



CITY OF West Linn

STAFF REPORT FOR THE PLANNING COMMISSION

FILE NUMBER: PLN-19-01

HEARING DATE: July 17, 2019

REQUEST: For the Planning Commission to consider a recommendation for City Council regarding the adoption of the West Linn Sanitary Sewer Master Plan update along with proposed amendments to Comprehensive Plan Goals 11; and Community Development Code Chapters 85.

APPROVAL

CRITERIA: Community Development Code (CDC) Chapters 98, 100, and 105

STAFF REPORT

PREPARED BY: John Boyd, Planning Manager

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GENERAL INFORMATION

- APPLICANT:** City of West Linn Public Works Department
- DESCRIPTION:** For the Planning Commission to consider a recommendation for City Council regarding the adoption of the West Linn Sanitary Sewer Master Plan update along with proposed amendments to Comprehensive Plan Goals 11; and Community Development Code Chapters 85.
- APPROVAL CRITERIA:** Community Development Code (CDC) Chapter 98 provides administrative procedures for legislative amendments to the Comprehensive Plan. Section 98.100 of the CDC lists the factors upon which a decision shall be based. These are briefly described below and addressed in greater detail in a separate Section of this report:
1. The Statewide Planning Goals and rules adopted under ORS Chapter 197 and other applicable state statutes;
 2. Any federal or state statutes or rules found applicable;
 3. Applicable plans and rules adopted by the Metropolitan Service District (Metro);
 4. The applicable Comprehensive Plan policies and map; and,
 5. The applicable provisions of implementing ordinances.
- Chapter 100 provides Procedures for adoption or amendment Of Supporting Plans. Section 100.050 describes the required hearing and recommendation to City Council.
- Chapter 105 provides direction for Amendments to the Code and Map. Section 105.030 provides direction for legislative amendments to the code and map.
- PUBLIC NOTICE:** Legal notice was published in the West Linn Tidings on June 27, 2019 and provided to required public agencies and persons who requested notice in writing on June 24, 2019.
- ORS 227.186 NOTICE:** A Measure 56 notice is not required because no zone changes or new regulations are proposed.
- 120-DAY RULE:** Not applicable to this legislative action.

EXECUTIVE SUMMARY

In 1989 the City adopted a Sanitary Sewer Master Plan. That plan was updated in 1999. In 2016, the City of West Linn engaged in a planning process involving citizens and agency stakeholders to update the Sanitary Sewer Master Plan (SSMP). While this is an update to the 1999 SSMP, the 2019 SSMP completely replaces the old plan. The 2019 SSMP maintains the original plan's objectives and basis of planning. The update includes review of facilities constructed since 1999, and consideration of aging facilities, regulatory changes, and population trends, utilizing the current best practices of the industry.

The proposed amendments to the Comprehensive Plan and Community Development Code are found in Exhibit PC-3. Adoption of the proposal will ensure goals and policies, and land use development criteria, are aligned with the vision outlined in the SSMP for an efficient sanitary sewer collection system to meet community needs into the future. The primary intent of this legislative action is to ensure the City's SSMP and the Comprehensive Plan and Community Development Code remain viable tools for decision-makers. By adopting the amendments, the City will also ensure continued compliance with applicable laws, rules, regulations, plans, and programs.

RECOMMENDATION

Staff recommends the Planning Commission finds this request to meet the necessary approval criteria. Therefore, staff recommends the Planning Commission **RECOMMEND** to the West Linn City Council that it adopt the Sanitary Sewer Master Plan, adopt amendments to West Linn Comprehensive Plan, and West Linn Community Development Code as provided in Exhibits PC-2 and PC-3.

Planning Background

To better understand the process, a short primer on the Oregon Land Use System is provided.

Oregon's Planning Program History - Senate Bill 100

Senate Bill 100:

- Created Land Conservation and Development Commission (LCDC) and Department of Land Conservation and Development (DLCD)
- Directed LCDC to develop statewide planning goals
- Required all cities and counties to adopt comprehensive plans
- Gave LCDC the authority to approve or reject comprehensive plans
- Required state agencies to comply with comprehensive plans

Land Conservation & Development Commission (LCDC)

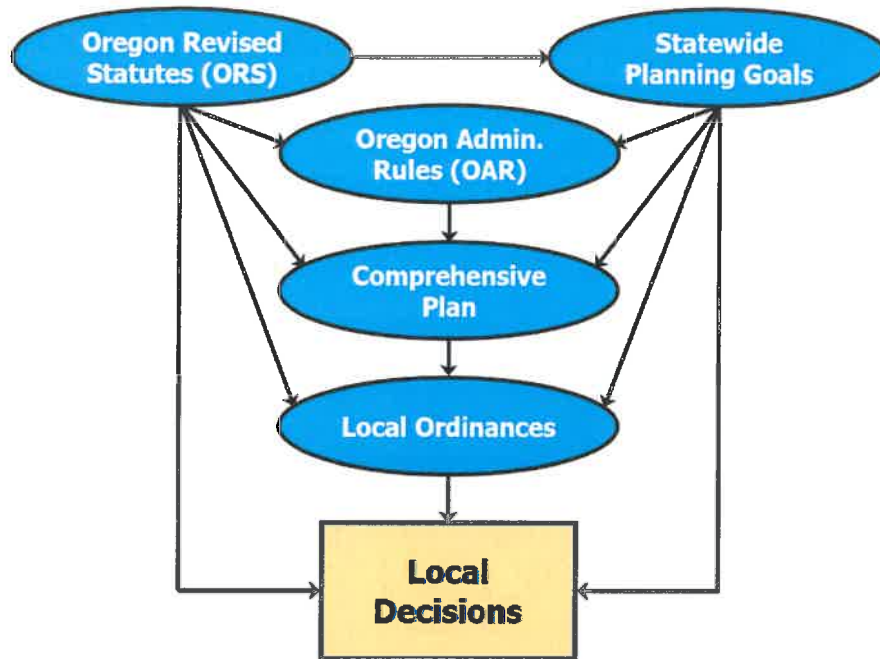
- Seven citizen volunteers appointed by the Governor and approved by the Senate
- Geographic representation
- Adopts state land use goals and rules
- Ensures local plan compliance with goals
- Hears certain land use cases

Land Use Board of Appeals

- Created in 1979
- Designated body for land use appeals
- Three "referees" appointed by Governor, confirmed by the Senate
- OAR 661: "...intended to promote the speediest practicable review of land use decisions..."

The City of West Linn's Comprehensive Plan adopted on December 31, 1983 was developed in accordance with the Oregon Land Use System and was acknowledged by LCDC, DLCD and Governor on May 31, 1984.

Land Use Regulation Hierarchy



The City's acknowledged Comprehensive Plan (Plan) is a guiding land use document for local government. The Plan is the document that guides land use, infrastructure development, conservation of natural resources, economic development, public services, and was acknowledged because it addressed all 12 base goals and the applicable natural resource goals. The Plan is the basis for and implemented by zoning regulations. Plan policies can sometimes be regulatory ("shall" statements) and are often organized consistently with statewide planning goals, but not always.

The 1983 Comprehensive Plan Inventories document Section 11 Public Facilities and Services (page 36) noted "In 1977, CRAG (now MSD), adopted an area wide Wastewater Treatment Manager Plan for Clackamas, Washington and Multnomah Counties." The inventory report also notes "The City of West Linn owns and operates the wastewater collection system which serves all residential, commercial and industrial users within city limits." The current Comprehensive Plan notes (Page PS-4) "In 1999, the City contracted with Bookman-Edmonston Engineering to update the 1989 Sanitary Sewer System Master Plan. The study determined expansion and rehabilitation needs of the current system, and identified a comprehensive schedule for improvements."

The proposed Sanitary Sewer Master Plan (SSMP) is an update to the 1999 Sanitary Sewer Master Plan. This series of plans have been in effect over 40 years. The proposed SSMP is consistent with the existing plan, is a required update that is consistent with existing information and reformats the plan to be more

contemporary. As you review this plan consider this has been previously reviewed and adopted by Council and is a minor update to the Master Plan.

Project Background

The City of West Linn owns, operates and maintains the sanitary sewer collection system within the City, and transports the wastewater to the Tri-City Water Pollution Control Plant for treatment. The Tri-City Water Pollution Control Plant belongs to the Water Environment Services partnership of Clackamas County (WES). The City's Sanitary Sewer Master Plan provides an in-depth analysis of existing system conditions and incorporates hydraulic modeling of the system to identify hydraulic capacity deficiencies in the sewer collection system for both existing and future planning needs. The SSMP is considered a living document that is inherently flexible to allow the City to respond to opportunities and changing conditions as they develop.

The main topics covered in the SSMP include the following:

- Identify the basis of planning and performance criteria
- Describe the existing system
- Hydraulic model development and calibration
- Capacity evaluation
- Inflow/infiltration reduction
- Develop a capital improvement program
- Identify planning level cost estimates for identified projects

The SSMP defines the capacity needs of the sanitary sewer collection system to meet current and future populations within the twenty-year planning period based upon population projects, underlying zones, past wastewater flow data, existing conditions and regulatory requirements. The projects identified are conceptual, and future work will be required to design, permit and construct the improvements.

Proposed Comprehensive Plan Amendments (see Exhibit PC-3)

In addition to adopting the West Linn SSMP Update, a number of amendments are proposed to goals, policies, and action measures found in the West Linn Comprehensive Plan. The proposed amendments will ensure consistency and compliance with regional and state plans and policies, and includes the following:

- Update to the narrative for Goal 11 Public Facilities and Services – Section 1 Sanitary Sewers
- Update the goal to provide reliable and environmentally sound wastewater collection.
- Update policy to encourage development and annexation that makes orderly and efficient use of the wastewater collection system.
- Update action measures to:
 - Edit measure #1 to coordinate with WES with regard to sanitary sewer needs.
 - Edit measure #2 to refer to the sanitary sewer system.
 - Add measure #4 continue to make an effort to reduce inflow and infiltration into the collection system.

These changes are more fully shown in the in attachment A of the application.

Proposed CDC Amendments

In addition to adopting the West Linn SSMP, one amendment is proposed to the CDC. The proposed amendment will ensure consistency and compliance with regional and state plans and policies, and includes the following:

- Update chapter 85 to refer to the "SSMP dated March 2019" instead of the "SSMP".

ADDENDUM
PLANNING COMMISSION STAFF REPORT
May 16, 2018

APPLICABLE CRITERIA AND COMMISSION FINDINGS

West Linn Community Development Code

Chapter 98 - Procedures for Decision Making: Legislative

CDC 98.040 Duties of Director

A. The Director shall:

- 1. If appropriate, or if directed by the City Council or Planning Commission in their motion, consolidate several legislative proposals into a single file for consideration;*

Finding 1: The proposed legislative amendments to the West Linn Comprehensive Plan and Chapter 85 of the Community Development Code have been consolidated into one file as allowed. The consolidation is appropriate as all proposed amendments are the result of recent planning efforts conducted within the City and are necessary to ensure the documents remain viable tools for decision-makers.

2. Upon the initiation of a legislative change, pursuant to this chapter:

a. Give notice of the Planning Commission hearing as provided by CDC 98.070 and 98.080;

b. Prepare a staff report that shall include:

1) The facts found relevant to the proposal and found by the Director to be true;

2) The Statewide planning goals and rules adopted under Chapter 197 ORS found to be applicable and the reasons why any other goal or rule is not applicable to the proposal except that goals 16 through 19 which are not applicable to the City of West Linn need not be addressed;

3) Any federal or State statutes or rules the Director found applicable;

4) Metro plans and rules the Director found to be applicable;

5) Those portions of the Comprehensive Plan found to be applicable, and if any portion of the plan appears to be reasonably related to the proposals and is not applied, the Director shall explain the reasons why such portions are not applicable;

6) Those portions of the implementing ordinances relevant to the proposal, and if the provisions are not considered, the Director shall explain the reasons why such portions of the ordinances were not considered; and

7) An analysis relating the facts found to be true by the Director to the applicable criteria and a statement of the alternatives; a recommendation for approval, denial, or approval with modifications; and at the Director's option, an alternative recommendation;

Finding 2: The Planning Commission public hearing will be held on July 17, 2019, with the City Council public hearing tentatively scheduled for September 9, 2019. Legislative notice was provided as required and affidavit documentation can be found in Exhibit PC-1.

Finding 3: Relevant facts and associated analysis for applicable Statewide Planning Goals, federal and state statutes/rules, Metro plans/rules, West Linn Comprehensive Plan goals and policies, and West Linn Community Development Code criteria are found in the sections of the Staff Report below.

c. *Make the staff report and all case file materials available 10 days prior to the scheduled date of the public hearing under CDC 98.070;*

Finding 4: The staff report, proposed amendments, and all other associated project materials were made available on July 3, 2019.

d. *Cause a public hearing to be held pursuant to CDC 98.070;*

Finding 5: The West Linn Planning Commission is scheduled to hold the first evidentiary public hearing on July 17, 2018 with the West Linn City Council tentatively scheduled to hold its public hearing and make a final decision on September 9, 2019.

CDC 98.100 Standards for Decision

A. *The recommendation of the Planning Commission and the decision by the City Council shall be based on consideration of the following factors:*

1. *The Statewide planning goals and rules adopted under Chapter 197 ORS and other applicable State statutes;*

Statewide Planning Goal 1 – Citizen Involvement:

This goal outlines the citizen involvement requirement for the adoption of Comprehensive Plans and changes to the Comprehensive Plan and implementing documents.

Finding 6:

This goal was addressed with the following steps. The City has maintained a project website tracking the project development since inception in November 2016. The SSMP was introduced to the public at the November 2018 Utility Advisory Board with a more detailed presentation in March of 2019. The draft SSMP has been posted to the City website for public comment since April 2, 2019. Additionally, a public hearing before the Planning Commission and City Council will occur prior to final adoption of the SSMP pursuant to CDC Chapter 98. As a result, the SSMP is in compliance with Goal 1.

No goal or policy changes are recommended.

As part of the legislative process, public notice of the Planning Commission public hearing was sent to affected government agencies, and was published in the June 27, 2018 issue of the West Linn Tidings. Notice will be published again prior to the City Council public hearing. The notice invited public input and included the phone number of a contact person to answer questions. The notice also included the address of the City's webpage where the entire draft of proposed amendments could be viewed.

Statewide Planning Goal 2 – Land Use Planning:

This goal outlines the land use planning process and policy framework. The Comprehensive Plan was acknowledged by DLCD as being consistent with the statewide planning goals.

Finding 7: The City of West Linn has an acknowledged Comprehensive Plan and enabling ordinances. The SSMP was developed to maintain that support the underlying land use zones and the populations

anticipated. Therefore, the SSMP continues to support the land use and zoning policies. Goal 2 references carrying capacity, but the only reference to the sanitary system is the overall quality of life. The SSMP recommendations are aimed at properly sizing sanitary facilities and thus helps to maintain the overall quality of life. The amendments will be processed in accordance with City's adopted procedures, which requires any applicable statewide planning goals, federal or state statutes or regulations, Metro regulations or plans, comprehensive plan policies, and the City's implementing ordinances be addressed as part of the decision-making process. This amendment will be processed as a post-acknowledgement plan amendment (PAPA) and noticing requirements will be met. All applicable review criteria has been addressed within this application; therefore, the requirements of Goal 2 have been met.

No goal or policy changes are recommended.

Statewide Planning Goal 5 – Natural Resources:

This goal requires the inventory and protection of natural resources, open spaces, historic sites and areas.

Finding 8: The City is currently in compliance with the State's Goal 5 program and Metro's Title 13: Nature in Neighborhoods program, which implements Goal 5. The SSMP does not alter the City's acknowledged Goal 5 inventories or associated land use programs. No changes will occur to current natural resource protections. As a result, the amendments are in compliance with Goal 5 process requirements.

No goal or policy changes are recommended.

Statewide Planning Goal 6 – Air, Water, and Land Resource Quality:

To maintain and improve the quality of air, water, and land resources of the state.

Finding 9: The City is currently in compliance with Metro's Title 3: Water Quality and Flood Management program, which implements Goal 6. The SSMP does not alter the City's acknowledged land use programs regarding water quality and flood management protections. The City is included in the Metro Area Airshed, which is in compliance with Federal Clean Air Act regulations. As a result, the SSMP is in compliance with Goal 6.

No goal or policy changes are recommended

Statewide Planning Goal 7 – Areas Subject to Natural Hazards:

To protect people and property from natural hazards.

Finding 10: The City is currently in compliance with Goal 7 and Metro's Title 3: Water Quality and Flood Management program. The amendments do not alter the City's acknowledged Goal 7 land use programs. No changes will occur to current natural hazard protections. As a result, the amendments are in compliance with Goal 7.

No goal or policy changes are recommended

Statewide Planning Goal 8 – Recreational Needs:

This goal requires the satisfaction of the recreational needs of the citizens of the state and visitors.

Finding 11: West Linn provides a robust range of recreational facilities throughout the community, and has an adopted Parks Master Plan and is in the process of updating that plan. The SSMP does not alter the Parks Master Plan. The SSMP is in compliance with Goal 8.

No goal or policy changes are recommended.

Statewide Planning Goal 9 – Economic Development:

To provide adequate opportunities for a variety of economic activities vital to the health, welfare, and prosperity of Oregon’s citizens.

Finding 12: The City is currently in compliance with Goal 9 and Metro’s Title 1: Requirements for Housing an Employment Accommodation and Title 4: Industrial and Other Employment Areas. The SSMP does not alter the City’s compliance with Goal 9. The SSMP recommendations are aimed at properly sizing sanitary facilities and thus help to support economic growth. The requirements of Goal 9 have been met.

No goal or policy changes are recommended.

Statewide Planning Goal 10 – Housing:

To provide adequate housing for the needs of the community, region and state.

Finding 13: The City is currently in compliance with Goal 10 and the Metropolitan Housing Rule (OAR 660-007/Division 7), and Metro’s Title 1: Requirements for Housing an Employment Accommodation. The SSMP does not alter the City’s compliance with Goal 10. The SSMP recommendations are aimed at properly sizing sanitary facilities and thus help to accommodate housing needs. The requirements of Goal 10 have been met.

No goal or policy changes are recommended.

Statewide Planning Goal 11 – Public Facilities and Services:

To plan and develop a timely, orderly, and efficient arrangement of public facilities and services to serve as framework for urban and rural development.

Finding 14: The City is currently in compliance with Goal 11 through its acknowledged Comprehensive Plan. This includes an adopted Public Facility Plan as required by Oregon Revised Statute 197.712 and Oregon Administrative Rule (OAR) 660-011. The purpose of facility planning per OAR 660-011 is to help assure that urban development “is guided and supported by types and levels of urban facilities and services appropriate for the needs and requirements of the urban areas to be serviced”. The SSMP will update the sanitary sewer component of the Public Facility Plan as allowed by Oregon Administrative Rule 660-011-0010-0045. As a result, the SSMP is in compliance with Goal 11.

West Linn Comprehensive Plan Goal 11: Public Facilities and Services, Section 1 should be amended to read as provided in Attachment A.

Sections 2: Water System; 3: Storm Drainage; 4: Fire and Police; 5: Government Administration Facilities; 6: Libraries; 7: Schools; 8: Private Utilities and Telecommunications; and 9: Health Services are not affected by the SSMP and no changes in goals or policies are required.

Statewide Planning Goal 12 – Transportation:

To provide and encourage a safe, convenient, and economic transportation system.

Finding 15: The City is currently in compliance with Goal 12 and Metro’s Regional Transportation Plan through its acknowledged Comprehensive Plan and TSP as required by Oregon Administrative Rule 660-012 (Transportation Planning Rule). The SSMP does not alter the City’s compliance with Goal 12. The SSMP recommendations are aimed at properly sizing sanitary facilities which does not affect the transportation system. The requirements of Goal 12 have been met.

No goal or policy changes are recommended

Statewide Planning Goal 13 – Energy Conservation:

Land and uses developed on the land shall be managed and controlled so as to maximize the conservation of all forms of energy, based on sound economic principles.

Finding 16: The City is currently in compliance with Goal 13 through its acknowledged Comprehensive Plan. The adoption of the SSMP does not alter the City’s compliance with Goal 13. The SSMP includes a plan to reduce inflow and infiltration into the collections system which would reduce the energy cost to transport wastewater through the pump stations, which supports energy conservation. The requirements of Goal 13 have been met.

