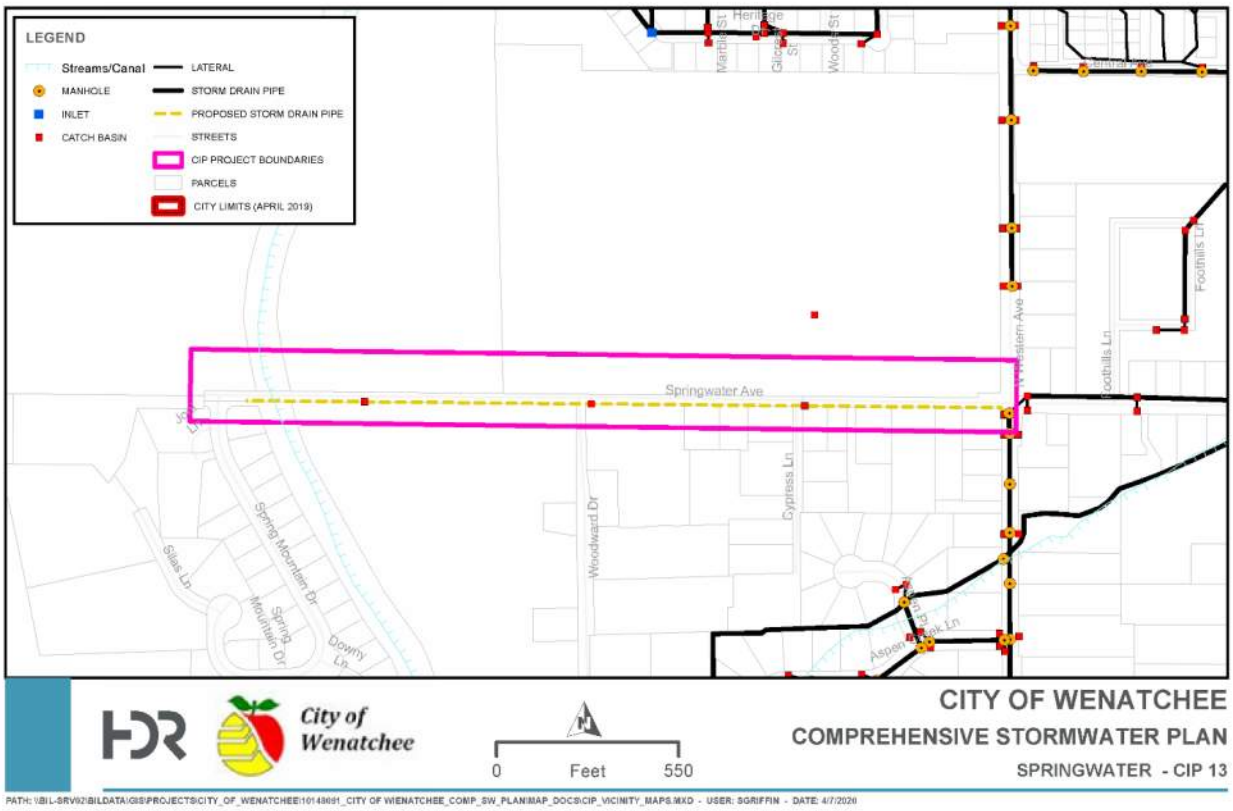
CIP number and name:	CIP 37 Snohomish Street Outfall
Original CSWP number:	New 2020 project
Problem description:	Flooding at the intersection of Marr and Snohomish caused severe erosion around the last manhole prior to the outfall.
Project solution:	Provide drainage improvements to prevent flooding and bank erosion. Repair bank and other outfall improvements as needed.
Project benefit:	Improves local drainage; infrastructure renewal
Estimated project cost 2019:	$395,000

Note: Cost estimate obtained from 2010 CSWP escalated to 2019-dollar values.



6.3.10 Springwater Drainage Extension

Problem description:	No collection or conveyance system exist in the public ROW.
Project solution:	Provide drainage extension conveyance pipeline from Western Avenue to Pershing (contingent on Pershing). Explore retention or take storm within the sewer easement that is being established with the WSU development.
Project benefit:	Provides drainage system in ROW and prepares for new development in the foothills
Estimated project cost 2019:	$993,000



Project Cost Estimate

City of Wenatchee **Date:** August 2019

Stormwater Comprehensive Plan **Project no.:** CIP 13

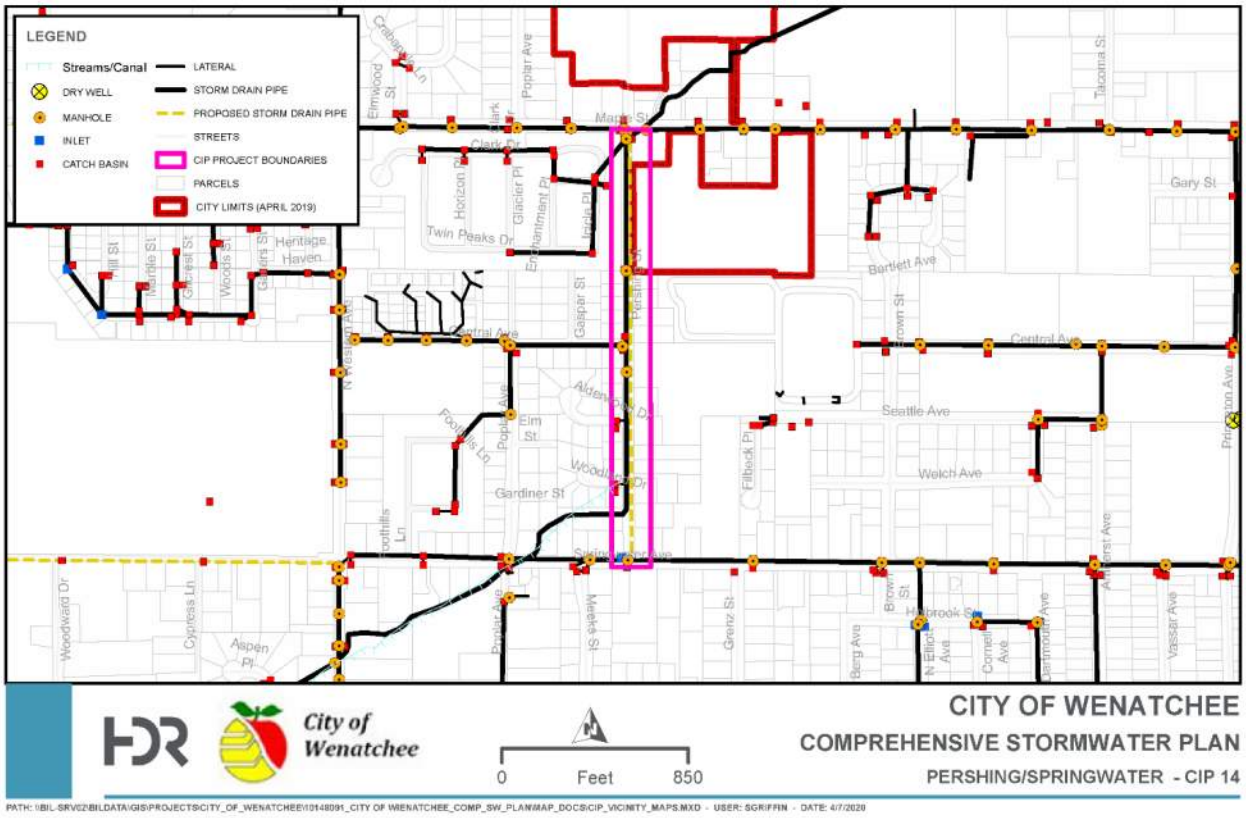
Springwater Drainage Extension **Estimate by:** Erlandsen/HDR

Engineers Estimate

NO.	*DESCRIPTION OF ITEM*	*UNIT*	*QUANTITY*	*UNIT PRICE*	*ESTIMATE*
DIVISION 1 -GENERAL REQUIREMENTS					
1	Mobilization	LS	1	$65,000	$65,000
2	Temporary Traffic Control	LS	1	$34,000	$34,000
3	Construction Signs Class A	LS	1	$3,000	$3,000
4	Record Drawings	LS	1	$5,000	$5,000
5	SPCC Plan	LS	1	$500	$500
DIVISION 2 -EARTHWORK					
6	Sawcutting Existing Asphalt	LF	2,600	$4	$9,750
7	Structure Excavation Class B Incl. Haul	CY	850	$10	$8,500
8	Select Borrow incl. Haul	TON	800	$10	$8,000
9	Removal of Structures and Obstructions	LS	1	$30,000	$30,000
DIVISION 4 -BASES					
10	Crushed Surfacing Top Course	TON	2,085	$55	$114,675
DIVISION 5 -SURFACE TREATMENTS AND PAVEMENTS					
11	HMA Cl. 1/2 In. PG 64-28	TON	710	$120	$85,200
DIVISION 7 -DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS					
12	Catch Basin Type 1	EA	18	$1,750	$31,500
13	Catch Basin Type 2 48 in. Diam.	EA	8	$7,000	$56,000
14	Corrugated Polyethylene Storm Sewer Pipe (CPSS) Pipe 12 in. Diam.	LF	2,550	$60	$153,000
15	Connecting to Existing System	EA	2	$2,500	$5,000
16	Shoring	LF	2,550	$5	$12,750
DIVISION 8 -MISC. CONSTRUCTION					
17	Erosion Control/SWPPP	LS	1	$750	$750
18	Permanent Signing	LS	1	$4,000	$4,000
DIVISION 9 -MATERIALS					
19	Monument Case and Cover	EA	4	$2,100	$8,400
	Estimated Construction Subtotal				$635,025
	Sales Tax (8.4%)				None
	Contingency (25%)				$158,756
	Estimated Construction Total				$793,781
	Engineering /Cultural/Environmental (25%)				$198,445
				APPROXIMATE TOTAL	**$993,000**

6.3.11 Pershing Street

Problem description:	Localized drainage system outfalls to canyon drain. Goal is to disconnect City-owned drainage from canyon drains.
Project solution:	This project consists of the installation of a new parallel storm pipe to separate No. 1 Canyon drainage flow from the urban collection system. The proposed project would modify the existing drainage system so that it connects to the existing Maple Street collection system.
Project benefit:	Reduces flooding risk by creating a hydraulic barrier between canyon flows and street drainage system
Estimated project cost 2019:	$717,000



Project Cost Estimate

City of Wenatchee **Date:** August 2019

Stormwater Comprehensive Plan **Project no.:** CIP 14

Pershing St. Drainage Improvements **Estimate by:** Erlandsen/HDR

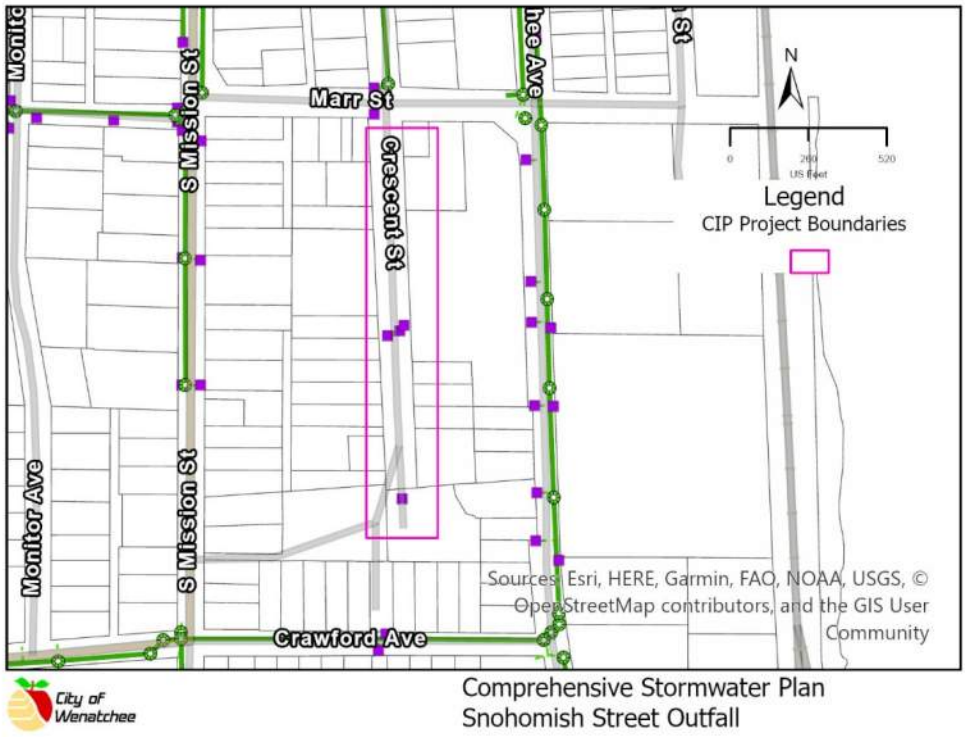
Engineers Estimate

NO.	*DESCRIPTION OF ITEM*	*UNIT*	*QUANTITY*	*UNIT PRICE*	*ESTIMATE*
DIVISION 1 -GENERAL REQUIREMENTS					
1	Mobilization	LS	1	$42,000	$42,000
2	Temporary Traffic Control	LS	1	$19,000	$19,000
3	Construction Signs Class A	LS	1	$3,000	$3,000
4	Record Drawings	LS	1	$5,000	$5,000
5	Canyon System Reconstruction	LS	1	$64,000	$64,000
6	SPCC Plan	LS	1	$500	$500
DIVISION 2 -EARTHWORK					
7	Sawcutting Existing Asphalt	LF	1,400	$4	$5,600
8	Structure Excavation Class B Incl. Haul	CY	800	$10	$8,000
9	Select Borrow incl. Haul	TON	850	$10	$8,500
10	Removal of Structures and Obstructions	LS	1	$15,000	$15,000
DIVISION 4 -BASES					
11	Crushed Surfacing Top Course	TON	1,095	$55	$60,225
DIVISION 5 -SURFACE TREATMENTS AND PAVEMENTS					
12	HMA Cl. 1/2 In. PG 64-28	TON	375	$120	$45,000
DIVISION 7 -DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS					
13	Catch Basin Type 1	EA	8	$1,750	$14,000
14	Catch Basin Type 2 48 in. Diam.	EA	4	$7,000	$28,000
15	Corrugated Polyethylene Storm Sewer Pipe (CPSS) Pipe 24 in. Diam.	LF	1,340	$80	$107,200
16	Connecting to Existing System	EA	6	$2,500	$15,000
17	Shoring	LF	1,340	$5	$6,700
DIVISION 8 -MISC. CONSTRUCTION					
18	Erosion Control/SWPPP	LS	1	$750	$750
19	Permanent Signing	LS	1	$5,000	$5,000
DIVISION 9 -MATERIALS					
20	Monument Case and Cover	EA	3	$2,100	$6,300
	Estimated Construction Subtotal				$458,775
	Sales Tax (8.4%)				None
	Contingency (25%)				$114,694
	Estimated Construction Total				$573,469
	Engineering /Cultural/Environmental (25%)				$143,367
				APPROXIMATE TOTAL	**$717,000**

6.3.12 Crescent Street

Problem description:	Existing drywells are not able to handle the stormwater in this area, resulting in flooding.
Project solution:	Install a stormwater main and catch basins on Crescent to tie into S Wenatchee Avenue
Project benefit:	Improved drainage and reduced flood risk
Estimated project cost 2019:	$200,000

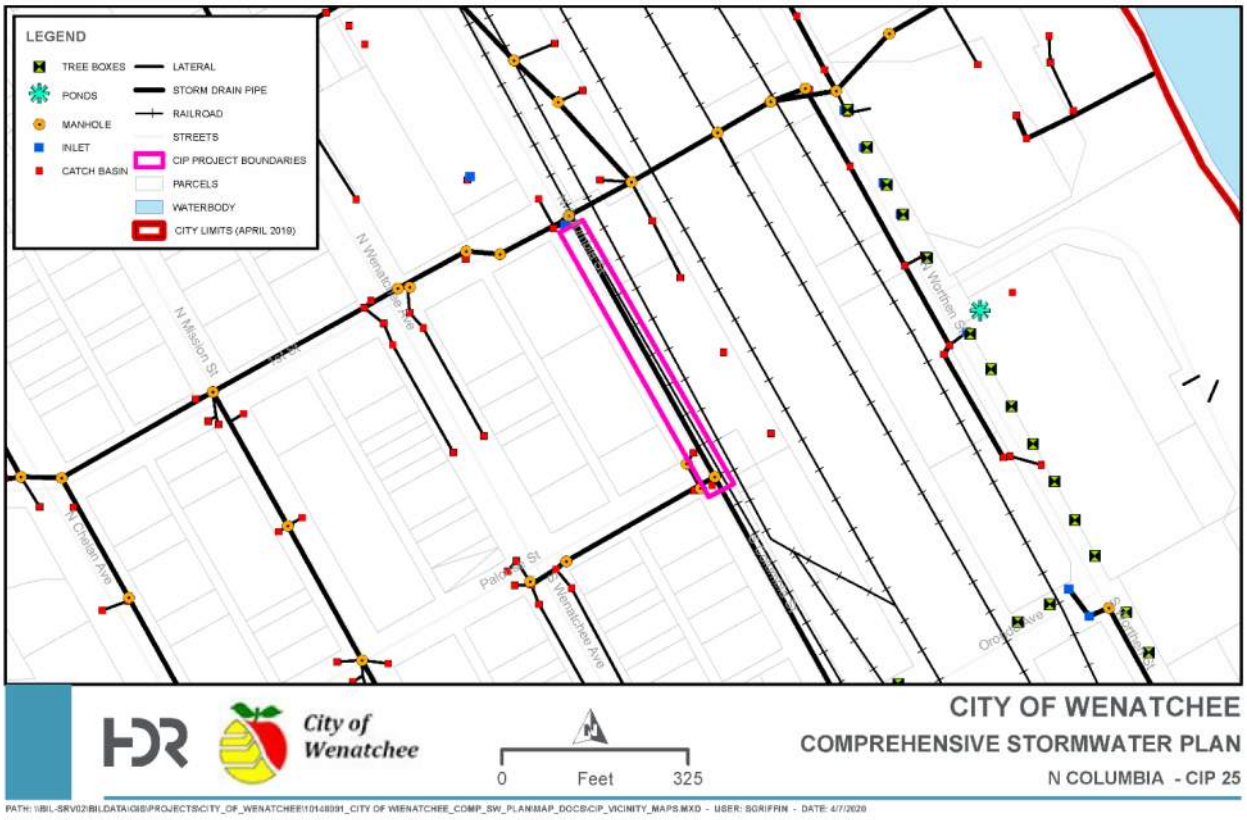
Note: Cost escalated from original plan to 2019-dollar values.



6.3.13 North Columbia

Problem description:	The existing storm drainage is undersized.
Project solution:	Improvements to either side of the two deficient locations on Columbia Street will require installation of new or parallel pipes. Alternatives for upgrading will need to be evaluated based on the structural condition of the existing pipe and conflicts with utilities. If the installation of parallel pipes is chosen, new pipes may be installed to function as an overflow pipe. No downstream problems are expected with these proposed improvements. Palouse to First street improvements need to be in conjunction with the Water CIP.
Project benefit:	Improve drainage
Estimated project cost 2019:	$210,000

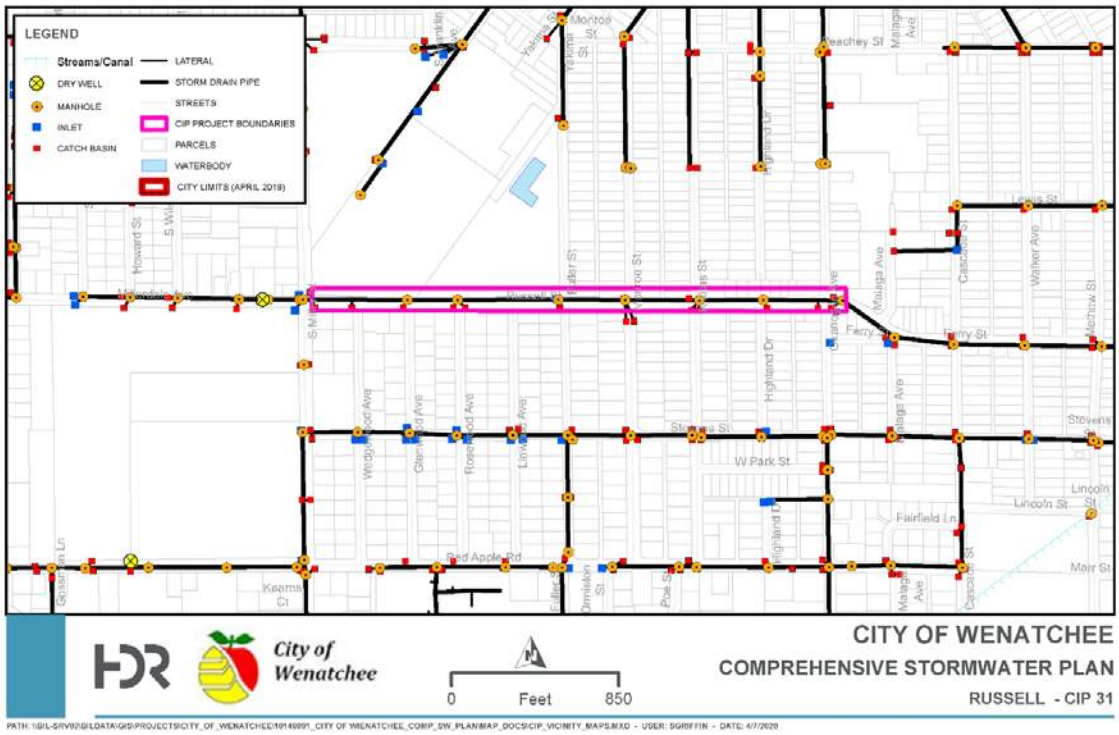
Note: Cost escalated from original plan to 2019-dollar values.



6.3.14 Russell Street

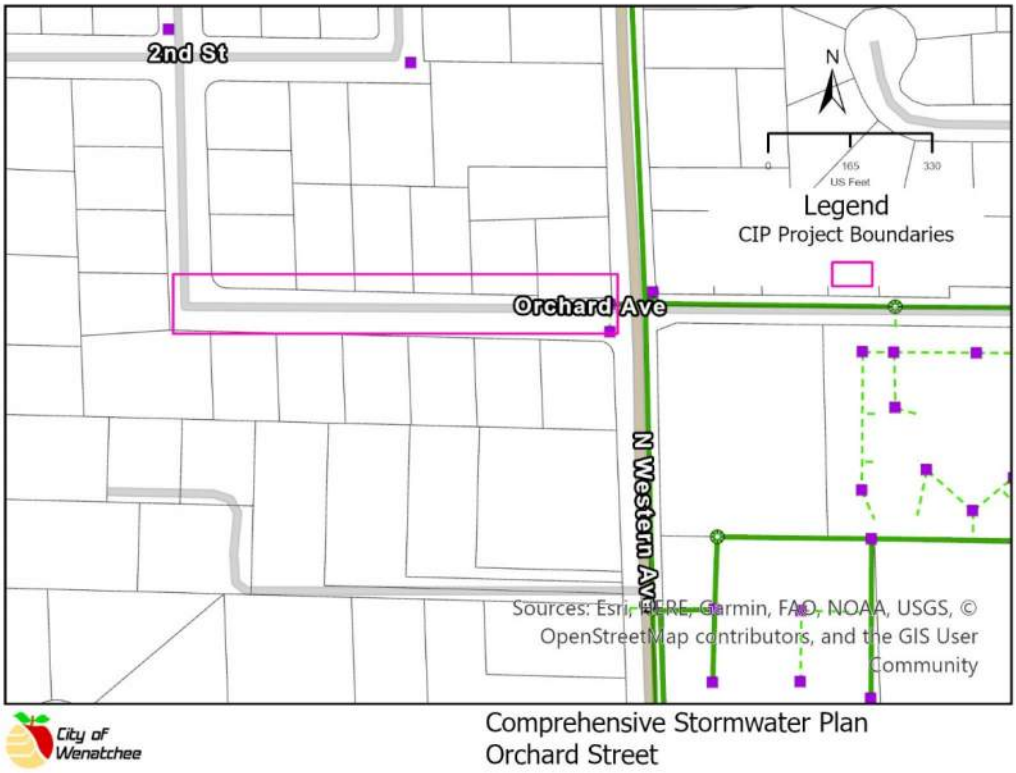
CIP number and name:	CIP 31 Russell Street Drainage Improvements
Original CSWP number:	2009 (Project 8.4.1.8)
Problem description:	Old inlets need to be replaced to improve drainage.
Project solution:	Replace existing pipe or install parallel pipe to maintain or improve conveyance capacity. Replace existing inlets.
Project benefit:	Improved drainage, reduced flood risk, infrastructure renewal
Estimated project cost 2019:	$1,020,000

Note: Cost escalated from original plan to 2019-dollar values.