No goal or policy changes are recommended.

Statewide Planning Goal 14 – Urbanization:

To provide for orderly and efficient transition from rural to urban land use, to accommodate urban population and urban employment inside urban growth boundaries, to ensure efficient use of land, and to provide for livable communities.

Finding 17: The City is currently in compliance with Goal 14 and Metro’s Title 11: Planning for New Urban Areas through its acknowledged Comprehensive Plan and land use regulations. The City also has a signed Urban Growth Management Agreement with Clackamas County as required by ORS 195.065. The SSMP does not alter the City’s compliance with Goal 14. The SSMP recommendations are aimed at properly sizing sanitary facilities and thus helps to promote orderly growth. The requirements of Goal 14 have been met.

No goal or policy changes are recommended.

Statewide Planning Goal 15 – Willamette River Greenway:

To provide for keeping the land green along the banks of the river and providing for recreation access.

Finding 18: The City is currently in compliance with Goal 15 through its acknowledged Comprehensive Plan and land use regulations. The SSMP does not alter the City’s compliance with Goal 15 and is consistent with this goal. The requirements of Goal 15 have been met.

No goal or policy changes are recommended.

Conclusion: Based on the analysis above, the proposed SSMP is consistent with applicable

Statewide Planning Goals.

2. Any federal or State statutes or rules found applicable;

Oregon Administrative Rule 660-011

Finding 19: The Land Conservation and Development Commission adopted Oregon Administrative Rule 660-011 (Public Facility Planning Rule) to implement Statewide Planning Goal 11. The proposed SSMP describes the sewer facilities necessary to support the land use designated in the City's acknowledged comprehensive plan within the City's urban growth boundary, one component of the City's overall Public Facilities Plan. See the material above which addresses State Wide Planning.

Oregon Administrative Rule 340-041-0009 (7) (DEQ Bacterial Rule)

Finding 20: The requirement generally prohibits the sanitary sewer overflow during the summer except in storms greater than a one in ten-year event, and in winter to a one in five year event. Planning and sizing of sanitary sewers must be based upon this criteria. The SSMP uses the five year 24 hour storm event with an adjustment for climate change to model the system and size the facilities. The City has not had any documented overflows in the past. The SSMP is in compliance with the rule.

Oregon Administrative Rule 340-045

Finding 21: This rule requires a discharge permit (NPDES or WPCF) for wastewater. The City of West Linn transports the wastewater to the Tri-City Water Pollution Control Plant managed by Water Environment Services (WES). Therefore, the City of West Linn does not discharge wastewater and is not required to have a discharge permit. The SSMP is in compliance with the rule.

Oregon Administrative Rule 340-050

Finding 22: This rule defines the requirement for land application of biosolids. The City of West Linn transports the wastewater to the Tri-City Water Pollution Control Plant managed by Water Environment Services. Therefore, the City of West Linn does not manage biosolids, so this rule does not pertain. The SSMP is in compliance with the rule.

Conclusion: Based on the analysis above, the proposed SSMP is consistent with applicable federal or state statutes or rules.

3. Applicable plans and rules adopted by the Metropolitan Service District;

Finding 23: Metro's responsibility includes management of the boundary that separates urban and rural lands with regard to land use and development, coordinate and plan investments in the transportation system for the three-county area, act a regional clearinghouse for land information, manage regional parks and natural areas, operate regional visitor venues, and oversee the regions solid waste system. Their responsibility does not extend to sanitary sewer collection or treatment.

Under the land use goals 2, 5 and 8 earlier in this document a response has been provided addressing land use planning, natural areas and recreational areas. The SSMP does not affect the Metro plans and rules.

Conclusion: Based on the analysis above, the SSMP is consistent with applicable plans and rules adopted by Metro.

4. The applicable Comprehensive Plan policies and map; and

Goal 1: Citizen Involvement

Policy 4. Provide timely and adequate notice of proposed land use matters to the public to ensure that all citizens have an opportunity to be heard on issues and actions that affect them.

Policy 5. Communicate with citizens through a variety of print and broadcast media early in and throughout the decision-making process.

Finding 24: Notice was provided to affected agencies and Neighborhood Agencies 20 days prior to the scheduled hearings. Notice was also published in the West Linn Tidings 20 days prior to the land use hearing.

Goal 2: Land Use Planning

Section 5: Intergovernmental Coordination

Policy 1. Maintain effective coordination with other local governments, special districts, state and federal agencies, Metro, the West Linn-Wilsonville School District, and other governmental and quasi-public organizations.

Policy 2. Coordinate the City's plans and programs with affected governmental units in the developing solutions to environmental quality problems, hazardous physical conditions, natural resource management programs, public facilities and services programs, transportation planning, annexation proceedings, and other municipal concerns with intergovernmental implications.

Goal 6: Air, Water, and Land Resources Quality

Section 1: Air Quality

Policy 1. Coordinate with DEQ, Metro, and other relevant agencies to reduce air pollution emission levels in West Linn and the Portland area.

Finding 25: The development of the West Linn Sanitary Sewer Master Plan was coordinated with the Oregon Department of Land Conservation and Development (DLCD), Metro, DEQ and Clackamas County to ensure consistency across jurisdictions' plans and compliance with federal, state, and regional requirements. They were provided notice, the opportunity to review and comment on all work leading up to the documents proposed for adoption.

Section 2: Water Quality

Section 3: Land Resources

Section 4: Noise Control

Finding 26: The proposal to update the Sanitary Sewer Master Plan, amendments to the Comprehensive Plan, and Community Development Code do not change regulations regarding improved water quality, landfills or noise control.

Goal 7: Areas Subject to Natural Disasters and Hazards

Policy 11. Meet the goals of Title 3 of the Metro Urban Growth Management Functional Plan to protect floodplains and other hazard areas.

Finding 27: The City is currently in compliance with Metro’s Title 3: Water Quality and Flood Management program, which implements Goal 7. The amendment does not alter the City’s acknowledged land use programs regarding water quality and flood management protections. The amendments do not alter the City’s compliance with Metro’s Title 3, therefore this does not apply to the proposed amendments.

Goal 8: Parks and Recreation

Goal 9: Economic Development

Goal 10: Housing

Finding 28: The City is currently updating the Park and Recreation Master Plan as a separate process. The City has an updated Economic Development Plan. The City is currently in compliance with Goal 10 and the Metropolitan Housing Rule (OAR 660-007/Division 7), and Metro’s Title 1: Requirements for Housing an Employment Accommodation. The SSMP amendment does not alter these Goal 8, 9 or 10, therefore these Goals do not apply to the proposed amendments.

Goal 11: Public Facilities and Services

Policy 13. Adopt, maintain, and periodically update, as supporting documents to this Plan, a Public Facilities Plan for the development of public services and facilities in conformance with the policies of the Comprehensive Plan. The Public Facilities Plan shall include a summary. The summary, but not any other part of the Public Facilities Plan, is hereby incorporated as part of this Comprehensive Plan. The Public Facilities Plan Summary shall list the planned water, sewer, storm drainage, and transportation projects by title; shall provide a map or written description of the locations of the projects or their service areas; and shall list the service providers for each project. In establishing the priorities and preparing the CIP, the City will consider the following:

- a. The health, safety, and general welfare of the citizens.*
- b. The projected population and employment levels stated in the Comprehensive Plan.*
- c. The need to equitably distribute the cost based on the benefit received from the facility.*
- d. The existing plans and programs which have provided the basis for decision-making (e.g., sewer plans, water service plans, and drainage plans).*
- e. Timing, coordination, and available dedicated funding.*

Finding 29: The City is currently in compliance with Goal 11 through its acknowledged Comprehensive Plan. This includes an adopted Public Facility Plan as required by Oregon Revised Statute 197.712 and Oregon Administrative Rule 660-011. The amendments update information but do not alter the sanitary sewer component of the Public Facility Plan. As a result, the amendments to update information are in compliance with Goal 11 and consistent with this policy.

Goal 12: Transportation

Goal 13: Energy Conservation

Finding 30: The Comprehensive Plan amendments that result from the proposed update to the Sanitary Sewer Master Plan will not impact regulations regarding transportation or energy conservation. There are no proposed changes to the transportation policies. Therefore this does not apply to the proposed amendments.

Goal 14: Urbanization

Policy 1. Promote cooperation between the City, County, and regional agencies to ensure that urban development is coordinated with public facilities and services within the Urban Growth Boundary.

Recommended Action Measure 4. Pursue intergovernmental agreements with adjoining jurisdictions to assure coordination of public facilities, services, and other land use planning issues.

Finding 31: The development of the West Linn Sanitary Sewer Master Plan was coordinated with West Linn residents, the Oregon Department of Land Conservation and Development (DLCD), Metro, and Clackamas County to ensure consistency across jurisdictions' plans and compliance with federal, state, and regional requirements. They were provided the opportunity to review and comment on all work leading up to the documents proposed for adoption.

Finding 32: Comprehensive policies have been addressed in this application under the Statewide Planning Goals. Amendments to Goal 11 Public Facilities and Services Section 1: Sanitary Sewer have been recommended. The Comprehensive Plan does not include maps pertaining to the sanitary sewer system. Therefore, there are no map changes required.

Conclusion: Based on the analysis above, the proposed SSMP is consistent with the Comprehensive Plan policies and map

5. *The applicable provisions of the implementing ordinances.*

Finding 33: The applicant is not aware of any additional applicable provisions, which are not found above. Implementing ordinances include:

- *CDC Chapter 55.100 I 4 – Design Review Approval Standards: Public Facilities, Sanitary Sewers.*
- *CDC Chapter 60.070 A 4 – Conditional Uses Approval Standards and Conditions, Adequate Public Facilities.*
- *CDC Chapter 85.170 – General Provisions Submittal Requirements for Tentative Plan, and Supplemental Submittal Requirements for Tentative Subdivision or Partition Plan.*
- *CDC Chapter 85.200 G - General Provisions Submittal Requirements for Tentative Plan, and Approval Criteria, Sanitary Sewers.*

Finding 34: These chapters require design engineers to demonstrate sufficient capacity available in the sanitary sewer system to serve the proposed development. The proposed SSMP provides updated capacity information, but does not alter this requirement. CDC Chapter 85.170.E.1 and 85.200.G.1 references SSMP, but not a specific SSMP, therefore that section of the CDC should be modified as proposed in Attachment A.

Chapter 92.010 F – Required Improvements, Public Improvements for all Development, Sanitary Sewer.

Finding 35: This requires that sanitary sewers shall be installed to City standards to serve the subdivision and to connect the subdivision to existing mains. The SSMP does not affect this requirement.

Conclusion: Based on the analysis above, Chapter 85.170.E.1 and Chapter 85.200.G.1 of the CDC is proposed to be amended to be consistent with the SSMP. Otherwise the proposed SSMP is consistent with the CDC.

100.050 PROCESS

The Planning Commission shall hold at least one public hearing and shall make a recommendation to the City Council. The City Council shall hold at least one public hearing before adopting or amending any supporting plan. The City Council shall adopt any amendments or new supporting plan by resolution, but may deny a requested amendment or supporting plan by motion.

100.070 NOTICE

Notice shall be given in a newspaper of general circulation in the City at least 10 days prior to the initial hearing of the Planning Commission and at least 10 days prior to the initial hearing of the City Council.

Finding 36: The Planning Commission scheduled a public hearing on July 17, 2019 and the City Council has set a date to hold a public hearing on September 9, 2019. A 20 day notice was provided for the Planning Commission hearing and a 10 day notice will be provided for the City Council hearing. This meets the requirements of 100.050 and 100.070

105.030 LEGISLATIVE AMENDMENTS TO THIS CODE AND MAP

Legislative amendments to this code and to the map shall be in accordance with the procedures and standards set forth in Chapter 98 CDC.

Finding 37: The above findings address the compliance with Chapter 98 for this legislative hearing process.

PC – 1 AFFIDAVIT OF NOTICE AND MAILING PACKET

AFFIDAVIT OF NOTICE

We, the undersigned do hereby certify that, in the interest of the party (parties) initiating a proposed land use, the following took place on the dates indicated below:

Complete 5/29/19

GENERAL

File No. PLN-19-01 Applicant's Name AMY PEPPER COWL
Development Name Engineering
Scheduled Meeting/Decision Date PC WS 6/19/19 HC 7/17/19 CC WS 9/2/19 14 9/9/19

NOTICE: Notices were sent at least 20 days prior to the scheduled hearing, meeting, or decision date per Section 99.080 of the Community Development Code. (check below)

TYPE A

- A. The applicant (date) 6/24/19 (signed) [Signature]
B. Affected property owners (date) N/A 6/24/19 (signed) [Signature]
C. School District/Board (date) N/A (signed) _____
D. Other affected gov't. agencies (date) 6/24/19 (signed) [Signature]
E. Affected neighborhood assns. (date) DCCO, DEC, CLACKAMAS COUNTY, WES, METRO (signed) [Signature]
F. All parties to an appeal or review (date) 6/24/19 (signed) _____

At least 10 days prior to the scheduled hearing or meeting, notice was published/posted:

Tidings (published date) 6/27/19 (signed) [Signature]
City's website (posted date) 6/24/19 (signed) [Signature]

SIGN

At least 10 days prior to the scheduled hearing, meeting or decision date, a sign was posted on the property per Section 99.080 of the Community Development Code.

(date) LEGISLATURE - NA (signed) [Signature]

NOTICE: Notices were sent at least 14 days prior to the scheduled hearing, meeting, or decision date per Section 99.080 of the Community Development Code. (check below)

TYPE B _____

- A. The applicant (date) _____ (signed) _____
B. Affected property owners (date) _____ (signed) _____
C. School District/Board (date) _____ (signed) _____
D. Other affected gov't. agencies (date) _____ (signed) _____
E. Affected neighborhood assns. (date) _____ (signed) _____

Notice was posted on the City's website at least 10 days prior to the scheduled hearing or meeting.

Date: _____ (signed) _____

STAFF REPORT mailed to applicant, City Council/Planning Commission and any other applicable parties 10 days prior to the scheduled hearing.

(date) _____ (signed) _____

FINAL DECISION notice mailed to applicant, all other parties with standing, and, if zone change, the County surveyor's office.

(date) _____ (signed) _____

**CITY OF WEST LINN
PUBLIC HEARING PLN-19-01**

TO ADOPT COMPREHENSIVE PLAN AMENDMENTS TO GOAL 11 PUBLIC FACILITIES AND SERVICES, TO REPEAL EXISTING SANITARY SEWER MASTER PLAN (SSMP) AND REPLACE WITH SSMP DATED MARCH 2019 AND AMEND CHAPTER 85 OF COMMUNITY DEVELOPMENT CODE

The West Linn Planning Commission will hold a public hearing on **Wednesday July 17, 2019, at 6:30 p.m.** in the Council Chambers of City Hall, 22500 Salamo Road, West Linn, to consider adoption of Ordinance Number 1695 "An Ordinance Adopting an Amendment to the Comprehensive Plan Goal 11, Public Facilities And Services and Repealing and Replacing the Sanitary Sewer Master Plan March 2019, and amending Chapter 85 of the Community Development Code." Following the hearing, the Planning Commission will make a recommendation to the City Council.

The Council will make a final decision regarding the Planning Commission recommendation following its own public hearing on **Monday, September 9, 2019 at 6:30 p.m.**, in the Council Chambers of City Hall, 22500 Salamo Road, West Linn.

The hearing will be conducted in accordance with the rules of CDC Chapter 98, Chapter 100, and Chapter 105. Anyone wishing to present written testimony on this proposed action may do so prior to, or at the public hearings. Oral testimony may be presented at the public hearings. At the public hearing(s), the Planning Commission and City Council will receive a staff presentation, and invite both oral and written testimony. The Commission or Council may continue the public hearing to another meeting to obtain additional information, leave the record open, or close the public hearing and take action on the proposed amendments as provided by state law. Failure to raise an issue in person or by letter at some point prior to the close of the hearing, or failure to provide sufficient specificity to afford the decision maker an opportunity to respond to the issue, precludes an appeal to the Land Use Board of Appeals (LUBA) based on that issue.

At least 10 days prior to the hearing, a copy of Ordinance 1695 and associated staff report will be available for inspection or purchase at a cost of \$0.25 a page after the first five pages at the Planning Department, 22500 Salamo Road. The information is also available on the West Linn website at <https://westlinnoregon.gov/planning/sanitary-sewer-master-plan-update-0>

For further information, please contact John Boyd, Planning Manager, at City Hall, 22500 Salamo Road, West Linn, OR 97068, phone (503) 503-742-6058, or via e-mail at jboyd@westlinnoregon.gov.

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COWL - PUBLIC WORKS DEPT.

PC – 2 WEST LINN SANITARY SEWER MASTER PLAN



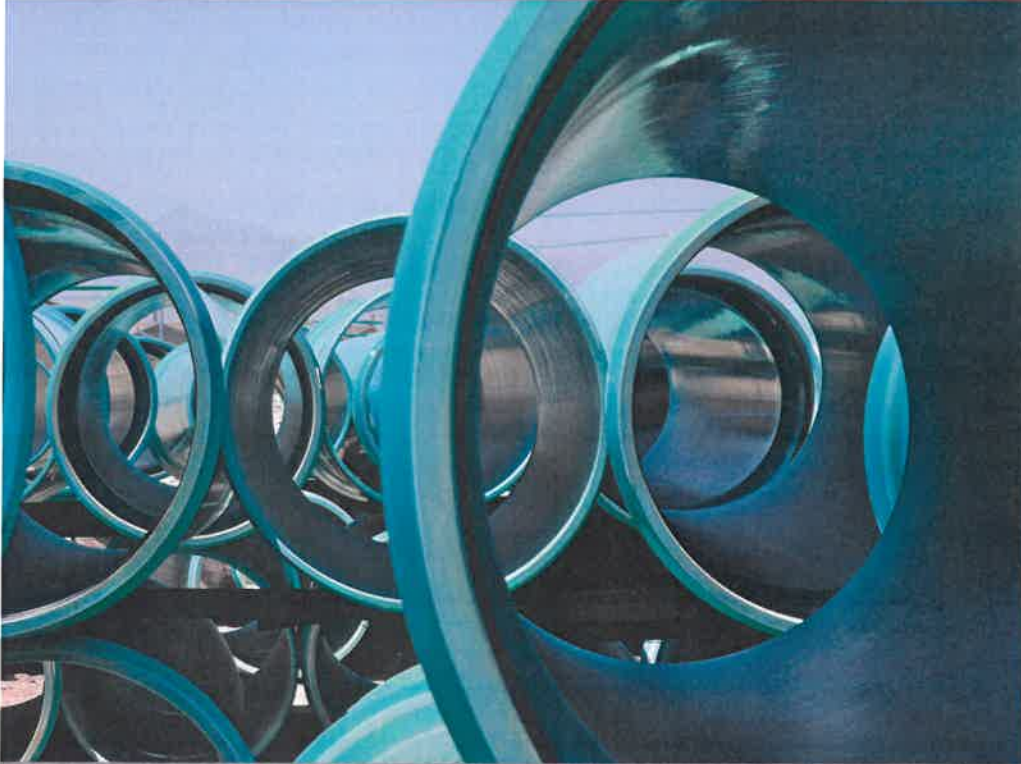
CITY OF
**West
Linn**



City of West Linn

Sanitary Sewer Master Plan Update

DRAFT



March 2019

carollo
Engineers...Working Wonders With Water®

Brown AND Caldwell





CITY OF
**West
Linn**

City of West Linn
Sanitary Sewer Master Plan Update

SANITARY SEWER MASTER PLAN

DRAFT | March 2019

This document is released for the purpose of information exchange review and planning only under the authority of Matthew M. Huang, March 25, 2019, State of Oregon, P.E. No. 91512.

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- Attachment B Technical Memorandum 2: Existing System
- Attachment C Technical Memorandum 3: Hydraulic Model Development
- Attachment D Technical Memorandum 4: Capacity Analysis and I/I Reduction Program
- Attachment E Technical Memorandum 5: Capital Improvement Plan

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EXECUTIVE SUMMARY

The City of West Linn (City) is located in Clackamas County, near Portland, Oregon. It is surrounded by the Clackamas River, Willamette River, and City of Lake Oswego. The City owns and operates most of the sewer collection system within the City limits. The City discharges wastewater to Clackamas County's Water Environment Services (WES)'s Regional Treatment Plant.