6.3.15 Orchard Street

Problem description:	There is no collection or conveyance system in the project area.
Project solution:	This project will install a new collection and conveyance system in Orchard Avenue. Installation of catch basins will be included in the project.
Project benefit:	Reduces flooding risk
Estimated project cost 2019:	$412,000



Project Cost Estimate

City of Wenatchee **Date:** August 2019

Stormwater Comprehensive Plan **Project no.:** CIP 26

Orchard St. Drainage Improvements **Estimate by:** Erlandsen/HDR

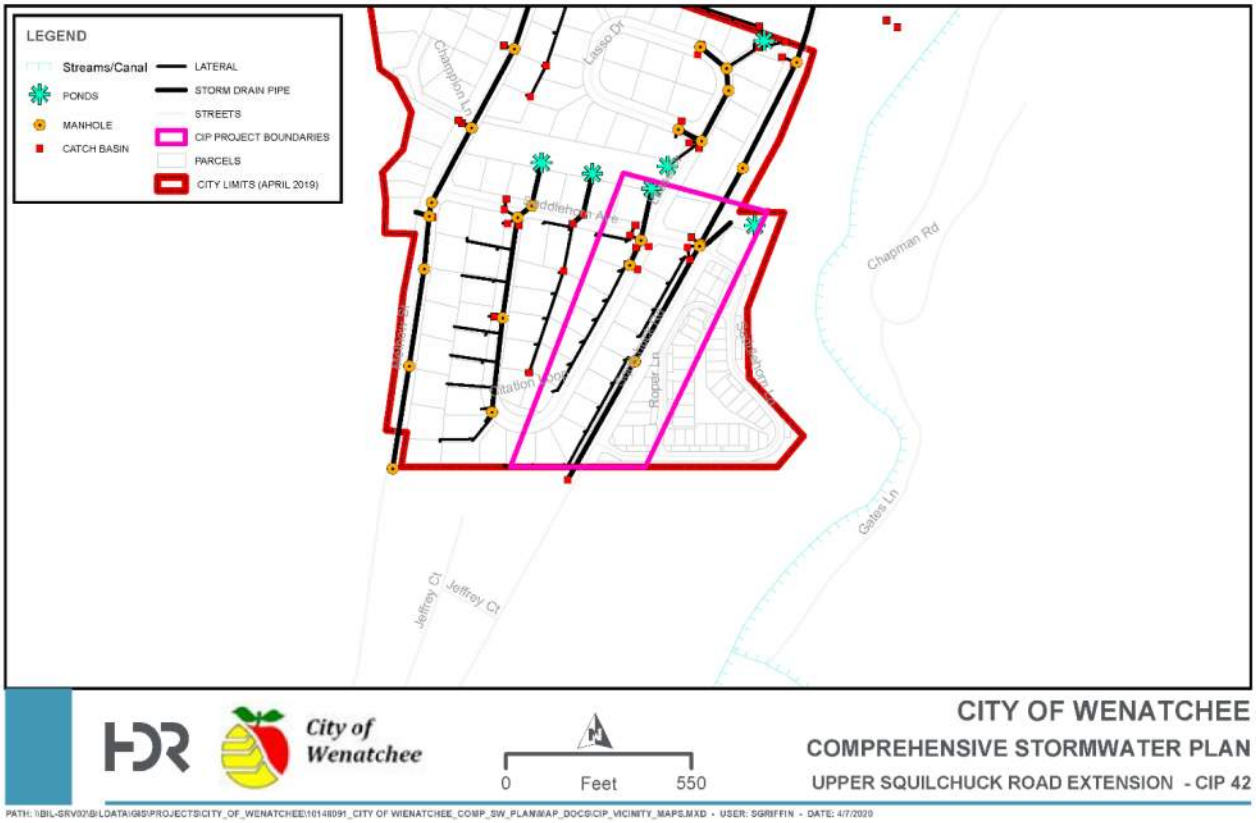
Engineers Estimate

NO.	*DESCRIPTION OF ITEM*	*UNIT*	*QUANTITY*	*UNIT PRICE*	*ESTIMATE*
DIVISION 1 -GENERAL REQUIREMENTS					
1	Mobilization	LS	1	$27,000	$27,000
2	Temporary Traffic Control	LS	1	$13,000	$13,000
3	Construction Signs Class A	LS	1	$3,000	$3,000
4	Record Drawings	LS	1	$5,000	$5,000
5	SPCC Plan	LS	1	$500	$500
DIVISION 2 -EARTHWORK					
6	Sawcutting Existing Asphalt	LF	1,000	$4	$4,000
7	Structure Excavation Class B Incl. Haul	CY	350	$10	$3,500
8	Select Borrow incl. Haul	TON	400	$10	$4,000
9	Removal of Structures and Obstructions	LS	1	$15,000	$15,000
DIVISION 4 -BASES					
10	Crushed Surfacing Top Course	TON	800	$55	$44,000
DIVISION 5 -SURFACE TREATMENTS AND PAVEMENTS					
11	HMA Cl. 1/2 In. PG 64-28	TON	270	$120	$32,400
DIVISION 7 -DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS					
12	Catch Basin Type 1	EA	6	$1,750	$10,500
13	Catch Basin Type 2 48 in. Diam.	EA	4	$7,000	$28,000
14	Corrugated Polyethylene Storm Sewer Pipe (CPSS) Pipe 12 in. Diam.	LF	974	$60	$58,440
15	Connecting to Existing System	EA	1	$2,500	$2,500
16	Shoring	LF	974	$5	$4,870
DIVISION 8 -MISC. CONSTRUCTION					
17	Erosion Control/SWPPP	LS	1	$750	$750
18	Permanent Signing	LS	1	$2,000	$2,000
19	Cement Conc. Traffic Curb and Gutter	LF	30	$20	$600
DIVISION 9 -MATERIALS					
20	Monument Case and Cover	EA	2	$2,100	$4,200
	Estimated Construction Subtotal				$263,260
	Sales Tax (8.4%)				None
	Contingency (25%)				$65,815
	Estimated Construction Total				$329,075
	Engineering /Cultural/Environmental (25%)				$82,269
				APPROXIMATE TOTAL	**$412,000**

6.3.16 Upper Squilchuck Road Extension

CIP number and name:	CIP 42 Upper Squilchuck Road Extension
Original CSWP number:	New 2020 Project
Problem description:	Erosion and maintenance access problem
Project solution:	Drainage improvements to convey flow over a steep slope. This project will provide a collection system and catch basins from Saddlehorn Lane to Saddlehorn Avenue along Squilchuck Road.
Project benefit:	Provides water quality benefits and improves local drainage
Estimated project cost 2019:	$150,000

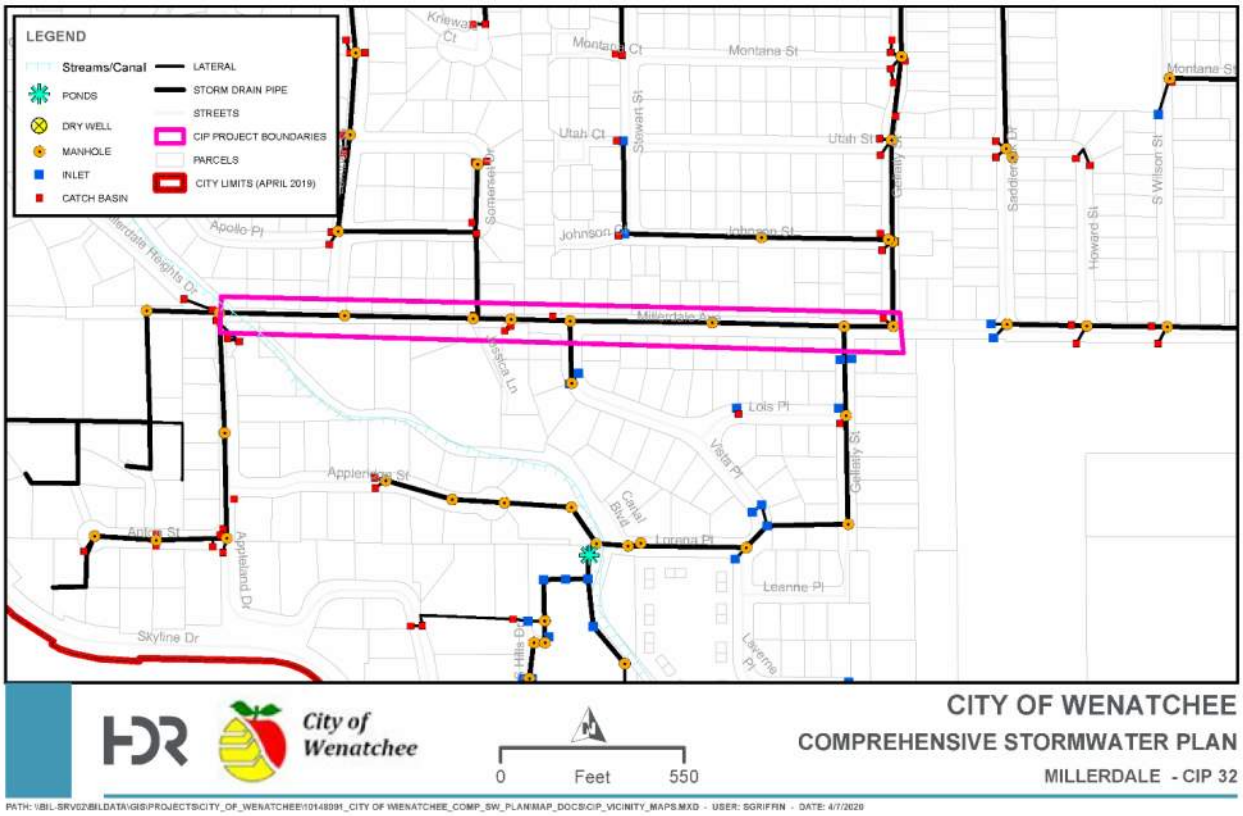
Note: City Engineer's cost estimate



6.3.17 Millerdale

Problem description:	Flooding issues—coordinate with road and water line improvements (Appleland to Miller)
Project solution:	Drainage improvements to Millerdale Street will include either new or parallel pipes. During the design phase, the structural condition of the existing pipes will need to be evaluated to determine which option to proceed with. If parallel pipes are chosen, they should be installed as overflow pipes to minimize clogging from sediments.
Project benefit:	Reduce the potential for groundwater seepage through roadway and sidewalks
Estimated project cost 2019:	$340,000

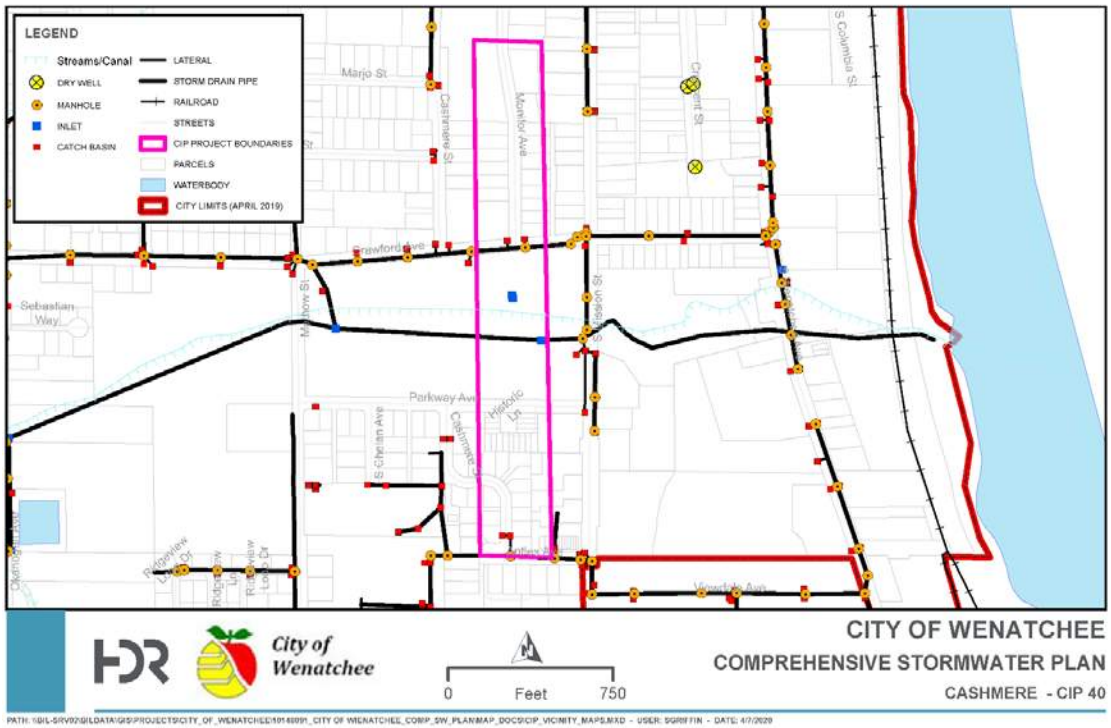
Note: Cost escalated from original plan to 2019-dollar values.



6.3.18 Cashmere Street Drainage Improvements

Problem description:	Drainage problem exists on residential cul-de-sac when runoff flows down street toward low-lying property.
Project solution:	Improvements include installation of new pipes in Monitor and Cashmere Streets to provide means for collection of runoff and prevent localized flooding on Crawford Street. This project consists of installing a new conveyance system or infiltration basin. Conduct alternatives analysis to establish the most cost-effective approach.
Project benefit:	Improved drainage, reduced flood risk, infrastructure renewal
Estimated project cost 2019:	$172,000

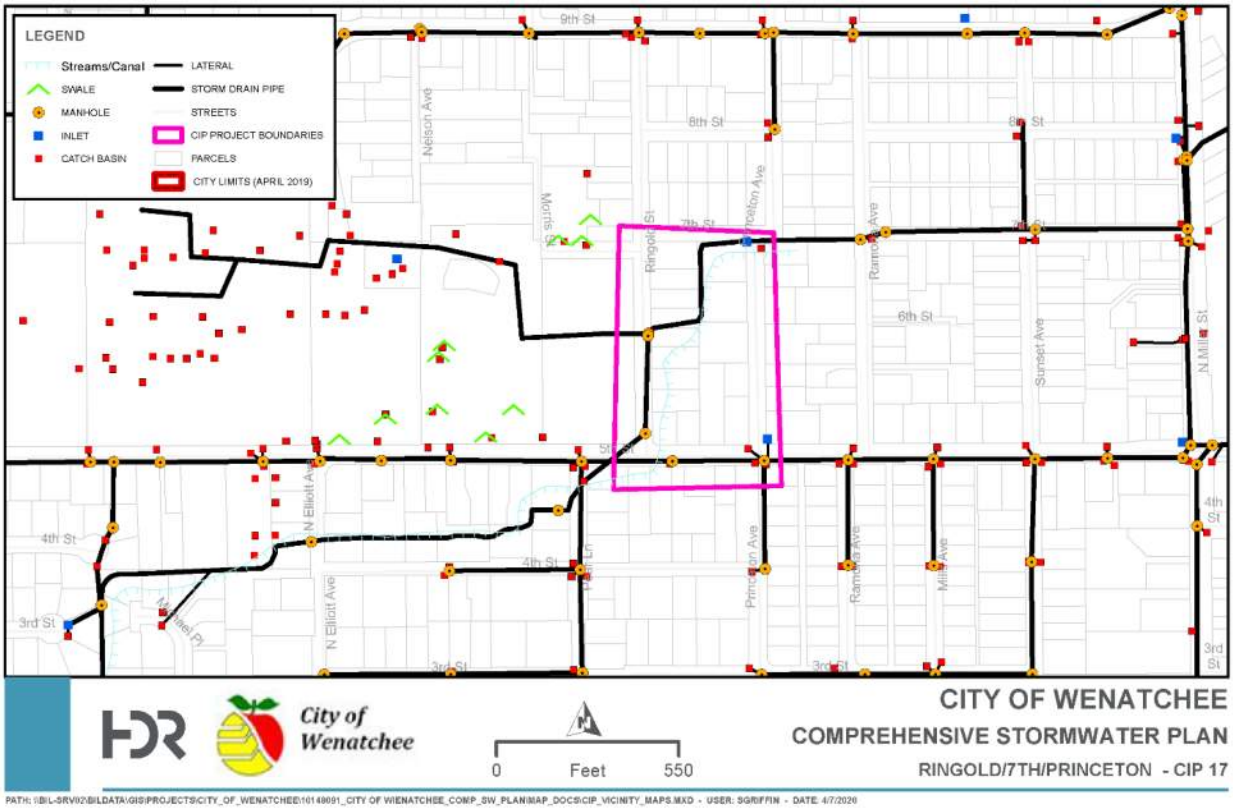
Note: Cost escalated from original plan to 2019-dollar values.



6.3.19 Ringold/Seventh/Princeton Street Drainage Improvements

Problem description:	All drainage from the college campus is routed to the canyon drainage system on Ringold Street.
Project solution:	Replace existing pipe or install parallel pipe to redirect drainage to the public conveyance system. In alternatives analysis phase, explore opportunities for on-site infiltration of runoff on the college campus and possible property purchase(s) for a stormwater runoff pond.
Project benefit:	Improved drainage, reduced flood risk, infrastructure renewal, disconnection from canyon drainage system
Estimated project cost 2019:	$628,000

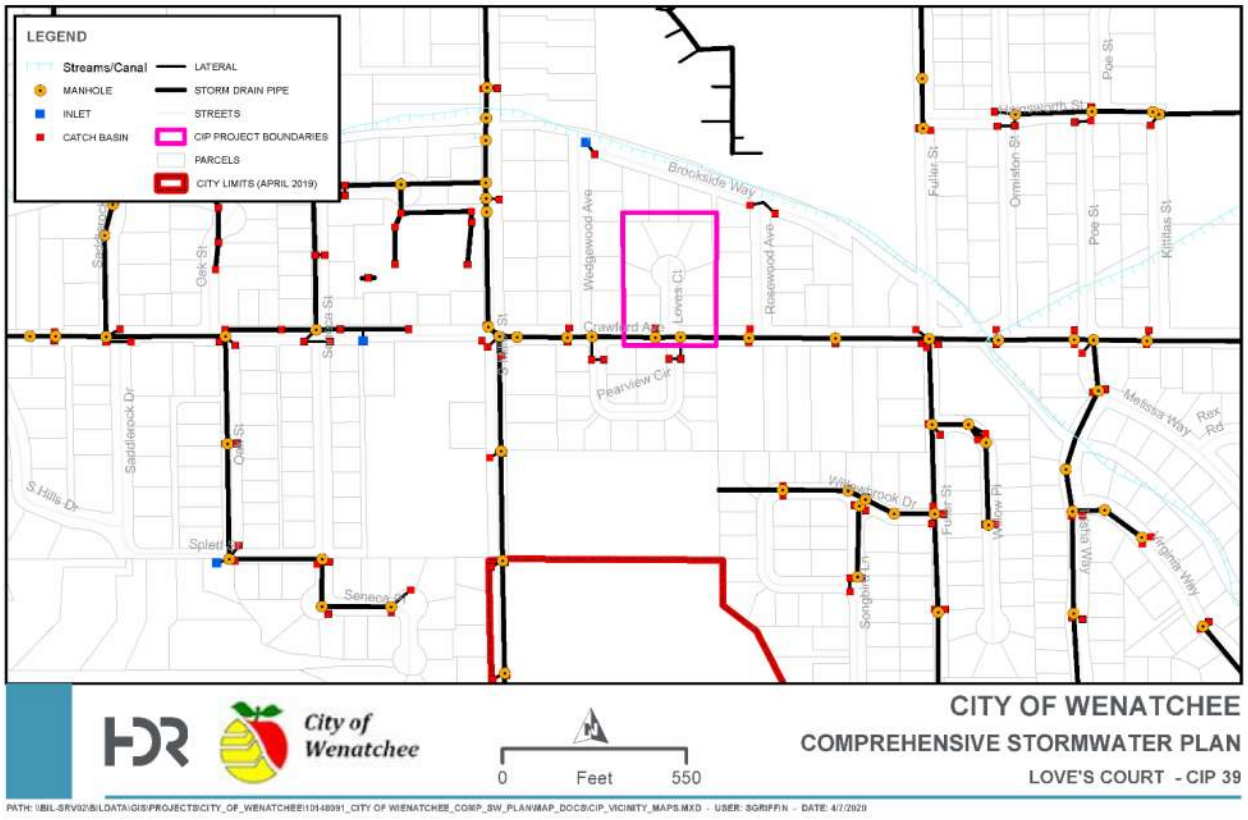
Note: Cost escalated from original plan to 2019-dollar values.



6.3.20 Loves Court Street Drainage Improvements

Problem description:	Storm inlets are connected to sewer system.
Project solution:	Improvements consist of installing a new conveyance system or infiltration basin. Conduct alternatives analysis to establish the most cost-effective approach.
Project benefit:	Improved drainage, reduced flood risk, remove connections to sewer system
Estimated project cost 2019:	$256,000

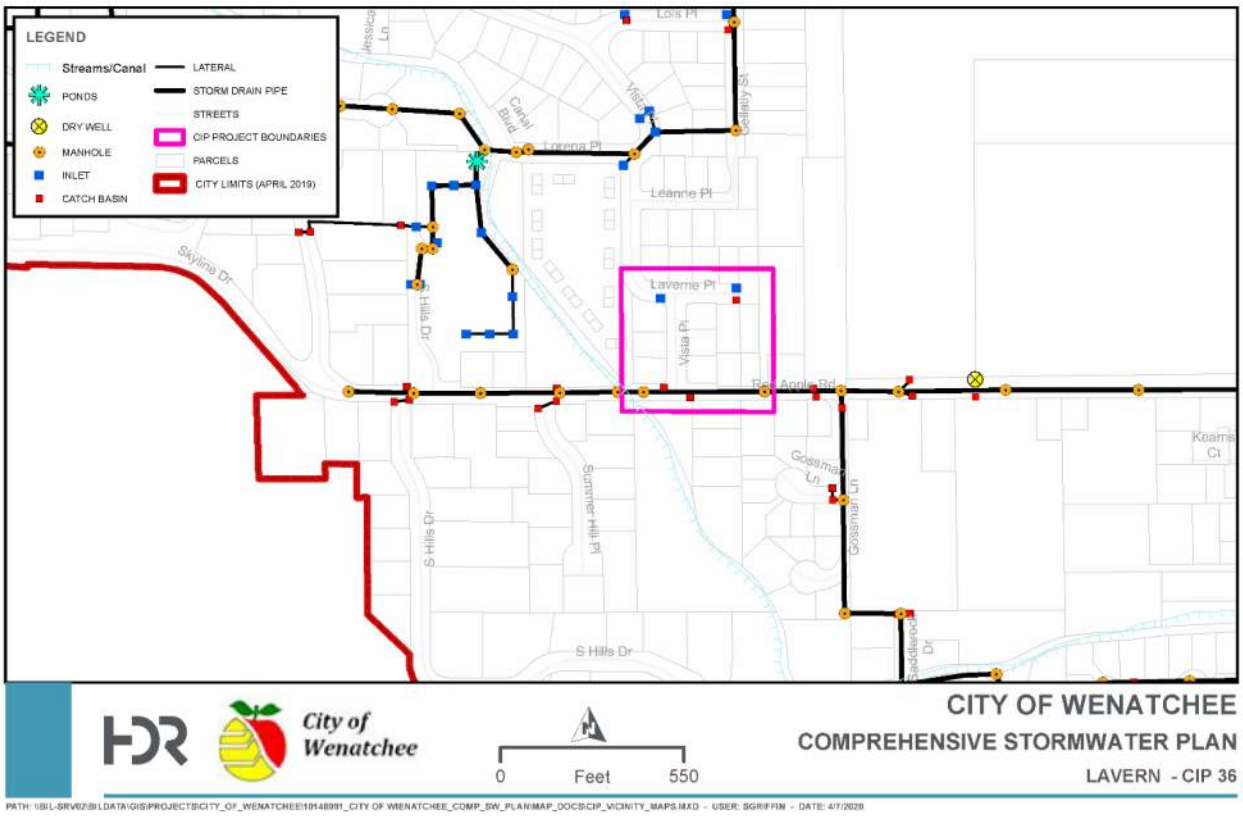
Note: Cost escalated from original plan to 2019-dollar values.



6.3.22 Lavern Place Drainage Improvements

Problem description:	Storm lines are connected to sanitary sewer.
Project solution:	Conduct alternatives analysis to establish the most cost-effective approach for disconnecting drainage lines from sanitary. Drainage improvements to provide a collection system and catch basins along Lavern Place through a utility easement to Red Apple Road.
Project benefit:	Improved drainage, reduced flood risk, remove connections to sewer system
Estimated project cost 2019:	$285,000

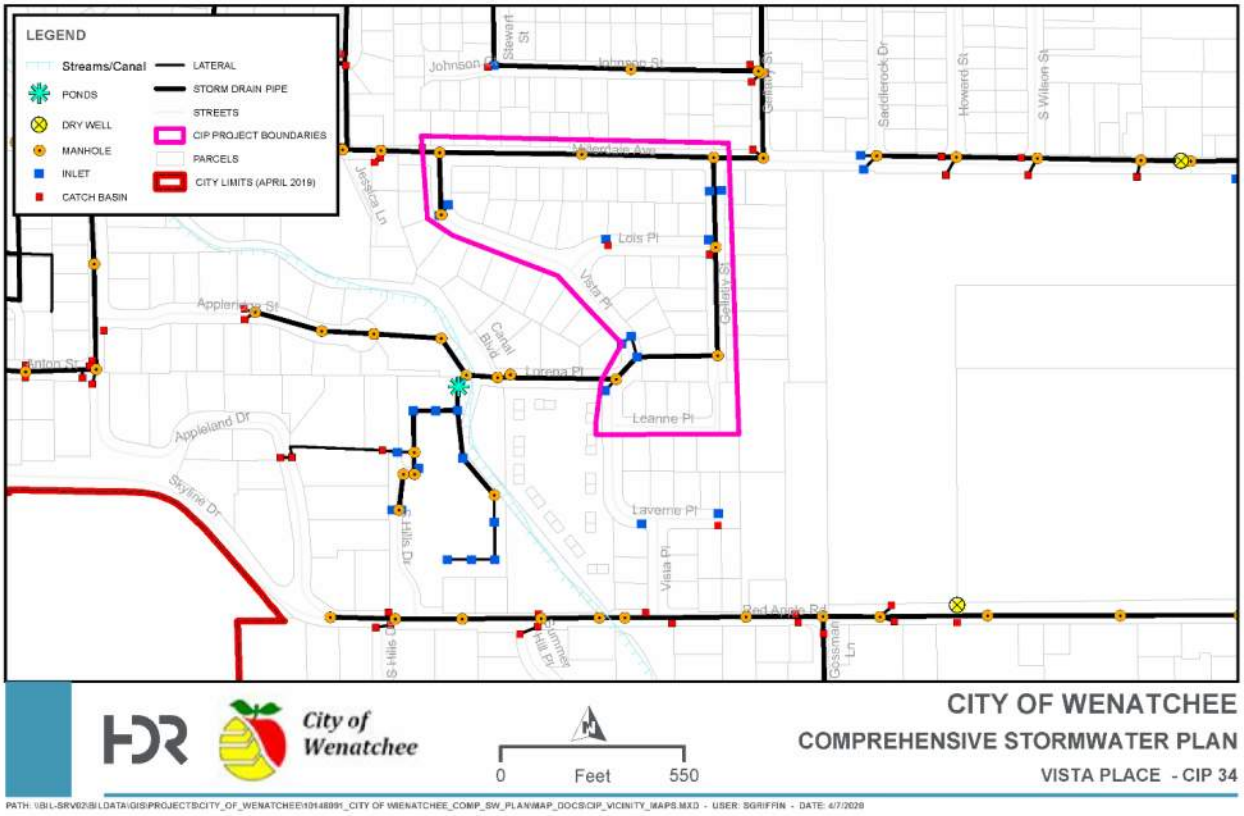
Note: Cost escalated from original plan to 2019-dollar values.