The City has prepared this Sanitary Sewer Master Plan (SSMP) to document the status of the City's sewer system and analyze the system to anticipate future needs. In order to provide effective, reliable, and safe sewer service, this SSMP will be used as a guide for operation, maintenance, and expansion of the sewer system for the next 20 years and beyond. This SSMP serves as the framework on which to evaluate future growth and system replacement and rehabilitation over the next 20 years, and estimate system capacity, ultimately leading to an updated Capital Improvement Plan (CIP) as part of the Sanitary Sewer Master Plan (SSMP). This SSMP covers the following main topics:

- Basis of Planning
- Existing System
- Model Development and Calibration
- Capacity Evaluation and Inflow/Infiltration Reduction
- Capital Improvement Program

This SSMP is a planning level document utilizing the best practices in the industry. The SSMP is a living document, and will allow for amendment as conditions change. This SSMP is inherently flexible to allow the City to respond to opportunities and changing conditions as they develop. In particular, Water Environment Services (WES) will complete their SSMP after the City's SSMP has been completed and the results of their SSMP may change the Capital Improvement Program recommended in this document. Beyond this, the City should be prepared to update the model to incorporate changes within the community and the collection system at approximately 10-year intervals.

Table 1 below summarizes the City's recommended Capital Improvement Program.

Table 1 CIP Overview Costs

| | High Priority Cost (\$) | Medium Priority Cost (\$) | Low Priority Cost (\$) | Total Cost (\$) |
|-------------------|-------------------------|---------------------------|------------------------|----------------------|
| Pipeline (P) | \$ 2,363,000 | \$ 2,330,000 | \$ 1,320,000 | \$ 6,013,000 |
| Gravity Main | \$ 2,363,000 | \$ 1,113,000 | \$ 1,320,000 | \$ 4,796,000 |
| Force Main | \$ – | \$ 1,217,000 | \$ – | \$ 1,217,000 |
| Pump Station (PS) | \$ 1,049,000 | \$ 4,254,000 | \$ – | \$ 5,303,000 |
| Planning (PL) | \$ 100,000 | \$ 200,000 | \$ 300,000 | \$ 600,000 |
| General (G) | \$ 5,947,000 | \$ 5,947,000 | \$ 11,895,000 | \$ 23,789,000 |
| Total | \$ 9,459,000 | \$ 12,731,000 | \$ 13,515,000 | \$ 35,705,000 |

Carollo Engineers, Inc. would like to acknowledge and thank the following individuals for their efforts and assistance in completing this SSMP. Their cooperation and courtesy in obtaining a variety of necessary information were valuable components in completing and producing this report:

- Erich Lais, City of West Linn, Assistant City Engineer
- Amy Pepper, City of West Linn, Senior Engineer
- Lara Kammereck, Carollo Engineers, Inc., Principal-in-Charge
- Matt Huang, Carollo Engineers, Inc., Project Manager
- Aurelie Nabonnand, Carollo Engineers, Inc., Project Engineer
- Angela Wieland, Brown and Caldwell, Project Manager
- Karen Hooge, Carollo Engineers, Inc., Document Processor
- Jackie Silber, Carollo Engineers, Inc., GIS Analyst

Section 1

BASIS OF PLANNING

The Study Area, shown as a dashed green line in Figure 1, is the currently agreed-upon service boundary. The Study Area contains area that coincide with the City limits and urban growth boundary (UGB).

Three planning periods are evaluated in this SSMP:

- Existing system.
- 5-year Planning Period.
- Build-out.

Evaluations are performed for both average dry weather flow (ADWF) and peak wet weather flows (PWWF).

ADWF is the average flow that occurs on a daily basis during the dry weather season, and is representative of routine wastewater discharges into the collection system from customers as well as baseline groundwater infiltration. PWWF is the highest observed hourly flow that occurs following the selected design storm event.

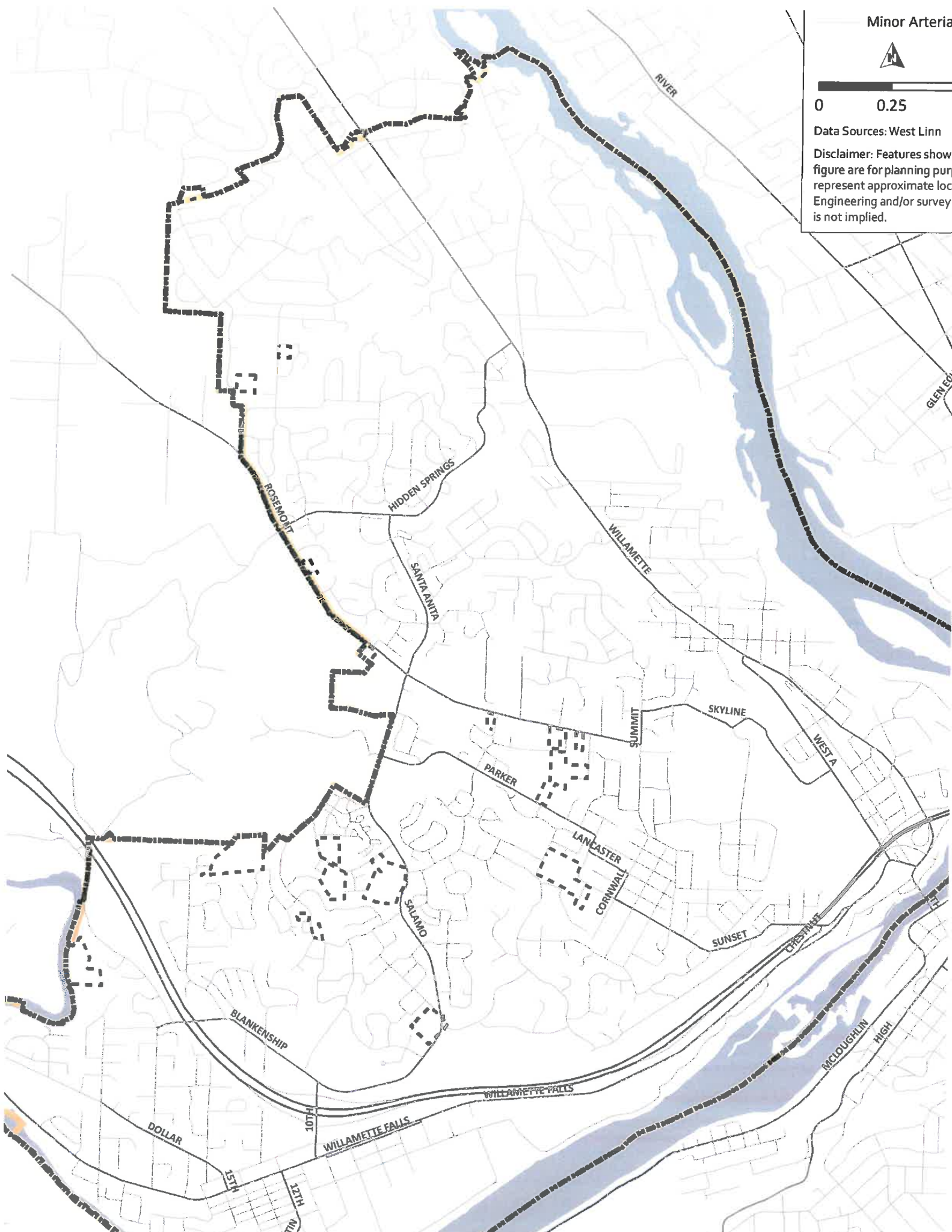
Estimated ADWFs for each basin were estimated using data from the Flow Monitoring Program for each of the flow monitoring basins. Flows were monitored at ten locations in the collection system. Future ADWF were estimated using an area based methodology using wastewater flow factors for the different land use categories. Peak wet weather flows in a sewer system can be more than ten times the base flow, causing utilities to construct high-capacity infrastructure to convey and treat these extraneous flows. Existing and projected PWWFs are predicted using the hydraulic model and design storm used for this SSMP. This analysis uses a 5-year, 24-hour design storm, accounting for climate change, with a maximum intensity of 0.5 inches/hour. To represent typical winter Pacific Northwest winter rainfall conditions, antecedent rainfall was added from historical data, as shown in Figure 2. Further detail on the development of the design storm can be found in Attachment A of this SSMP (Technical Memorandum (TM) 1 – Basis of Planning).

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Minor Arterial



Data Sources: West Linn
Disclaimer: Features shown in this figure are for planning purposes only. They represent approximate locations and are not intended to represent Engineering and/or survey data. No warranty is implied.



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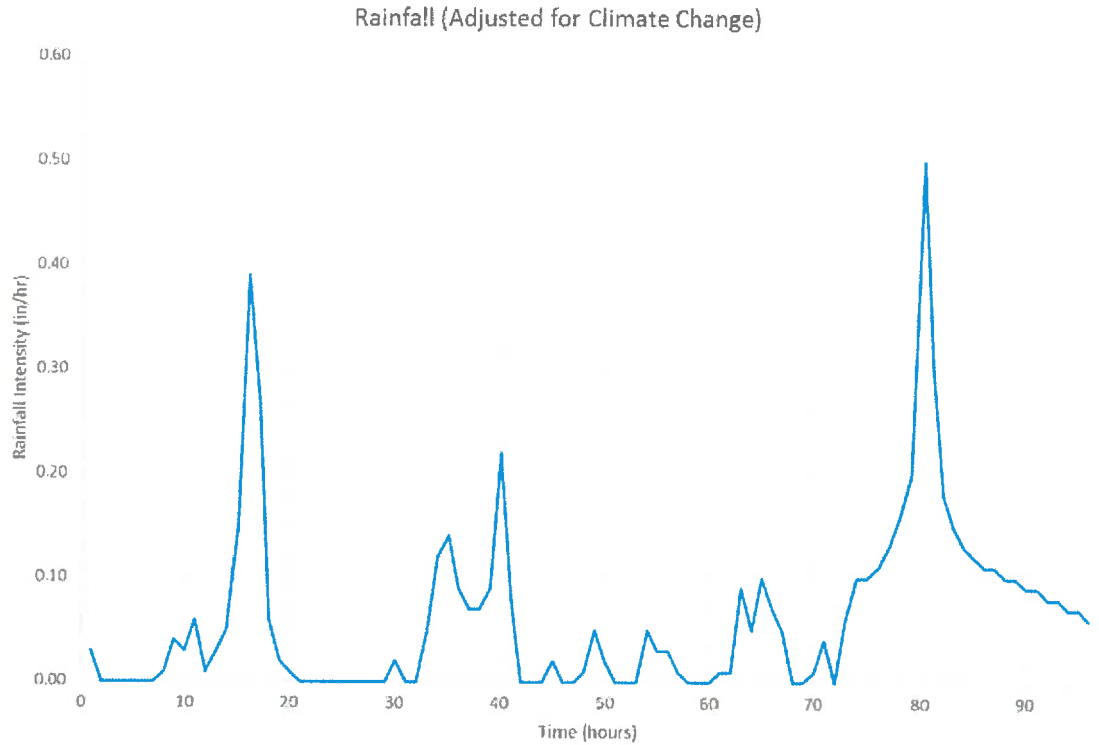


Figure 2 Design Storm Hyetograph

A summary of the predicted ADFW and PWWF flows for each planning period is shown in Table 2.

Table 2 Existing and Projected Wastewater Flows

| Flow Condition | Existing Conditions | 5-year Planning Period | Build-out Conditions |
|---------------------|---------------------|------------------------|----------------------|
| ADWF (mgd) | 3.34 | 3.42 | 3.74 |
| PWWF (mgd) | 20.17 | 21.26 | 23.68 |
| Peaking Factor (PF) | 6.0 | 6.2 | 6.3 |

The City is responsible for managing and operating its sewer system in accordance with local, state, and federal regulations. To best manage the sewer system and comply with regulations, the City has adopted sewer system policies and criteria. These policies guide the development and financing of the infrastructure required to provide sewer service, and document the City’s commitments to current sewer system customers as well as those considering service from the City.

Carollo performed a high-level review of the City’s existing policies against similar policies developed for other wastewater agencies to identify potential missing policies or clarifications to better meet the City’s current sewer management needs. While not comprehensive, this review provides recommended direction for future policy revisions. Recommended modifications and additions to these policies are shown in Tables 3, 4, 5, and 6.

Further information on the Basis of Planning can be found in Technical Memorandum (TM) 1 – Basis of Planning, which is in Attachment A of this SSMP.

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fy future service area extend.

re Recommendation (Example Text Provided):

rials shall be owned and maintained by the property owner up to and including the connection to the City-owned sewer main.

re Recommendation (Example Text Provided):

The extension of the sanitary sewer system may be initiated as follows:

- a) Any person may request that the City extend the sanitary sewer system in order to serve property owned by that person.
- b) The City may initiate the extension of the sanitary sewer system.

A request to extend the sanitary sewer system shall be in writing and shall consist of the following information:

- a) A map of the property to be served by the extension of the system identifying the property by address and tax map and lot number;
- b) A written report containing the reasons for the extension to the sanitary sewer system; and
- c) Any other relevant information required by the City Engineer.

The City Engineer shall review each request for extension of the system and determine if it is in the City's interest to proceed with extension of the system. The review shall consider the following factors:

- a) The potential health hazard if the system is not extended;
 - b) Whether the properties to be served by the extension are within the City limits at the time of the request, are likely to connect to the system and agree to be annexed within a reasonable period, or are slated to receive service from pursuant to a valid intergovernmental between the City and another governmental unit.
 - c) The number of properties that will benefit if the system is extended and whether those properties are currently developed; and
 - d) The potential water quality benefits if the system is extended.
 - e) Adequacy of the available funding source.
 - f) Availability of public right-of-way or easements.
- The City Engineer determines that it is in the City's interest to proceed with extension pursuant to subsection 3 of this section, the extension shall be scheduled for construction. Persons who apply to connect to the extended line shall pay the fee established prior to and as a condition of connection.

re Recommendation (Example Text Provided):

corporated property shall be required to annex prior to the receipt of City sanitary sewer service, or as set forth below:

of the following conditions must be met to provide unincorporated property with City sanitary sewer service prior to annexation:

The property shall be located within the Urban Growth Boundary;

Existing sanitary sewer line operated by the City to which connection can be made in accordance with subsection (4) below is within 300 feet of the property;

The City has found that the septic system serving the property is failing and the City has directed connection to a sanitary sewer system;

The extension of a sanitary sewer line to be connected to the City sanitary sewer line shall be subject to acceptance of an approved plan by the City Engineer.

re Recommendation (Example Text Provided):

itary sewer study will be required when an 8-inch diameter gravity sewer is inadequate to serve the current or future development or when the City Engineer determines that a recently annexed area situated outside the limits of the current Plan warrants a study. The study shall incorporate the proposed design system including features as the pipe slope, cover, and size; the study shall include, but not be limited to, a detailed map of the sanitary sewer service, sewage treatment plants, and pipe hydraulic calculations.

re Recommendation (Example Text Provided):

n land outside a new development will logically direct flow into a storm drain or sanitary sewer within the new development, the system shall be "public" and shall be extended to one or more of the upstream development boundaries. The system shall be designed to accommodate all off-site flows, based on a fully developed condition using the current Comprehensive Plan.

re Recommendation (Example Text Provided):

facility system serves different geographic sub-areas of the City. While facilities such as parks and schools relate more to neighborhoods defined by population size and travel time/distance, systems such as sewers, water, and storm water are more logically defined by topography, soils, and other natural constraints. Such disparities can interfere with coordination of planning for public facilities, affecting different client populations. To help overcome these barriers, the City Engineer should be organized, where possible, in relation to a common set of geographic sub-areas.

re Recommendation:

fy policy in Municipal Code 4.005 to require connection to sanitary sewer system from 200 feet to 300 feet. This modification is recommended to match policies from other agencies in the Portland metropolitan area.

ure Recommendation (Example Text Provided):

: City shall make reasonable attempts to protect the security of its sewer collection system. The City shall determine what information about the system should remain unavailable to the general public.

ure Recommendation (Example Text Provided):

: City shall manage the sewer collection system through developing design standards, overseeing construction, operating, and maintaining the system such that service to areas in the Urban Services Boundary is adequate and reliable. Whenever possible, the City shall anticipate system interruptions, such as power outages, and design and operate the system to minimize the impact of such interruptions on its customers and the environment.

ollo can provide example text to reference Oregon Resilience Plan.

ure Recommendation (Example Text Provided):

ess specifically directed otherwise by the City, all facilities and equipment shall be maintained in accordance with manufacturers' specifications. The City adheres to maintenance and replacement schedules for all facilities and equipment

ure Recommendation (Example Text Provided):

: City shall maintain a complete inventory of all City-owned equipment, supplies, parts, and service vehicles used for maintenance of sewer facilities. The inventory should include planned replacement dates as applicable.

ure Recommendation (Example Text Provided):

a regular basis, the City shall update their Emergency Operations Plan focusing on responding to emergencies and disasters.

ure Recommendation (Example Text Provided):

a regular basis the City shall update and maintain their Natural Hazards Mitigation Plan addressing risks associated with natural hazards.

mental Policies

ure Recommendation (Example Text Provided)

: City will manage the sewer collection system, including monitoring and adapting plans, policies, and practices to collect and convey wastewater from its customers in a safe and sustainable manner in accordance with the City's Environment of the Comprehensive Plan.

ure Recommendation (Example Text Provided)

: City has implemented programs to prevent overflows of wastewater in the existing system, and requires all new construction to convey peak flows and storm events without overflowing the sewer during the design storm event.

ure Recommendation (Example Text Provided)

w wastewater infrastructure will be sited outside of stream corridors, wetlands, and significant tree groves whenever feasible.

on Item. Update design storm requirement

in accordance with all applicable federal, state, and local regulations, the City should design its sewer facilities to adequately and reliably convey peak hour flows associated with a 24-hour, 5-year recurring storm event without overflowing to any water bodies.

on Item: Update surcharging requirement

- New facilities shall be designed to prevent the hydraulic grade line from exceeding the crown of pipe during Peak Wet Weather Flow (PWWF). Allowable depth to full depth (d/D) ratios for new pipes can be based on a graduated c according to pipe size, as shown in the following:
 - <=12-inch; d/D = 0.5
 - >=15-inch; d/D = 0.75
- The existing system shall be evaluated for two conditions of surcharging, as follows:
 - Under Peak Dry Weather Flow (PDWF), pipes can flow full with a depth to full depth (d/D) ratio of 0.90
 - Under Peak Wet Weather Flow (PWWF), the Hydraulic Grade Line (HGL) may not rise above one foot above any pipe invert.

ify criteria such that cleanouts are never permitted at any location.

ire Recommendation:

ify policy from "A 6 in. diameter sewer will be allowed with the City Engineer's approval." To "A 6 in. diameter sewer may be allowed with the City Engineer's approval."

ire Recommendation (Example Text Provided):

isions shall be included in the design of any pump station to allow the station to remain fully operational and accessible during the design storm.

ire Recommendation (Example Text Provided):

nant flow meters shall be provided in a separate vault for all new pump stations.

ire Recommendation (Example Text Provided):

der to reduce the risk of overflows during power outages or when performing routine maintenance, the City shall install emergency back-up power generators, receptacles for portable generators and/or bypass pump connections at all p stations. For pump stations without telemetry, it is recommended to install telemetry. The telemetry system shall have back-up battery power that allows the telemetry system to continue to operate for up to seven days.

ire Recommendation:

well sizing can be achieved in stations with low influent flow rates, but would likely result in oversized wet wells for larger stations. We would recommend for the standard of 4 hours of storage above high water alarm to be respected never possible, but that a reduced duration be acceptable if approved by the City.

ire Recommendation (Example Text Provided):

City's pump stations shall be designed with bypass pump connections that will allow the City to pump directly from the wet well into the pump station's force main with a portable pump, thus bypassing the pumps in the dry well. This fe id allow the City to manage wet well levels during power outages and routine maintenance.

ire Recommendation (Example Text Provided):

ign engineers shall provide to the City and DEQ all documentation required by OAR 340-052-0040 including the final O&M Manuals and certification that the construction was inspected by the design engineer and found to be in accorda plans and specifications.

ire Recommendation (Example Text Provided)

er flows are composed of residential, institutional, commercial, and industrial sewage, along with infiltration and inflow. Sewers must be capable of conveying the peak hourly flows of these wastewater sources as estimated using the di m.

ire Recommendation:

existing policy requires an air test for gravity sanitary sewer testing. The City should also permit a water test.