6.3.23 Vista Place Drainage Improvements

Problem description:	Storm lines are connected to sanitary sewer.
Project solution:	Conduct alternatives analysis to establish the most cost-effective approach for disconnecting drainage lines from sanitary. Drainage improvements to provide a collection system and catch basins along Vista Place, Leanne Place, Gellatly Street to Millerdale Avenue.
Project benefit:	Improved drainage, reduced flood risk, remove connections to sewer system
Estimated project cost 2019:	$285,000

Note: Cost escalated from original plan to 2019-dollar values.



7 Financial Program

The purpose of the financial program is to demonstrate the financial viability of the stormwater utility during the execution of the CIP identified in this CSWP. This analysis considers historical performance, the sufficiency of utility revenues to meet current and future cost and policy obligations, and the impact of executing the CIP. Furthermore, this chapter provides a review of the utility's current rate structure with respect to rate adequacy, equity, and customer affordability. Based on this review of the rate structure, FCS GROUP has made recommendations to improve equity. This financial chapter of the CSWP has been prepared by FCS GROUP, in coordination with HDR and City staff.

7.1 Historical Financial Condition

The 2014–2019 statements are summarized in Table 7-1 and Table 7-2. Noteworthy findings and trends are highlighted to demonstrate the performance and condition of the utility.

7.1.1 Statement of Revenues, Expenditures, and Changes in Fund Net Position

As shown in Table 7-1, from 2014 to 2019 stormwater utility sales increased by 29 percent ($550,000). This comprises 18 percent and 38 percent increases in residential and commercial/industrial revenue, respectively. Total operating expenses increased by 72 percent ($909,000). In total, the net position of the utility increased by 65 percent ($4.7 million) over the 5-year period.

The stormwater utility appears to be in a stable financial position during this period, given existing operating expenditures. In 2019 revenues were sufficient to cover operating expenditures, depreciation, and annual debt service. This historical review does not take into account whether the utility is saving enough for future capital projects identified in the CIP (see Appendix D), or able to comply with new Phase II Permit requirements.

Table 7-1. Statement of Revenues, Expenditures, and Changes in Fund Net Position

City of Wenatchee - Stormwater Income Statements (All figures in $)	2014	2015	2016	2017	2018	2019
OPERATING REVENUES						
Residential Utility Sales	827,436	882,600	904,001	933,487	957,582	976,427
Commercial/Industrial Utility Sales	1,049,073	1,124,433	1,153,753	1,394,769	1,396,924	1,450,713
Charges for Services	2,766	74	2,379	5,544	(1,893)	22,825
Miscellaneous	4,930	40	-	-	46	906
Total Operating Revenues	**1,884,205**	**2,007,147**	**2,060,133**	**2,333,800**	**2,352,659**	**2,450,871**
OPERATING EXPENSES						
Operations and Maintenance	1,113,828	1,120,074	1,219,465	1,300,244	1,276,999	1,888,682
Depreciation/Amortization	151,430	161,304	184,102	197,300	200,824	285,500
Total Operating Expenses	**1,265,258**	**1,281,378**	**1,403,567**	**1,497,544**	**1,477,823**	**2,174,182**
Operating Gain (Loss)	**618,947**	**725,769**	**656,566**	**836,256**	**874,836**	**276,689**
NON-OPERATING REVENUES (EXPENSES)						
Interest Income	3,762	11,297	20,718	30,825	76,623	143,506
Interest Expense & Related Charges	(131,685)	(127,774)	(121,826)	(117,274)	(111,094)	(111,160)
Capital Contributions	-	192,440	-	-	-	-
Amortization of Debt Issues	6,845	7,357	7,357	9,602	7,289	7,577
Grant Revenue	186,034	-	25,000	-	23,382	61,618
Non-Operating Revenues Net of Expense	**64,956**	**83,320**	**(68,751)**	**(76,847)**	**(3,800)**	**101,541**
Net Income Before Transfers	**683,903**	**809,089**	**587,815**	**759,409**	**871,036**	**378,230**
Transfers Out	(179,173)	(483,888)	(26,800)	(27,800)	(29,800)	(309,260)
Capital Contributions	-	-	620,320	-	84,800	-
Change in Net Position	**504,730**	**325,201**	**1,181,335**	**731,609**	**926,036**	**68,970**
Net Position January 1	**6,721,350**	**7,226,080**	**7,429,874**	**8,611,272**	**9,342,881**	**12,498,258**
Prior Period Adjustment	-	(121,407)	-	-	(115,276)	(627,766)
Net Position December 31	**7,226,080**	**7,429,874**	**8,611,209**	**9,342,881**	**10,153,641**	**11,939,462**

7.1.2 Statement of Net Position

As shown in Table 7-2, from 2014 to 2019 total utility assets have increased by 48 percent ($5.0 million) while liabilities have increased by 26 percent ($870,000), increasing the utility's total net position by 65 percent ($4.7 million). The utility's unrestricted net position has increased by $1.3 million during this same period. The following bullets provide additional insight into the performance of the utility over the 5 years from 2014 to 2019:

- In 2019 the regional decant facility was added to the stormwater fund and increased the January 1, 2019, position by approximately $2.34 million.
- Within current assets, cash and investments have increased by more than $2.46 million.
- Within noncurrent assets, net capital assets have increased by more than $3.75 million.
- Within noncurrent liabilities, total revenue bonds payable have decreased by nearly $1 million.

Table 7-2. Statement of Net Position

City of Wenatchee - Stormwater Statement of Net Position (All figures in $)	2014	2015	2016	2017	2018	2019
ASSETS						
Current Assets						
Cash & Cash Equivalents	1,562,394	2,178,852	2,771,322	1,951,745	2,060,226	2,340,930
Investments	-	-	-	-	-	1,684,389
Receivable (net)						
Accounts	136,926	144,934	147,174	214,712	188,082	171,219
Intergovernmental	33,715	2,410	735	439	-	24,851
Due from Other Funds	130,070	-	-	-	-	-
Restricted Cash	682,364	296,822	262,010	-	-	-
Total Current Assets	2,545,469	2,623,018	3,181,241	2,166,896	2,248,308	4,221,389
Noncurrent Assets						
Investments	-	-	250,317	1,794,505	2,020,353	-
Investments (At Fair Value)	248,920	249,903	-	-	-	-
Restricted Assets:						
Cash-Revenue Bond Debt Service	29,678	28,790	29,029	347,889	215,983	207,812
Investments	318,847	320,107	321,436	-	-	-
Capital Assets (Net)	7,378,820	7,434,669	7,861,733	7,866,771	8,421,435	11,135,989
Total Noncurrent Assets	7,976,265	8,033,469	8,462,515	10,009,165	10,657,771	11,343,801
Total Assets	10,521,734	10,656,487	11,643,756	12,176,061	12,906,079	15,565,190
DEFERRED OUTFLOWS OF RESOURCES						
Deferred Outflows Related to Asset Retirement	-	-	-	-	-	570,000
Deferred Outflows Related to Pensions	-	37,802	41,597	31,036	49,686	73,606
Total Deferred Outflows of Resources	-	37,802	41,597	31,036	49,686	643,606
LIABILITIES						
Current Liabilities						
Accounts Payable	5,123	9,551	23,101	32,312	39,482	149,636
Wages and Benefits Payable	-	-	44	1,221	-	-
Deposits Payable	-	-	-	-	19,155	32,770
Retainage Payable	-	-	-	-	-	-
Total Current Liabilities	5,123	9,551	23,145	33,533	58,637	182,406
Current Liabilities Payable from Restricted Assets						
Due to Other Governments	-	-	-	-	-	25,618
Accrued Interest Payable	10,682	10,178	9,807	9,301	8,780	12,781
Revenue Bonds Payable - Current	191,948	198,074	202,158	208,284	172,549	178,675
Total Current Liabilities Payable from Restricted Assets	202,630	208,252	211,965	217,585	181,329	217,074
Noncurrent Liabilities						
Due to Other Governments	-	-	-	-	-	461,118
Unamortized Debt Premium	121,896	114,540	107,183	97,581	90,292	82,715
Revenue Bonds Payable	2,966,005	2,767,931	2,565,773	2,357,489	2,184,940	2,006,265
Asset Retirement Obligations	-	-	-	-	-	1,000,000
Net Pension Liability	-	126,370	145,448	107,452	191,051	182,113
Compensated Absences	-	4,036	7,962	12,675	20,297	34,304
Total Noncurrent Liabilities	3,087,901	3,012,877	2,826,366	2,575,197	2,486,580	3,766,515
Total Liabilities	3,295,654	3,230,680	3,061,476	2,826,315	2,726,546	4,165,995
DEFERRED INFLOWS OF RESOURCES						
Deferred Inflows Related to Pensions	-	33,735	12,605	37,901	75,578	103,339
Total Deferred Inflow of Resources	-	33,735	12,605	37,901	75,578	103,339
NET POSITION						
Net Invested in Capital Assets	4,088,289	4,343,946	4,976,812	5,194,116	5,964,874	8,368,817
Restricted	1,030,889	645,719	612,475	347,889	215,983	207,812
Unrestricted	2,106,902	2,440,209	3,021,985	3,800,876	3,972,784	3,362,833
Total Net Position	**7,226,080**	**7,429,874**	**8,611,272**	**9,342,881**	**10,153,641**	**11,939,462**

7.1.3 Outstanding Debt Principal

The stormwater utility has about $2.2 million in outstanding revenue bond debt principal. The City has also drawn about $490,000 on a Public Works Trust Fund (PWTF) loan. City staff do not anticipate that repayment on the PWTF loan will begin until required in 2021. Table 7-3 outlines the outstanding debt for the stormwater utility at the end of 2019.

Table 7-3. Outstanding Debt Principal

Outstanding Debt Principal at Dec. 31, 2019		
Debt Description	Principal Outstanding	Maturity Year
2011 Revenue Bond	$ 2,184,940	2030
PC18-96103-019	$ 486,736	2040
Total	**$ 2,671,676**	

7.2 Types of Capital Funding Resources

This section describes the types of funding sources that can be used for capital costs identified in a CIP. Feasible long-term capital funding strategies should be defined to ensure that adequate resources are available to fund the CIP identified in this CSWP. In addition to the City's resources such as accumulated cash reserves and rate revenues earmarked for capital projects, capital needs can also be met from outside sources such as grants, low-interest loans, and other financing options. This section presents a summary of the following:

- Internal utility resources
- Government programs and resources
- Market debt financing

7.2.1 Internal Utility Resources

This section describes internal stormwater utility resources, including utility rates and cash reserves and system investments fees.

Utility Rates and Cash Reserves

Capital funding resources for a utility start with rate revenue. Utility rates are paid monthly or bimonthly by the utility's customers. This is the ultimate funding source for all utility activities, including the cost of operating and maintaining the system.

Rates can pay for capital improvement projects in two ways: either paying for debt service or through cash financing ("pay as you go"). Cash financing includes paying for capital projects in the same year that the rate revenue comes in, and it also includes building cash reserves or drawing down cash reserves previously accumulated from rate revenue.

Cash financing requires advance planning to mitigate the normal ups and downs of capital spending, but it avoids the interest expense from issuing debt. It is especially

useful for capital projects that are scalable and known in advance, such as repair and replacement projects.

System Investment Fees

System investment fees (SIFs) can have many other names: system development charges, general facilities charges, capital facilities charges, or just connection charges. All refer to a one-time charge imposed on new customers as a condition of connection to a utility system, designed to recover a proportionate share of the existing and planned capital cost of the system. For cities, SIFs are authorized in RCW 35.92.025. While the City's water and sewer utilities have SIFs, its stormwater utility does not.

7.2.2 Government Programs and Resources

Historically, federal and state grant programs were available to local utilities for capital funding assistance. However, these assistance programs have been mostly eliminated, substantially reduced in scope and amount, or replaced by loan programs. Remaining grant and loan programs are generally lightly funded and heavily subscribed. Nonetheless, the benefit of low-interest loans often makes the effort of applying worthwhile.

Appendix E to this chapter contains a document titled *Summary of Some Grant and Loan Programs for Drinking Water and Wastewater Projects; Updated 3-30-20.* This document, which is maintained by the State of Washington's Department of Commerce, contains details on government programs, eligibility requirements, and contact information, should the City wish to inquire about program offerings and eligibility requirements.

7.2.3 Market Debt Financing

This section describes market debt financing options, including General Obligation (G.O.) bonds and revenue bonds.

General Obligation Bonds

G.O. bonds are secured by the full faith and credit of the issuing agency, committing all available tax and revenue resources to debt repayment. With this high level of commitment, G.O. bonds have relatively low interest rates. However, the use of G.O. bond financing is limited in relation to assessed valuation.

RCW 39.36.020 states:

> (ii) Counties, cities, and towns are limited to an indebtedness amount not exceeding one and one-half percent of the value of the taxable property in such counties, cities, or towns without the assent of three-fifths of the voters therein voting at an election held for that purpose.
>
> (b) In cases requiring such assent counties, cities, towns, and public hospital districts are limited to a total indebtedness of two and one-half percent of the value of the taxable property therein.

If G.O. bonds are used for utility purposes, rate savings may be realized through two avenues: the lower interest rate and the extension of repayment obligation to all tax-paying properties (not just developed properties) through the authorization of an *ad valorem* property tax levy. However, the voter approval requirement means that this funding tool is not often used for utilities.

Revenue Bonds

Revenue bonds are commonly used to fund utility capital improvements. The debt is secured by the revenues of the issuing utility; the debt obligation does not extend to the City's other revenue sources. With this limited commitment, revenue bonds usually bear higher interest rates than G.O. bonds. They typically require the maintenance of a bond reserve and the achievement of minimum debt service coverage each year. The City agrees by ordinance to meet the applicable bond covenants as a condition of bond sale.

Revenue bonds can be issued in Washington without a public vote. There is no limit, except the practical limit of the utility's ability to generate revenue to repay the debt and meet coverage.

The City currently has one outstanding revenue bond related to the stormwater utility. This bond matures in 2030.

7.2.4 Capital Resource Funding Summary

An optimal funding strategy would include the use of grants when available and low-cost loans when debt is needed. However, these resources are limited and competitive in nature, and they are not a reliable source of funding for planning purposes. FCS GROUP recommends that the City pursue these funding sources but assume revenue bond financing to meet utility capital needs above projected cash resources.

The capital financing strategy used in this financial plan follows the general funding priorities listed below:

1. Available grant funds and/or developer contributions
2. Interest earnings on allocated fund balances
3. Planned rate-funded capital reinvestment or excess rate revenue above what is needed to maintain the policy minimum operating reserve balance
4. Accumulated capital cash reserves from prior years
5. Revenue bond financing

In this financial plan, the capital projects over the next 10 years are about 29 percent debt-financed and 71 percent cash-financed with rate revenues and accumulated reserves. Over the entire planning period (through 2038), the projected capital spending is 39 percent debt-financed and 61 percent cash-financed.

7.3 Financial Structure and Policies

This section presents the stormwater utility's finance structure and policies, including reserves and planned rate-funded capital reinvestment.

7.3.1 Reserves

Utility reserves serve two primary functions. Risk reserves provide a cushion against the cost of unexpected adverse events. In addition, planned capital reserves are a type of capital funding tool, used to minimize debt by saving up in advance for planned future capital costs. The reserve thresholds discussed in this section are for risk reserves. The City accounts for its stormwater finances in Fund 410: Storm Drain Utility.

Operating Reserve

An operating reserve is designed to provide a liquidity cushion; it protects a utility from the risk of short-term variation in the timing of revenue collection or payment of expenses. Like other types of reserves, operating reserves also serve another purpose: they help smooth rate increases over time. Target funding levels for an operating reserve are generally expressed as a certain number of days of O&M expenses, with the minimum requirement varying with the expected revenue volatility. Industry practice for utility operating reserves ranges from 30 days (8 percent) to 120 days (33 percent) of O&M expenses, with the lower end of the range more appropriate for utilities with stable revenue streams and the higher end more appropriate for utilities with significant seasonal or consumption-based fluctuations.

This financial plan incorporates a minimum operating reserve target of 30 days of O&M, with a maximum target of 45 days of O&M. Based on the 2020 budget, this minimum and maximum target is equivalent to about $185,000 to $275,000. In the annual forecast, if the operating fund balance would end the year above the maximum policy threshold, FCS GROUP assumes that the surplus is “swept” into the capital reserves.

Capital Contingency Reserve

A capital contingency is the minimum forecast balance in the capital fund. Most years in a forecast, the projected fund balance will be comfortably above the minimum, because of the planned capital reserves. However, it is important to have a basic level of cash available for unplanned capital needs, and that is the capital contingency. The unplanned capital need might be the unexpected failure of a key system asset, or it might be a shortfall in a capital revenue source, or it might be unexpected overruns in the implementation of the CIP. Either way, a capital contingency allows the City to complete the most timely capital improvements, or respond to an emergency, or stop a project at a logical point, so that past investment will not be wasted.

Industry practice for the capital contingency ranges from maintaining a balance equal to 1 or 2 percent of fixed assets, an amount equal to a multi-year rolling average of CIP costs, or an amount sufficient to fund the repair or replacement of a critical asset. The most common benchmark is 1 percent of the original cost of fixed assets, which is what is assumed in this financial plan. This is forecast to be approximately $120,000 as of the end of 2020 and builds to just over $265,000 by the end of the 10-year forecast in 2029. The minimum reserve increases as the City executes the CIP, thereby adding fixed assets to the utility.

Debt Reserve

Bond covenants typically include debt reserve requirements as a means of protecting bondholders against the risk of nonpayment or delayed payment. Some state loans also have a reserve requirement. Debt reserves are typically funded at the time of borrowing as part of the debt principal. When this forecast assumes a revenue bond issue, it also assumes a reserve amount equal to annual debt service. The City currently maintains debt reserves to meet the contractual requirements of its existing debt.

7.3.2 Planned Rate-Funded Capital Reinvestment

A planned rate-funded capital reinvestment policy can provide a steady stream of rate funding toward capital projects. A certain percentage of the City's capital expenditures in any given year are based on a foreseeable need—the deterioration and eventual replacement of existing assets. The purpose of setting aside funds from current rates for capital purposes is to minimize reliance on debt and ensure that there is enough money to at least keep up with known asset replacements. This type of policy is typically characterized as either a flat dollar amount per year or a certain percentage of annual depreciation.

Most of the capital projects in the stormwater utility CIP are repair and replacement in nature, and therefore are good candidates to cash-fund versus debt-fund. However, to execute the CIP in the time frame identified by the City and HDR, some debt funding is needed.

The proposed capital funding strategy takes into account operating and capital reserve minimums, existing cash reserves, debt service coverage achievement, and debt service load. These debt-related metrics are discussed in further detail below. Additionally, rates are set to create a stable but growing cash funding resource. By the end of the 10-year forecast, rate-funded system reinvestment is forecast to be nearly $1.2 million per year, which is roughly 75 percent of the average annual capital spending during the 10-year period. By 2038, rate-funded system reinvestment is forecast to be $2.0 million per year.

7.4 Debt Management

This section describes debt management, including debt service coverage and debt service load.

7.4.1 Debt Service Coverage

There are two forms of debt service coverage tests. One applies to debt service from revenue bonds only, and the other applies to debt service on total debt, including state loans. Revenue bonds typically have bond covenants specifying a minimum coverage requirement. State loans usually do not carry a minimum coverage requirement.

The minimum coverage for revenue bonds is typically 1.25. Recently, municipal bond advisors have indicated that bond buyers find a coverage of 2.0 or greater particularly strong. In this forecast, coverage of 2.0 is targeted over the 10-year study period and is achieved in all years except 2020 (1.27). The average coverage during this 10-year

period is 4.46 and is forecast to be 3.12 in 2029. During the latter half of the forecast, debt service coverage averages 3.34.

7.4.2 Debt Service Load

"Debt service load" compares annual debt service against annual rate revenues. Total debt service takes into account revenue bonds and state loans. To preserve future financial flexibility, FCS GROUP generally recommends that utilities not have annual debt service more than about one-third (33 percent) of annual rate revenues.

The City currently has an estimated debt service load of 13 percent for the stormwater utility. This percentage gradually decreases to 6 percent by 2027. Debt service load increases starting in 2028 as the utility begins to borrow for large capital projects, reaching a peak of 21 percent in 2036.

7.5 Capital Funding Strategy

A capital funding strategy assesses the resources available to fund the CIP and determines how much new debt financing will be required. The stormwater utility started 2020 with just over $4.2 million in cash and investments, of which $0.5 million is reserved to meet policy-based minimum reserves, which leaves $3.7 million available for capital projects.

In this CSWP, the total CIP from 2020 to 2038 is $30.6 million in 2019 dollars, or $46.3 million in inflated dollars. It is referred to as a "back-loaded" CIP because average spending is higher in the latter years of the forecast period. Average capital spending for the first 14 years (2020–2033) averages $1.7 million including inflation, while capital costs in the last 5 years average $4.45 million.

Table 7-4 shows the capital funding strategy for the City's stormwater utility. It shows that of the $46.3 million in escalated capital costs, $28.4 million is expected to be funded from rate revenues and existing reserves, while the remaining $17.9 million is expected to be funded through revenue bond proceeds. Before the uptick in capital spending starting in 2034, the CIP is forecast to be 32 percent debt-funded and 68 percent cash-funded.

Table 7-4. 2020–2038 Capital Funding Strategy

	Capital Projects		Capital Funding	
Year	Current $	Inflated $	Cash Funded	Debt Issues
2020	$ 550,000	$ 569,250	$ 569,250	$ -
2021	1,117,775	1,197,389	1,197,389	-
2022	1,312,975	1,455,719	1,455,719	-
2023	1,341,200	1,539,058	1,539,058	-
2024	1,296,510	1,539,847	1,539,847	-
2025	1,205,375	1,481,714	1,481,714	-
2026	1,080,065	1,374,144	1,374,144	-
2027	1,308,165	1,722,603	1,722,603	-
2028	1,322,933	1,803,022	-	4,500,000
2029	2,163,923	3,052,428	355,450	-
2030	1,797,423	2,624,184	2,624,184	-
2031	1,698,257	2,566,182	2,566,182	-
2032	1,060,667	1,658,836	-	6,700,000
2033	910,767	1,474,253	-	-
2034	3,024,800	5,067,595	1,500,684	-
2035	2,932,500	5,084,914	5,084,914	-
2036	2,150,333	3,859,151	-	6,700,000
2037	2,333,333	4,334,141	1,493,292	-
2038	2,026,667	3,896,269	3,896,269	-
Grand Total	**$ 30,633,668**	**$ 46,300,699**	**$ 28,400,699**	**$ 17,900,000**

7.6 Annual Financial Forecast

The annual cash flow forecast focuses on how much annual revenue the system needs to meet its financial obligations. The analysis incorporates operating revenue, O&M expenses, existing debt service, new debt service, and required reserves, and it tests the sufficiency of current rates. Revenue needs are also affected by revenue bond covenants and the fiscal policies of the utility.

For this analysis, FCS GROUP used two criteria for revenue sufficiency: (1) cash needs must be met, including minimum policy reserves, and (2) debt service coverage must be achieved, to ensure compliance with bond covenants. For the projected level of rate revenue to be sufficient, both tests must be met. If the revenue is insufficient, FCS GROUP tests higher levels of rates until both criteria are met. The forecast is based on the City's 2020 budgeted revenues and expenses, the capital funding strategy, and many assumptions. Following are key assumptions.

7.6.1 Revenue Assumptions

Below are revenue assumptions applied to the annual financial forecast:

- The citywide customer growth rate is assumed at 0.90 percent per year.
- Miscellaneous revenues are conservatively assumed to stay at budgeted levels.
- City utility tax revenue is assumed to proportionately increase with rate revenues.

- Interest earnings are assumed at 1.50 percent, based on recent historical Local Government Investment Pool (LGIP) rates.

7.6.2 Expenditures and Other Miscellaneous Assumptions

Below are expenditures and other miscellaneous assumptions applied to the annual financial forecast:

- General operating expenses are escalated from the 2020 budget figures at 2.5 percent per year, labor costs increase at 2.5 percent per year, and benefits increase at 8.0 percent per year.
- Taxes owed are calculated based on the following prevailing rates:
  - State business and operating tax: 1.75 percent
  - City utility tax: 16.00 percent
- Existing debt service schedules were provided by the City. Annual debt service is currently about $280,000 and will increase to about $310,000 in 2021 with the beginning of the PWTF repayments. These figures do not take into account new debt service associated with future capital funding.
- Budget realization factor: FCS GROUP assumes that the City will spend 90 percent of its operating budget. This budget realization assumption is informed by historical spending data provided by City staff.
- The operating expenditures contained in the 2020 budget were approximately $900,000 higher than the 2019 operating expenditure budget, partially due to new Phase II Permit requirements effective in August 2019. A high-level summary of some notable changes from 2019 to 2020 are shown below by budget category:
  - Administration:
    - Parks maintenance services (+$90,000 for stormwater facilities maintenance, mowing, decant disposal: recurring)
    - Professional services ($60,000 for the North Wenatchee Master Plan: one-time)
    - Staffing (+$155,000; recurring cost-of-living adjustments plus one-time 0.5 FTE GIS Technician and 0.25 FTE Development Review Engineer)
  - Operations:
    - Equipment repair and replacement (+$130,000: recurring)
    - Repair and maintenance ($122,000: roughly half is one-time)
    - Decant facility (+$118,000: recurring)
  - Squilchuck Outfall project (+$100,000: one-time City share)
  - Support for Street Tree Program (+$100,000 starting 2021: recurring)
  - General inflation above the City's 2019 operating budget (recurring)

- Gap analysis findings:
  - In addition to the increases in the 2020 operating budget, a gap analysis performed by HDR and refined by City staff indicates that the City should add three FTEs by 2023 to maintain Phase II Permit compliance and execute the stormwater CIP. The fully loaded cost per FTE is assumed to be roughly $130,000 per year, based on City staff's estimate of salary and benefits, plus the equipment and supplies needed to support each position.
- Deferred O&M expenses in 2020:
  - The City does not plan to implement a mid-year stormwater rate increase in 2020. To meet the required level of debt service coverage for 2020, the City will need to defer about $225,000 of O&M expenses from 2020 to 2021. This level of deferred O&M expenses is assumed in the forecast.

7.6.3 Financial Forecast through 2020–2038

Table 7-5 shows the results of the annual forecast through 2029. Table 7-6 shows the years 2030–2038. The forecast is based on operating revenues, expenditures, fiscal policies, and the capital funding strategy. The estimated beginning 2020 fund balances were used as the starting point. For the majority of the city outside of Olds Station, FCS GROUP recommends a "step-up" rate increase strategy, consisting of a monthly rate per equivalent residential unit (ERU) of $11.31 in 2021 (an increase of $3.29 over the current $8.02), followed by $12.96 in 2022 (a further increase of $1.65), and annual inflationary increases of 3.5 percent for 2022–2029. Additional rate design details are shown in Section 7.7.

Two rows in the table refer to rate revenues. The first shows rate revenues at existing rates plus customer growth, without rate increases. The second shows the added revenue expected to come from rate increases. The rate increases are projected to generate $2.5 million of annual new revenue by 2029.

Table 7-5. Financial Forecast, 2020–2029

Cash Flow Forecast	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Monthly Rate per ERU - Olds Station	$5.90	$8.37	$11.15	$13.11	$13.56	$14.04	$14.53	$15.04	$15.57	$16.11
Monthly Rate per ERU - Rest of City	$8.02	$11.31	$12.96	$13.11	$13.56	$14.04	$14.53	$15.04	$15.57	$16.11
Monthly Rate Increase ($) - Rest of City		$3.29	$1.65	$0.14	$0.46	$0.47	$0.49	$0.51	$0.53	$0.54
Operations										
Beginning Operating Reserve	$ 300,000	$ 254,415	$ 303,782	$ 295,116	$ 304,452	$ 333,749	$ 357,937	$ 383,991	$ 393,493	$ 406,140
Revenues at Existing Rates plus Growth	2,122,042	2,141,141	2,160,411	2,179,855	2,199,473	2,219,269	2,239,242	2,259,395	2,279,730	2,300,247
Revenue from Rate Increases	-	856,456	1,378,342	1,515,718	1,659,869	1,811,101	1,969,733	2,136,101	2,310,552	2,493,453
Other Revenue (incl. Utility Tax & Interest)	424,740	424,056	424,796	424,666	424,807	425,246	425,609	426,000	426,142	430,788
Operating & Maintenance	(2,244,918)	(2,481,400)	(2,404,313)	(2,472,233)	(2,709,999)	(2,906,334)	(3,117,812)	(3,195,041)	(3,297,790)	(3,405,465)
Existing Debt Service	(277,486)	(307,434)	(307,148)	(307,465)	(270,668)	(271,108)	(271,191)	(270,917)	(270,552)	(270,771)
New Debt Service	-	-	-	-	-	-	-	-	(297,083)	(297,083)
Resources for Capital	(69,964)	(583,451)	(1,260,755)	(1,331,206)	(1,274,185)	(1,253,986)	(1,219,526)	(1,346,036)	(1,138,352)	(1,237,916)
Ending Operating Reserve	**$ 254,415**	**$ 303,782**	**$ 295,116**	**$ 304,452**	**$ 333,749**	**$ 357,937**	**$ 383,991**	**$ 393,493**	**$ 406,140**	**$ 419,394**
Days of O&M	*41*	*45*	*45*	*45*	*45*	*45*	*45*	*45*	*45*	*45*
Capital										
Beginning Capital Reserve	$ 3,696,360	$ 3,252,519	$ 2,151,757	$ 1,989,070	$ 1,811,054	$ 1,572,558	$ 1,368,418	$ 1,234,326	$ 876,273	$ 3,924,747
Additions from Operating Reserve	69,964	583,451	1,260,755	1,331,206	1,274,185	1,253,986	1,219,526	1,346,036	1,138,352	1,237,916
Interest Earnings	55,445	48,788	32,276	29,836	27,166	23,588	20,526	18,515	13,144	58,871
Grant Contributions	-	-	-	-	-	-	-	-	-	-
New Debt Proceeds	-	-	-	-	-	-	-	-	3,700,000	-
Capital	(569,250)	(1,733,001)	(1,455,719)	(1,539,058)	(1,539,847)	(1,481,714)	(1,374,144)	(1,722,603)	(1,803,022)	(3,052,428)
Ending Capital Reserve	**$ 3,252,519**	**$ 2,151,757**	**$ 1,989,070**	**$ 1,811,054**	**$ 1,572,558**	**$ 1,368,418**	**$ 1,234,326**	**$ 876,273**	**$ 3,924,747**	**$ 2,169,106**
Minimum Target	*113,407*	*130,737*	*145,294*	*160,684*	*176,083*	*190,900*	*204,641*	*221,867*	*239,898*	*270,422*
Ending Cash Reserve Summary										
Operating Reserve	$ 254,415	$ 303,782	$ 295,116	$ 304,452	$ 333,749	$ 357,937	$ 383,991	$ 393,493	$ 406,140	$ 419,394
Capital Reserve	3,252,519	2,151,757	1,989,070	1,811,054	1,572,558	1,368,418	1,234,326	876,273	3,924,747	2,169,106
Restricted Debt Service	215,983	215,983	215,983	215,983	215,983	215,983	215,983	215,983	513,066	513,066
Combined Ending Reserves	**$ 3,722,916**	**$ 2,671,522**	**$ 2,500,168**	**$ 2,331,488**	**$ 2,122,289**	**$ 1,942,337**	**$ 1,834,300**	**$ 1,485,749**	**$ 4,843,953**	**$ 3,101,566**
Debt Service Coverage										
Bonded Debt	1.29	3.55	5.72	6.02	6.62	6.49	6.34	6.79	3.21	3.48
Total Debt	1.29	3.22	5.18	5.46	5.92	5.80	5.67	6.07	3.05	3.31

Table 7-6. Financial Forecast, 2030–2038

Cash Flow Forecast	2030	2031	2032	2033	2034	2035	2036	2037	2038
Monthly Rate per ERU - Olds Station	$16.84	$17.59	$18.38	$19.21	$20.08	$20.98	$21.92	$22.91	$23.94
Monthly Rate per ERU - Rest of City	$16.84	$17.59	$18.38	$19.21	$20.08	$20.98	$21.92	$22.91	$23.94
Monthly Rate Increase ($) - Rest of City	$0.72	$0.76	$0.79	$0.83	$0.86	$0.90	$0.94	$0.99	$1.03
Operations									
Beginning Operating Reserve	$ 419,394	$ 433,291	$ 447,991	$ 463,427	$ 479,646	$ 496,696	$ 514,630	$ 533,505	$ 553,380
Revenues at Existing Rates plus Growth	2,320,950	2,341,838	2,362,915	2,384,181	2,405,639	2,427,289	2,449,135	2,471,177	2,493,418
Revenue from Rate Increases	2,733,552	2,987,654	3,256,528	3,540,988	3,841,889	4,160,135	4,496,678	4,852,523	5,228,728
Other Revenue (incl. Utility Tax & Interest)	430,987	427,570	427,790	435,850	436,094	436,349	436,618	444,730	445,028
Operating & Maintenance	(3,519,344)	(3,638,863)	(3,764,370)	(3,896,237)	(4,034,866)	(4,180,683)	(4,334,148)	(4,495,752)	(4,666,023)
Existing Debt Service	(28,799)	(28,799)	(28,799)	(28,799)	(28,799)	(28,799)	(28,799)	(28,799)	(28,799)
New Debt Service	(297,083)	(297,083)	(818,986)	(818,986)	(818,986)	(818,986)	(1,340,889)	(1,340,889)	(1,340,889)
Resources for Capital	(1,626,365)	(1,777,616)	(1,419,642)	(1,600,778)	(1,783,920)	(1,977,372)	(1,659,721)	(1,883,114)	(2,110,521)
Ending Operating Reserve	**$ 433,291**	**$ 447,991**	**$ 463,427**	**$ 479,646**	**$ 496,696**	**$ 514,630**	**$ 533,505**	**$ 553,380**	**$ 574,322**
Days of O&M	*45*	*45*	*45*	*45*	*45*	*45*	*45*	*45*	*45*
Capital									
Beginning Capital Reserve	$ 2,169,106	$ 1,203,824	$ 433,315	$ 6,700,620	$ 6,927,654	$ 3,747,894	$ 696,569	$ 5,007,588	$ 2,631,675
Additions from Operating Reserve	1,626,365	1,777,616	1,419,642	1,600,778	1,783,920	1,977,372	1,659,721	1,883,114	2,110,521
Interest Earnings	32,537	18,057	6,500	100,509	103,915	56,218	10,449	75,114	39,475
Grant Contributions	-	-	-	-	-	-	-	-	-
New Debt Proceeds	-	-	6,500,000	-	-	-	6,500,000	-	-
Capital	(2,624,184)	(2,566,182)	(1,658,836)	(1,474,253)	(5,067,595)	(5,084,914)	(3,859,151)	(4,334,141)	(3,896,269)
Ending Capital Reserve	**$ 1,203,824**	**$ 433,315**	**$ 6,700,620**	**$ 6,927,654**	**$ 3,747,894**	**$ 696,569**	**$ 5,007,588**	**$ 2,631,675**	**$ 885,402**
Minimum Target	*296,664*	*322,326*	*338,914*	*353,656*	*404,332*	*455,182*	*493,773*	*537,114*	*576,077*
Ending Cash Reserve Summary									
Operating Reserve	$ 433,291	$ 447,991	$ 463,427	$ 479,646	$ 496,696	$ 514,630	$ 533,505	$ 553,380	$ 574,322
Capital Reserve	1,203,824	433,315	6,700,620	6,927,654	3,747,894	696,569	5,007,588	2,631,675	885,402
Restricted Debt Service	271,359	271,359	793,262	793,262	793,262	793,262	1,315,165	1,315,165	1,315,165
Combined Ending Reserves	**$ 1,908,474**	**$ 1,152,665**	**$ 7,957,309**	**$ 8,200,562**	**$ 5,037,852**	**$ 2,004,462**	**$ 6,856,258**	**$ 4,500,220**	**$ 2,774,889**
Debt Service Coverage									
Bonded Debt	6.73	7.19	2.80	3.13	3.36	3.54	2.28	2.50	2.64
Total Debt	6.13	6.56	2.70	3.03	3.25	3.42	2.23	2.44	2.59

As noted previously, the CIP is much higher in the final 5 years of the CSWP. To maintain a minimum debt service coverage of about 2.0 through the end of the forecast, annual increases of 4.50 percent are projected for 2030–2038.

The City should review actual revenue against projected revenue each year to ensure that rates remain adequate. Any significant changes should be incorporated into the financial plan and future rates should be adjusted as needed.

7.7 Rate Design/ERU Update

The City currently has two area-based stormwater rates. Upon the annexation of Olds Station, the City committed to grandfather favorable stormwater rates to Olds Station properties through the end of 2020. Customers located in Olds Station are charged $5.90 monthly per ERU as defined as 4,600 impervious square feet impervious. Customers in the rest of the city are charged $8.02 monthly per ERU, defined as 3,000 impervious square feet. To improve equity, FCS GROUP recommends that the City blend its ERU definition and charge a uniform rate per ERU, no matter the location of a parcel. Based on input from City staff and the City Council, this rate structure change is to be phased in over 3 years. The current Olds Station discount is 26 percent. The proposed rate structure maintains that discount in 2021, reduces it to 14 percent in 2022, and fully eliminates the Olds Station discount starting on January 1, 2023.

7.7.1 Updating the ERU Definition

To support a uniform ERU, HDR measured the impervious area on approximately 300 randomly selected single-family parcels. This sampling analysis found that the average single-family parcel in the sample contained 4,200 impervious square feet. Based on this finding, FCS GROUP recommends that the City definition for an ERU be updated to 4,200 impervious square feet and that it apply to both Olds Station and the rest of the city. Figure 7-1 shows the results of this sampling analysis.

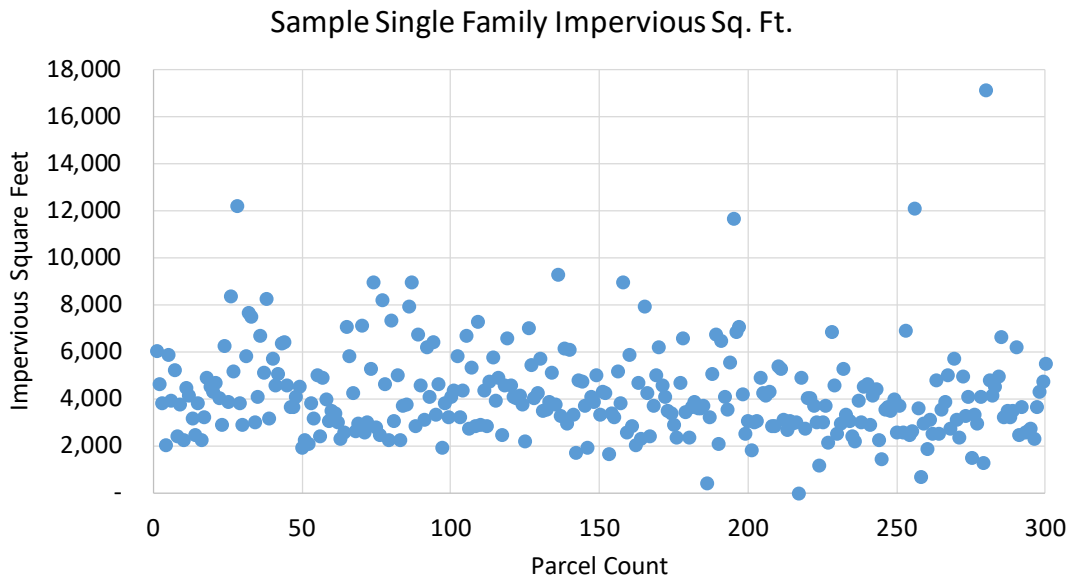


Figure 7-1. Impervious area for random sample of single-family parcels within city limits

7.7.2 City Audit of Commercial/Multifamily Impervious Area

As part of the rate design update, City staff reviewed the impervious area on commercial and multifamily parcels within the city. A significant amount of impervious area was previously not counted in the billing system. The City has been billing for about 33.6 million impervious square feet; after the audit, the City will now be billing for 58.2 million impervious square feet (564.7-acre increase in impervious area). Regardless of any changes to the citywide rate per ERU, this change could result in large increases for some commercial parcels because more impervious area would be charged.

7.7.3 Impact of Updated ERU Definition and Additional Impervious Area

Updating the ERU definition and billing for more impervious area both affect the rate per ERU. For most of the City's commercial stormwater customers, an ERU of 4,200 impervious square feet instead of 3,000 ft^2 reduces the number of ERUs per customer. For example, a commercial parcel with 12,000 impervious square feet would be charged for 4 ERUs with the existing ERU definition (3,000 ft^2/ERU) but only 2.9 ERUs with the new ERU definition (4,200 ft^2/ERU).

However, as the City discovered in the audit, many parcels have been charged for less impervious area than is present on a given parcel. Correcting this error adds more commercial ERUs.

These two changes tend to move the ERU rate in opposite directions. By itself, the updated ERU definition would result in fewer ERUs and therefore a higher rate per ERU. By itself, billing for more impervious area would result in more ERUs and therefore a lower rate per ERU.

As it turns out, combining those two changes has the net effect of reducing the ERU rate, all else being equal. For any given level of rate revenue required, the impact of the impervious area audit is more significant than the impact of the increased ERU definition.

Following are rates that generate the forecasted revenue requirement in Table 7-5:

- **Current rate design:** adopted 2020 rates
  - **Olds Station:** $5.90 monthly per ERU (4,600 impervious square feet)
  - **Rest of city:** $8.02 monthly per ERU (3,000 impervious square feet)
- **Proposed rate design:** January 1, 2021
  - **Olds Station:** $8.37 monthly per ERU (4,200 impervious square feet)
  - **Rest of city:** $11.31 monthly per ERU (4,200 impervious square feet)
- **Proposed rate design:** January 1, 2022
  - **Olds Station:** $11.15 monthly per ERU (4,200 impervious square feet)
  - **Rest of city:** $12.96 monthly per ERU (4,200 impervious square feet)
- **Proposed rate design:** January 1, 2023
  - **Olds Station:** $13.11 monthly per ERU (4,200 impervious square feet)

- **Rest of city:** $13.11 monthly per ERU (4,200 impervious square feet)

It is important to remember that the revenue requirement needs to increase to fund operating and capital needs for the stormwater system. However, because of changes to rate design and billing accuracy, the ERU rate increase will not need to be as steep as it would otherwise be.

Table 7-7 details the rates per ERU and forecasted revenue per year. The 2020 ERUs, assuming 4,200 impervious square feet per ERU, were provided by City staff and then an annual customer growth rate of 0.9 percent was used to forecast ERUs in future years. As noted previously, the Olds Station discount is reduced from 26 percent to 0 percent by 2023.

Table 7-7. ERU Rate Design

Rate per ERU Forecast	2020	2021	2022	2023
ERUs by Location*				
City Residential	9,009	9,090	9,172	9,254
City Commercial	10,065	10,155	10,247	10,339
Olds Station Commercial	3,801	3,836	3,870	3,905
Total	22,875	23,081	23,289	23,498
Monthly Rate per ERU				
City Residential	$8.02	$11.31	$12.96	$13.11
City Commercial	$8.02	$11.31	$12.96	$13.11
Olds Station Commercial	$5.90	$8.37	$11.15	$13.11
Olds Station Discount	26%	26%	14%	0%
Annual Revenue				
City Residential		$ 1,233,866	$ 1,426,878	$ 1,455,443
City Commercial		$ 1,378,469	$ 1,594,101	$ 1,626,014
Olds Station Commercial		$ 385,261	$ 517,775	$ 614,116
Total		$ 2,997,597	$ 3,538,753	$ 3,695,573

* Assuming 4,200 impervious square feet per ERU and 0.9% growth.

7.7.4 Projected Rate Schedule

Table 7-8 presents an ERU rate forecast.

Table 7-8. Monthly Rate Schedule (without City Utility Tax)

Rate Schedule	2021	2022	2023	2024	2025	2026	2027	2028	2029
Rate per ERU									
Olds Station	$8.37	$11.15	$13.11	$13.56	$14.04	$14.53	$15.04	$15.57	$16.11
Rest of City	$11.31	$12.96	$13.11	$13.56	$14.04	$14.53	$15.04	$15.57	$16.11
ERU = 4,200 impervious square feet									

A City utility tax of 16 percent is applied as a markup on customer bills. This tax is not included in the rates shown in Table 7-8**.**

7.8 Affordability and Sample Bills

The Washington State Department of Health and the State Public Works Board have historically used an affordability index to prioritize low-cost loan awards. If monthly bills are less than 1.5 percent of the median annual household income for an area, they are generally considered affordable.

The median household income for Wenatchee is estimated to be just over $54,000 in 2020 (U.S. Census Bureau 2018). This figure is based on a 2018 estimate from the U.S. Census Bureau, adjusted for 2 years of inflation. Median income is forecasted to include a 2.5 percent annual escalation factor.

Table 7-9 presents the average single-family bill with the projected annual rate increases for the forecast period, tested against the threshold. The City's rates—including the utility tax—are forecasted to remain well within the 1.5 percent affordability threshold.

Table 7-9. Affordability Test (with City Utility Tax)

Affordability Table				
Year	Inflation	Median HH Income	Projected Monthly Bill	% of Median HH Income
2020	2.50%	$54,171	$9.30	0.21%
2021	2.50%	$55,526	$13.12	0.28%
2022	2.50%	$56,914	$15.04	0.32%
2023	2.50%	$58,337	$15.20	0.31%
2024	2.50%	$59,795	$15.73	0.32%
2025	2.50%	$61,290	$16.29	0.32%
2026	2.50%	$62,822	$16.86	0.32%
2027	2.50%	$64,393	$17.45	0.33%
2028	2.50%	$66,002	$18.06	0.33%
2029	2.50%	$67,653	$18.69	0.33%

Median Household Income Data from Census Bureau;
2014-2018 American Community Survey 5-Year Estimates.

7.9 Comparison with Other Utilities

This section compares the City of Wenatchee stormwater utility rates to those of other utilities.

7.9.1 Rate Comparison

Figure 7-2 compares the City's single-family stormwater rate against those of other jurisdictions in eastern Washington. Some cities embed their city utility tax in their rates, while others (like Wenatchee) separately itemize the tax on customer bills above the stated rates. FCS GROUP does not have data on the billing practices of other cities, so there may or may not be a tax embedded in other utility rates. The City utility tax was excluded from the City of Wenatchee rates.

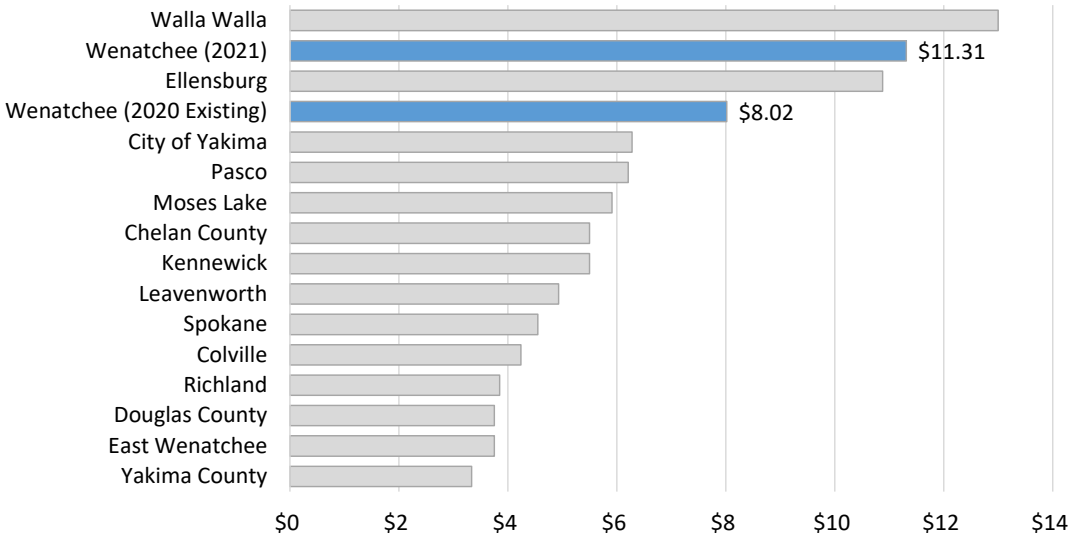


Figure 7-2. Rate comparison of single-family monthly stormwater 2020 rates

The City of Wenatchee's current monthly rate is lower than that of two utilities but higher than many others. However, each utility has unique population, development, topography, and assets.

7.9.2 Regional System Benchmarking

City staff conducted a survey of Wenatchee and three nearby stormwater utilities. The survey compares the number of ERUs, miles of pipe, and number of catch basins. In general, ERUs generate revenue while assets such as pipe and catch basins drive costs.

The results are shown in Table 7-10. For example, the city of Wenatchee has roughly twice as many ERUs as the city of East Wenatchee but more than four times as many miles of pipe and nearly three times as many catch basins. This affects the unit costs, which affects the rates.

Table 7-10. Regional System Benchmarking

Jurisdiction	ERUs	Miles of Pipe	# of Catchbasins
Chelan County	2,500	4.7	650
Douglas County	7,004	15.3	1,699
East Wenatchee	12,698	15.0	1200
Wenatchee	23,057	70.0	4,119

7.10 Conclusions

This conclusion section summarizes the findings of this financial analysis, including revenue requirement, rate design, and making updates to this analysis.

7.10.1 Revenue Requirement

The results of this analysis indicate that the ERU rates shown in Table 7-8 above will provide sufficient revenue to cover financial obligations through 2029. The additional revenue will support increased costs arising from permitting requirements and capital investment needs.

For the years 2030–2038, annual increases of 4.5 percent per year are needed to accommodate higher-than-average planned capital spending in the latter years of the study period. As that period of increased capital spending approaches, the City should reevaluate its capital resources and capital needs to determine if that level of capital could be spread over a longer period.

7.10.2 Rate Design

Updating the City's rate design simplifies the billing and improves equity between customer classes. A blended rate for all customers while defining an ERU as 4,200 impervious square feet aligns the new rate with findings from the random sample of single-family parcels. FCS GROUP recommends that the City adopt a 3-year phase-in as shown in Table 7-8 above. With this approach, by January 1, 2023, customers in Olds Station and customers in the rest of the city will be charged the same monthly rate per ERU.

Additionally, the City's audit of non-single-family parcels found approximately 24.6 million impervious square feet that were previously not being billed. Billing for this additional area ensures that individual customers are paying their fair share of system expenses. FCS GROUP recommends that the updated data from the billing audit be implemented on January 1, 2021.