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Section 2

EXISTING SYSTEM

The City's collection system consists of approximately 115 miles of gravity mains, 1.5 miles of force mains, and 10 pump stations that collect and convey wastewater to the Tri-City Water Pollution Control Plant. Figure 3 presents the City's existing collection system, and shows the currently connected and contributing tax lots as provided by the City.

The City owns and maintains six small pump stations and one larger pump station, the Mapleton Pump Station. The remaining three pump stations (Bolton, River Street, and Willamette Pump Station) are operated and maintained by Clackamas County's Water Environment Services (WES). County customers contribute flow both upstream and downstream of the City collection system. This SSMP only discusses the City's system and does not cover WES' system.

The City's gravity mains are approximately 25 percent (%) clay pipe, 25% polyvinyl chloride (PVC) pipe, and 50% concrete pipe. A summary of the gravity pipelines are listed in Table 7 by diameter size. The City owns seven pump stations and their associated force mains; a summary of the pump stations are in Table 8 and the force mains in Table 9.

The City's collection system is divided into 25 wastewater basins that are denoted alphabetically. Figure 4 shows the wastewater basins, showing which areas contribute flows to which pipelines.

Further information on the Existing System can be found in TM 2 – Existing System, which is in Attachment B of this SSMP.

Table 7 Collection System Gravity Main Inventory

| Diameter (inch) | Length (LF) | Percentage of System |
|----------------------|----------------|----------------------|
| Unknown | 293,629 | 48.6% |
| 4 | 164 | 0.03% |
| 6 | 16,704 | 2.8% |
| 8 | 212,131 | 35.1% |
| 10 | 25,278 | 4.2% |
| 12 | 15,798 | 2.6% |
| 14 | 1,765 | 0.3% |
| 15 | 15,107 | 2.5% |
| 18 | 11,149 | 1.8% |
| 21 | 7,898 | 1.3% |
| 24 | 5,123 | 0.8% |
| Total (feet) | 604,747 | 100% |
| Total (miles) | 114.5 | 100% |

Notes:

(1) System only includes gravity mains and excludes private sewers and WES pipes.

Table 8 Existing Pump Stations Inventory Summary (City Owned)

| Pump Station | Sewer Basin | Address | Number of Pumps | Horsepower (hp) | Flow (gpm) | Head (ft) | Pump Station Capacity | | Year Constructed / Rehabilitated |
|---------------------------|-------------|--------------------|-----------------|-----------------|------------|-----------|----------------------------|---------------------------|----------------------------------|
| | | | | | | | Total ⁽¹⁾ (gpm) | Firm ⁽²⁾ (gpm) | |
| Arbor PS | 5A | 3609 Arbor Dr | 2 | 10 | 190 | 70 | 380 | 190 | 1990 |
| Calaroga PS | 4A | 3831 S Calaroga Dr | 2 | 7.5 | 80 | 44 | 160 | 80 | 1993 |
| Cedar oak PS | 7A | 3964 Cedar Oak Dr | 2 | 2 | 150 | 21.5 | 300 | 150 | 1990 |
| Dollar (River Heights) PS | 9D | 2220 Brandon Pl | 2 | 18 | 118 | 112 | 236 | 118 | 1992 |
| Johnson PS | 10A | 23701 S Johnson Rd | 2 | 6.5 | 175 | 64 | 350 | 175 | 1998 |
| Mapleton PS | 3C | 19050 Nixon Ave | 2 | | 1,000 | 125 | 2,950 | 1,950 | 1998 |
| | | | 1 | | 950 | 115 | | | |
| Marylhurst PS | 3A | 900 Marylhurst Cir | 2 | 3 | 160 | 28 | 320 | 160 | 1990 |

Notes:

Total capacity corresponds to the capacity of the station with all pumps running.

Firm capacity corresponds to the capacity of the station with largest pump out of service.

Table 9 Collection System Force Main Inventory

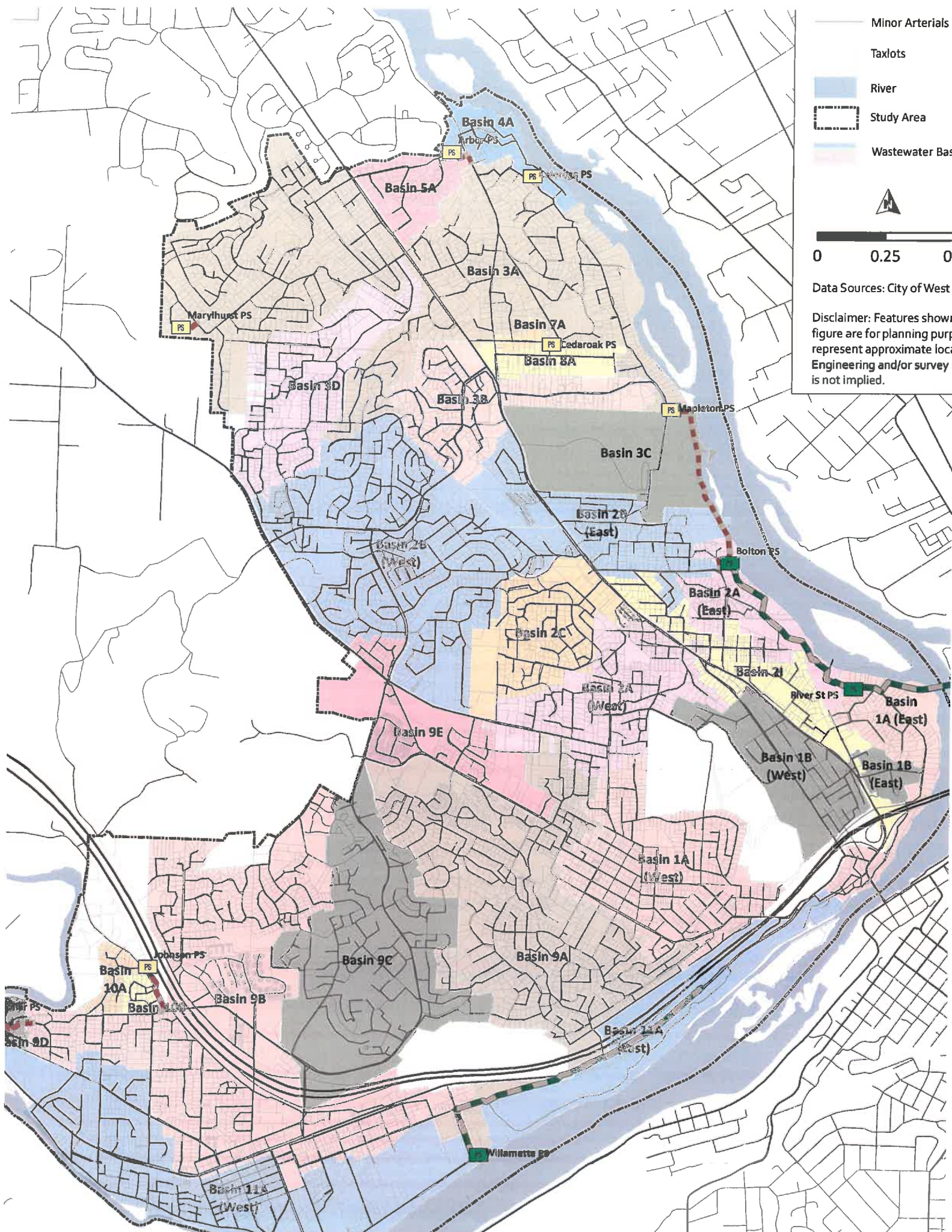
| Pump Station | 4-inch | 8-inch | 12-inch | 16-inch | 18-inch | Total (ft) | Percent System (%) |
|-------------------------|--------------|------------|--------------|--------------|--------------|---------------|--------------------|
| Arbor PS | 628 | | | | | 628 | 2.8% |
| Bolton PS | | | | 6,380 | | 6,380 | 28.3% |
| Calaroga PS | 213 | | | | | 213 | 0.9% |
| Cedar oak PS | 234 | | | | | 234 | 1.0% |
| Dollar PS | 926 | | | | | 926 | 4.1% |
| Johnson PS | 987 | | | | | 987 | 4.4% |
| Mapleton PS | | | 3,746 | | | 3,746 | 16.6% |
| Marylhurst PS | | 394 | | | | 394 | 1.8% |
| River Street PS | | | 2,675 | | | 2,675 | 11.9% |
| Willamette PS | | | | | 6,322 | 6,322 | 28.1% |
| Grand Total (ft) | 2,988 | 394 | 6,421 | 6,380 | 6,322 | 22,505 | 100% |



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 - Major Arterials
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 - Taxlots
 - River
 - Study Area
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- Minor Arterials
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Section 3

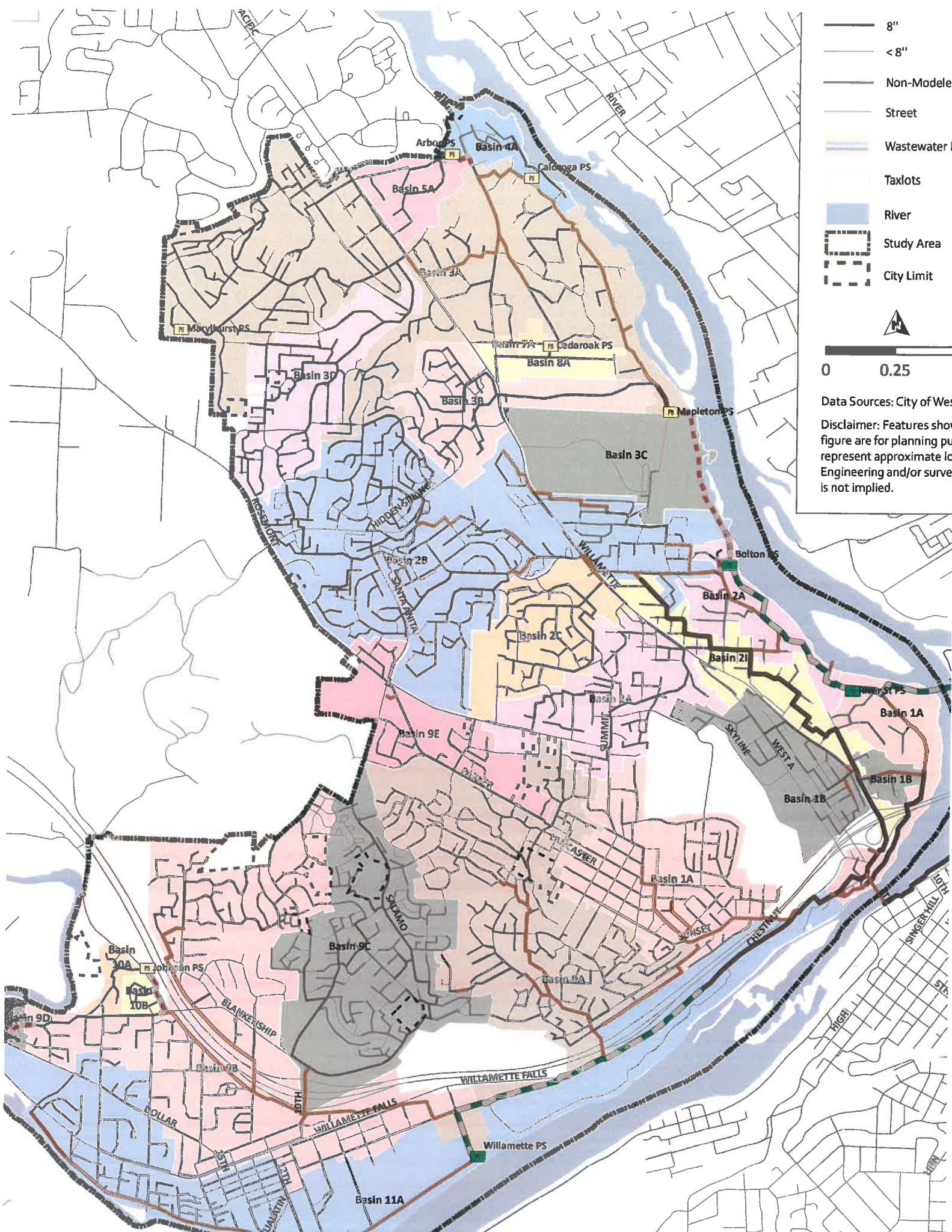
HYDRAULIC MODEL DEVELOPMENT AND CALIBRATION










Wastewater collection system models are valuable tools used to assess the performance of collection systems during dry and wet weather conditions, and to plan for future improvements. These models provide a means to simulate the impact of different sized storms on the collection system, and determine where future system deficiencies are likely to occur. In addition, a well-calibrated model provides a method for testing alternative improvement scenarios.


A sewer collection system model is a simplified representation of the real sewer system. Sewer system models can assess the conveyance capacity for a collection system. In addition, sewer system models can perform “what if” scenarios to assess the impacts of future developments and land use changes. The City’s collection system hydraulic model was constructed using a multi-step process utilizing data from a variety of sources. A hydraulic model was developed to evaluate the sanitary sewer system, with the model consisting of the City’s main gravity pipelines, and all pump stations and force mains. The model was constructed in InfoSWMM, a hydraulic modeling software package, and the part of the collection system modeled is shown in Figure 5.


For this project, flow monitoring was conducted at 10 meter sites for a period of approximately nine weeks from January 2016 to March 2016. Dry weather flow (DWF) calibration ensures an accurate depiction of base wastewater flow generated within the study area. The wet weather flow (WWF) calibration consists of calibrating the hydraulic model to specific storm events to accurately simulate the peak and volume of infiltration/inflow (I/I) into the sewer system. The model was calibrated to field flow measurements. Further information on the hydraulic modeling can be found in TM 3, which is in Attachment C of this SSMP.

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Section 4

CAPACITY EVALUATION AND INFLOW/INFILTRATION REDUCTION

As the City continues to grow and age, some of the City's sewer infrastructure may reach capacity for adequately handling flows. Capacity evaluation of the wastewater collection system was performed in accordance with the following criteria, using the hydraulic model developed for this SSMP:

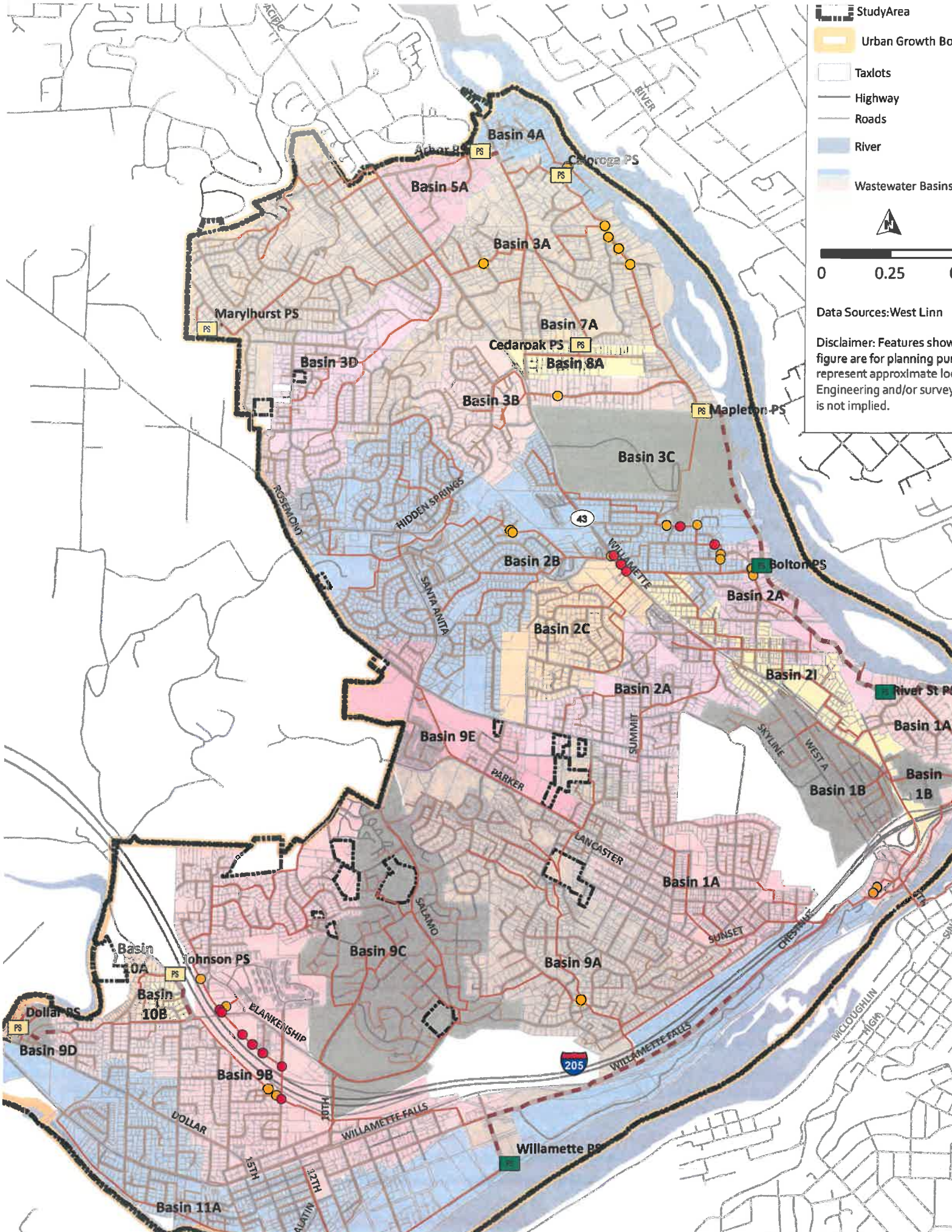
- During Peak Wet Weather Flow (PWWF), water levels were allowed to rise no more than 1 foot above the pipe crown. Sewers were allowed to surcharge under these maximum flow conditions during the design storm. Additionally, no surcharging was allowed for shallow manholes (the difference between the manhole rim and top of pipe was less than four feet).
- Pump capacity shall be sized to handle PWWF from a tributary area with the largest pump out of service.
- The existing force mains shall have a maximum pipe velocity of 8 feet per second (ft/sec) during pumping of PWWF.
- The 5-year, 24-hour design storm is used for sizing the City's sewer infrastructure. Essentially, this design storm has a five percent chance (1/20) that 3.2 inches of rain will fall in any 24-hour period in a given year, and accounts for climate change assumptions.
- It was assumed that degradation (increase in peak I/I rate) would be 7 percent per decade.

4.1 Capacity Evaluation

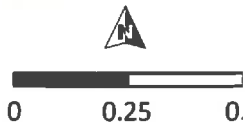
A capacity analysis of the modeled collection system was performed with the City's calibrated hydraulic model using the system performance criteria outlined above. I/I degradation (increase in peak I/I rate) of 7 percent per decade was the assumption used for this analysis, allowing for a conservative scenario system outcome in 20 years.

The capacity analysis identified areas in the sewer system where flow restrictions may occur or where the pipe does not have capacity to convey design flows. Sewers that lack sufficient capacity to convey design flows could produce backwater effects in the collection system that increase the risk of Sanitary Sewer Overflows (SSOs). Potential system deficiencies were identified for PWWF for existing and build-out conditions and are highlighted in Figure 6.