7.10.3 Updating This Analysis

FCS GROUP recommends that the City periodically review the key underlying assumptions, revenues, and costs in the financial plan to ensure that adequate revenue is collected to meet total financial obligations.

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Appendix A. General Conditions

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GENERAL CONDITIONS

G1. DISCHARGE VIOLATIONS

All discharges and activities authorized by this Permit shall be consistent with the terms and conditions of this Permit.

G2. PROPER OPERATION AND MAINTENANCE

The Permittee shall, at all times, properly operate and maintain all facilities and systems of collection, treatment, and control (and related appurtenances) which are installed or used by the Permittee for pollution control to achieve compliance with the terms and conditions of this Permit.

G3. NOTIFICATION OF DISCHARGE INCLUDING SPILLS

If a Permittee has knowledge of a discharge, including spills, into or from a MS4 which could constitute a threat to human health, welfare, or the environment, the Permittee shall:

A. Take appropriate action to correct or minimize the threat to human health, welfare, and/or the environment.

B. Notify the Ecology regional office and other appropriate spill response authorities immediately, but in no case later than within 24 hours of obtaining that knowledge.

C. Immediately report spills or discharges of oils or hazardous substances to the Ecology regional office, and to the Washington Emergency Management Division at 1-800-258-5990.

G4. BYPASS PROHIBITED

The intentional bypass of stormwater from all or any portion of a stormwater treatment BMP, whenever the design capacity of the treatment BMP is not exceeded, is prohibited unless the following conditions are met:

A. Bypass is: (1) unavoidable to prevent loss of life, personal injury, or severe property damage; or (2) necessary to perform construction or maintenance-related activities essential to meet the requirements of the Clean Water Act (CWA); ***and***

B. There are no feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated stormwater, or maintenance during normal dry periods.

"Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass.

G5. RIGHT OF ENTRY

The Permittee shall allow an authorized representative of Ecology, upon the presentation of credentials and such other documents as may be required by law, at reasonable times:

A. To enter upon the Permittee's premises where a discharge is located or where any records shall be kept under the terms and conditions of this Permit.

B. To have access to, and copy at reasonable cost and at reasonable times, any records that shall be kept under the terms of the Permit.

C. To inspect, at reasonable times, any monitoring equipment or method of monitoring required in the Permit.

D. To inspect, at reasonable times, any collection, treatment, pollution management, or discharge facilities.

E. To sample, at reasonable times, any discharge of pollutants.

G6. DUTY TO MITIGATE

The Permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this Permit which has a reasonable likelihood of adversely affecting human health or the environment.

G7. PROPERTY RIGHTS

This Permit does not convey any property rights of any sort, or any exclusive privilege.

G8. COMPLIANCE WITH OTHER LAWS AND STATUTES

Nothing in this Permit will be construed as excusing the Permittee from compliance with any other applicable federal, state, or local statutes, ordinances, or regulations.

G9. MONITORING

A. ***Representative Sampling:*** Samples and measurements taken to meet the requirements of this Permit shall be representative of the volume and nature of the monitored discharge, including representative sampling of any unusual discharge or discharge condition, including bypasses, upsets, and maintenance-related conditions affecting effluent quality.

B. ***Records Retention:*** The Permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original recordings for continuous monitoring instrumentation, copies of all reports required by this Permit, and records of all data used to complete the application for this Permit, for a period of at least five years. This period of retention shall be extended during the course of any unresolved litigation regarding the discharge of pollutants by the Permittee or when requested by Ecology. On request, monitoring data and analysis shall be provided to Ecology.

C. ***Recording of Results:*** For each measurement or sample taken, the Permittee shall record the following information: (1) the date, exact place and time of sampling; (2) the individual who performed the sampling or measurement; (3) the dates the analyses were performed; (4) who performed the analyses; (5) the analytical techniques or methods used; and (6) the results of all analyses.

D. ***Test Procedures:*** All sampling and analytical methods used to meet the monitoring requirements specified in this Permit shall conform to the Guidelines Establishing Test Procedures for the Analysis of Pollutants contained in 40 CFR Part 136, unless otherwise specified in this Permit or approved in writing by Ecology.

E. ***Flow Measurement:*** Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated, and maintained to ensure that the accuracy of the measurements is consistent with the accepted industry standard for that type of device. Frequency of calibration shall be

in conformance with manufacturer's recommendations or at a minimum frequency of at least one calibration per year. Calibration records should be maintained for a minimum of three years.

F. ***Lab Accreditation:*** All monitoring data, except for flow, temperature, conductivity, pH, total residual chlorine, and other exceptions approved by Ecology, shall be prepared by a laboratory registered or accredited under the provisions of, Accreditation of Environmental Laboratories, Chapter 173-50 WAC. Soils and hazardous waste data are exempted from this requirement pending accreditation of laboratories for analysis of these media by Ecology. Quick methods of field detection of pollutants, including nutrients, surfactants, salinity, and other parameters, are exempted from this requirement when the purpose of the sampling is identification and removal of a suspected illicit discharge.

G. ***Additional Monitoring:*** Ecology may establish specific monitoring requirements in addition to those contained in this Permit by permit modification.

G10. REMOVED SUBSTANCES

With the exception of decant from street waste vehicles, the Permittee shall not allow collected screenings, grit, solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of stormwater to be re-suspended or reintroduced to the MS4 or to waters of the State. Decant from street waste vehicles resulting from cleaning stormwater facilities may be reintroduced only when other practical means are not available, and only in accordance with the *Street Waste Disposal Guidelines* in Appendix 6. Solids generated from maintenance of the MS4 may be reclaimed, recycled, or reused when allowed by local codes and ordinances. Soils that are identified as contaminated pursuant to Chapter 173-350 WAC shall be disposed at a qualified solid waste disposal facility (see Appendix 6).

G11. SEVERABILITY

The provisions of this Permit are severable, and if any provision of this Permit, or the application of any provision of this Permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this Permit will not be affected thereby.

G12. REVOCATION OF COVERAGE

The director may terminate coverage under this General Permit in accordance with Chapter 43.21B RCW and Chapter 173-226 WAC. Cases where coverage may be terminated include, but are not limited to, the following:

A. Violation of any term or condition of this General Permit.

B. Obtaining coverage under this General Permit by misrepresentation or failure to disclose fully all relevant facts.

C. A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

D. A determination that the permitted activity endangers human health or the environment, or contributes significantly to water quality standards violations.

E. Failure or refusal of the Permittee to allow entry, as required in RCW 90.48.090.

F. Nonpayment of permit fees assessed pursuant to RCW 90.48.465.

Revocation of coverage under this General Permit may be initiated by Ecology or requested by any interested person.

G13. TRANSFER OF COVERAGE

The director may require any discharger authorized by this General Permit to apply for and obtain an individual permit in accordance with Chapter 43.21B RCW and Chapter 173-226 WAC.

G14. GENERAL PERMIT MODIFICATION AND REVOCATION

This General Permit may be modified, revoked and reissued, or terminated in accordance with the provisions of WAC 173-226-230. Grounds for modification, revocation and re-issuance, or termination include, but are not limited to, the following:

A. A change occurs in the technology or practices for control or abatement of pollutants applicable to the category of dischargers covered under this General Permit;

B. Effluent limitation guidelines or standards are promulgated pursuant to the CWA or Chapter 90.48 RCW, for the category of dischargers covered under this General Permit;

C. A water quality management plan containing requirements applicable to the category of dischargers covered under this General Permit is approved;

D. Information is obtained which indicates that cumulative effects on the environment from dischargers covered under this General Permit are unacceptable; or

E. Changes made to State law reference this General Permit.

G15. REPORTING A CAUSE FOR MODIFICATION OR REVOCATION

A Permittee who knows or has reason to believe that any activity has occurred or will occur which would constitute cause for modification or revocation and re-issuance under General Condition G12 or G14, or 40 CFR 122.62 shall report such plans, or such information, to Ecology so that a decision can be made on whether action to modify, or revoke and reissue this Permit will be required. Ecology may then require submission of a new or amended application. Submission of such application does not relieve the Permittee of the duty to comply with this Permit until it is modified or reissued.

G16. APPEALS

A. The terms and conditions of this General Permit, as they apply to the appropriate class of dischargers, are subject to appeal within thirty days of issuance of this general permit, in accordance with Chapter 43.21B RCW and Chapter 173-226 WAC.

B. The terms and conditions of this General Permit, as they apply to an individual discharger, can be appealed in accordance with Chapter 43.21B RCW within thirty days of the effective date of coverage of that discharger. Consideration of an appeal of general permit coverage of an individual discharger is limited to the general permit's applicability or non-applicability to that individual discharger.

C. The appeal of general permit coverage of an individual discharger does not affect any other dischargers covered under this General Permit. If the terms and conditions of this General Permit are found to be inapplicable to any individual discharger(s), the matter will be remanded to Ecology for consideration of issuance of an individual permit or permits.

D. Modifications of this Permit can be appealed in accordance with Chapter 43.21B RCW and Chapter 173-226 WAC.

G17. PENALTIES

40 CFR 122.41(a)(2) and (3), 40 CFR 122.41(j)(5), and 40 CFR 122.41(k)(2) are hereby incorporated into this Permit by reference.

G18. DUTY TO REAPPLY

The Permittee shall apply for permit renewal at least 180 days prior to the specified expiration date of this Permit.

G19. CERTIFICATION AND SIGNATURE

All formal submittals to Ecology shall be signed and certified.

A. All permit applications shall be signed by either a principal executive officer or ranking elected official.

B. All formal submittals required by this Permit shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

1. The authorization is made in writing by a person described above and submitted to Ecology, ***and***
2. The authorization specifies either an individual or a position having responsibility for the overall development and implementation of the Stormwater Management Program. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)

C. Changes to authorization. If an authorization under General Condition G19.B.2 is no longer accurate because a different individual or position has responsibility for the overall development and implementation of the Stormwater Management Program, a new authorization satisfying the requirements of General Condition G19.B.2 shall be submitted to Ecology prior to or together with any reports, information, or applications to be signed by an authorized representative.

D. Certification. Any person signing a formal submittal under this Permit shall make the following certification:

"I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that Qualified Personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for willful violations."

G20. NON-COMPLIANCE NOTIFICATION

In the event it is unable to comply with any of the terms and conditions of this Permit, the Permittee shall:

A. Notify Ecology of the failure to comply with the permit terms and conditions in writing within 30 days of becoming aware that the non-compliance has occurred. The written notification shall include all of the following:

1. A description of the non-compliance, including dates.
2. Beginning and ending dates of the non-compliance and, if the non-compliance has not been corrected, the anticipated date of correction.
3. Steps taken or planned to reduce, eliminate, or prevent reoccurrence of the non-compliance.

B. Take appropriate action to stop or correct the condition of non-compliance.

G21. UPSETS

Permittees shall meet the conditions of 40 CFR 122.41(n) regarding "Upsets." The conditions are as follows:

A. ***Definition.*** "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

B. ***Effect of an upset.*** An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of paragraph (C) of this condition are met. Any determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, will not constitute final administrative action subject to judicial review.

C. ***Conditions necessary for demonstration of upset.*** A Permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed contemporaneous operating logs or other relevant evidence, that:

1. An upset occurred and that the Permittee can identify the cause(s) of the upset;
2. The permitted facility was at the time being properly operated;
3. The Permittee submitted notice of the upset as required in 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice of noncompliance); ***and***
4. The Permittee complied with any remedial measures required under 40 CFR 122.41(d) (Duty to Mitigate).

D. ***Burden of proof.*** In any enforcement proceeding, the Permittee seeking to establish the occurrence of an upset has the burden of proof.

Appendix B. Public Education and Outreach and Public Involvement and Participation

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Appendix B

Public Education and Outreach
And
Public Involvement and Participation

Wenatchee Valley Stormwater Program

Public Involvement, Education And Outreach Plan

Public Involvement, Education and Outreach Plan

The National Pollutant Discharge Elimination System (NPDES) Phase II permit program requires local governments to apply for a permit to discharge stormwater runoff from a municipal separate storm sewer system (MS4s). This program is a federal requirement developed under the Clean Water Act. The Washington State Department of Ecology (Ecology) is responsible for administering the NPDES program in this state. The program requires the development of local controls to reduce stormwater pollutant discharges to surface water. The Wenatchee Valley, including the cities of Wenatchee and East Wenatchee, Douglas County and Chelan County are now required to comply with the requirements of that program. Staff from the Cities and Counties have been working together in an effort to share the work load and ensure consistency in developing the local controls. The group was formalized with a memorandum of understanding and is referred to as the Wenatchee Valley Stormwater Technical Advisory Committee or WVSTAC.

As part of efforts to comply with the Eastern Washington Phase II Municipal Stormwater Permit issued by Ecology, the City of Wenatchee, City of East Wenatchee, Douglas County, and Chelan County have developed this public involvement, education and outreach plan ("Plan"). This Plan is an important element of the local and regional efforts to develop a stormwater management program (SWMP). The purpose of this plan is to outline the Cities' and Counties' public education and involvement process and actions to accomplish this important project. The Plan seeks to engage the public by providing information and by gathering public input through all stages of the development of the SWMP. Outreach will be focused on both the general public and targeted audiences of stakeholders.

The public involvement and participation part of this Plan has been developed to provide the public with the opportunity to participate in the development of the SWMP, while the public education and outreach component is designed to educate the public about stormwater and actions they can take to participate in this process and help combat stormwater problems.

1.0 Public Involvement and Participation Plan

The components of the regional public involvement and participation plan are described in this section. Pursuant to the NPDES Phase II permit, the program requires a process for obtaining and considering public comments on the SWMP, including required ordinances and regulatory mechanisms. The permit requires that the latest updated version of the SWMP plan be made available to the public no later than May 31 each year.

The SWMP public involvement plan has the following general public involvement goals:

- Build understanding of the program and credibility for the process leading to decisions
- Establish and maintain productive partnerships with citizens, agencies, and organizations that have stake in or have shown interest in the program
- Promote early involvement with stakeholders in identifying issues and opportunities
- Provide information to the public, businesses, and the media
- Maintain a record of public involvement in the decision making process

The public involvement and participation plan complies with applicable State, Tribal, and local public notice requirements for implementing a public involvement and participation program. The SWMP update process will include public involvement opportunities including public hearings and open houses, and establishment of a steering committee.

The following principles will guide public involvement throughout the SWMP development:

- All major public policy decisions or large implementation projects will affect many people.
- Good solutions can come from a variety of sources including professionals, elected officials, agencies, citizens, and community organizations.
- Even if a project or policy decision is sensible and beneficial, it must be arrived at properly and fairly, involving the community at all appropriate levels to be acceptable.
- People are much more willing to support a decision if the decision-making process is open, objective, and considers all viewpoints.
- Effective public notification and participation is essential to sound decision-making.
- Financial constraints should be reasonably considered in designing public participation programs.

1.1 Public Involvement Approach

The SWMP's public involvement goals will be met through a focus on working with the public to build consensus on the program elements and identifying solutions that meet the requirements of the permit and meet the needs of the region.

- **Steering Committee**: The WVSTAC will continue to organize the steering committee representing different community interests to provide comments and suggestions during program implementation. The members of the steering committee will be appointed by local elected officials. This steering committee will also provide input into ordinance revisions that will take place throughout the permit period. It is anticipated that members of the steering committee would represent the following interests/organizations:
    - Legislative body members or Planning Commission
    - Home Builders Association
    - Chamber of Commerce
    - Environmental organization
    - Land trust
    - Professional engineers
    - Developers/contractors
    - Citizens or local business (at large)
    - Recreation

  The WVSTAC will meet with the steering committee to discuss the updates to the SWMP planand to provide an opportunity for comments and suggestions. Exhibit 1 shows an organizational chart of the groups involved in the SWMP plan update and implementation process.

- **Public Open House**: An open house may be held to provide information to the public about the SWMP plan updates and as a mechanism to receive public comments.

- **Public Meetings:** Information regarding ordinance revisions and updates to the SWMP plan will be presented at public meetings such as city council meetings, planning commission meetings, city council workshops, and county commissioner meetings.

- **Public Hearings**: Public hearings will be held prior to the adoption of ordinances and revisions to ordinances required by the NPDES Phase II Permit.

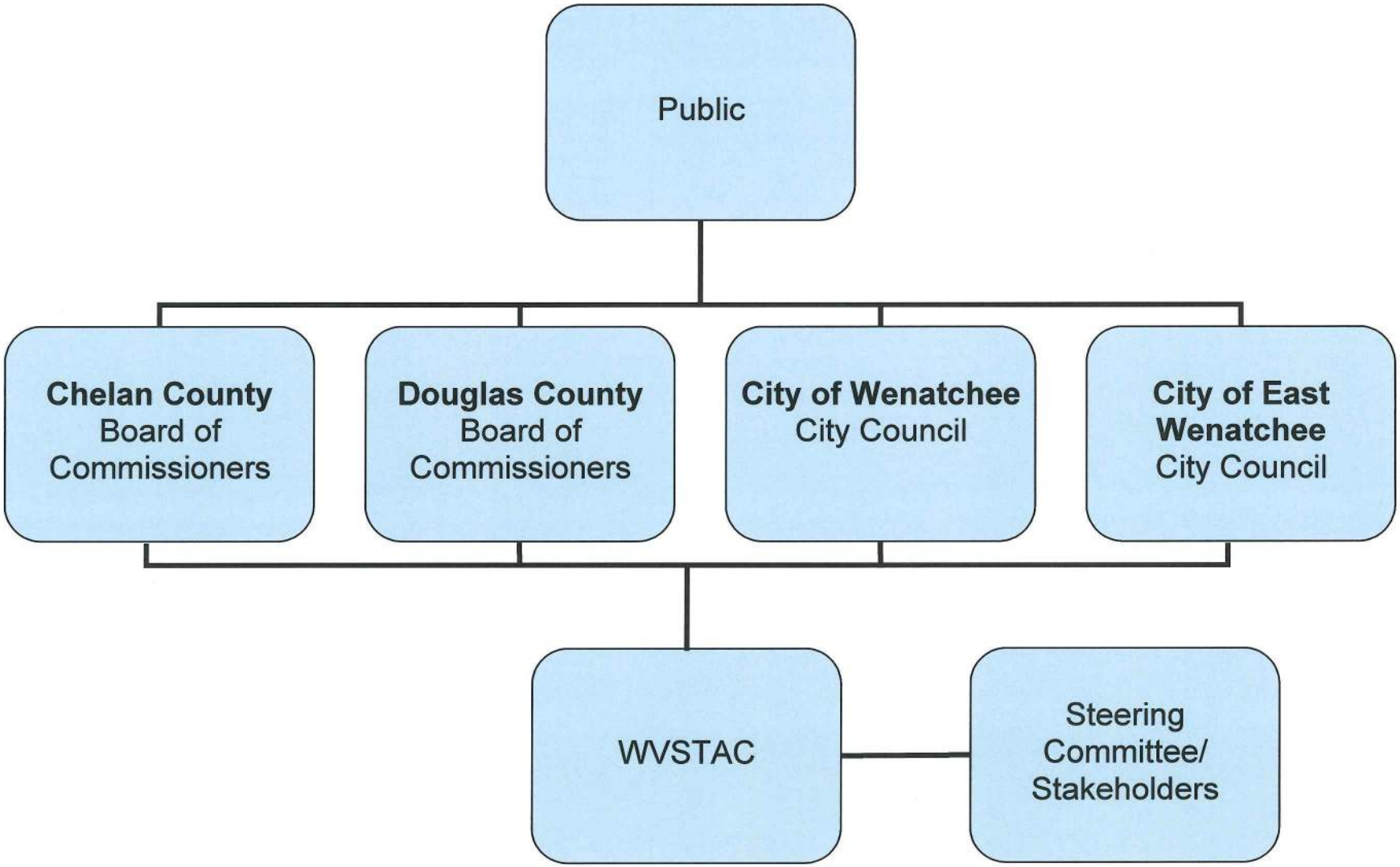
1.1.1 Public Notice

Public notice of open houses and public hearings will be made through local radio stations, printing newspaper notices (legal and feature articles), news releases, the jurisdiction websites, and other venues as established in existing policies and notification procedures and state and local regulations. Notices may also target specific population sectors, including minorities, low-income households, neighborhood and community groups, outdoor recreation groups, and business and industry groups, as appropriate. Notices will include the date, time, location, and purpose of the event.

1.1.2 Process for Consideration of Public Comments

The public will be able to provide comments on the SWMP plan and ordinances at open houses and public hearings, as well as in writing. . All public comments will be considered by the WVSTAC and decision makers throughout the process.

Exhibit 1
Stormwater Management Program Organizational Chart



1.1.3 Public Involvement Schedule

Exhibit 2 provides the schedule for implementation of the requirements in the Eastern Washington Phase II Municipal Stormwater Permit issued on August 1, 2012. The Cities and Counties will aim to complete the necessary public involvement opportunities for ordinance revisions and SWMP plan updates. . The NPDES Municipal permit requires that the updated SWMP be provided by May 31 every year thereafter throughout the duration of the permit. The process for the annual review and update will consist of an evaluation of the effectiveness of the program in addition to opportunities for public input:

- The WVSTAC will prepare an annual report to identify the successes of the SWMP in accordance with the permit requirements. The WVSTAC will present their findings and recommendations to the steering committee.
- The WVSTAC will present their recommendations and updates to their respective commissions and councils.
- Any proposed SWMP updates will be prepared and made available to the public through the website and at public meetings.
- The updates will be adopted by each jurisdiction.

2.0 Public Education and Outreach Plan

The objective of this public education plan is to develop and implement a public education and outreach program to distribute educational materials to the community or conduct equivalent outreach activities on the impacts of stormwater discharges to water bodies, and the steps the public can take to reduce pollutants in stormwater. Outreach and educational efforts include a multimedia approach and are targeted to specific audiences for increased effectiveness.

2.1 Components of the Public Education and Outreach Program

The components of the regional public outreach and education program are described in this section. The program will include:

- Information for the general public, including school-age children about the importance of improving water quality and protecting beneficial uses of waters of the State; potential impacts from stormwater discharges; methods for avoiding, minimizing, reducing and/or eliminating the adverse impacts of stormwater discharges; and actions individuals can take to improve water quality, including encouraging participation in local stewardship activities and programs.
- Information for businesses and the general public about preventing illicit discharges, including 1) what constitutes illicit discharges, 2) the impacts from illicit discharges, and 3) the proper management and disposal of waste. Targeted business education should include topics appropriate to the type of business, such as the use and storage of automotive chemicals, hazardous cleaning supplies, carwash soap and other hazardous materials.
- Information for engineers, construction contractors, developers, development review staff, municipal maintenance personnel, and land use planners about technical standards, development of stormwater site plans and erosion control plans, low impact development (LIDE) when it becomes available and stormwater best management practices for reducing adverse impacts from stormwater runoff during construction.

Exhibit 2

Eastern Washington Phase II Municipal Stormwater Permit Implementation Timeline (2014

The first Eastern Washington Phase II Municipal Stormwater Permit was issued on January 17, 2007 and modified on June 17, 2009. This permit was re-issued without changes in 2012 and will expire on Ju 31, 2014. The second Eastern Washington Permit was issued on August 1, 2012 and will be effective August 1, 2014. The new permit will expire on July 31, 2019. This implementation schedule shows the deadlines for implementing the new requirements in the second permit.

Program Component	August 1, 2014	March 31, 2016	June 30, 2016	June 30, 2017	August 1, 2017	December 31, 2017	March 31, 2018	December 31, 2018
Stormwater Management Program (SWMP)	Update SWMP to include planned activities for the upcoming year (S5.A.3)	Written description of internal coordination mechanisms (S5.A.5.b)						
Public Education & Outreach/ Public Involvement & Participation	Update Public Education Outreach & Involvement Plan (S5.B.1 & 2)							
Illicit Discharge Detection & Elimination	Update IDDE Code, Program & Procedures (S5.B.3)							Field Assessments of 40% of the MS4 (Average of 12% of the MS4 assessed each year after 2018) (S5.B.3.c.iii)
Construction Stie Storwmater Runoff Control/Post-Construction Stormwater Management for New Development and Redevelopment						Update Construction/Post-Construction Code, Program & Procedures (S5.B.4 & 5)	Summary of Criteria Defining Low Impact Development Infeasibility (S5.B.5.b.2)	
Municipal Operations & Maintenance					Update Operations & Maintenance Plan (S5.B.6.a.i)			Inspect all catch basins & inlets at least once. (Inspect every 2 years after 2018 unless otherwise documented) (S5.B.6.a.ii)
Monitoring & Assessment			Submit ranked list of SWMP Effectiveness Studies (S8.B.3)	Determine SWMP Effectiveness Study Lead & Submit Detailed Proposal (S8.B.4 & 5)		Submit Quality Assurance Project Plan for SWMP Effectiveness Study (S8.B.6)		

2.1.1 Identify and Characterize Target Audiences

The NPDES Phase II stormwater permit requires permittees to identify and provide outreach to target audiences. The WVSTAC has developed a list of target audiences, including residents, school-age children, public employees, businesses, industries, construction contractors, and developers. Each City and County will be responsible for communicating to their respective target audiences, except for shared contacts which will be contacted at the regional or semi-regional level to avoid duplicative efforts. The list of target audiences and topics can be found in Attachment A.

2.1.2 WVSTAC Website

The regional website to support public education and outreach efforts will be hosted and maintained by the City of Wenatchee. The website will provide a description of the SWMP, downloadable educational materials such as brochures, and schedule of upcoming program activities. Each City and County will have a link to the regional stormwater website on their individual websites, and will be responsible for maintaining these sites. Web address: www.wenatcheewa.gov/WVSTAC

2.1.3 Logo

The Cities and Counties will use the following logo on outreach and education materials:

2.1.4 Media Involvement

The media will be contacted with news stories about the development and implementation of the SWMP. Public access television and public service announcements may also be utilized, as appropriate.

2.1.5 Storm Drains

The Cities and Counties stencil or imprint "Drains to River" on new and replacement storm drain inlets draining to the Columbia River, as applicable. This practice will continue and may be expanded as necessary to meet the timeline below.

2.1.6 Educational and Outreach Materials

The Cities and Counties will prepare educational and outreach materials to distribute to target audiences that will accomplish two main goals:

- Educate the public about general stormwater issues
- Educate the public about illicit discharges and best management practices that can prevent them
- Educate the public about what they can do to help reduce stormwater runoff and reduce water pollution

2.1.6.1 General Stormwater Educational and Outreach Materials

Education and outreach materials related to personal stewardship are targeted to all affected Bi-County residents. The intent is to provide the public and businesses with general stormwater information and best management practices that can be implemented to lessen impacts on stormwater. All of the educational materials will be developed regionally and semi-regionally. Materials will be posted on the regional website and also distributed as hard copies, as appropriate. Some educational and outreach materials will also be made available in Spanish, including the general information brochure, construction brochure, and illicit discharge brochures.

General Information/Frequently Asked Questions Brochures
Target Audience: All adults
Content of Message: Explanation of what stormwater is, why stormwater can be a problem, practices that can protect water quality, and practices that should be avoided.
Delivery Mechanism(s): The brochures will be available at City and County offices, at appropriate public events, and as a billing insert. Brochures may also be mailed to customers or available at public events as funding permits.

Stormwater Education Brochure for Construction Sites
Target Audience: Construction contractors and developers
Content of Message: Storm drains discharge to water bodies, stormwater treatment requirements prior to discharge, control of stormwater runoff from construction sites, explanation of the impacts to surface water from stormwater, understanding of stormwater drainage in the regional area.
Delivery Mechanism(s): The brochure will be available on the website and a through the following departments:

- Douglas County Transportation and Land Services Department
- City of East Wenatchee Community Development Department
- Chelan County Community Development Department
- City of Wenatchee Community Development Department

Map of the Coverage Area
Target Audience: All adults
Content of Message: A map showing the Eastern Washington Phase II permit coverage area
Delivery Mechanism(s): In addition to the regional website, the map will be available at City and County offices and appropriate public events.

Stormwater Education Programs for School-age Children
As an optional program element, the WVSTAC may participate in local events for school-age children, such as Expanding Your Horizons and Kids in the Creek. The WVSTAC may also provide educational materials to schools with funding constraints.
Target Audience: Students, Grades K-12
Content of Message: Explanation of what stormwater is, why stormwater can be a problem, practices that can protect water quality, and practices that should be avoided.
Delivery Mechanism(s): Options for curriculum include an updated "Kids in the Creek" curriculum that was previously used in area schools, an interactive presentation, and EPA Water Sourcebooks. Field trips may be planned to view stormwater systems, drainages, and outfalls (if accessible). Posters showing the link between homes, stormwater runoff, and water bodies may be provided to schools for display.

General Stormwater Display
Target Audience: Everyone

Content of Message: The display promotes the Wenatchee Valley Stormwater Program and website, why stormwater can be a problem, practices that can protect water quality, practices that should be avoided.
Delivery Mechanism(s): An Enviroscape watershed model, posters on stormwater pollution prevention, and a WVSTAC banner can be used at public events and meetings. The City of Wenatchee and Douglas County also have portable trade show booths for use at these events. Events may include the local home and garden show, public meetings, county fairs, stewardship events, and local youth programs such as Kids in the Creek and Expanding Your Horizons.

2.1.6.2 Illicit Discharge Education and Outreach Materials

Education and outreach materials related to illicit discharges will be available for all residents within the permit coverage area, and specific materials will be made to target homeowners and commercial businesses. The intent is to educate the public about illicit discharges and provide them with a mechanism to report such discharges. For more details on the target audiences and topics, please refer to Attachment A.

Best Management Practices for Illicit Discharges Brochures – Residential Activities
Target Audience: Adult community residents, particularly homeowners
Content of Message: What illicit discharges are, typical homeowner actions that result in illicit discharges, best management practices for illicit discharges, especially for washing cars and draining pools; and actions and precautions for those who live along drainage areas. The brochures will provide the regional call numbers for residents to report illicit discharges.
Delivery Mechanism(s): Brochure may b be distributed as a utility bill insert as well as at appropriate public events. Brochures will also be available at City and County offices. Direct mailings may also be used as funding permits.

Commercial Business Brochure addressing Illicit Discharges
Target Audience: Commercial businesses
Content of Message: What illicit discharges are, general best management practices for illicit discharges, and how to report discharges. Specific best management practices for commercial propertiesand industrial operations, will also be provided in the brochure.
Delivery Mechanism(s): Brochure will be delivered to businesses along with their renewal license information, and during site visits. The brochures will also be available at City and County offices.
Timeline:

Attachment A
Target Audiences & Topics

	Vehicle Washing	Material Storage	Solid Waste Management	Building & Sidewalk Washing	Landscape Maintenance	Wastewater Disposal	Chemical Storage & Disposal	Erosion & Sediment
Residential	X	X	X	X	X	X	X	
Restaurants			X	X	X	X		
Landscapers & Yard Maintenance		X	X		X		X	
Specialty Contractors: Plumbing, Electrical & Heating/Cooling	X	X	X				X	
Mobile Cleaning: auto, carpet, building	X		X	X		X	X	
Construction Services	X	X	X	X				X
Pool & Spa Installation & Maintenance					X	X	X	
Transportation: Freight, trucking, auto & RV sales, rentals and repair, car washes	X	X	X	X	X	X	X	

Stormwater Outreach & Educational Materials

Erosion & Sediment Management Control Flyer, Construction Services, 2007
Construction Stormwater Pollution Prevention, Construction Services, 2010
Post-Construction Stormwater Program Flyer, Construction Services, 2010
IDDE: Frequently Asked Questions About Vehicle Washing, Residential, 2010
Best Management Practices Flyer, Commercial, 2010
Winter Stormwater Pollution Prevention Brochure ("Snow Brochure"), Residential & Commercial, 2010
WA Waters Flyers, Residential (Boats, Lawn Maintenance, Dog Poop, Vehicle Washing), 2010
Lawn Watering, Residential, 2010
Stormwater Pollution Prevention for Restaurants (English & Spanish), Restaurants, 2010

Storm Drains: Do you know where the water (and any debris goes)?, Residential, 2011
Commercial Businesses: Stormwater Management & Pollution Prevention, 2011
Eastern Washington Erosion Prevention and Sediment Control Field Guide, Construction Services, 2011
4 C's Poster, Transportation, 2011
Dump Smart, Mobile Cleaning, 2011
Car Wash Kit Flyer, Residential & Commercial, 2012
Pool Brochure, Residential & Pool & Spa, Revised 2012
Dog Waste Receptacle Signs 2013
Dog Waste Management Brochures, Residential, 2013
Fall/Winter Stormwater Pollution Prevention Ad, 2014
Landscaping Best Management Practices, 2015
New Dog Owner Kits (Managing Pet Waste), 2015
Frequently Asked Questions About Vehicle Washing, 2015
Portable Toilet Handout, 2015

Appendix C. Gap Analysis Table

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Key	
Existing Requirement	This permit condition was present in the 2015 Phase II Permit.
New Requirement	This permit condition was not present in the 2015 Phase II Permit, and is new for the 2019 Phase II Permit.
Modified Requirements	The permit condition was present in the 2015 Phase II Permit, but was modified for the 2019 Phase II Permit.
☐	This permit condition was not found during gap analysis. See descriptions of **Gap** and **Recommendation** for further actions.
☑	This permit condition is met. No further action is required.

Abbreviations
AKART = all known, available, and reasonable methods of prevention, control and treatment BMP = best management practice CAD = computer-aided design Ecology = Washington State Department of Ecology EIM = Environmental Information Management GIS = geographic information system LID = low-impact development MEP =maximum extent practicable MS4 = municipal separate storm sewer system N/A = not applicable NPDES = National Pollutant Discharge Elimination System O&M = operations and maintenance Pg = page QAPP = Quality Assurance Project Plan SWMMEW = *Stormwater Management Manual for Eastern Washington* SWMP = Stormwater Management Program SWPPP = stormwater pollution prevention plan TMDL = total maximum daily load WQWeb =https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Water-quality-permits-guidance/WQWebPortal-guidance.

Permit Section	Compliance Date	Requirement Type		Description of Permit Condition
S1. Permit Coverage Areas and Permittees				
				This section describes the geographic area of Phase II Permit coverage, required Permittees, areas not covered under this Phase II Permit, and application requirements. No documentation is required.
S2. Authorized Discharges				
				This section describes the allowable discharges to surface waters and groundwaters covered under the MS4 permit for Eastern Washington. No documentation is required.
S3. Responsibilities of Permittees				
				This section describes the responsibilities of the Permittees to comply with the MS4 permit. No documentation is required.
S4. Compliance With Standards				
S4.F.3.d	Ongoing	Data Management	☑	This section describes if the City included with each Annual Report the results of any monitoring, assessment, or evaluation efforts conducted during the reporting period associated with an ongoing compliance issue. **(Existing Requirement)** **Citation:** 2019 MS4 Annual Report for Wenatchee City pg. 5.
S5. Stormwater Management Program For Cities, Towns, and Counties				
S5.A	Ongoing	Policy Development & Implementation	☑	This section describes how the Permittees have developed and implemented a SWMP during the Phase II Permit year. **(Modified Requirement)** **Citation:** 2019 Stormwater Management Program (SWMP) for Wenatchee Valley Stormwater Program

Permit Section	Compliance Date	Requirement Type	Description of Permit Condition
S5.A.3	Ongoing	Policy Development & Implementation	☑ This section describes if the Permittees will continue implementation of the existing SWMP until they implement the updated SWMP. **(Existing Requirement)** **Citation:** 2019 Stormwater Management Program (SWMP) for Wenatchee Valley Stormwater Program pg. 12
S5.A.4	March 31, each year	Documentation	Written documentation of the SWMP Plan. **(Existing Requirement)** ☑ a. Planned activities for each of the SWMP components included in S5.B.1 through S5.B.6. ☑ b. Any additional planned actions to meet the requirements of applicable TMDLs pursuant to S7 – Compliance with Total Maximum Daily Load Requirements. ☑ c. Any additional planned actions to meet the requirements of S8 – Monitoring and Assessment. **Citation:** Wenatchee Valley Stormwater Program, Appendix A 2019 Stormwater Management Plan
S5.A.5.a	Ongoing	Record Keeping	☑ This section describes the ongoing program for gathering, tracking, maintaining, and using information to evaluate SWMP development and implementation and Phase II Permit compliance, and to set priorities. **(Existing Requirement)** **Citation:** 2019 Stormwater Management Program (SWMP) for Wenatchee Valley Stormwater Program and SWMP expense tracking spreadsheet **Gap:** A combination of paper and electronic record keeping is used. The electronic records are in various programs and databases. **Recommendation:** Recommend the City evaluate options to consolidate data storage for easier access and move to electronic record-keeping methods.
S5.A.5.a.i	Ongoing	Record Keeping	☑ This section describes if the Permittee is tracking the number of inspections performed, follow-up actions as a result of inspections, official enforcement actions taken, and types of public education activities implemented as required for each SWMP component and if it is included in the Annual Report. **(Modified Requirement)** **Citation:** 2019 MS4 Annual Report for Wenatchee City and 2019 SWMP
S5.A.5.a.ii	Ongoing	Record Keeping	☑ This section describes if the Permittee tracks the estimated cost of development and implementation of each component of the SWMP as it may be required to provide to Ecology upon request. **(Existing Requirement)** **Citation:** 2019 MS4 Annual Report for Wenatchee City pg. 1
S5.A.6.a	Ongoing	Policy Development & Implementation	☑ This section describes coordination among entities covered under this Phase II Permit. The SWMP shall include coordination mechanisms to encourage coordinated stormwater-related policies, programs, and projects within adjoining or shared areas. **(Existing Requirement)** **Citation:** 2019 MS4 Annual Report for Wenatchee City
S5.A.6.a.i	Ongoing	Policy Development & Implementation	☑ This section describes the coordination mechanisms to clarify roles and responsibilities for the control of pollutants between physically interconnected MS4s covered by a municipal stormwater permit. **(Existing Requirement)** **Citation:** 2019 MS4 Annual Report for Wenatchee City
S5.A.6.a.ii	Ongoing	Policy Development & Implementation	☑ This section describes coordinating stormwater management activities for shared water bodies or watersheds among Permittees, to avoid conflicting plans, policies, and regulations. **Citation:** 2019 Stormwater Management Program (SWMP) for Wenatchee Valley Stormwater Program

Permit Section	Compliance Date	Requirement Type	Description of Permit Condition
S5.A.6.b	March 31, 2021	Documentation	☑ The SWMP shall also include coordination mechanisms among departments within each jurisdiction to eliminate barriers to compliance with the terms of this Phase II Permit. Permittees shall include a written description of internal coordination mechanisms in the Annual Report due no later than March 31, 2021. **(Existing Requirement)** **Citation**: 2019 Stormwater Management Program (SWMP) for Wenatchee Valley Stormwater Program
S5.B Public Education & Outreach (E&O)			
S5.B	Ongoing	Documentation	☑ This section describes the components that the SWMP shall include. **(Existing Requirement)** **Citation:** 2019 Stormwater Management Program (SWMP) for Wenatchee Valley Stormwater Program, Appendix B
S5.B.1	Ongoing	Training	☑ This section describes the public education and outreach program to educate target audiences about the impacts of stormwater discharges to bodies of water. **(Modified Requirement)** **Citation:** 2019 Stormwater Management Program (SWMP) for Wenatchee Valley Stormwater Program
S5.B.1.a	Ongoing	Training	This section describes the implementation of public education and outreach programs. **(Modified Requirement)** ☑ i. Inform the general public about the criteria described in Sections S5.B.1.a.i.a through S5.B.1.a.i.d ☑ ii. Inform the businesses and the general public about the criteria described in Sections S5.B.1.a.ii.a through S5.B.1.a.ii.e ☑ iii. Inform engineers, contractors, developers, and land use planners about the criteria described in Sections S5.B.1.a.iii.a through S5.B.1.a.iii.e **Citation:** 2019 Wenatchee Valley Stormwater Management Program Plan
S5.B.1.b	December 23, 2021	Data Management	☑ This section describes how the Permittee shall measure the understanding and adoption of the targeted behaviors no later than December 31, 2021, and how they evaluate the changes in the adopted behaviors. **(New Requirement)** **Citation:** 2019 MS4 Annual Report for Wenatchee City
S5.B.2 Public Involvement and Participation			
S5.B.2	N/A	Policy Development & Implementation	This section describes how the Permittees shall provide ongoing opportunities for public involvement and participation such as advisory panels, public hearings, watershed committees, participation in developing rate structures, or other similar activities. **(Existing Requirement)** ☑ a. The Permittee has implemented a program or policy directive to create opportunities for the public to provide input during the decision-making process. ☑ b. The Permittee has posted by May 31 each year the latest version of its Annual Report and SWMP Plan. **Citation:** 2019 MS4 Annual Report for Wenatchee City and https://www.wenatcheewa.gov/government/public-works/stormwater/wvstac
S5.B.3 Illicit Discharge Detection and Elimination			
S5.B.3	N/A	Policy Development & Implementation	☑ This section describes the program for the Permittee to implement and enforce a designed to prevent, detect, characterize, trace, and eliminate illicit connections and illicit discharges into the MS4. **(Existing Requirement)** **Citation:** 2019 Stormwater Management Program (SWMP) for Wenatchee Valley Stormwater Program pg. 6

Permit Section	Compliance Date	Requirement Type	Description of Permit Condition
S5.B.3.a	February 2, 2023	Record Keeping	This section describes how the Permittee shall continue to maintain and update a map of the MS4 program. **(Existing Requirement)** ☐ i. Show known outfalls and known discharge points ☑ ii. Receiving waters ☑ iii. Areas served by the MS4 that discharge to the ground ☑ iv. Permanent stormwater facilities owned or operated by the City ☑ v. Connections to the MS4 authorized or approved by the Permittee after August 1, 2019 ☐ vi. Connections from the MS4 to privately owned stormwater systems ☑ vii. Connections between the MS4 owned and operated by the Permittee and other entities ☑ viii. Upon request, Permittees shall provide maps and mapping information to Ecology or other entities ☐ ix. Mapping must be done with GIS, CAD, or other software with fully described mapping standards. **Citation:** 2019 Stormwater Management Program (SWMP) for Wenatchee Valley Stormwater Program and 2019 MS4 Annual Report for Wenatchee City **Gap:** Not all of the mapping requirements have been met and a description of the mapping standards is needed. **Recommendation:** The map will need to be updated by February 2, 2023, and mapping standards documented by August 1, 2021, to the meet the new requirements.
S5.B.3.b	Ongoing	Policy Development & Implementation	This section describes how the Permittee shall effectively prohibit, through ordinance or other regulatory mechanism, non-stormwater discharges into the MS4. **(Existing Requirement)** ☑ i. Implement ordinance or other regulatory mechanisms that prohibit illicit discharges and enforcement actions including on private property ☑ ii. Allowable discharges include (a) diverted stream flows, (b) rising groundwater, (c) uncontaminated groundwater infiltration, (d) uncontaminated pumped groundwater, (e) foundation drains, (f) air conditioning condensation, (g) irrigation water from agriculture, (h) springs, (i) uncontaminated water from crawl space pumps, (j) footing drains, (k) flows from riparian habitats and wetlands, (l) discharges from emergency firefighting activities, (m) non-stormwater discharges authorized by another NDPES permit or state discharge permit ☑ iii. Conditionally allowable discharges including (a) potable water sources, (b) lawn and irrigation runoff, (c) dechlorinated pool, spa, and hot tub discharges, (d) street and sidewalk wash water, and (e) other non-stormwater discharges in compliance with the pollution prevention plan ☑ iv. The ordinance or regulatory mechanism addresses any category discharge. ☑ v. The ordinance has an escalating regulatory enforcement procedure and action. ☑ vi. There is a compliance strategy that includes informal actions as well as enforcement provisions: (a) application of operational or structural source BMPs for pollution generating sources and (b) maintenance of stormwater facilities with discharges into the MS4 boundary. ☑ vii. Ordinance or other regulatory mechanism in effect shall be revised as necessary to meet the requirement no later than February 2, 2023. **Citation:** 2019 Stormwater Management Program (SWMP) for Wenatchee Valley Stormwater Program and 2019 MS4 Annual Report for Wenatchee City
S5.B.3.c	Ongoing	Policy Development & Implementation	This section describes how the Permittee shall implement an ongoing program designed to detect and identify illicit discharges and illicit connections into the Permittee's MS4. **(Existing Requirement)** ☑ i. Procedures for conducting investigations of the Permittee's MS4 including field screening to identify potential sources. ☑ ii. Procedures for locating priority areas most likely to contribute illicit discharges. ☑ iii. Field assessment activities including outfalls, discharge points, and facilities serving priority areas. ☑ iv. Compliance shall be achieved by assessing at least 12% of the Phase II Permit area each year to verify that criteria are met. ☑ v. Publicly listed hotline to report spills. ☑ vi. Provide adequate training for all municipal field staff. ☑ vii. Inform public employees, businesses, and the general public about the hazards associated with illicit discharges. **Citation:** https://www.wenatcheewa.gov/government/contact-us and 2019 Stormwater Management Program (SWMP) for Wenatchee Valley Stormwater Program and 2019 MS4 Annual Report for Wenatchee City

Permit Section	Compliance Date	Requirement Type	Description of Permit Condition
S5.B.3.d	Ongoing	Operations & Maintenance	This section describes the implementation of the ongoing program designed to address illicit discharges, including spills and illicit connections into the MS4. **(Existing Requirement)** ☑ i. Procedures for characterizing the nature of potential environmental threats posed by illicit discharges. ☑ ii. Procedures for tracing the source of illicit discharges. ☑ iii. Procedures for eliminating the discharge including notification of appropriate authorities. **Citation:** 2019 Stormwater Management Program (SWMP) for Wenatchee Valley Stormwater Program, Appendix C and 2019 MS4 Annual Report for Wenatchee City
S5.B.3.d.iv	N/A	N/A	This section describes the compliance with the provisions in (i), (ii), and (iii) above. **(Existing Requirement)** ☑ a. Immediately respond to all illicit discharges including spills. ☑ b. Investigate any complaints or reports of illicit discharges within 7 days. ☑ c. Initiate investigation of suspected illicit discharges within 21 days of any report to determine the source and the party responsible. ☑ d. Use the compliance strategy outlined in S5.B.3.b.vi to eliminate the illicit connection within 6 months. **Citation**: 2019 MS4 Annual Report for Wenatchee City
S5.B.3.e	Ongoing	Training	☑ This section states that Permittees shall provide training and follow-up training and document and maintain records of training for staff who are responsible for identification, investigation, termination, cleanup, and reporting of illicit discharges, including spills, and illicit connections to conduct these activities. **(Existing Requirement)** **Citation:** 2019 MS4 Annual Report for Wenatchee City
S5.B.3.f	Ongoing	Record Keeping	☑ This section states that Permittees shall track and maintain records of the activities conducted to meet the requirements of this section. **(Modified Requirement)** **Citation:** 2019 MS4 Annual Report for Wenatchee City
S5.B.4 Construction Site Stormwater Runoff Control			
S5.B.4	N/A	Policy Development & Implementation	☑ This section describes the program required to reduce pollutants in any stormwater runoff to the MS4 from construction activities that disturb 1 acre or more, and from construction projects of less than 1 acre that are part of a larger common plan of development or sale. **(Existing Requirement)** **Citation:** 2019 MS4 Annual Report for Wenatchee City
S5.B.4.a	December 31, 2022	Policy Development & Implementation	This section describes the minimum performance measures that shall implement an ordinance or other regulatory mechanism to require erosion and sediment controls, and other construction-phase stormwater pollution controls at new development and redevelopment projects. The ordinance or other regulatory mechanism shall include sanctions to ensure compliance. **(Modified Requirement)** ☑ i. The ordinance at a minimum shall apply to construction sites disturbing 1 acre or more or sites that are part of a larger common plan or development. ☑ ii. The ordinance or regulatory mechanism that requires construction operators to adhere to the requirements in Appendix 1, Core Element 2: (a) erosion control BMPs and construction waste, (b) document how the requirements or ordinances protect water quality including how BMPs were selected, the pollutant removal expected, the technical basis of these claims, and how the BMP will comply with applicable water quality standards. the ☑ iii. Include appropriate escalating enforcement procedures. ☑ iv. Enforcement strategy and provisions of the ordinance. ☑ v. Provisions for access by qualified personnel to inspect construction phase BMPs. **Citation:** 2019 MS4 Annual Report for Wenatchee City

Permit Section	Compliance Date	Requirement Type	Description of Permit Condition
S5.B.4.b	N/A	Policy Development & Implementation	☑ This section describes that the Permittees shall implement procedures for site plan review that incorporate consideration of potential water quality impacts. **(Modified Requirement)** i. Prior to clearing and construction, Permittees shall review Construction SWPPPs for, at a minimum, all construction sites that disturb 1 acre or more, or are less than 1 acre and that are part of a larger common plan and coordination with S5.B.5.c unless the Permittee chooses to allow the site to apply the "Erosivity Wavier." The Permittee shall investigate complaints about the sites that apply the "Erosivity Wavier." **Citation:** 2019 MS4 Annual Report for Wenatchee City
S5.B.4.c	Ongoing	Policy Development & Implementation	☑ This section describes implementation of procedures for site inspection and enforcement of construction stormwater pollution control measures. **(Existing Requirement)** i. All new construction sites that disturb 1 acre or more or part of a larger common plan or development: (a) prior to clearing and grading for construction if high potential for sediment transport, (b) during construction to verify proper installation and maintenance of required erosion and sediment controls, (c) compliance with this inspection requirement will be determined by maintaining records of the inspection program for all pertinent sites. **Citation:** 2019 MS4 Annual Report for Wenatchee City
S5.B.4.d	Ongoing	Training	☑ This section explains that each Permittee shall ensure that all staff whose primary job duties are implementing the program to control stormwater runoff from new development, redevelopment, and construction sites, including permitting, plan review, construction site inspections, and enforcement, are trained to conduct these activities with follow-up training and shall document and maintain records of the training provided and the staff trained. **(New Requirement)** **Citation:** 2019 MS4 Annual Report for Wenatchee City
S5.B.4.e	Ongoing	Training	☑ This section explains that Permittees shall provide information to construction site operators about training available on how to install and maintain effective erosion and sediment controls and how to comply with the requirements of Appendix 1 and apply the BMPs described in the SWMMEW. **(Existing Requirement)** **Citation:** 2019 MS4 Annual Report for Wenatchee City
S5.B.4.f	Ongoing	Record Keeping	This section describes the requirement to comply with these provisions and keep records of all projects disturbing 1 acre or more, and all projects of any size that are part of a common plan of development or sale that is 1 acre or more. **(New Requirement)** ☑ i. Record of site plan review, inspections, and enforcement actions, and other records. ☑ ii. Staff training records including dates, activities, course descriptions, and names and positions of staff. ☑ iii. Kept copies of information provided to construction site operators and information distributed to a large number of design professionals. ☑ iv. Records of "Erosivity Wavier." **Citation:** 2019 MS4 Annual Report for Wenatchee City, paper and electronic stormwater records, SmartGov permitting database, and 2019 Stormwater Management Program (SWMP) for Wenatchee Valley Stormwater Program, Appendix D and Appendix E
S5.B.5	N/A	Policy Development & Implementation	☑ This section describes the post-construction stormwater runoff to the MS4 from new development and redevelopment projects that disturb 1 acre or more, and from projects of less than 1 acre that are part of a larger common plan of development or sale. (**Modified Requirement)** a. By December 31, 2022, Permittees shall develop an ordinance or other regulatory mechanism that requires post-construction stormwater controls at new development and redevelopment projects to meet the requirements of S5.B.5.b.i-v **Citation:** 2019 MS4 Annual Report for Wenatchee City
S5.B.5.b	N/A	Policy Development & Implementation	☑ This section describes that at a minimum the ordinance or other enforceable mechanism shall include: i. New development and redevelopment sites. **Citation:** 2019 MS4 Annual Report for Wenatchee City