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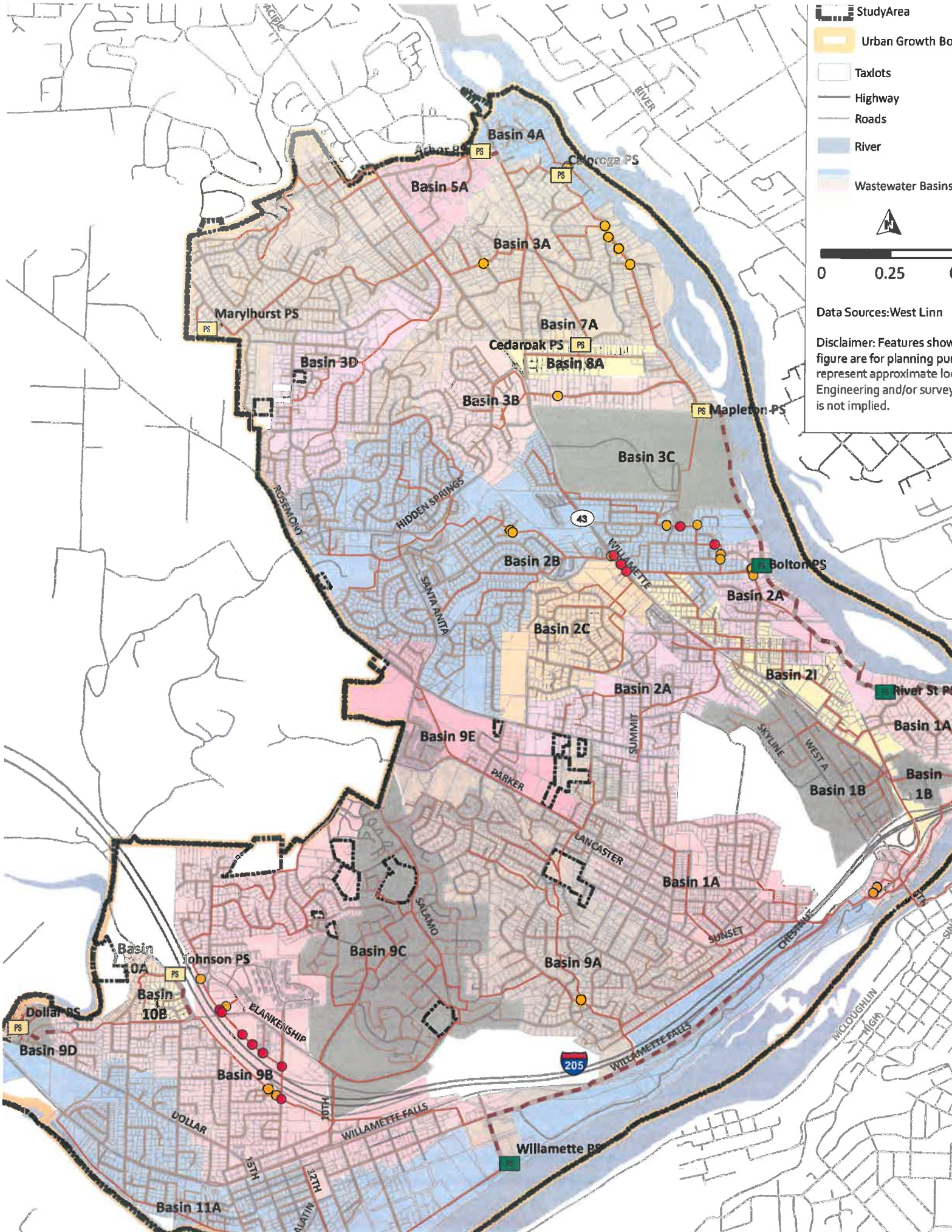


- Study Area
- Urban Growth Boundary
- Taxlots
- Highway
- Roads
- River
- Wastewater Basins



Data Sources: West Linn

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Table 10 summarizes the results of the City owned pump station capacity evaluation. The total capacity and firm capacity of each pump station is compared to the projected PWWFs for both existing and build-out conditions.

As seen in Table 9, all pump stations, except for the Mapleton and Calaroga pump stations, have adequate capacity for existing and build-out conditions. Calaroga is deficient by 0.07 mgd for total capacity and 0.13 mgd for firm capacity under existing conditions.

Mapleton has adequate total capacity for existing conditions, but is deficient by 1.1 mgd under firm capacity and does not meet the City’s redundancy criteria. By build-out, Mapleton will be deficient by 0.62 mgd for total capacity and 2.06 mgd for firm capacity.

In conjunction with the pump station analysis, City-owned force mains were analyzed using the hydraulic model. All force mains are adequately sized, with the exception of Mapleton. At build-out, modeled velocity in the existing force main was 8.7 fps, greater than the City’s 8 fps velocity criteria. This Mapleton force main deficiency should be addressed in conjunction with capacity improvements to the Mapleton pump station.

Table 10 Pump Station Evaluation

| Pump Station Name | Total Capacity (mgd) | Firm Capacity (mgd) | Existing Maximum PWWF (mgd) | Build-out Maximum PWWF (mgd) | Existing Condition Deficiency (Total/Firm) (mgd) | Build-out Condition Deficiency (Total/Firm) (mgd) |
|-------------------|----------------------|---------------------|-----------------------------|------------------------------|--|---|
| Arbor | 0.55 | 0.27 | 0.13 | 0.14 | - / - | - / - |
| Calaroga | 0.12 | 0.06 | 0.19 | 0.19 | 0.07 / 0.13 | 0.07 / 0.13 |
| Cedar Oak | 0.43 | 0.22 | 0.10 | 0.11 | - / - | - / - |
| Johnson | 0.50 | 0.25 | 0.11 | 0.12 | - / - | - / - |
| Mapleton | 4.25 | 2.81 | 3.91 | 4.87 | - / 1.1 | 0.62 / 2.06 |
| Marylhurst | 0.46 | 0.23 | 0.02 | 0.02 | - / - | - / - |
| River Heights | 0.34 | 0.17 | 0.06 | 0.07 | - / - | - / - |

4.2 Inflow and Infiltration Reduction Program

Inflow and infiltration (I/I) into the sanitary sewer system increases as degradation of the system occurs, reducing total available capacity in pipelines, pump stations, and treatment facilities. The rainfall-dependent I/I is seen immediately (inflow) or within hours after a storm (infiltration).

An important factor in the reduction of I/I in the City’s system is Water Environment Services (WES)’ collection system. Flows and I/I from the City and neighboring partners may trigger capacity issues for WES’s pump stations, pipelines, and treatment facility. The City’s capacity analysis presented above did not show significant capacity deficiencies that would trigger the need for an extensive I/I program.

WES is currently developing its sanitary sewer master plan. As part as this effort, preliminary data and flow targets were provided by WES as guidance when investigating I/I status. The preliminary data from WES correspond to peak flow estimates in 2040, assuming a 65-percent I/I reduction in select sub-basins.

I/I reduction goals for the City to meet WES' preliminary data were developed using an iterative process with the City's calibrated hydraulic model. Several iterations were simulated using a range of wastewater basins and I/I percent reduction goals.

Based on modeling results, preliminary data available from WES at the time of the development of this SMMP and high expense (\$99.3 M – see details in TM No.4) to implement an I/I program to meet WES' preliminary flow targets, it is not recommended that the City pursue an extensive I/I program at this time with a full Sanitary Sewer Evaluation Survey (SSES).

Further collaboration between the City and WES to refine and clarify future assumptions and I/I reduction goals is highly recommended. The City's capacity analysis presented in Section 4.1 did not show significant capacity deficiencies in the collection system that would trigger an extensive I/I program need. Further coordination should confirm flow reduction targets and assumptions. Further investigation of the cost of treatment and conveyance versus the cost of implementing I/I reduction strategies is needed.

In the meantime, it is recommended that the City focus its CCTV and repair and replacement program in the following basins:

- Basin 1A West
- Basin 2B East
- Basin 1B West
- Basin 1A East
- Basin 2A West
- Basin 2I

Given the relatively elevated I/I parameters identified in these basins, especially Basin 1A West, it is recommended that the City prioritize these wastewater basins for condition and repair and replacement (Project G-1 in the CIP). CCTV and repair and replacement in these basins will ultimately decrease flows from I/I.

Further information on the capacity reduction and I/I reduction evaluation can be found in TM 4, which is in Attachment D of this SSMP.

Section 5

CAPITAL IMPROVEMENT PROGRAM

The purpose of the CIP is to provide the City with a guideline for planning and budgeting for improvements to its sanitary sewer system. The CIP consists of cost estimates and timing for each project. Capital projects were categorized by the nature of infrastructure:

- Pipeline Projects (P)
- Pump Stations (PS)
- General (G)

CIP projects were prioritized based on the urgency to mitigate existing deficiencies and to service anticipated growth. The CIP projects were separated into three phases based on project priority:

- High Priority (2019-2023)
- Medium Priority (2024-2028)
- Low Priority (2029-2038)

5.1 Cost Estimating Assumptions

Association for the Advancement of Cost Engineering (AACE) Class 4 estimates were used for this SSMP. Class 4 cost estimates of this type are order of magnitude estimates; actual costs may vary from these estimates by minus 30 percent to plus 50 percent.

Baseline construction costs were calculated by multiplying estimated project quantities by the unit cost.

The Estimated Construction Cost consists of the Baseline Construction Cost and the following multipliers applied to Baseline Construction Cost:

- Construction Contingency (30 percent)
- Planning Contingency (20 percent)
- Traffic Control/Utility Relocation (5 – 10 percent)

The Capital Improvement Cost consists of the Estimated Construction Cost with the following multipliers applied on top of the Estimated Construction Cost:

- Engineering/Permitting/Project Administration (25 percent)
- Construction Administration (10 percent)

5.2 Capital Improvement Program

The CIP cost estimates were developed from cost curves, information obtained from previous studies, and experience from other projects. Estimated project quantities were developed in TM 4. These costs were determined based on the City's and Carollo Engineers, Inc.'s (Carollo's) understanding of current conditions at the project locations.

All cost estimates were made using September 2018 dollars. The Engineering News-Record (ENR) U.S. 20-City Construction Cost Index for September 2018 is 11,170. Cost estimates are subject to change as the project design matures. Cost of labor, materials, and equipment may vary in the future. Details on cost estimating and assumptions can be found in TM No. 5 – CIP (Attachment E).

Table 11 summarizes the City's recommended Capital Improvement Program. The CIP is graphically shown in Figures 7 and 8.

As per Section 4.2 discussion, an extensive I/I reduction program is not recommended at this time, therefore, no I/I reduction costs are included in this CIP. It is recommended that the City target higher I/I areas as part of its ongoing pipeline replacement program (included in General (G) project costs). Further collaboration between the City and WES to refine and clarify future assumptions and I/I reduction goals is highly recommended. The City's capacity analysis presented in Section 4.1 did not show significant capacity deficiencies in the collection system that would trigger an extensive I/I program need. Further coordination should confirm flow reduction targets and assumptions. Further investigation of the cost of treatment and conveyance versus the cost of implementing I/I reduction strategies is needed.

Further information on the capacity reduction and inflow/infiltration reduction program can be found in TM 4, which is in Attachment D of this SSMP.

Table 11 CIP Overview Costs

| | High Priority Cost (\$) | Medium Priority Cost (\$) | Low Priority Cost (\$) | Total Cost (\$) |
|-------------------|-------------------------|---------------------------|------------------------|----------------------|
| Pipeline (P) | \$ 2,363,000 | \$ 2,330,000 | \$ 1,320,000 | \$ 6,013,000 |
| Gravity Main | \$ 2,363,000 | \$ 1,113,000 | \$ 1,320,000 | \$ 4,796,000 |
| Force Main | \$ – | \$ 1,217,000 | \$ – | \$ 1,217,000 |
| Pump Station (PS) | \$ 1,049,000 | \$ 4,254,000 | \$ – | \$ 5,303,000 |
| Planning (PL) | \$ 100,000 | \$ 200,000 | \$ 300,000 | \$ 600,000 |
| General (G) | \$ 5,947,000 | \$ 5,947,000 | \$ 11,895,000 | \$ 23,789,000 |
| Total | \$ 9,459,000 | \$ 12,731,000 | \$ 13,515,000 | \$ 35,705,000 |

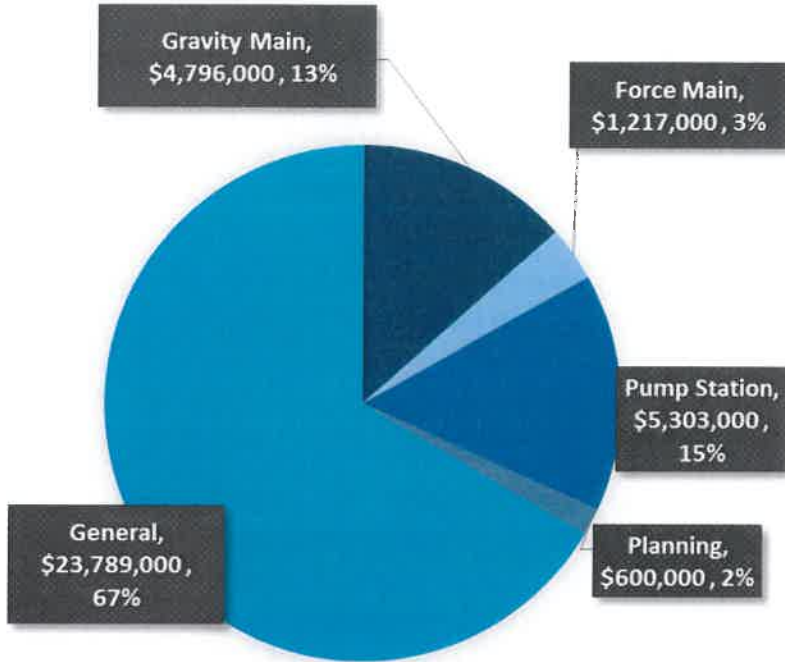


Figure 7 CIP Costs by Project Type

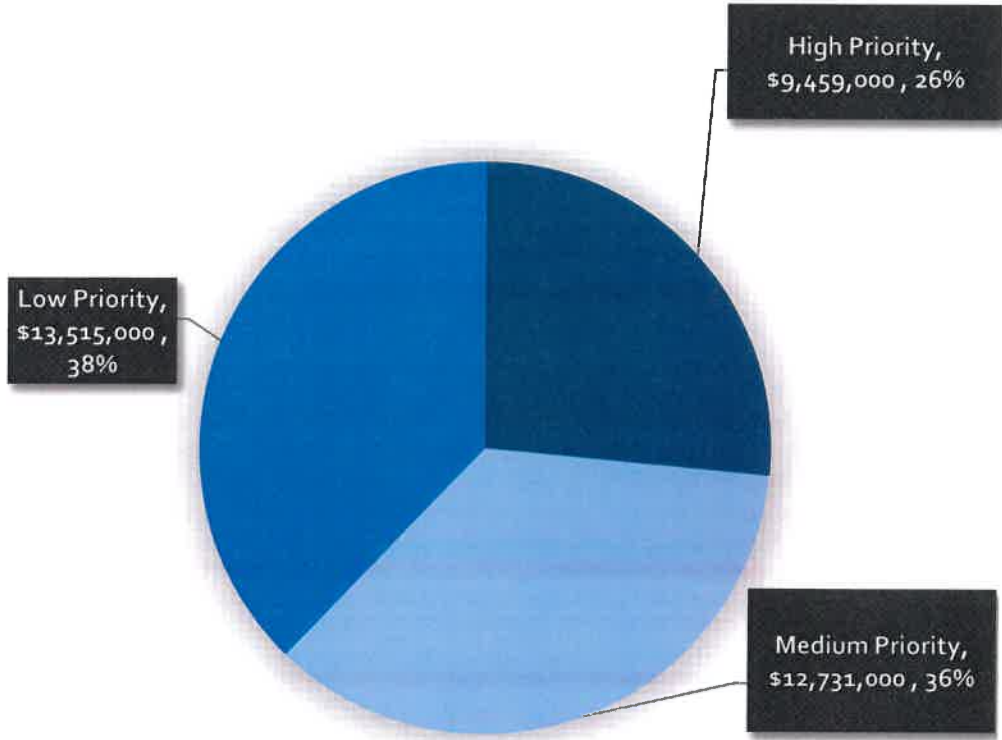


Figure 8 CIP Costs by Project Priority

5.3 Pipeline Projects

Pipeline projects are broken down into two categories: gravity main projects and force main projects. Details on both types of projects are provided below. The locations of all CIP projects are shown in Figure 9, with project prioritization shown in Figure 10.

5.3.1 Gravity Main Projects

5.3.1.1 I-205 Crossing (P-1)

The existing I-205 crossing acts as a bottleneck in the collections system due to inadequately sized pipes in the area. Hydraulic deficiencies were identified under existing conditions, and are amplified with additional flow in the basin under build-out conditions. Project P-1 is located in wastewater basin 9B and consists of upsizing 2,520 feet of existing 10-inch gravity main to 15-inch gravity main running parallel to I-205 southwest of the Willamette Terrace Apartments and crossing I-205 at 13th Street. This includes 617 feet of highway crossing with 15-inch pipe and a 30-inch casing. This is a high priority project and is estimated to cost \$2,363,000.

5.3.1.2 Wellington Drive (P-2)

Project P-2 is located in wastewater basin 9A and consists of upsizing 425 feet of existing 10-inch gravity main to 12-inch gravity main crossing Wellington Drive near the intersection of Wellington Drive and Wellington Court. This project resolves a deficiency identified under the build-out condition. This section of pipe is identified as deficient mainly due to a relatively flat slope section, which causes the hydraulic grade line (HGL) to rise above the one-foot above pipe crown criteria. No deficiencies are identified under existing condition, therefore, it is recommended that the City monitor this area as flows increase and system degrades in the future.

This is a low priority project to be addressed in the long-term and is estimated to cost \$147,000.

5.3.1.3 Willamette Drive (P-3)

Project P-3 is located in wastewater basin 2B and consists of upsizing 614 feet of existing 12-inch gravity main to 15-inch gravity main along Willamette Drive between Magone Lane and Pimlico Drive. In addition, 69 feet of 15-inch gravity main is to be upsized to 18-inch gravity main along Dillow Drive from Willamette Drive to Tulane Street. This project resolves deficiencies identified under existing conditions due to relatively flat slopes for both sections of pipe. Both sections of pipe are surrounded by steeper sections upstream and downstream, a configuration that typically triggers the HGL to rise in the flat portions of the system.

This is a medium priority project and is estimated to cost \$269,000. Note, this project is located in a basin (wastewater basin 2B), where an I/I reduction program might mitigate the need for this improvement.

5.3.1.4 Palomino Circle (P-4)

Project P-4 is located in wastewater basin 2B and consists of upsizing 508 feet of existing 8-inch gravity main running northwest of Palomino Circle and north of Pimlico Drive to the main southeast of Bronco Court to 12-inch gravity main. This section of pipe was identified as deficient under build-out conditions, with the deficiency caused mainly by a relatively flat slope section that causes the HGL to rise above the one-foot above pipe crown criteria.

This is a low priority project to be addressed in the long-term and is estimated to cost \$175,000.

5.3.1.5 Larson Ave (P-5)

Project P-5 is located in wastewater basin 2B and consists of upsizing 1,162 feet of existing 8-inch gravity main to 12-inch gravity main along Larson Avenue from Tulane Street to Jolie Point Road and along Jolie Point Road to Munger Drive. This section of pipe was identified as deficient under existing conditions, with the deficiency caused mainly by a relatively flat slope section that causes the HGL to rise above the one-foot above pipe crown criteria. Additionally, modeling shows that the entire section is capacity deficient based on PWWF. I/I degradation and development are anticipated to amplify this problem.

This is a medium priority project and is estimated to cost \$401,000. Note, this project is located in a basin (wastewater basin 2B), where an I/I reduction program might be recommended that could mitigate the need for this improvement.

5.3.1.6 Dillow Drive and Maple Terrace (P-6)

Project P-6 is located in wastewater basin 2B and consists of upsizing 351 feet of existing 10-inch gravity main to 15-inch gravity main between Dillow Drive and Maple Terrace. This project is triggered by deficiencies highlighted in the existing condition, and deficiencies are anticipated to be amplified once project P-5 is completed and with the addition of flows caused by growth and system aging. Additionally, this section of pipe is relatively flat, which causes the HGL to rise up quickly.

This is a medium priority project and is estimated to cost \$132,000. Note, this project is located in a basin (wastewater basin 2B), where an I/I reduction program might be recommended that could mitigate the need for this improvement.