Permit Section	Compliance Date	Requirement Type	Description of Permit Condition
S5.B.5.b.ii	Ongoing	Policy Development & Implementation	This section describes the ordinance or other regulatory mechanism for project proponents and property owners to adhere to the minimum technical requirements in Appendix 1 including BMP selection, design, installation, operation, and maintenance standards necessary to protect water quality, reduce the discharge of pollutants to the MEP, and satisfy state AKART requirements. **(Existing Requirement)** ☑ a. Maintain natural drainages to the MEP with minimal disturbance, and allow non-structural preventive actions, LID, and minimal impervious surfaces. ☑ b. Requirements for project proponents and property owners to implement runoff treatment, flow control, and appropriate source control BMPs. Including (1) specific hydrologic method for calculating runoff volumes and flow rates, (2) retain runoff generated on site, and (3) may use definitions and requirements from the SWMMEW. ☑ c. Implement procedures for site plan review that consider water quality impacts prior to clearing or construction and shall be performed by qualified personnel. ☑ d. Site inspection and enforcement of post-construction stormwater control measures. **Citation:** 2019 MS4 Annual Report for Wenatchee City and 2019 Stormwater Management Program (SWMP) for Wenatchee Valley Stormwater Program, Appendix D and Appendix E
S5.B.5.b.iii	Ongoing	Policy Development & Implementation	☑ This section describes regulations to allow the Permittee to include provisions for construction and post-construction access to inspect BMPs. **(Existing Requirement)** **Citation:** Code 9.2.
S5.B.5.b.iv	Ongoing	Policy Development & Implementation	☑ This section describes the ordinance or other regulatory mechanism that shall include appropriate, escalating enforcement procedures and actions. **(Existing Requirement)** **Citation:** 2019 MS4 Annual Report for Wenatchee City and 2019 Stormwater Management Program (SWMP) for Wenatchee Valley Stormwater Program, Appendix D and Appendix E
S5.B.5.b.v	Ongoing	Policy Development & Implementation	☑ This section describes implementation and enforcement strategy and the enforcement provisions of the ordinance or other regulatory mechanism. **(Existing Requirement)** **Citation:** 2019 MS4 Annual Report for Wenatchee City and 2019 Stormwater Management Program (SWMP) for Wenatchee Valley Stormwater Program, Appendix D and Appendix E
S5.B.5.c	N/A	Policy Development & Implementation	This section describes implementation of procedures for site plan review that incorporate consideration of potential water quality impacts. **(Existing Requirement)** ☑ i. Permittees shall review stormwater site plans of all new development and redevelopment that meet the thresholds in S5.B.5.b. ☑ ii. Site plan review shall be performed by qualified personnel and include review of construction SWPPPs where required pursuant to S5.B.4.b.i. **Citation**: 2019 MS4 Annual Report for Wenatchee City and 2019 Stormwater Management Program (SWMP) for Wenatchee Valley Stormwater Program, Appendix D and Appendix E
S5.B.5.d	Ongoing	Policy Development & Implementation	This section describes procedures for site inspection and enforcement of post-construction stormwater control measures. **(i and iii are Modified Requirements ii and iv are Existing Requirements)** ☑ i. Structural BMPs inspected at least once during installation and upon final installation or completion. ☑ ii. Structural BMPs shall be inspected at least once every 5 years after final installation or as necessary. ☑ iii. Recommended O&M standards for structural BMPs in the SWMMEW. ☑ iv. If problems are identified the Permittee shall require and confirm necessary repairs and maintenance as soon as is practical. **Citation:** 2019 MS4 Annual Report for Wenatchee City
S5.B.5.e	Ongoing	Training	☑ This section describes training for all staff involved in permitting, planning, review, inspection, and enforcement to carry out the provisions of this SWMP component. **(Existing Requirement)** **Citation:** 2019 MS4 Annual Report for Wenatchee City

Permit Section	Compliance Date	Requirement Type	Description of Permit Condition
S5.B.5.f	Ongoing	Training	☑ This section describes information provided to design professionals about training available on how to comply with the requirements of Appendix 1 and apply the BMPs described in the SWMMEW. **(Existing Requirement)** **Citation:** 2019 MS4 Annual Report for Wenatchee City
S5.B.5.g	N/A	Record Keeping	This section describes the record keeping of all projects disturbing 1 acre or more, and all projects of any size that are part of a common plan of development or sale that is 1 acre or more. **(Existing Requirement)** ☑ i. Keep project records for 5 years or until construction is completed. ☑ ii. Training records including dates, activities, course descriptions, and names of staff in attendance. ☑ iii. Keep copies of information provided to design professionals and any information distributed to a large number of professionals at once. **Citation:** 2019 MS4 Annual Report for Wenatchee City, paper and electronic stormwater records, SmartGov permitting database, and 2019 Stormwater Management Program (SWMP) for Wenatchee Valley Stormwater Program, Appendix D and Appendix E
S5.B.6 Municipal Operations and Maintenance			
S5.B.6	N/A	Policy Development & Implementation	☑ This section describes implementation of an O&M program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations. **(Existing Requirement)**
S5.B.6.a	December 31, 2022	Policy Development & Implementation	☑ This section describes a schedule of municipal O&M activities (an O&M Plan). Permittees shall review and, if needed, update the O&M Plan no later than December 31, 2022, and include BMPs that, when applied to the municipal activity or facility, will protect water quality, reduce the discharge of pollutants to the MEP, and satisfy state AKART requirements. **(Modified Requirement)** **Citation:** 2019 MS4 Annual Report for Wenatchee City
S5.B.6.a.i	December 31, 2022	Operations & Maintenance	The O&M Plan shall include appropriate pollution prevention and good housekeeping procedures for all of the following types of facilities and/or activities listed below. **(a through h Modified Requirements i and j Existing Requirements)** ☑ a. Stormwater collection and conveyance systems ☑ b. Roads, highways, and parking lots ☑ c. Vehicle fleets ☑ d. Municipal buildings ☑ e. Parks and open space ☑ f. Construction projects ☑ g. Industrial activities ☑ h. Material storage areas ☑ i. Flood management projects ☑ j. Other facilities expected to discharge contaminated runoff **Citation:** 2019 Stormwater Management Program (SWMP) for Wenatchee Valley Stormwater Program, Appendix F **Gap:** The BMPs in the O&M Plan have not been updated with the 2019 version of the SWMMEW. **Recommendation:** Update the O&M Plan by December 31, 2021.
S5.B.6.a.ii	December 31, 2022	Record Keeping	This section describes the schedule of inspections and requirements for record keeping pursuant to S9 Reporting and Recordkeeping. **(Existing Requirement)** ☑ a. A minimum of 95% of all known stormwater treatment and flow control facilities (except catch basins) owned, operated, or maintained by the Permittee shall be inspected at least once every 2 years, with problem facilities identified during inspections to be inspected more frequently. **Citation:** 2019 MS4 Annual Report for Wenatchee City, 2019 Stormwater Management Program (SWMP) for Wenatchee Valley Stormwater Program, Appendix F and Elements

Permit Section	Compliance Date	Requirement Type	Description of Permit Condition
S5.B.6.a.ii.b	Ongoing	Operations & Maintenance	This section describes the maintenance of basin inlets occurring every 2 years and complying with maintenance standards. **(1 and 2 are Modified Requirements, 3 is Existing Requirement)** ☑ 1) Scheduled every 2 years may be changed as appropriate to meet maintenance standard with records of double the length of time of proposed inspection frequency. ☑ 2) Inspections occur every 2 years on a circuit basis where 25% are inspected to identify maintenance needs. ☑ 3) Clean all pipes, ditches, catch basins, and inlets within circuit once during Phase II Permit term. **Citation:** 2019 MS4 Annual Report for Wenatchee City, 2019 Stormwater Management Program (SWMP) for Wenatchee Valley Stormwater Program, Appendix F and Elements
S5.B.6.a.ii.c	Ongoing	Operations & Maintenance	☑ This section confirms spot checks for potentially damaged stormwater treatment and flow control facilities after major storm events (24-hour, 10-year event). **(Modified Requirement)** **Citation:** 2019 MS4 Annual Report for Wenatchee City and paper records
S5.B.6.a.iii	December 31, 2022	Policy Development & Implementation	☑ This section describes the O&M Plan describing which staff is responsible for performing each activity. **(Modified Requirement)** **Citation:** 2019 MS4 Annual Report for Wenatchee City
S5.B.6.b	Ongoing	Training	☑ This section describes required training for all employees who have primary construction, operations, or maintenance job functions that are likely to impact stormwater quality. **(Existing Requirement)** **Citation:** 2019 MS4 Annual Report for Wenatchee City
S8. Monitoring and Assessment			
S8.A	N/A	Policy Development & Implementation	☑ This section describes the SWMP Effectiveness Studies. **(Modified Requirement)**
S8.A.1	Ongoing	Policy Development & Implementation	This section describes how the Permittee shall participate in implementation of the eight Ecology-approved studies that were selected pursuant to Section S8.B in the Phase II Permit (2014–2019). **(Existing Requirement)** ☑ a. Each lead entity shall implement the study according to the Ecology-approved Quality Assurance Project Plan (QAPP). **Citation:** 2019 MS4 Annual Report for Wenatchee City
S8.A.2	Prior to March 31, 2021	Policy Development & Implementation	This section describes coordination with other local governments in your urban area, to plan and begin an additional SWMP effectiveness study. **(New Requirement)** ☐ a. Each Permittee shall serve as lead entity, contribute staff or other services, or provide funding. ☐ b. Submit to Ecology a list of participants and associated roles before June 30, 2021. ☐ c. Submit a detailed study to Ecology before June 30, 2022. ☐ d. Submit a completed QAPP on or before July 31, 2023. ☐ e. Begin to conduct the study on or before December 1, 2023, or within 3 months of receiving Ecology's approval of the QAPP (whichever is later). ☐ f. Include effectiveness study activities (assigned duties; participation in meetings, proposal development, project reviews; and study implementation) in the Permittees' updated SWMP. **Citation:** 2019 Stormwater Management Program (SWMP) for Wenatchee Valley Stormwater Program **Recommendation:** Continue coordinating with the WVSTAC to meet the new Effectiveness Study requirements.

Permit Section	Compliance Date	Requirement Type	Description of Permit Condition
S8.B.1	Timeline per the approved QAPP	Documentation	This section describes the responsibility of the lead entity to follow reporting requirements and timelines in the approved QAPP for the study. **(New Requirement)** ☑ a. Enter all applicable data collected as part of conducting the study into Ecology's Environmental Information Management (EIM) database. Project data that are not appropriate for EIM shall be submitted in the Annual Report. ☑ b. Within 60 days of completing the study, publish a final report with the result of the study and recommended future actions based on the findings. ☑ c. Within 90 days of completing the study, produce a fact sheet summarizing the findings and recommendations and share it with other Permittees. The target audience for the fact sheet is stormwater managers and local government elected officials. **Citation:** 2019 MS4 Annual Report for Wenatchee City
S.8.B.2	See above	Documentation	☑ This section describes that the city and county Permittee listed in S1.D.2.a.i and S1.D.2.a.ii shall track assigned duties and record participation in effectiveness study meetings, proposal development, project review, and study implementation, and include a summary in the Permittee's Annual Report. **(New Requirement)** **Citation:** 2019 MS4 Annual Report for Wenatchee City
S9. Reporting Requirements			
S9.A	March 31 of each year	Documentation	☑ Section **S9** describes that each Permittee shall submit an Annual Report electronically using Ecology's WQWebPortal program available on Ecology's website, unless otherwise directed by Ecology. The Annual Report should be submitted no later than March 31 of each year beginning in 2020, and the reporting period for the first Annual Report will be January 1, 2019, through December 31, 2019. The reporting period for all subsequent Annual Reports will be the previous calendar year unless otherwise specified. ☑ Section **S9.A** states that each Permittee is required to keep all records related to this Phase II Permit for at least 5 years. **(Modified Requirement)** **Citation:** 2019 Phase II Permit.
S9.B	Ongoing	Record Keeping	This section describes that each Permittee shall make all records related to this Phase II Permit and the Permittee's SWMP available to the public at reasonable times during business hours. The Permittee will provide a copy of the most recent Annual Report to any individual or entity, upon request. **(Existing Requirement)** ☑ 1. A reasonable charge may be assessed by the Permittee for making photocopies of records. ☑ 2. The Permittee may require reasonable advance notice of intent to review records related to this Phase II Permit. **Citation:** The current SWMP is posted to the City website and copies are available upon request.
S9.C.1	March 31 of each year	Documentation	☑ This section states that the Annual Report must include a copy of the Permittee's current SWMP Plan, as required by S5.A.2. **(Existing Requirement)** **Citation:** 2019 MS4 Annual Report for Wenatchee City
S9.C.2	March 31 of each year	Documentation	This section describes that the Annual Report submittal must include the Annual Report form, which describes the status of the implementation of the Permit requirements during the reporting period. This form is provided by Ecology pursuant to S9. **(Existing Requirement)** **Citation:** 2019 Phase II Permit and 2019 MS4 Annual Report for Wenatchee City
S9.C.3	March 31 of each year	Documentation	This section describes that the Annual Report form must include attachments, such as summaries, descriptions, reports, and other information as required or as applicable, to meet the conditions of this Phase II Permit during the reporting period. Refer to Appendix 3 for Annual Report questions. **(Existing Requirement)** **Citation:** 2019 Phase II Permit **Gap:** The Annual Report form does not include additional documentation ensuring compliance with the Phase II Permit conditions. **Recommendation:** The updated Annual Report should include attachments to confirm that the Phase II Permit conditions are being met.

Permit Section	Compliance Date	Requirement Type	Description of Permit Condition
S9.C.4	March 31 of each year	Documentation	☑ This section describes that, if applicable, the Annual Report must disclose that the MS4 is relying on another governmental entity to satisfy any of the obligations under this Phase II Permit. **(Existing Requirement)** **Citation:** 2019 Stormwater Management Program (SWMP) for Wenatchee Valley Stormwater Program
S9.C.5	March 31 of each year	Documentation	☑ This section describes that the Annual Report must include the certification and signature of the delegated signatory pursuant to G19.D, and notification of any changes to authorization pursuant to G19.C. **(Existing Requirement)** **Citation:** 2019 Phase II Permit
S9.C.6	March 31 of each year	Documentation	☑ This section states that the Permittees shall include with the Annual Report notification of any annexations, incorporations, or jurisdictional boundary changes resulting in an increase or decrease in the Permittee's geographic area of Phase II Permit coverage during the reporting period. **(Existing Requirement)** **Citation:** 2019 Phase II Permit
General			
G3	Ongoing	Policy Development & Implementation	This section describes that if Permittees have knowledge of a discharge, including spills, into or from an MS4 that could constitute a threat to human health, welfare, or the environment, the Permittee shall: **(Existing Requirement for A and C, Modified Requirement for B)** ☑ A. Take appropriate action to correct or minimize the threat to human health, welfare, and/or the environment. ☑ B. Notify the Ecology regional office and other appropriate spill response authorities immediately but in no case later than within 24 hours of obtaining that knowledge. ☑ C. Immediately report spills or discharges of oil or hazardous substances to the Ecology regional office, and to the Washington Emergency Management Division at 1-800-258-5990. **Citation:** 2019 MS4 Annual Report for Wenatchee City and past stormwater records
G19.B	Ongoing	Policy Development & Implementation	☑ This section states that all formal submittals required by this Phase II Permit shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if both of the following conditions are met: 1. The authorization is made in writing by a person described above and submitted to Ecology 2. The authorization specifies either an individual or a position having responsibility for the overall development and implementation of the SWMP. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) **(Existing Requirement)** **Citation:** 2019 Phase II Permit
G19.C	Prior to or with required reports, information, or applications	Policy Development & Implementation	☑ This section describes that the authorization under General Condition G19.B.2 must be accurate to the individual responsible for the overall development and implementation of the SWMP. Otherwise, a new authorization satisfying the requirements of General Condition G19.B.2 shall be submitted to Ecology prior to or together with any document to be signed by an authorized representative. **(Existing Requirement)** **Citation:** 2019 Phase II Permit
G19.D	When required reports, information, or applications are due	Policy Development & Implementation	☑ This section describes that any person signing a formal submittal under this Phase II Permit shall make the following certification: "I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a s ystem designed to assure that Qualified Personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for willful violations." **(Existing Requirement)** **Citation:** 2019 MS4 Annual Report for Wenatchee City

Permit Section	Compliance Date	Requirement Type	Description of Permit Condition
G20	30 days of noncompliance	Policy Development & Implementation	☑ In the event that it is unable to comply with any of the terms and conditions of this Phase II Permit, the Permittee must: **(Existing Requirement)** A. Notify Ecology of the failure to comply with the Phase II Permit terms and conditions in writing within 30 days of becoming aware that the noncompliance has occurred. The written notification must shall include all of the following: 1. A description of the noncompliance, including dates. 2. Beginning and ending dates of the noncompliance, and if the noncompliance has not been corrected, the anticipated date of correction. 3. Steps taken or planned to reduce, eliminate, or prevent reoccurrence of the noncompliance. B. Take appropriate action to stop or correct the condition of noncompliance. **Citation:** Past stormwater records

Appendix D. CIP Projects (2019 Dollars)

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Appendix D: CIP Projects (2019 Dollars)

Description	Unescalated Total	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Peachey Street Outfall	**$ 300,000**	$ 300,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Tacoma	**100,000**	50,000	50,000	-	-	-	-	-	-	-	-
Maple St	**100,000**	50,000	50,000	-	-	-	-	-	-	-	-
Walla Walla Ave Retrofit	**300,000**	150,000	150,000	-	-	-	-	-	-	-	-
North Wenatchee Facility Phase 2	**200,000**	-	100,000	100,000	-	-	-	-	-	-	-
Roosevelt Drainage Improvements	**110,550**	-	55,275	55,275	-	-	-	-	-	-	-
Snohomish Outfall	**395,000**	-	197,500	197,500	-	-	-	-	-	-	-
Springwater	**100,000**	-	50,000	50,000	-	-	-	-	-	-	-
Pershing (Springwater to Maple	**1,095,000**	-	365,000	365,000	365,000	-	-	-	-	-	-
Crescent Street	**200,000**	-	-	100,000	100,000	-	-	-	-	-	-
N Columbia (First to Palouse)	**210,000**	-	-	105,000	105,000	-	-	-	-	-	-
Russell	**1,020,600**	-	-	340,200	340,200	340,200	-	-	-	-	-
Orchard	**412,000**	-	-	-	206,000	206,000	-	-	-	-	-
Upper Squilchuck Road Extension	**150,000**	-	-	-	75,000	75,000	-	-	-	-	-
Millerdale	**100,000**	-	-	-	50,000	50,000	-	-	-	-	-
North Wenatchee Facility Phase 3	**450,000**	-	-	-	-	225,000	225,000	-	-	-	-
Cashmere	**172,620**	-	-	-	-	86,310	86,310	-	-	-	-
Ringold/7th/Princeton	**628,000**	-	-	-	-	314,000	314,000	-	-	-	-
Ohme Garden Road	**1,440,195**	-	-	-	-	-	480,065	480,065	480,065	-	-
Canyon Drainage	**1,800,000**	-	-	-	-	-	-	600,000	600,000	600,000	-
Love's Court	**256,200**	-	-	-	-	-	-	-	128,100	128,100	-
Lavern	**248,000**	-	-	-	-	-	-	-	-	124,000	124,000
Vista Place	**285,000**	-	-	-	-	-	-	-	-	142,500	142,500
Ramona and Sunset	**985,000**	-	-	-	-	-	-	-	-	328,333	328,333
Kenaston and Linville	**743,000**	-	-	-	-	-	-	-	-	-	371,500
Western Ave	**1,604,000**	-	-	-	-	-	-	-	-	-	534,667
South Hills Dr	**757,000**	-	-	-	-	-	-	-	-	-	252,333
Fifth Street	**931,770**	-	-	-	-	-	-	-	-	-	310,590
Miller	**499,800**	-	-	-	-	-	-	-	-	-	-
Michael Place	**138,600**	-	-	-	-	-	-	-	-	-	-
Canal/Marie/Marilyn	**344,400**	-	-	-	-	-	-	-	-	-	-
S Chelan	**200,000**	-	-	-	-	-	-	-	-	-	-
Day Road	**987,000**	-	-	-	-	-	-	-	-	-	-
Filbeck/Seattle	**693,000**	-	-	-	-	-	-	-	-	-	-
Cedarwood Lane	**138,600**	-	-	-	-	-	-	-	-	-	-
Miller	**3,393,000**	-	-	-	-	-	-	-	-	-	-
Skyline Drive	**2,097,000**	-	-	-	-	-	-	-	-	-	-
Walnut	**1,311,000**	-	-	-	-	-	-	-	-	-	-
Avenda	**221,000**	-	-	-	-	-	-	-	-	-	-
Poplar	**241,500**	-	-	-	-	-	-	-	-	-	-
S Miller	**283,500**	-	-	-	-	-	-	-	-	-	-
Jennings St/Ione and Maxine	**1,234,000**	-	-	-	-	-	-	-	-	-	-
Methow	**690,000**	-	-	-	-	-	-	-	-	-	-
McKittrick from Pine to Western	**1,564,000**	-	-	-	-	-	-	-	-	-	-
Horse Lake Road	**603,333**	-	-	-	-	-	-	-	-	-	-
Horse Lake/Dawn Terrace	**-**	-	-	-	-	-	-	-	-	-	-
Capital Studies	**900,000**	-	100,000	-	100,000	-	100,000	-	100,000	-	100,000
Total Capital Projects	**$ 30,633,668**	**$ 550,000**	**$ 1,117,775**	**$ 1,312,975**	**$ 1,341,200**	**$ 1,296,510**	**$ 1,205,375**	**$ 1,080,065**	**$ 1,308,165**	**$ 1,322,933**	**$ 2,163,923**

Description	Unescalated Total	2030	2031	2032	2033	2034	2035	2036	2037	2038
Peachey Street Outfall	$ 300,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Tacoma	100,000	-	-	-	-	-	-	-	-	-
Maple St	100,000	-	-	-	-	-	-	-	-	-
Walla Walla Ave Retrofit	300,000	-	-	-	-	-	-	-	-	-
North Wenatchee Facility Phase 2	200,000	-	-	-	-	-	-	-	-	-
Roosevelt Drainage Improvements	110,550	-	-	-	-	-	-	-	-	-
Snohomish Outfall	395,000	-	-	-	-	-	-	-	-	-
Springwater	100,000	-	-	-	-	-	-	-	-	-
Pershing (Springwater to Maple	1,095,000	-	-	-	-	-	-	-	-	-
Crescent Street	200,000	-	-	-	-	-	-	-	-	-
N Columbia (First to Palouse)	210,000	-	-	-	-	-	-	-	-	-
Russell	1,020,600	-	-	-	-	-	-	-	-	-
Orchard	412,000	-	-	-	-	-	-	-	-	-
Upper Squilchuck Road Extension	150,000	-	-	-	-	-	-	-	-	-
Millerdale	100,000	-	-	-	-	-	-	-	-	-
North Wenatchee Facility Phase 3	450,000	-	-	-	-	-	-	-	-	-
Cashmere	172,620	-	-	-	-	-	-	-	-	-
Ringold/7th/Princeton	628,000	-	-	-	-	-	-	-	-	-
Ohme Garden Road	1,440,195	-	-	-	-	-	-	-	-	-
Canyon Drainage	1,800,000	-	-	-	-	-	-	-	-	-
Love's Court	256,200	-	-	-	-	-	-	-	-	-
Lavern	248,000	-	-	-	-	-	-	-	-	-
Vista Place	285,000	-	-	-	-	-	-	-	-	-
Ramona and Sunset	985,000	328,333	-	-	-	-	-	-	-	-
Kenaston and Linville	743,000	371,500	-	-	-	-	-	-	-	-
Western Ave	1,604,000	534,667	534,667	-	-	-	-	-	-	-
South Hills Dr	757,000	252,333	252,333	-	-	-	-	-	-	-
Fifth Street	931,770	310,590	310,590	-	-	-	-	-	-	-
Miller	499,800	-	249,900	249,900	-	-	-	-	-	-
Michael Place	138,600	-	69,300	69,300	-	-	-	-	-	-
Canal/Marie/Marilyn	344,400	-	114,800	114,800	114,800	-	-	-	-	-
S Chelan	200,000	-	66,667	66,667	66,667	-	-	-	-	-
Day Road	987,000	-	-	329,000	329,000	329,000	-	-	-	-
Filbeck/Seattle	693,000	-	-	231,000	231,000	231,000	-	-	-	-
Cedarwood Lane	138,600	-	-	-	69,300	69,300	-	-	-	-
Miller	3,393,000	-	-	-	-	1,696,500	1,696,500	-	-	-
Skyline Drive	2,097,000	-	-	-	-	699,000	699,000	699,000	-	-
Walnut	1,311,000	-	-	-	-	-	437,000	437,000	437,000	-
Avenda	221,000	-	-	-	-	-	-	110,500	110,500	-
Poplar	241,500	-	-	-	-	-	-	120,750	120,750	-
S Miller	283,500	-	-	-	-	-	-	141,750	141,750	-
Jennings St/Ione and Maxine	1,234,000	-	-	-	-	-	-	411,333	411,333	411,333
Methow	690,000	-	-	-	-	-	-	230,000	230,000	230,000
McKittrick from Pine to Western	1,564,000	-	-	-	-	-	-	-	782,000	782,000
Horse Lake Road	603,333	-	-	-	-	-	-	-	-	603,333
Horse Lake/Dawn Terrace	-	-	-	-	-	-	-	-	-	-
Capital Studies	900,000	-	100,000	-	100,000	-	100,000	-	100,000	-
Total Capital Projects	**$ 30,633,668**	**$ 1,797,423**	**$ 1,698,257**	**$ 1,060,667**	**$ 910,767**	**$ 3,024,800**	**$ 2,932,500**	**$ 2,150,333**	**$ 2,333,333**	**$ 2,026,667**

Note: Two projects have capital expenditures projected beyond the forecast period: McKittrick from Pine to Western ($782,000 in 2039) and Horse Lake Road ($603,333 per year in 2039 and 2040).

Appendix E. Funding Sources Document from Department of Commerce, Washington State

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Funding Programs for Drinking Water and Wastewater Projects

Updated 3-30-20

Please contact Cathi Read at cathi.read@commerce.wa.gov if you would like to update your program information or if you would like an electronic version of this document.

PLANNING **Programs**	**Eligible Projects**	**Eligible Applicants**	**Funding Available**	**How To Apply**
CDBG Community Development Block Grant – General Purpose Grant Fund – Planning-Only Activities	• Comprehensive plans • Non-routine infrastructure plans • Feasibility studies • Community action plans • Low-income housing assessments	Projects must principally benefit low- to moderate-income people in non-entitlement cities and counties. • Cities or towns with fewer than 50,000 people • Counties with fewer than 200,000 people	Grant • Up to $30,000 for a single jurisdiction.	Applications will be due June 3, 2020. **Contact:** Jeff Hinckle 360-725-3060 jeff.hinckle@commerce.wa.gov Visit www.commerce.wa.gov/cdbg for information and forms.
SOURCE WATER PROTECTION GRANT PROGRAM	Source water protection studies (watershed, hydrogeologic, feasibility studies). Eligible activities can lead to reducing the risk of contamination of a system's drinking water sources(s), or they can evaluate or build resiliency for a public water supply. They must contribute to better protecting one or more public water supply sources.	Non-profit Group A water systems. Local governments proposing a regional project. Project must be reasonably expected to provide long-term benefit to drinking water quality or quantity.	Grants • Funding is dependent upon project needs, but typically does not exceed $30,000.	Applications accepted anytime; grants awarded on a funds available basis. **Contact:** Corina Hayes Source Water Protection Program Manager 360-236-3114 corina.hayes@doh.wa.gov http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/SourceWater/SourceWaterProtection.aspx Grant guidelines https://www.doh.wa.gov/Portals/1/Documents/Pubs/331-552.pdf
ECOLOGY: INTEGRATED WATER QUALITY FUNDING PROGRAM State Water Pollution Control Revolving Fund (SRF) Centennial Clean Water Fund	Planning projects associated with publicly-owned wastewater and stormwater facilities. The integrated program also funds planning and implementation of nonpoint source pollution control activities.	Counties, cities, towns, conservation districts, or other political subdivision, municipal or quasi-municipal corporations, and tribes	Loan interest rates (SFY 2021) • 6-20 year loans: 2.0% • 1-5 year loans: 1.0% Pre-Construction Set-aside (Distressed Communities) 50% forgivable principal loan and 50% loan	Applications due October 13, 2020. **Contact:** David Dunn 360-407-6503 david.dunn@ecy.wa.gov https://ecology.wa.gov/About-us/How-we-operate/Grants-loans/Find-a-grant-or-loan/Water-Quality-grants-and-loans

PLANNING **Programs**	**Eligible Projects**	**Eligible Applicants**	**Funding Available**	**How To Apply**
RD PRE-DEVELOPMENT PLANNING GRANTS (PPG) U.S. Dept. of Agriculture Rural Development – Rural Utilities Service – Water and Waste Disposal Direct Loans and Grants	Water and/or sewer planning; environmental work; and other work to assist in developing an application for infrastructure improvements.	Low-income, small communities and systems serving areas under 10,000 population.	Planning grant to assist in paying costs associated with developing a complete application for RD funding for a proposed project. Maximum $30,000 grant. Requires minimum 25% match.	Applications accepted year-round, on a fund-available basis. **Contact:** Janice Roderick 360-704-7739 janice.roderick@usda.gov http://www.rd.usda.gov/wa
RD 'SEARCH' GRANTS: SPECIAL EVALUATION ASSISTANCE FOR RURAL COMMUNITIES U.S. Dept. of Agriculture Rural Development – Rural Utilities Service – Water and Waste Disposal Direct Loans and Grants	Water and/or sewer planning; environmental work; and other work to assist in developing an application for infrastructure improvements.	Low-income, small communities and systems serving areas under 2,500 population.	Maximum $30,000 grant. No match required.	Applications accepted year-round, on a fund-available basis. **Contact:** Janice Roderick 360-704-7739 janice.roderick@usda.gov http://www.rd.usda.gov/wa
CERB PLANNING AND FEASIBILITY GRANTS Community Economic Revitalization Board – Project-Specific Planning Program	Project-specific feasibility and pre-development studies that advance community economic development goals for industrial sector business development.	Eligible statewide • Counties, cities, towns, port districts, special districts. • Federally recognized tribes • Municipal corporations, quasi-municipal corporations w/ economic development purposes.	Grant • Up to $50,000 per application. • Requires 25% (of total project cost) matching funds.	Applications accepted year-round. The Board meets six times a year. **Contact:** Janea Delk 360-725-3151 janea.delk@commerce.wa.gov

PLANNING **Programs**	**Eligible Projects**	**Eligible Applicants**	**Funding Available**	**How To Apply**
RCAC **RURAL COMMUNITY ASSISTANCE CORPORATION** Feasibility and Pre-Development Loans	Water, wastewater, stormwater, and solid waste planning; environmental work; and other work to assist in developing an application for infrastructure improvements.	Non-profit organizations, public agencies, tribes, and low-income rural communities with a 50,000 population or less, or 10,000 or less if proposed permanent financing is through USDA Rural Development.	• Typically up to $50,000 for feasibility loan. • Typically up to $350,000 for pre-development loan. • Typically up to a 1-year term. • 5% interest rate.	Applications accepted anytime. **Contact**: Michael Archer 406-593-0065 marcher@rcac.org Applications available online at http://www.rcac.org/lending/environmental-loans/
DWSRF Drinking Water State Revolving Fund **Consolidation Feasibility Study Grants**	Feasibility studies, preliminary engineering, public outreach, and water system plan update for a consolidation or restructuring project of a Group A water System.	Group A not-for-profit community water system, county, public utility districts, and water districts that consolidate or restructure other Group A water system serving fewer than 10,000 people. Tribal water system that meets the definition of a Group A not-for-profit community water system also eligible to apply.	• All grant. • Up to $30,000 per project • No match required.	2020 applications accepted August 3-31, 2020. On-line application. **Contact:** Janet Cherry 360-236-3153 Janet.cherry@doh.wa.gov For information and forms visit: http://www.doh.wa.gov/DWSRF
PRE-DISASTER MITIGATION PROGRAM FEMA/WA Emergency Management Division *This program is changing in 2020 to Building Resilient Infrastructure in Communities (BRIC) Program.*	Disaster risk-reduction projects and planning before a disaster occurs.	Any state, tribe, county, or local jurisdiction (incl., special purpose districts) that has a current FEMA-approved hazard mitigation plan.	Funding amount is set by Congress and varies each year but has been as much as $250+ million. Funding is nationally competitive. Local jurisdiction cost-share: 25%	Applications are typically opened every October. **Contact**: David Spicer Mitigation Program Manager 253-512-7082 David.spicer@mil.wa.gov

PRECONSTRUCTION ONLY Programs	Eligible Projects	Eligible Applicants	Funding Available	How To Apply
ECOLOGY: INTEGRATED WATER QUALITY FUNDING PROGRAM State Water Pollution Control Revolving Fund (SRF) Centennial Clean Water Fund Stormwater Financial Assistance Program (SFAP)	Design projects associated with publicly-owned wastewater and stormwater facilities. The integrated program also funds planning and implementation of nonpoint source pollution control activities.	Counties, cities, towns, conservation districts, or other political subdivision, municipal or quasi-municipal corporations, and tribes.	Loan interest rates (SFY 2021) • 6-20 year loans: 2.0% • 1-5 year loans: 1.0% Pre-Construction Set-aside (Distressed Communities) 50% forgivable principal loan and 50% loan	Applications due October 13, 2020. A cost effectiveness analysis must be complete at the time of application. **Contact:** David Dunn 360-407-6503 david.dunn@ecy.wa.gov https://ecology.wa.gov/About-us/How-we-operate/Grants-loans/Find-a-grant-or-loan/Water-Quality-grants-and-loans
PWB PRE-CON Public Works Board – Pre-Construction Program	Low-interest loans to fund pre-construction activities that prepare a specific project for construction.	Counties, cities, special purpose districts, and quasi-municipal organizations that meet certain requirements. School districts and port districts are not eligible.	• There is no funding currently available; all funds have been awarded. • Maximum loan amount $1 million per jurisdiction per biennium. • 5-year loan term. • Interest rates vary. • Pre-construction work must be completed within 2 years.	Check the Public Works Board website periodically at http://www.pwb.wa.gov to obtain the latest information on program details or to contact Public Works Board staff. **Contact:** Connie Rivera 360-725-3088 connie.rivera@commerce.wa.gov
RCAC RURAL COMMUNITY ASSISTANCE CORPORATION Feasibility and Pre-Development Loans	Water, wastewater, stormwater, or solid waste planning; environmental work; and other work to assist in developing an application for infrastructure improvements.	Non-profit organizations, public agencies, tribes, and low-income rural communities with a 50,000 population or less, or 10,000 or less if proposed permanent financing is through USDA Rural Development.	• Typically up to $50,000 for feasibility loan. • Typically up to $350,000 for pre-development loan. • Typically a 1-year term. • 5% interest rate.	Applications accepted anytime. **Contact**: Michael Archer 406-593-0065 marcher@rcac.org Applications available online at http://www.rcac.org/lending/environmental-loans/

CONSTRUCTION AND DESIGN/CONSTRUCTION Programs	**Eligible Projects**	**Eligible Applicants**	**Funding Available**	**How To Apply**
CDBG-GP Community Development Block Grant – General Purpose Grants	• Final design and construction of wastewater, drinking water, side connections, stormwater, streets, and community facility projects. • Infrastructure in support of economic development or affordable housing. • Planning activities including comprehensive plans, non-routine infrastructure plans, feasibility studies, community action plans, and low-income housing assessments.	Projects must principally benefit low- to moderate-income people in non-entitlement cities and counties. • Cities or towns with fewer than 50,000 people • Counties with fewer than 200,000 people	Maximum grant amounts: • $900,000 for construction projects and acquisition projects. • $500,000 for local housing rehabilitation programs. • $250,000 for local microenterprise assistance programs. • $30,000 for planning-only activities.	Applications will be due June 3, 2020. **Contact:** Jacquie Andresen 360-725-3017 Jacquie.andresen@commerce.wa.gov Visit www.commerce.wa.gov/cdbg and click on the General Purpose Grants menu for information and forms.
RD U.S. Dept. of Agriculture Rural Development - Rural Utilities Service - Water and Waste Disposal Direct Loans and Grants	Pre-construction and construction associated with building, repairing, or improving drinking water, wastewater, solid waste, and stormwater facilities.	• Cities, towns, and other public bodies, tribes and private non-profit corporations serving rural areas with populations under 10,000.	Loans; Grants in some cases • Interest rates change quarterly; contact staff for latest interest rates. • Up to 40-year loan term. • No pre-payment penalty.	Applications accepted year-round on a fund-available basis. **Contact:** Janice Roderick 360-704-7739 janice.roderick@usda.gov http://www.rd.usda.gov/wa

CONSTRUCTION AND DESIGN/CONSTRUCTION Programs	**Eligible Projects**	**Eligible Applicants**	**Funding Available**	**How To Apply**
DWSRF Drinking Water State Revolving Fund **Water Main Replacement Loan Program**	Replacement of water mains.	Group A community not-for-profit water systems serving a residential population less than 10,000 people.	Loan • 1.5% loan fee. • $1 million per jurisdiction. • 2.25% interest rate, no subsidy available • Loan repayment period: 20 years. • No local match required. • $10 million expected to be available.	Online applications will be available and accepted August 3 through August 31, 2020. **Contact:** Janet Cherry 360-236-3153 janet.cherry@doh.wa.gov For information and forms visit: http://www.doh.wa.gov/DWSRF
DWSRF Drinking Water State Revolving Fund Construction Loan Program	Drinking water system infrastructure projects aimed at increasing public health protection. There is a limited amount of principal forgiveness for communities with high affordability index numbers and water system restructuring/ consolidation projects.	Group A (private and publicly-owned) community and not-for-profit non-community water systems, but not federal or state-owned systems. Tribal systems are eligible provided the project is not receiving other national set-aside funding for the project.	Loan • 1.5% loan fee (water systems receiving subsidy are not subject to loan fees). • $5 million per jurisdiction. • 1.75 – 2.25% interest rate. • Loan repayment period: 20 years or life of the project, whichever is less. • No local match required. • $35 million expected to be available this cycle.	Online applications will be available and accepted October 1 through November 30, 2020. **Contact:** Janet Cherry 360-236-3153 janet.cherry@doh.wa.gov For information and forms visit: http://www.doh.wa.gov/DWSRF

CONSTRUCTION AND DESIGN/CONSTRUCTION Programs	**Eligible Projects**	**Eligible Applicants**	**Funding Available**	**How To Apply**
ECOLOGY: INTEGRATED WATER QUALITY FUNDING PROGRAM State Water Pollution Control Revolving Fund (SRF) Centennial Clean Water Fund Stormwater Financial Assistance Program (SFAP)	Construction projects associated with publicly-owned wastewater and stormwater facilities. The integrated program also funds planning and implementation of nonpoint source pollution control activities.	Counties, cities, towns, conservation districts, or other political subdivision, municipal or quasi-municipal corporations, and tribes. Hardship Assistance Jurisdictions listed above with a population of 25,000 or less.	Loan interest rates (SFY 2021) • 21-30 year loans: 2.7% • 6-20 year loans: 2.0% • 1-5 year loans: 1.0% Hardship assistance for the construction of wastewater treatment facilities may be available in the form of a reduced interest rate, grant subsidy, or loan forgiveness. Hardship assistance is based on impact to residential ratepayers and the community MHI. Hardship funding is only available for the portion of a facility serving existing residential need. Stormwater grant maximum award per jurisdiction: $5 million, with a required 25% match.	Applications due October 13, 2020. A cost effectiveness analysis must be complete at the time of application. **Contact:** David Dunn 360-407-6503 david.dunn@ecy.wa.gov https://ecology.wa.gov/About-us/How-we-operate/Grants-loans/Find-a-grant-or-loan/Water-Quality-grants-and-loans
RCAC **RURAL COMMUNITY ASSISTANCE CORPORATION** Construction Loans	Water, wastewater, solid waste and stormwater facilities that primarily serve low-income rural communities. Can include pre-development costs.	Non-profit organizations, public agencies, tribes, and low-income rural communities with a 50,000 population or less, or 10,000 populations or less if using USDA Rural Development financing as the takeout.	• Typically up to $3 million with commitment letter for permanent financing • Security in permanent loan letter of conditions • Term matches construction period. • 5% interest rate • 1% loan fee	Applications accepted anytime. **Contact**: Michael Archer 406-593-0065 marcher@rcac.org Applications available online at http://www.rcac.org/lending/environmental-loans/
RCAC **RURAL COMMUNITY ASSISTANCE CORPORATION** Intermediate Term Loan	Water, wastewater, solid waste and stormwater facilities that primarily serve low-income rural communities.	Non-profit organizations, public agencies, tribes, and low-income rural communities with a 50,000 population or less.	• For smaller capital needs, normally not to exceed $100,000. • Typically up to a 20-year term • 5% interest rate • 1% loan fee	Applications accepted anytime. **Contact**: Michael Archer 406-593-0065 marcher@rcac.org Applications available online at http://www.rcac.org/lending/environmental-loans/

CONSTRUCTION AND DESIGN/CONSTRUCTION Programs	Eligible Projects	Eligible Applicants	Funding Available	How To Apply
RURAL WATER REVOLVING LOAN FUND	Short-term costs incurred for replacement equipment, small scale extension of services, or other small capital projects that are not a part of regular operations and maintenance for drinking water and wastewater projects.	Public entities, including municipalities, counties, special purpose districts, Native American Tribes, and corporations not operated for profit, including cooperatives, with up to 10,000 population and rural areas with no population limits.	• Loan amounts may not exceed $100,000 or 75% of the total project cost, whichever is less. Applicants will be given credit for documented project costs prior to receiving the RLF loan. • Interest rates at the lower of the poverty or market interest rate as published by USDA RD RUS, with a minimum of 3% at the time of closing. • Maximum repayment period is 10 years. Additional ranking points for a shorter repayment period. The repayment period cannot exceed the useful life of the facilities or financed item.	Applications accepted anytime. **Contact:** Tracey Hunter Evergreen Rural Water of WA 360-462-9287 thunter@erwow.org Download application online: http://nrwa.org/initiatives/revolving-loan-fund/
CERB Community Economic Revitalization Board - Construction Program	Public facility projects required by private sector expansion and job creation. Projects must support significant job creation or significant private investment in the state. • Bridges, roads and railroad spurs, domestic and industrial water, sanitary and storm sewers. • Electricity, natural gas and telecommunications • General purpose industrial buildings, port facilities. • Acquisition, construction, repair, reconstruction, replacement, rehabilitation	• Counties, cities, towns, port districts, special districts • Federally-recognized tribes • Municipal and quasi-municipal corporations with economic development purposes.	Loans; grants in unique cases • Projects without a committed private partner allowed for in rural areas. • $3 million maximum per project, per policy. • Interest rates: 1-3% Based on Debt Service Coverage Ratio (DSCR), Distressed County, and length of loan term. • 20-year maximum loan term • Match for committed private partners: 20% (of total project cost). • Match for prospective partners: 50% (of total project cost). • Applicants must demonstrate gap in public project funding and need for CERB assistance. • CERB is authority for funding approvals.	Applications accepted year-round. The Board meets six times a year. **Contact:** Janea Delk 360-725-3151 janea.delk@commerce.wa.gov

CONSTRUCTION AND DESIGN/CONSTRUCTION Programs	Eligible Projects	Eligible Applicants	Funding Available	How To Apply
PWB Public Works Board - Construction Program	New construction, replacement, and repair of existing infrastructure for stormwater, solid waste, recycling, road or bridge projects.	• Counties, cities, special purpose districts, and quasi-municipal organizations. • No school districts, port districts, or tribes per statute.	• There is no funding currently available; all funds have been awarded.	Please visit: http://www.pwb.wa.gov **Contact:** Connie Rivera 360-725-3088 connie.rivera@commerce.wa.gov
Energy Efficiency and Solar Grants Program: Energy Efficiency Grant Commerce	Projects that will result in reduced energy (electricity, gas, water, etc.) and operational cost savings.	• Washington State public entities, such as municipalities and districts. • 20% of funds reserved for projects in small towns or cities with populations of 5,000 or less. • Applicants who have not received funding previously will be prioritized.	2020: $1,731,450 2021: $1,731,450 • Maximum grant: $500,000 • Minimum match requirements will apply. • Other State funds cannot be used as match.	**Contact:** Dever Haffner-Ratliffe 360-522-3610 EEandS@commerce.wa.gov Visit https://www.commerce.wa.gov/growing-the-economy/energy/energy-efficiency-and-solar-grants/ for more information.
Energy Efficiency and Solar Grants Program: Solar Grants Commerce	Installation of grid-tied solar photovoltaic (electric) arrays. Additional points for 'Made in Washington' components.	• Washington State public entities, such as municipalities and districts.	2021: $3,465,810 • Maximum grant: $350,000 • Minimum match requirements will apply. • Other State funds cannot be used as match.	**Contact:** Dever Haffner-Ratliffe 360-522-3610 EEandS@commerce.wa.gov Visit https://www.commerce.wa.gov/growing-the-economy/energy/energy-efficiency-and-solar-grants/ for more information.

EMERGENCY **Programs**	**Eligible Projects**	**Eligible Applicants**	**Funding Available**	**How To Apply**
RD – ECWAG U.S. Dept. of Agriculture Rural Development Emergency Community Water Assistance Grants	Domestic water projects needing emergency repairs due to an incident such as: a drought; earthquake; flood; chemical spill; fire; etc. A significant decline in quantity or quality of potable water supply that was caused by an emergency.	Public bodies, tribes and private non-profit corporations serving rural areas with populations under 10,000.	Grant; pending availability of funds • $150,000 limit for incident related emergency repairs to an existing water system. • $500,000 limit to alleviate a significant decline in potable water supply caused by an emergency.	Applications accepted year-round on a fund-available basis. **Contact:** Janice Roderick 360-704-7739 janice.roderick@usda.gov http://www.rd.usda.gov/wa
DWSRF Department of Health – Drinking Water State Revolving Fund Emergency Loan Program	Will financially assist eligible communities experiencing the loss of critical drinking water services or facilities due to an emergency.	• Publicly or privately owned (not-for-profit) Group A community water systems with a population of fewer than 10,000. • Transient or non-transient non-community public water systems owned by a non-profit organization. Non-profit non-community water systems must submit tax-exempt documentation. • Tribal systems are eligible provided the project is not receiving other national set-aside funding for the project.	Loan • Interest rate: 0%, no subsidy available • Loan fee: 1.5% • Loan term: 10 years • $500,000 maximum award per jurisdiction. • Time of performance: 2 years from contract execution to project completion date. • Repayment commencing first October after contract execution.	To be considered for an emergency loan, an applicant must submit a completed emergency application package to the department. **Contacts:** Department of Health Regional Engineers or Janet Cherry 360-236-3153 Janet.cherry@doh.wa.gov For information and forms visit: http://www.doh.wa.gov/DWSRF

EMERGENCY **Programs**	**Eligible Projects**	**Eligible Applicants**	**Funding Available**	**How To Apply**
PWB Public Works Board – Emergency Loan Program: Repair, replace, rehabilitate, or reconstruct eligible systems to current standards for existing users.	A public works project made necessary by a natural disaster, or an immediate and emergent threat to the public health and safety due to unforeseen or unavoidable circumstances. Demonstrate financial need through inadequate local budget resources.	Counties, cities, special purpose districts, and quasi-municipal organizations. No school districts, port districts, or tribes per statute. Water, sanitary sewer, storm water, roads, streets, bridges, solid waste, and recycling facilities.	• Approximately $4 million for emergency loan funding. • Maximum loan amount $1 million per jurisdiction per biennium. • 20-year loan term or life of the improvement, whichever is less. • Interest rates vary. • Application cycle is open until appropriated funds are exhausted.	Check the Public Works Board website periodically at: http://www.pwb.wa.gov to obtain the latest information on program details or to contact Public Works Board staff. **Contact:** Connie Rivera 360-725-3088 connie.rivera@commerce.wa.gov
RURAL WATER REVOLVING LOAN FUND Disaster area emergency loans	Contact staff for more information on emergency loans.	Public entities, including municipalities, counties, special purpose districts, Native American Tribes, and corporations not operated for profit, including cooperatives, with up to 10,000 population and rural areas with no population limits.	90-day, no interest, disaster area emergency loans with immediate turn-around.	Applications accepted anytime. **Contact**: Tracey Hunter Evergreen Rural Water of WA 360-462-9287 thunter@erwow.org Download application online: http://nrwa.org/initiatives/revolving-loan-fund/
ECOLOGY – Clean Water State Revolving Fund Emergency Funding Program	Water quality-related projects that meet the definition of "environmental emergency" in WAC 173-98-030(27) and have received a Declaration of Emergency from the local government. Eligible projects may result from a natural disaster or an immediate and emergent threat to public health due to water quality issues resulting from unforeseen or unavoidable circumstances.	Counties, cities, towns, federally-recognized tribes, and special purpose districts serving a population of 10,000 or less.	Loan • 10-year loan term or the life of the project, whichever is less. • 0.0% interest rate. • $5,000,000 maximum total per year. • $500,000 maximum per jurisdiction per year. • 2 years to complete project after loan execution. • Repayment begins 1 year after completion.	Applications accepted any time. **Contact:** Daniel Thompson 360-407-6510 daniel.thompson@ecy.wa.gov Funding Guidelines and Applicant Prep Tool: https://fortress.wa.gov/ecy/publications/summarypages/2010005

EMERGENCY **Programs**	**Eligible Projects**	**Eligible Applicants**	**Funding Available**	**How To Apply**
HAZARD MITIGATION GRANT PROGRAM FEMA/WA Emergency Management Division	Disaster risk-reduction projects and planning after a disaster declaration in the state.	Any state, tribe, county, or local jurisdiction (incl., special purpose districts) that has a current FEMA-approved hazard mitigation plan.	Varies depending on the level of disaster, but projects only need to compete at the state level. Local jurisdiction cost-share: 12.5%	Applications will be opened after a disaster declaration. **Contact**: Tim Cook State Hazard Mitigation Officer 253-512-7072 Tim.cook@mil.wa.gov
PRE-DISASTER MITIGATION PROGRAM FEMA/WA Emergency Management Division *This program is changing in 2020 to Building Resilient Infrastructure in Communities (BRIC) Program.*	Disaster risk-reduction projects and planning before a disaster occurs.	Any state, tribe, county, or local jurisdiction (incl., special purpose districts) that has a current FEMA-approved hazard mitigation plan.	Funding amount is set by Congress and varies each year but has been as much as $250+ million. Funding is nationally competitive. Local jurisdiction cost-share: 25%	Applications are typically opened every October. **Contact**: David Spicer Mitigation Program Manager 253-512-7082 David.spicer@mil.wa.gov
PUBLIC ASSISTANCE PROGRAM FEMA/WA Emergency Management Division	Construction, repair to, and restoration of publicly owned facilities damaged during a disaster. Debris-removal, life-saving measures, and restoration of public infrastructure.	State, tribes, counties, and local jurisdictions directly affected by the disaster.	Varies depending on the level of disaster and total damage caused.	Applications are opened after disaster declaration. **Contact:** Gary Urbas Public Assistance Project Manager 253-512-7402 Gary.urbas@mil.wa.gov