5.3.1.7 Nixon Ave (P-7)

Project P-7 is located in wastewater basin 3A and consists of upsizing 1,522 feet of existing 18-inch gravity main to 24-inch gravity main along Nixon Avenue from north of Island View Way to Calaroga Court. This project is triggered by deficiencies identified under build-out conditions. The City's effort to relining sewer lines in wastewater basin 3A decreased I/I rates in the northern part of the system significantly. The previous Master Plan, completed prior to these upgrades, showed high I/I and deficiencies in this area. It is recommended that the City monitor this area as the system degrades over time.

This low priority project is recommended for the long-term and is estimated to cost \$876,000.

5.3.1.8 Fairview Way (P-8)

Project P-8 is located in wastewater basin 3A and consists of upsizing 160 feet of existing 10-inch gravity main to 12-inch gravity main along Fairview Way between Rose Way and Chippewa Court. This project addresses deficiencies identified under build-out conditions.

This is a low priority project and is estimated to cost \$55,000.

5.3.1.9 Failing Street (P-9)

Project P-9 is located in wastewater basin 2A and consists of upsizing 160 feet of existing 12-inch gravity main to 18-inch gravity main from Failing Street to the Bolton Pump Station. This project addresses deficiencies identified under build-out conditions. It is recommended the City monitor this area as the system grows and degrades over time.

This low priority project is estimated to cost \$67,000.

5.3.1.10 Mill Street (P-10)

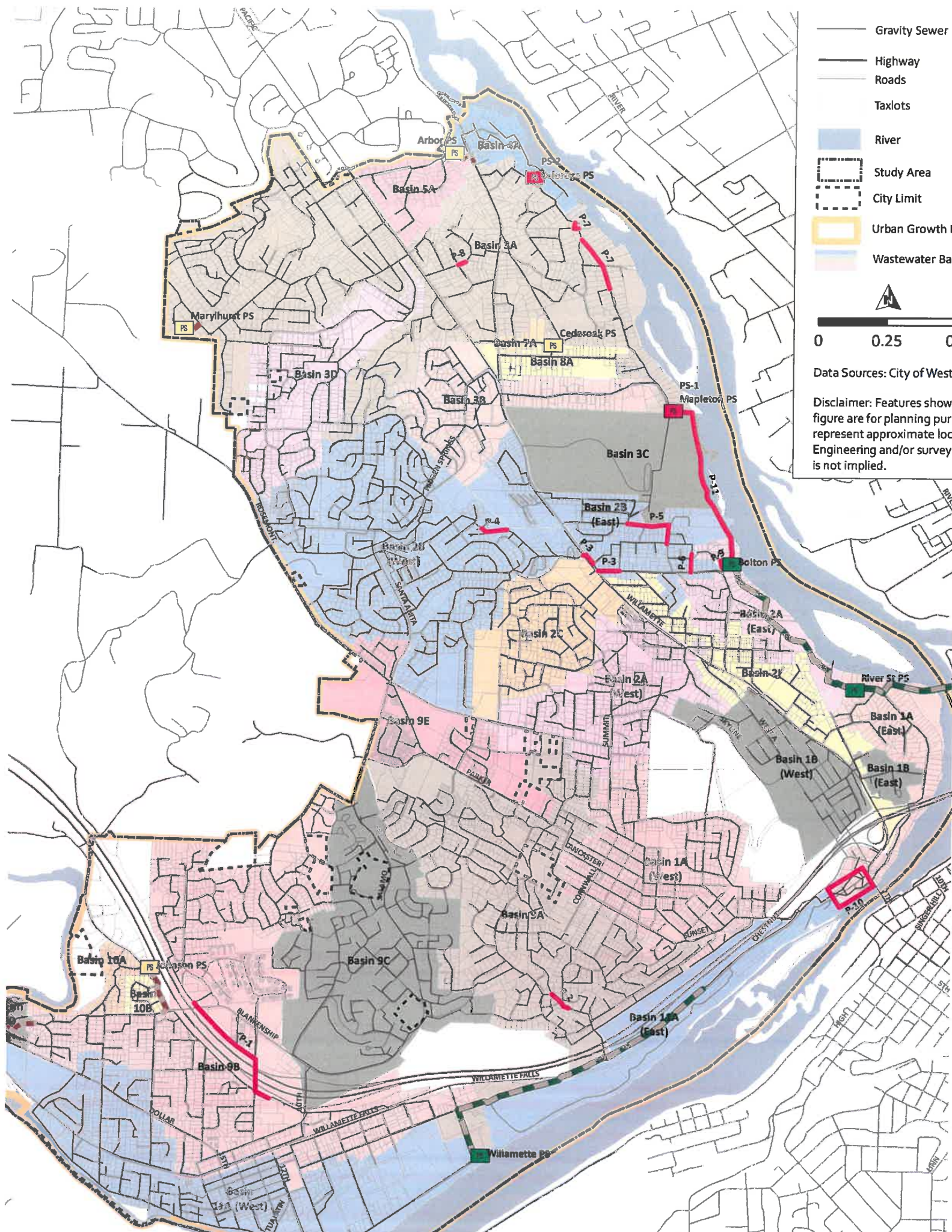
Project P-10 consists of relocating the sewer line in the vicinity of Mill Street, as shown in Figure 9. As the properties between WFD and Mill Street redevelop, this section of sewer line needs to be upgraded and realigned to the street right-of-way. This project will be part of the waterfront line project. Modeling shows no capacity issues with the existing pipe diameter, therefore, the recommendation is to replace it with the same diameter. However, when this project is triggered, this project should be evaluated in more detail and confirm pipe size and alignment. This project is anticipated as a medium priority project and is estimated to cost \$311,000.

5.3.2 Force Main Projects

5.3.2.1 Mapleton Force Main (P-11)

Project P-11 is located in wastewater basin 3A and consists of constructing 3,750 linear feet of 8-inch force main running parallel to the existing 12-inch force main from the Mapleton Pump Station to the Bolton Pump Station. Under build-out, velocities in the force main exceed the City's criteria of 8 fps under PWWF conditions, and is considered to be deficient.

This is a medium priority project, to be completed in conjunction with the Mapleton PS improvements, and is estimated to cost \$1,217,000.



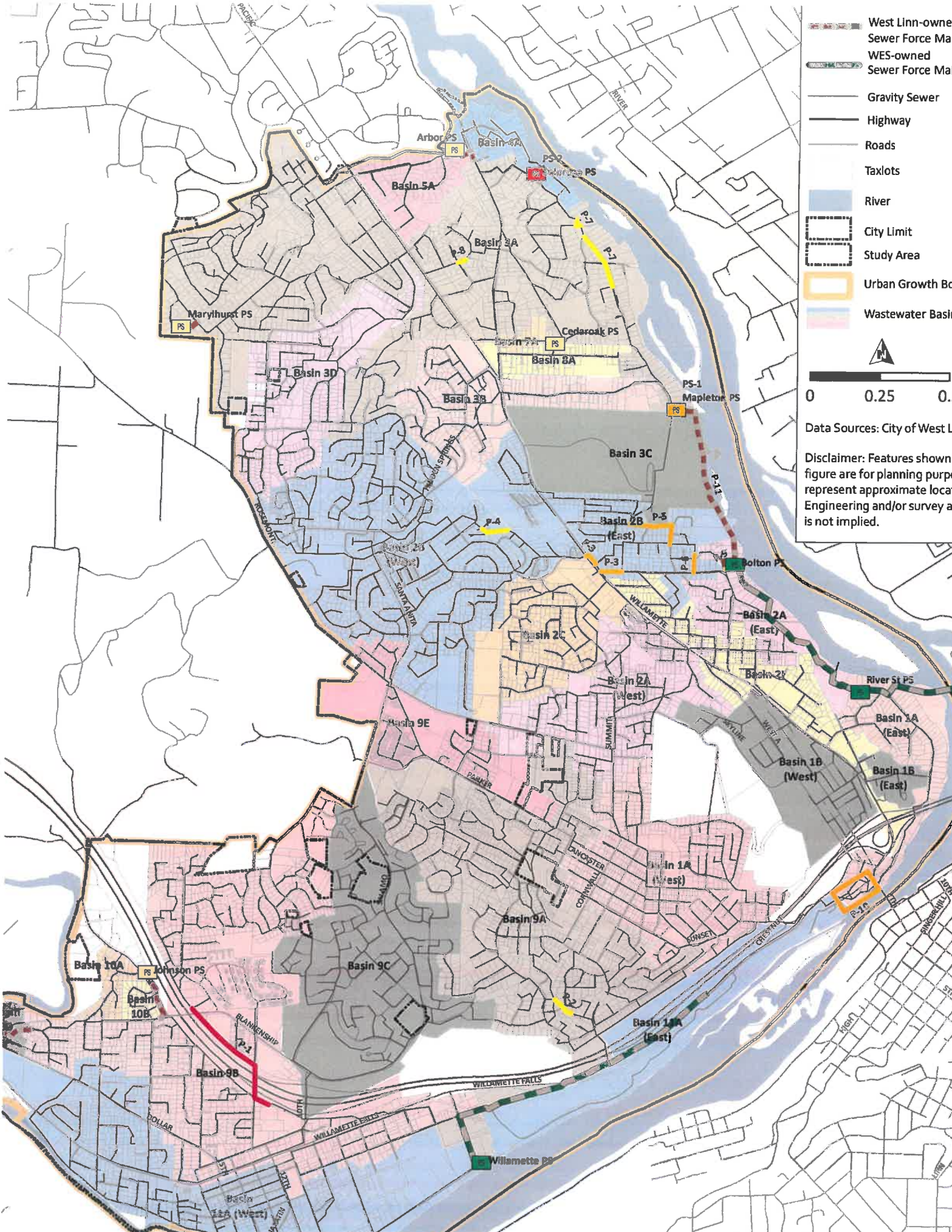
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- Highway
- Roads
- Taxlots
- River
- Study Area
- City Limit
- Urban Growth Boundary
- Wastewater Basin





Data Sources: City of West

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-  West Linn-owned Sewer Force Main
-  WES-owned Sewer Force Main
-  Gravity Sewer
-  Highway
-  Roads
-  Taxlots
-  River
-  City Limit
-  Urban Growth Boundary
-  Wastewater Basins



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Data Sources: City of West Linn

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5.4 Pump Station Projects

5.4.1 Mapleton Pump Station (PS-1)

Project PS-1 consists of upgrading Mapleton Pump Station capacity from an existing 2.81 mgd (firm)/4.25 mgd (total) to 4.87 mgd firm capacity. This medium priority project is needed for the City to meet an existing firm capacity deficiency of 1.1 mgd and to provide sufficient capacity for build-out. Prior to completing this project, the City should evaluate the condition of this pump station and install a flow meter to better understand flow trends.

It is assumed this project will be completed in conjunction with the Mapleton force main project, and is estimated to cost \$4,254,000.

5.4.2 Calaroga Pump Station (PS-2)

Project PS-2 consists of constructing a new pump station to increase Calaroga Pump Station capacity from an existing 0.06 mgd (firm)/0.12 mgd (total) to 0.19 mgd (firm)/0.40 mgd (total). A new pump station is recommended to address existing firm and total capacity deficiencies and existing issues with this pump station.

This project is estimated to cost \$1,049,000.

5.5 Planning Projects

5.5.1 Asset Management Program (PL-1)

The City should develop an Asset Management Program (AMP) to assist in prioritizing repair and replacement of its aging wastewater infrastructure. Developing an asset management plan will help the City find the optimal timing for repair or replacement (R&R) of assets by weighing the costs of continued maintenance against the cost of R&R. Development of this SSMP will help prioritize projects to reduce operation and maintenance risks resulting in lower overall costs burdened by ratepayers.

It is recommended the City take the following initial steps to prepare for implementing an AMP:

- Continue to update data such as pipe material, year installed, and invert elevations, in the City's Geographic Information Systems (GIS) and Computerized Maintenance Management Software.
- Standardize condition assessments and closed-circuit television (CCTV) reports using the Pipeline Assessment and Certification Program (PACP). This may entail working with non-City contractors performing CCTV inspections. City staff could be trained on PACP scoring.
- Take the Strategic Asset Management Gap (SAM-GAP), a free, online utility self-assessment tool.

No project costs are included for these recommendations, as they are assumed to be performed by current City staff. In addition to these steps, the following strategy is recommended for the City to develop and implement an AMP:

1. Assess the City's Current Asset Management Practices.
2. Review Appropriate Asset Management Tools.
3. Identify and Prioritize Gaps in Current Asset Management Practices.
4. Prepare an Asset Management Plan.
5. Implement the Asset Management Plan.

It is anticipated full development and implementation of steps 1 through 5 will cost between \$75,000 and \$200,000. The more conservative estimate of \$200,000 was used for planning in the CIP. Costs for implementing the projects prioritized by the AMP are assumed to come from other annual repair budgets. Development of the AMP was assumed to a medium priority project.

5.5.2 Sanitary Sewer Master Plan Update (PL-2)

This project assumes the City will update this Sanitary Sewer Master Plan one time in the long-term planning period. A long-term budget placeholder of \$300,000 was included, with no contingencies or cost multipliers applied.

5.5.3 Pump Station Condition Evaluation (PL-3)

Although a capacity assessment was completed as part of this SSMP effort, it is recommended that the City perform a condition assessment on the City's pump stations. This project is recommended for the short-term, and a budget cost of \$100,000 was assumed with no contingencies or cost multipliers applied.

5.6 General Projects

5.6.1 Repair and Replacement Program (G-1)

This project allocates an annual budget of \$750,000 to be used for pipeline R&R projects to effectively replace aging or failing pipe, which equates to approximately one mile of pipe per year. Projects will be identified by City staff annually, including projects identified as part of the AMP. To more cost-effectively address pipeline R&R projects, the City should consider geographically concentrated projects that address multiple concerns and incorporate other utilities, such as water main projects or roadway resurfacing, and focus on areas with high inflow/infiltration.

5.6.2 CCTV Program (G-2)

It is recommended that the City implement an Annual program for CCTV inspection of the City's gravity mains. This program will help the City determine pipeline condition and identify potential sources of I/I. It is assumed that the City will inspect 10 percent of the system per year, approximately 60,000 linear feet of pipeline per year. An annual budget of \$440,000 was allocated throughout the planning period for this effort, assuming a unit cost of \$3.50/LF for CCTV.

Further information on the capital improvement program can be found in TM 5, which is in Attachment E of this SSMP.

PC – 3 PROPOSED COMPREHENSIVE PLAN/
COMMUNITY DEVELOPMENT CODE AMENDMENTS

ORDINANCE NO. 1695

AN ORDINANCE ADOPTING AN AMENDMENT TO THE COMPREHENSIVE PLAN GOAL 11, PUBLIC FACILITIES AND SERVICES AND REPEALING AND REPLACING THE SANITARY SEWER MASTER PLAN MARCH 2019, AND AMENDING CHAPTER 85 OF THE COMMUNITY DEVELOPMENT CODE.

WHEREAS, Chapter II, Section 4, of the West Linn City Charter provides:

Powers of the City. The City shall have all powers which the Constitution, statutes and common law of the United States and of this State now or hereafter expressly or implied grant or allow the City, as fully as though this Charter specifically enumerated each of those powers; and

WHEREAS, the above referenced grant of power has been broadly interpreted to allow local governments to decide upon the scope of their powers in their charter so that specific statutory authorization is not required for a city to exercise its powers, LaGrande/Astoria v. PERB, 281 Or 137, 142 (1978), aff'd on reh'g 284 Or 173 (1978); and

WHEREAS, the City's Sanitary Sewer Master Plan ("SSMP") was last updated in 1999;

WHEREAS, the SSMP complies with state law and addresses state requirements to periodically review and update its policies and land needs; and

WHEREAS, the Planning Commission (PC) held public hearings and recommended approval of the SSMP at its July 17, 2019, meeting;

NOW, THEREFORE, THE CITY OF WEST LINN ORDAINS AS FOLLOWS:

SECTION 1. Adoption of Master Plan. The March 2019 City of West Linn Sanitary Sewer Master Plan, attached as Exhibit A, is adopted as a supporting document to the West Linn Comprehensive Plan and the new plan governing Sanitary Sewer planning policy.

SECTION 2. Amendment. West Linn Comprehensive Plan, Goal 11, Public Facilities and Services, page PS-4 "SECTION 1: SEWER SYSTEM" "BACKGROUND AND FINDINGS" is amended to read as follows:

The City of West Linn operates and maintains several ~~has 110 miles of public sanitary sewers, mains and several pump stations. ranging in diameter from 6 to 24 inches. Wastewater is conveyed through the City sanitary sewer system to the Tri-City Plant for treatment. The Tri-City Water Pollution Control Plan belongs to the~~ **The Water Environment Services partnership Department (WES)** ~~of Clackamas County is responsible for providing wastewater treatment services for the cities of West Linn, Oregon City, and Gladstone. Eleven pumping stations, eight City owned and three owned by Clackamas County, carry the City's wastewater to Clackamas County's Tri-City Wastewater Treatment Plant. The Water Environment Services Department of Clackamas County operates under a master plan adopted for the Tri-City~~

~~Wastewater Treatment Plant. The sanitary sewer system is separate from the storm sewer system and untreated storm water drains directly to surface streams.~~

In 1999, the City contracted with Bookman-Edmonston Engineering to update the 1989 Sanitary Sewer System Master Plan. The study determined expansion and rehabilitation needs of the current system, and identified a comprehensive schedule for improvements. **The City's Sanitary Sewer Master Plan, dated March 2019, provides an in-depth analysis of existing system conditions and incorporates hydraulic modeling of the system to identify hydraulic capacity deficiencies in the sewer collection system for both existing and future planning needs.**

SECTION 3. Amendment. West Linn Comprehensive Plan, Goal 11, Public Facilities and Services, page PS-5 "GOALS, POLICIES, AND RECOMMENDED ACTION MEASURES" "GOAL" is amended to read as follows:

Provide ~~adequate,~~ **reliable and** environmentally sound wastewater collection and treatment for all West Linn residents and businesses.

POLICIES

- ~~1. Coordinate sanitary sewer service to existing and future residents to allow for the most efficient provision of service within the City and subsequent expansion of the service area.~~ **Encourage development and annexation that makes orderly and efficient use of the wastewater collection systems.**
2. Require the installation of new sanitary sewer collection facilities to be the responsibility of property owners who will receive direct benefit from those facilities. The City may participate in the development of those facilities to the extent that they benefit residents or businesses in addition to those directly involved.
3. Maintain and operate the sanitary sewer system to meet all federal and state permitting requirements.

RECOMMENDED ACTION MEASURES

- ~~1. Participate~~ **Coordinate** with the Clackamas County Department of Water Environment Services in meeting the City's sanitary sewer ~~requirements~~ **needs.**
2. Work with Clackamas County and other affected agencies to plan major waste water treatment facilities. The City recognizes and assumes its responsibility for operation, planning, and regulating ~~the waste water~~ **sanitary sewer** systems as designated in the City's ~~1999~~ Sanitary Sewer System Master Plan **dated March 2019,** which is a supporting document of the Comprehensive Plan.
3. Encourage residents with septic systems to connect to the City sanitary sewer system.
- 4. Continue efforts to reduce inflow and infiltration into the wastewater collection system to the extent such reduction are documented to be cost-effective and/or required by State or Federal regulation.**

SECTION 4. Amendment. West Linn Community Development Code, Chapter 85 General Provisions, Section 85.170 SUPPLEMENTAL SUBMITTAL REQUIREMENTS FOR TENTATIVE SUBDIVISION OR PARTITION PLAN is amended and renumbered where needed to read as follows:

E. Sewer.

1. A plan prepared by a licensed engineer shall show how the proposal is consistent with the ~~current~~ **City of West Linn Sanitary Sewer Master Plan dated March 2019** ~~and subsequent updates and amendments~~. Agreement with that plan must demonstrate how the sanitary sewer proposal will be accomplished and how it is efficient. The sewer system must be in the correct zone.
2. Sanitary sewer information will include plan view of the sanitary sewer lines, including manhole locations and depths. Show how each lot or parcel would be sewered.
3. Sanitary sewer lines shall be located in the public right-of-way, particularly the street, unless the applicant can demonstrate why the alternative location is necessary and meets accepted engineering standards.
4. Sanitary sewer line should be at a depth that can facilitate connection with down-system properties in an efficient manner.
5. The sanitary sewer line should be designed to minimize the amount of lineal feet in the system.
6. The sanitary sewer line shall minimize disturbance of natural areas and, in those cases where that is unavoidable, disturbance shall be mitigated pursuant to the appropriate chapters (e.g., Chapter 32 CDC, Water Resource Area Protection).
7. Sanitary sewer shall be extended or stubbed out to the next developable subdivision or a point in the street that allows for reasonable connection with adjacent or nearby properties.
8. The sanitary sewer system shall be built pursuant to Department of Environmental Quality (DEQ), City, and Tri-City Service District sewer standards. This report should be prepared by a licensed engineer, and the applicant must be able to demonstrate the ability to satisfy these submittal requirements or standards at the pre-construction phase.

SECTION 5. Amendment. West Linn Community Development Code, Chapter 85 General Provisions, Section 85.200 APPROVAL CRITERIA is amended and renumbered where needed to read as follows:

G. Sewer.

1. A plan prepared by a licensed engineer shall show how the proposal is consistent with the Sanitary Sewer Master Plan ~~(July 1989)~~ **(March 2019)**. Agreement with that plan must demonstrate how the sanitary sewer proposal will be accomplished and how it is gravity-

efficient. The sewer system must be in the correct basin and should allow for full gravity service.

2. Sanitary sewer information will include plan view of the sanitary sewer lines, including manhole locations and depth or invert elevations.
3. Sanitary sewer lines shall be located in the public right-of-way, particularly the street, unless the applicant can demonstrate why the alternative location is necessary and meets accepted engineering standards.
4. Sanitary sewer line should be at a depth that can facilitate connection with down-system properties in an efficient manner.
5. The sanitary sewer line should be designed to minimize the amount of lineal feet in the system.
6. The sanitary sewer line shall avoid disturbance of wetland and drainageways. In those cases where that is unavoidable, disturbance shall be mitigated pursuant to Chapter 32 CDC, Water Resource Area Protection, all trees replaced, and proper permits obtained. Dual sewer lines may be required so the drainageway is not disturbed.
7. Sanitary sewer shall be extended or stubbed out to the next developable subdivision or a point in the street that allows for reasonable connection with adjacent or nearby properties.
8. The sanitary sewer system shall be built pursuant to DEQ, City, and Tri-City Service District sewer standards. The design of the sewer system should be prepared by a licensed engineer, and the applicant must be able to demonstrate the ability to satisfy these submittal requirements or standards at the pre-construction phase.
9. A written statement, signed by the City Engineer, that sanitary sewers with sufficient capacity to serve the proposed development and that adequate sewage treatment plant capacity is available to the City to serve the proposed development.

SECTION 6. Severability. The sections, subsections, paragraphs and clauses of this ordinance are severable. The invalidity of one section, subsection, paragraph, or clause shall not affect the validity of the remaining sections, subsections, paragraphs and clauses.

SECTION 7. Savings. Notwithstanding this amendment/repeal, the City ordinances in existence at the time any criminal or civil enforcement actions were commenced shall remain valid and in full force and effect for purposes of all cases filed or commenced during the times said ordinance(s) or portions of the ordinance were operative. This section simply clarifies the existing situation that nothing in this Ordinance affects the validity of prosecutions commenced and continued under the laws in effect at the time the matters were originally filed.

SECTION 8. Codification. Provisions of this Ordinance shall be incorporated in the City Code and the word "ordinance" may be changed to "code", "article", "section", "chapter" or another word, and the sections of this Ordinance may be renumbered, or re-lettered, provided however that any Whereas clauses and boilerplate provisions (i.e. Sections 2-5) need not be codified and the City Recorder or his/her designee is authorized to correct any cross-references and any typographical errors.

SECTION 9. Effective Date. This ordinance shall take effect on the 30th day after its passage.

The foregoing ordinance was first read by title only in accordance with Chapter VIII,

Section 33(c) of the City Charter on the _____ day of _____, 2019,
and duly PASSED and ADOPTED this _____ day of _____, 2019.

RUSSELL B. AXELROD, MAYOR

ATTEST:

KATHY MOLLUSKY, CITY RECORDER

APPROVED AS TO FORM:

CITY ATTORNEY

DRAFT

PC – 4 PUBLIC COMMENTS



CITY OF West Linn

Memorandum

Date: July 3, 2019
To: Planning Commission
From: John Boyd, Planning Manager
Subject: Submittals by Roberta Schwarz, June 19, 2019

On June 19, 2019 Roberta Schwarz asked that four emails all dated June 19, 2019 with the following subject lines:

Email # Subject:

- 1 - June 19th PC Meeting on Storm Water – Please include as part of Public Record.
- 2 - Hydrology Report by John J Rhodes and his C.V. (two attachments)
- 3 - Bernet Creek Daylighting Project – Updated Cost Estimates and Feasibility Assessment (one attachment)
- 4 - Testimony for June 17th CC Worksession and reason for urgency (one attachment)

Community Development Director John Williams also on June 19, 2019 responded to Email 1 from Roberta Schwarz to clarify “Tonight’s PC meeting is discussing the Sanitary Sewer Master Plan, not the Surface Water Plan. As far as I know, the Sanitary System Plan is unrelated to the Bernert Basin issue, so there is more time to work all this out.

This is only a clarification that this issue related to Bernet Creek and storm water was requested to be entered into the public record for the West Linn Sanitary Sewer Master Plan hearing.

This memo is provided to clarify that these submittals have no bearing on the Sanitary Sewer Master Plan and have been submitted into the record as requested by Roberta Schwarz.

Boyd, John

From: Williams, John
Sent: Wednesday, June 19, 2019 11:03 AM
To: 'Roberta Schwarz'; Planning Commission (Public); Axelrod, Russell; Cummings, Teri; Sakelik, Richard; Relyea, William; Walters, Julianna
Cc: Boyd, John; Savanna Oaks Neighborhood Association
Subject: RE: June 19th PC Meeting on Storm Water-Please include as part of Public Record

Roberta,

Tonight's [PC meeting](#) is discussing the Sanitary Sewer Master Plan, not the Surface Water Plan. As far as I know, the Sanitary System Plan is unrelated to the Bernert Basin issue, so there is more time to work all this out.

With that clarification, please let me know if you would still like to have any information provided to the Planning Commission this evening.

Thank you,
John

From: Roberta Schwarz [mailto:roberta.schwarz@comcast.net]
Sent: Wednesday, June 19, 2019 10:57 AM
To: Planning Commission (Public) ; Axelrod, Russell ; Cummings, Teri ; Sakelik, Richard ; Relyea, William ; Walters, Julianna
Cc: Williams, John ; Boyd, John ; Savanna Oaks Neighborhood Association
Subject: June 19th PC Meeting on Storm Water-Please include as part of Public Record

Hello City Council, City Planning Commission, John Williams, and John Boyd,

We would like to have standing in the Planning Commission's meeting tonight on the Storm Water Master Plan. Daylighting Bernert Creek is a park project and not a storm water project. It should be done with half of the funds from the Natural Play Area \$600,000 SDC funds. Please include the documents that we are going to send you today (including this email) in to the Public Record for this meeting and for the June 17th Work Session of the City Council on Bernert Creek Daylighting as well. There will be several documents sent to you today in three additional emails regarding Daylighting Bernert Creek. Please read each of them. The first will be the Hydrology Report by Jon J Rhodes. The second will be the Feasibility Study and Cost estimate, and the third will be the Testimony and Goal 5 attachments of Savanna Oaks Neighborhood Association President Edward Schwarz submitted on June 17th at the CC Work Session. We request that all of these documents be submitted to the Planning Commission tonight along with this email. This is the time to correct a serious mistake that was made in August of 2017.

Please note that when the Planning Commission heard the **application submitted by the City of West Linn Park Department for the City of West Linn** on the Natural Play Area in the White Oak Savanna in August of 2017, it should have considered CDC 32.020 and 32.060 as listed

below and highlighted. There is a piped stream in the White Oak Savanna. It is called Bernert Creek. This part of the CDC was not considered even though it is applicable. Documents we have recently reviewed that are part of the public record show that these Chapters were not included in the final application. The application did not consider this Chapter and that was not in keeping with our CDC code. We did not know this at the time because we are citizens and not professional land use planners.

Chapter 32 of the West Linn Community Development Code supports Bernert Creek being daylighted as part of the play area being constructed and it should have been included in that application. It states the following:

32.020 APPLICABILITY

A. This chapter applies to all development, activity or uses within WRAs identified on the WRA Map. It also applies to all verified, unmapped WRAs. The WRA Map shall be amended to include the previously unmapped WRAs.

32.060 APPROVAL CRITERIA (STANDARD PROCESS)

H. Daylighting Piped Streams.

1. As part of any application, covered or piped stream sections shown on the WRA Map are encouraged to be “daylighted” or opened. Once it is daylighted, the WRA will be limited to 15 feet on either side of the stream. Within that WRA, water quality measures are required which may include a storm water treatment system (e.g., vegetated bioswales), continuous vegetative ground cover (e.g., native grasses) at least 15 feet in width that provides year-round efficacy, or a combination thereof.

2. The re-opened stream does not have to align with the original piped route but may take a different route on the subject property so long as it makes the appropriate upstream and downstream connections and meet the standards of subsections (H)(3) and (4) of this section.

We ask that you correct this serious error and insure that the Daylighting Bernert Creek project is done as part of the Natural Play Area **park project**. It should have been done this way from the very beginning and would have been if the CDC above had been properly included as per the code. We further ask that the Natural Play Area project play structures be completely reviewed by you as it has been found that more than half of them are not compatible in the White Oak Savanna. There are grossly inappropriate items included in the current list and we request that these items all be reconsidered. A few examples include a xylophone, drums, an outdoor shower, a fort, water play (when extra water is very bad for oak trees), a full restroom (when an ADA porta toilet which does not require extra water is all that is necessary). These among other items do not belong in a Significant Natural Habitat.

The Savanna and Bernert Creek are both listed in West Linn’s Goal 5 Inventory-Wetland, Riparian, and Wildlife Habitat Inventory. This was approved by the Oregon Department of

State Lands in 2005. This is a Significant Natural Habitat. The Inventory lists Bernert Creek as a Wetland. Upper Bernert Creek was given an Enhanced Score of 58 on the Habitat Assessment Summary. Bernert Creek is listed on the National Wetlands Inventory and on the Clackamas County Surveyor's map as well.

Please look for the final three emails. This is important to the citizens. You have the ability to right a wrong.

Thank you,
Ed and Roberta Schwarz
President and Secretary
Savanna Oaks Neighborhood Association

Boyd, John

From: Roberta Schwarz <roberta.schwarz@comcast.net>
Sent: Wednesday, June 19, 2019 11:30 AM
To: Planning Commission (Public); Axelrod, Russell; Cummings, Teri; Sakelik, Richard; Relyea, William; Walters, Julianna
Cc: Williams, John; Boyd, John; Savanna Oaks Neighborhood Association
Subject: Hydrology Report by Jon J Rhodes and his C.V.
Attachments: WOS-Final3-18-19 Bernert Creek Jonathan Rhodes 2019 Update.pdf; NWI West Linn OR Bernert Creek 1 to 9K.pdf

Hello PC, CC, and Mr. Williams and Mr. Boyd,

Here is the Hydrology Report by Jon J Rhodes and his CV. This is the second of a total of four emails we will be sending today.

Ed and Roberta Schwarz
President and Secretary
Savanna Oaks Neighborhood Association

An evaluation of the benefits of daylighting Bernert Creek in the White Oak Savanna Park, West Linn, OR

By: Jonathan J. Rhodes, Hydrologist

Introduction

This report updates my previous written evaluation of hydrologic values in the White Oak Savanna Park,¹ dated Aug. 8, 2007, based on my field evaluation of July 31, 2007. This update provides an evaluation of the benefits of daylighting a section of Bernert Creek in the Park, based on my second field review of the area on March 9, 2019 and review of additional information. This evaluation only assesses the hydrologic effects and some environmental effects of daylighting Bernert Creek. The logistics, design, implementation, feasibility, and/or costs of daylighting are outside of the scope of this evaluation.

My evaluation is also based on my education and experience. The latter includes more than 35 years of professional experience, with about 25 of those years in the Pacific Northwest. Most of my work has focused on how land use and stream conditions affect water quality and quantity. My curriculum vitae, attached to this report, provides additional detail on my professional experience.

Existing and historic stream conditions

Prior to development, a segment of Bernert Creek, a tributary to the Willamette River, historically existed in the area now occupied by the stretch of Tannler Drive that runs along the westerly boundary of the Park, as other assessments have noted (Harris Stream Services, 2013; Herrera, 2017). This historic natural reach of Bernert Creek and associated floodplain were eliminated as part of the construction of Tannler Drive. As part of development, runoff from the watershed upstream of this segment of Bernert Creek is now routed into piped drainage buried underneath an existing vestigial stream channel in the Park, which runs easterly along Tannler Drive in the Park downstream towards Blankenship Road. The runoff is piped into lower Bernert Creek and discharges into the Willamette River. Photo 1 shows the existing alignment of Bernert Creek in the Park.

¹ At the time of my 2007 report, the area that is now the White Oak Savanna Park (hereinafter: "Park") was an undeveloped area that had not been established as a park.



Photo 1. 2005 aerial photo from Clackamas County Surveyor's Office, showing the current alignment of Bernert Creek (delineated by the blue line in photo), now in underground conveyance structures, in the Park along Tannler Drive. I added the red arrow and "Bernert Creek" text in red font for identification purposes.

As discussed in my previous 2007 evaluation, local topography and vegetation indicate that the existing stream channel in the Park is a vestige of a natural stream segment. The shunting of runoff, including stormwater, from the upper part of the watershed to the buried drainage infrastructure has disconnected the vestigial segment of Bernert Creek and remaining riparian area in the Park from runoff from the upper watershed. This diversion of runoff to piped drainage has greatly reduced the frequency and duration of streamflow in the existing remnant stream segment of Bernert Creek along Tannler Drive in the Park. It has also likely contributed to drying out riparian area soils along the vestigial channel in the Park, relative to historic conditions. This, in turn, has likely contributed to reducing and/or thwarting the development of riparian vegetation, which requires moist soils, in the area along the existing channel remnant of Bernert Creek in the Park.

The soils along the remnant Bernert Creek stream channel and the slopes flanking it in the Park still store, transmit, and release water to the vestigial channel in the Park, despite the diminution of runoff and the contributing watershed area. During my field review on March 9, 2019, I observed that subsurface water was percolating through the soil and seeping out of shallow excavation at the downstream end of the existing stream channel near the junction of Tannler Drive and Blankenship Road (Photo 2).



Photo 2. Water seeping from soil in the existing channel into a shallow excavation (bottom center of photo) near the junction of Tannler Drive and Blankenship Road on March 9, 2019. Photo taken looking upstream from near the road junction along the channel axis. The seepage indicates that the channel continues to transmit subsurface water despite the disconnection of the channel from upstream runoff.

Benefits of daylighting the Bernert Creek in the Park and reconnecting it to runoff from the upstream watershed

Daylighting Bernert Creek in the Park, including reconnecting it to runoff from its watershed, would have several environmental benefits. Very importantly, these benefits would be self-sustaining and perennial with daylighting.

First, it would help reduce the volume of discharge of urban runoff to the downstream reaches of Bernert Creek and Willamette River. This would occur because some of the water flowing in the stream will infiltrate into the channel beds, banks, and soils flanking the channel. While some of the infiltrated water may ultimately be transmitted back to stream, some of it would be taken up by riparian vegetation, particularly during the warmer growing season. Research has documented that riparian vegetation takes up a sizable fraction of the water delivered to riparian soils (Rhodes and Frissell, 2015). The reduction of urban runoff volume via uptake by vegetation is likely to increase for a period of time after daylighting because the vigor and density of riparian vegetation is likely to increase after daylighting.

In contrast to this benefit of daylighting the stream, the current situation precludes significant attenuation of urban runoff transmitted into the buried drainage pipes and then to the Willamette River. The water flowing in the pipes is not subject to significant soil infiltration, storage, and uptake by riparian vegetation.

The reduction in runoff volumes from daylighting would benefit conditions downstream. Urban runoff impacts are already a well-documented problem in the Willamette River. Reducing the volume of urban runoff would help ameliorate the downstream water quality impacts on the Willamette River.

This is a significant benefit because efforts to reduce urban runoff volumes have considerable fiscal costs. For instance, large sums are spent annually in nearby Portland on efforts to reduce the volume of urban runoff delivered to the Willamette River and its tributaries. The benefits from storm runoff volume reduction would be self-sustaining and continual after daylighting Bernert Creek in the Park and reconnecting it with its upstream watershed.

Second, restoring watershed connectivity and daylighting Bernert Creek in the Park would likely improve water quality and help reduce pollutant loads delivered to downstream reaches of Bernert Creek and the Willamette River. Infiltration of streamflow and flow through bank and riparian soils typically reduces pollutant loads. Bank vegetation helps remove particulates in streamflow, including constituents attached to the particulates.

Therefore, daylighting the stream would likely improve downstream water quality, providing benefits to the Willamette River. Other independent assessments (Herrera, 2013; Harris, 2017) also concluded that the daylighting of Bernert Creek would improve downstream water quality. This is an important benefit, because urban runoff contributes to existing, well-documented water quality problems in the Willamette River.

The current situation has little or no water quality benefits, because piped flow effectively precludes the interaction of runoff with soil and riparian vegetation. Therefore, daylighting the stream would likely convey significant water quality benefits relative to current conditions.

Third, daylighting the stream channel would likely benefit biodiversity because it would likely contribute to the re-establishment of riparian vegetation, as Harris (2013) and Herrera (2017) also noted. It is well-documented that riparian zones are critically important for biodiversity (Beschta et al. 2013). Healthy riparian areas provide a variety of functions and habitats that benefit a wide

array of species, including birds, amphibians, other vertebrates, and invertebrates, such as insects. Notably, invertebrates are important components of foodwebs for many species, including amphibians and birds. Thus, the riparian zone restoration that is likely to occur with stream daylighting would likely benefit the biodiversity of Park and surrounding areas.

Fourth, daylighting the stream would likely reduce the long-term costs of maintaining the drainage infrastructure that now conveys runoff from Bernert Creek's upper watershed. Nothing lasts forever. Drainage infrastructure eventually requires periodic replacement, which involves not only the direct costs of the infrastructure, but also the costs associated with excavation and reburial. Daylighting the stream would obviate these long-term recurring costs associated with maintaining the drainage infrastructure that currently routes runoff downstream.

In aggregate, daylighting Bernert Creek would provide several long-term, self-sustaining benefits to the environment.

Literature Cited

Beschta, R.L., Donahue, D.L., DellaSala, D.A., Rhodes, J.J., et al., 2013. Adapting to climate change on western public lands: Addressing the ecological effects of domestic, wild, and feral ungulates. *Env. Manage.*, 51: 474-491 DOI 10.1007/s00267-012-9964-9

Herrera, 2017. Technical Memorandum: Bernert Creek Daylighting Preliminary Feasibility and Cost Analysis, from A. Rhode, PE to R. Schwarz. Herrera, Portland, OR.

Harris Stream Services, 2013. Report to Nature in Neighborhoods Grant Committee from A. Harris. Harris Stream Services, LLC, West Linn, OR

Rhodes, J.J., and C.A. Frissell. 2015. The High Costs and Low Benefits of Attempting to Increase Water Yield by Forest Removal in the Sierra Nevada. 108 pp. *Environment Now*, 12400 Wilshire Blvd, Suite 650, Los Angeles, CA 90025.

Curriculum Vitae: Jonathan J. Rhodes
Hydrologist

EDUCATION

1989: Doctoral candidacy degree in forest hydrology at the Univ. of Wash. Completed all requirements but dissertation.

1985: M.S. in Hydrology and Hydrogeology at the Univ. of Nev.-Reno. Thesis topic: The influence of seasonal stream runoff patterns on water quality.

1981: B.S. in Hydrology and Water Resources at the Univ. of Ariz.

PROFESSIONAL HISTORY

Sept. 2001 -- present. Principal Hydrologist, Planeto Azul Hydrology. Main duties: Analysis of water and land use effects on streams and aquatic resources, including native salmonids and their habitats; diagnosis of watershed and stream conditions; stream monitoring; development of programmatic and site-specific watershed and stream protection measures; project management. Some recent projects (and clients): Analysis of potential effects of groundwater pumping on streamflow (Conf. Tribes of the Umatilla Indian Reservation, OR); diagnosis of watershed and stream conditions in an urbanized watershed (West Multnomah Soil and Water Conservation District, OR); analysis of data on sediment effects on ESA-listed salmon in the South Fork Stillaguamish River, WA (Snohomish County, WA).

Aug. 1990 -- Sept. 2001. Consulting hydrologist for non-profit organizations. Past projects (and clients) include: hydrologic characterization of remnant marsh proposed as urban wildlife refuge/greenspace (Multnomah Co. Parks Dept, OR); review of aquatic effects of: quarry expansion (Friends of Forest Park, OR), urban construction (homeowners consortium, W. Linn, OR); forest manipulations on streamflow (Pacific Rivers Council).

Apr. 1989 -- Sept. 2001. Senior Fishery Scientist-Hydrologist, Columbia River Inter-Tribal Fish Commission. Main duties: Administration and implementation of projects monitoring channel change from land use; development of programmatic and site-specific land management plans to ensure protection of watershed integrity, water quality and aquatic resources; development of restoration plans for watersheds degraded by grazing, roads, logging, and mining; design of plans for monitoring watershed and stream erosion, sedimentation, water quality, and habitat conditions; review of land management plans for adequacy of protection of aquatic resources; field evaluation of watershed and channel conditions throughout the Columbia Basin; expert witness testimony; development of technical recommendations for policy staff for protection of natal habitat for anadromous fish; review of state and federal aquatic resource monitoring plans; report and proposal writing; and, participation in various state and federal technical work groups.

Aug. '84 -- Apr. '89. Research assistant, College of Forestry, Univ. of Wash. Main duties: analysis and interpretation of water quality-quantity data; technical report writing; design and maintenance of water chemistry and quantity monitoring network in a coastal forested watershed; training in data acquisition techniques; public presentation of findings.

July -- Oct. 1987 and May -- Oct. 1988. Consulting hydrologist, Tahoe Regional Planning Association, CA and NV. Main duties: field delineation and mapping of riparian zones, wetlands, and erosion-prone areas.

June -- Sept. 1985 and July 1986. Research assistant, Dept. of Geophysics, Univ of Wash. Main duties: operation of field station for glacier research on Mt. Olympus, Wash.; measurement of snow and glacier melt rates; mapping of supra- and extra- glacial streams contributing to basal sub-glacial flow rates on surging and non-surging glaciers in the Alaska Range, Alaska.

Jan. 1984. Consultant with C.M. Skau, Reno, NV. Main duties: field evaluation of logging roads for erosion potential and sedimentation risk; recommendations for placement of future roads to minimize erosion and sediment delivery to fish-bearing streams in coastal Northern California.

Oct. 1983 -- June 1984. Hydrologic Tech., USGS, Carson City, NV. Main duties: aid in development and calibration of predictive water quality model for the Truckee River; statistical analysis of water quality data; identification and quantification of non-point sources of nutrients to Truckee River, NV.

Aug. 1981 -- Sept. 1983. Research Assistant, Univ. of Nev.-Reno. Main duties: design and installation of instrument network to monitor water chemistry and quantity in a small, forested alpine watershed in the Sierra Nevada; water quality sampling; data interpretation and management; preparation of reports, grant proposals, and publications, computer programming for data reduction and storage; mapping of geology, soils and runoff-producing areas; and, training of field technicians.

Feb. -- May 1981. Water Quality Intern, Pima Assoc. of Gov'ts., Tucson, AZ. Main duties: water quality sampling of agricultural production wells; mapping of groundwater levels; and, coordination of sampling efforts.

PROFESSIONAL SERVICE

May 2009 – present. Peer Reviewer for the scholarly journal, Open Forest Science Journal, for papers related to hydrology and forest and watershed responses to disturbance.

Feb. 2010. Invited Guest Lecturer, Lewis and Clark School of Law course on public lands law: "PACFISH and INFISH and Imperiled Salmonids on Public Lands" Portland, OR.

Feb. 2009. Invited Guest Lecturer, Lewis and Clark School of Law course on public lands law: "PACFISH and INFISH and Imperiled Salmonids on Public Lands" Portland, OR.

Feb. 2008. Invited Guest Lecturer, Lewis and Clark School of Law course on public lands law: "PACFISH and INFISH and Imperiled Salmonids on Public Lands" Portland, OR.

Mar. 2007. Invited Panel Speaker, International Environmental Law Conference: "Fuel Treatments & Thinning: Its Impacts and Low Priority Relative to Other Needed Restoration Measures," Univ. of OR, Eugene, OR.

Mar. 2007. Invited Panel Speaker, International Environmental Law Conference: "The Impacts of Livestock Grazing on Water Quality and Trout Habitats," Univ. of OR, Eugene, OR.

Feb. 2005. Invited Guest Lecturer, Lewis and Clark School of Law course on public lands law: "Postfire Watershed Management on Western Public Lands" Portland, OR.

Mar. 2004. Invited Panel Speaker, International Environmental Law Conference: "Postfire Watershed Restoration," Univ. of OR, Eugene, OR.

Curriculum Vitae: J.J. Rhodes

page 3 Professional Service (cont'd)

April 2002. Invited Speaker, Restoring Public Lands Conference: Reclaiming the Concept of Forest Restoration, "Watersheds and Fisheries: Restoration Needs for Trout Habitats," Univ. of CO, Boulder, CO

Mar 2002. Invited Panel Speaker, International Environmental Law Conference: "Soils, Impacts and Effects on Trout Habitat," Univ. of OR, Eugene, OR

Mar. 2001. Invited Panel Speaker, International Environmental Law Conference: "NFMA and Salmon Habitat Protection," Univ. of OR, Eugene, OR.

May 2000. Invited speaker, 5th National Tribal Conf. on Environmental Management: "Federal Land Management's Effects on Critical Habitat for Endangered Salmon," Lincoln City, OR

July 1998-2000. Peer Reviewer for the scholarly journal, N. Amer. J. Fish, for papers related to the sedimentation of fish habitat in response to erosion from land uses and fire.

Feb. 1998. Invited Speaker, Oregon AFS Annual meeting: "Adaptive management: Is it really adaptive?" Sunriver, OR

May 1996-2000. Guest lecturer, Oregon State Univ. graduate course on riparian and wetland ecology, Corvallis, OR

Apr.-May 1996. Peer-reviewer for Proceedings of Forest-Fish Conference: Land Management Affecting Aquatic Ecosystems, Proc. Forest-Fish Conf., May 1-4, 1996, Calgary, Alberta, Canada. Nat. Resour. Can., Can. For. Serv. Nort. For. Cent., Edmonton, Alberta. Inf. Rep. NOR-X-356.

Apr. 1995. Invited speaker, Pacific Rivers Council Workshop on Watershed Analysis and Salvage Logging, Wenatchee, Wash.

Apr. 1995. Invited speaker, Oregon State Univ. Dept of Fisheries and Wildlife Seminar, Corvallis, OR

Apr. 1995. Invited speaker, American Fisheries Society North Pacific International Chapter, Annual Meeting, Vancouver B.C., Can.

Mar. 1995. Invited speaker, American Fisheries Society Idaho Chapter Annual Meeting, Boise, ID.

Nov. 1994. Invited speaker, President's Council on Sustainable Development Workshop, Yakima, WA.

Sept. 1994. Invited speaker, Oregon Water Resources Research Institute Streambank Restoration Conference: "Biological Methods to Stabilize Streambanks--From Theory to Practice," Portland, OR.

Mar.-April, 1994. Peer-reviewer for Henjum et al., 1994. Interim Protection for Late Successional Forests, Fisheries, and Watersheds: National Forests East of The Cascade Crest, Oregon and Washington. The Wildlife Soc., Bethesda, MD.

Jan. 1993-Sept. 1995. Member, Oregon Department of Environmental Quality's (ODEQ) Technical Advisory Committee for Triennial Review of the State Water Temperature Standard.

Mar. 1993. Invited speaker, Northwest Scientific Association Symposium: "Cumulative Effects of Land Management Practices on Anadromous Salmonids," La Grande, OR.

Curriculum Vitae: **J.J. Rhodes**
page 4 Professional Service (cont'd)

Aug. 1992 - Sept. 1992. Member, Ad Hoc Consultant Selection Committee for Portland Water Bureau Study of Future Water Supply Needs.

May 1992. Invited Speaker, US Forest Service, Pacific Northwest Region, Regional Workshop on Monitoring Soil and Water Resources, Bend, OR.

May 1992. Invited Speaker, Northern Arizona University, School of Forestry, Graduate Seminar Series, Flagstaff, AZ.

Jan. 1991 - Mar. 1995. Member, Technical Work Group: Upper Grande Ronde River Anadromous Fish Habitat Protection, Restoration and Monitoring Plan.

Aug. 1989 - Feb. 1990. Member, Technical Advisory Committee to ODEQ for development of definitions for level of beneficial use impairment by nonpoint sources.

May 1989 - Jan. 1991. Member, Nonpoint Source Technical Advisory Committee to Idaho Department of Environmental Quality: Coordinated Nonpoint Source Monitoring Program For Idaho.

PUBLICATIONS

Peer-Reviewed:

Rhodes, J.J., C.M. Skau, and W.M. Melgin, 1984. Nitrate-nitrogen flux in a forested watershed -- Lake Tahoe, USA. In: Recent Investigations in the Zone of Aeration, Proc. of Inter. Symp., Munich, West Germany, 1984, P. Udluft, B. Merkel, and K. Prosl (Eds), pp. 671-680.

Rhodes, J.J., 1985. A Reconnaissance of Hydrologic Transport of Nitrate in An Undisturbed Forested Watershed Near Lake Tahoe. M.S. thesis, Univ. of Nev. Reno, 254 pp.

Rhodes, J.J., C.M. Skau, and J.C. Brown, 1985. An areally intensive approach to hydrologic nutrient transport in forested watersheds. In: The Forest-Atmosphere Interaction, B.A. Hutchison and B.B. Hicks (Eds), pp. 255-270.

Rhodes, J.J., C.M. Skau, D. Greenlee, and D.L. Brown, 1985. Quantification of nitrate uptake by riparian forests and wetlands in an undisturbed headwaters watershed. US Forest Service Gen. Tech. Rept. RM-120.

Rhodes, J.J., C.M. Skau, and D. Greenlee, 1986. The role of snowcover on diurnal nitrate concentration patterns in streamflow from a forested watershed in the Sierra Nevada, Nevada, USA. In: Proc. of AWRA Symposium: Cold Regions Hydrology, Fairbanks Alaska, 1986, D.L. Kane (Editor), pp. 157-166.

Rhodes, J.J., R.L. Armstrong, and S.G. Warren, 1987. Mode of formation of "ablation hollows" controlled by dirt content of snow. J. Glaciology, **33**: 135-139.

Edmonds, R.L., T.B. Thomas, and J.J. Rhodes, 1991. Canopy and soil modification of precipitation chemistry in a temperate rain forest. Soil Soc. of Amer. J., 55: 1685-1693.

Rhodes, J.J., McCullough, D.A., and Espinosa Jr., F.A., 1994. A Coarse Screening Process for Evaluation of the Effects of Land Management Activities on Salmon Spawning and Rearing Habitat in ESA Consultations. CRITFC Tech. Rept. 94-4, Portland, OR <http://www.critfc.org/tech/94-4report.htm>

Curriculum Vitae: **J.J. Rhodes**
page 5 **Publications** (cont'd)

Rhodes, J.J. 1995. A Comparison and Evaluation of Existing Land Management Plans Affecting Spawning and Rearing Habitat of Snake River Basin Salmon Species Listed Under the Endangered Species Act. CRITFC Tech. Rept. 95-4, Portland, OR <http://www.critfc.org/tech/95-4report.htm>

Rhodes, J.J. 1996. Description and Evaluation of Some Available Models for Estimating the Effects of Land Management Plans on Sediment Delivery, Channel Substrate, and Water Temperature, CRITFC, Portland, OR

Espinosa, F.A., Rhodes, J.J., and McCullough, D. A. 1997. The failure of existing plans to protect salmon habitat on the Clearwater National Forest in Idaho. J. Env. Management 49: 205-230.

Rhodes, J.J., and Purser, M.D., 1998. Overwinter sedimentation of clean gravels in simulated redds in the upper Grande Ronde River and nearby streams in northeastern Oregon, USA: Implications for the survival of threatened spring chinook salmon, Forest-Fish Conference: Land Management Affecting Aquatic Ecosystems, Proc. Forest-Fish Conf., May 1-4, 1996, Calgary, Alberta, Canada. Nat. Resour. Can., Can. For. Serv. Nort. For. Cent., Edmonton, Alberta. Inf. Rep. NOR-X-356, pp: 403-412.

Beschta, R.L., Rhodes, J.J., Kauffman, J.B., Gresswell, R.E, Minshall, G.W., Karr, J.R, Perry, D.A., Hauer, F.R., and Frissell, C.A., 2004. Postfire Management on Forested Public Lands of the Western USA. Cons. Bio., 18: 957-967. <http://pacificrivers.org/files/post-fire-management-and-sound-science/Beschta-et-al2004.pdf>

Karr, J.R., Rhodes, J.J., Minshall, G.W., Hauer, F.R., Beschta, R.L., Frissell, C.A. Perry, D.A, 2004. Postfire Salvage Logging's Effects on Aquatic Ecosystems in the American West. BioScience, 54: 1029-1033. <http://www.earthjustice.org/library/reports/the-effects-of-positive-salvage-logging.pdf>

Rhodes, J.J. and Odion, D.C., 2004. Comment Letter: Evaluation of the Efficacy of Forest Manipulations Still Needed. BioScience, 54: 980.

Rhodes, J.J., 2005. Comment on "Modeling of the interactions between forest vegetation, disturbances, and sediment yields" by Erkan Istanbuluoglu et al. J. Geophys. Res. Earth Surf., Vol. 110, No. F1, F01012 10.1029/2004JF000240

Rhodes, J.J., 2007. The Watershed Impacts of Forest Treatments to Reduce Fuels and Modify Fire Behavior. Pacific Rivers Council, Eugene, OR <http://pacificrivers.org/science-research/resources-publications/the-watershed-impacts-of-forest-treatments-to-reduce-fuels-and-modify-fire-behavior>

Rhodes, J.J. and Baker, W.L., 2008. Fire probability, fuel treatment effectiveness and ecological tradeoffs in western U.S. public forests. Open Forest Science Journal, 1: 1-7. <http://www.bentham.org/open/tofscij/openaccess2.htm>

Lewis, J., Rhodes, J.J., and Bradley, C. 2018. Turbidity responses from timber harvesting, wildfire, and post-fire logging in the Battle Creek watershed, Northern California. *Env. Mgmt*, 1-17.

Technical Reports:

1986. Annual Report on Watershed Studies at Olympic National Park. College of Forestry, Univ. of Wash., Seattle, Wash. (Co-authors: R.L. Edmonds, T.B. Thomas, T.W. Cundy)

1987. Annual Report on Watershed Studies at Olympic National Park. College of Forestry, Univ. of Wash., Seattle, Wash. (Co-authors: R.L. Edmonds, T.B. Thomas, T.W. Cundy)

Curriculum Vitae: **J.J. Rhodes**

page 6 Publications (cont'd)

1988. Annual Report on Watershed Studies at Olympic National Park. College of Forestry, Univ. of Wash., Seattle, Wash. (Co-authors: R.L. Edmonds, T.B. Thomas, T.W. Cundy)

1989. Annual Report on Watershed Studies at Olympic National Park. College of Forestry, Univ. of Wash., Seattle, Wash. (Co-authors: R.L. Edmonds, T.B. Thomas, T.W. Cundy)

1990. Coordinated Nonpoint Source Monitoring Program For Idaho. Idaho Dept. of Environmental Quality, Boise, Idaho. (Co-authors: B. Clark, D. McGreer, W. Reid, T. Burton, W. Low, I. Urnovitz, D. McCullough, T. Litke)

1992. The Upper Grande Ronde River Anadromous Fish Habitat Protection, Restoration and Monitoring Plan. Wallowa-Whitman National Forest, Baker, OR (Co-authors: M. Purser, P. Boehne, R.E. Gill, R.L. Beschta, J.R. Sedell, B. McIntosh, J. Zakel, J.W. Anderson, D. Bryson, S. Howes, R. George).

1992. Salmon Recovery Program for the Columbia River Basin: An Advisory Report for the US Congress. Col. Riv. Inter-Tribal Fish Comm., Portland, OR (Co-authors: P.R. Mundy, D.A. McCullough, M.L. Cuenco, T.W. Backman, D. Dompier, P. O'Toole, S. Whitman, E. Larson, B. Watson, G. James).

1993. A comprehensive approach to restoring habitat conditions needed to protect threatened salmon species in a severely degraded river--The Upper Grande Ronde River Anadromous Fish Habitat Protection, Restoration and Monitoring Plan. USFS Gen. Tech. Rept RM-226, pp. 175-179. (Co-authors: J.W. Anderson, R.L. Beschta, P. Boehne, D. Bryson, R.E. Gill, S. Howes, B. McIntosh, M.D. Purser and J. Zakel).

1993. Dante's Video Guide to Habitat Conditions for Wild Spring Chinook Salmon, Steelhead and Bull Trout in the John Day Basin, Oregon. (Video) Presented at AFS National Meeting, Portland, Or, Aug. 29-31. (Co-authors: R. Taylor and M. Purser).

1995. Wildfire and Salvage Logging: Recommendations for Ecologically Sound Post-Fire Salvage Logging and Other Post-Fire Treatments on Federal Lands in the West. Pacific Rivers Council, Portland, OR (Co-authors: R. Beschta, C. Frissell, R. Gresswell, R. Hauer, J. Karr, G. Minshall, D. Perry).

1998. Adaptive management: Is it really adaptive? Abstracts: Oregon AFS Annual Meeting, Feb. 11-13, 1998, p. 31.

1998. Thinning For Increased Water Yield in the Sierra Nevada: Free Lunch or Pie in the Sky? Pacific Rivers Council, Eugene, OR. (Co-author: M. Purser)

1999. Annual Project Report: Watershed Evaluation and Aquatic Habitat Response to Recent Storms. Bonneville Power Administration (BPA), Portland, OR. (Co-author: C. Huntington)

1999. Annual Project Report: Monitoring Fine Sediment in Salmon Habitat in John Day and Grande Ronde Rivers. BPA, Portland, OR (Co-author: M. Purser)

2000. Annual Project Report: Watershed Evaluation and Aquatic Habitat Response to Recent Storms. BPA, Portland, OR. (Co-author: C. Huntington)

2000. Annual Project Report: Monitoring Fine Sediment in Salmon Habitat in John Day and Grande Ronde Rivers. (Co-author: M. J. Greene)

Curriculum Vitae: J.J. Rhodes
page 7 **Publications** (cont'd)

2001. Annual Project Report: Monitoring Fine Sediment in Salmon Habitat in John Day and Grande Ronde Rivers. BPA, Portland, OR. (Co-author: M. J. Greene)

2001. Imperiled Western Trout and the Importance of Roadless Areas. Western Native Trout Campaign, Center for Biological Diversity, Tucson, Az. (Co-authors: J. Kessler, C. Bradley, and J. Wood)

2002. Tryon Creek Watershed: Overview of Existing Conditions, Data Gaps, and Recommendations for the Protection and Restoration of Aquatic Resources. West Multnomah Soil and Water Conservation District, Portland, OR

2002. An Analysis of Trout and Salmon Status and Conservation Values of Potential Wilderness Candidates in Idaho and Eastern Washington. Western Native Trout Campaign, Center for Biological Diversity, Tucson, AZ. (Co-authors: C. Bradley, J. Kessler, C. Frissell)

2003. Stream and Fish Habitat Conditions in Tryon Creek: Their Likely Causes and Ramifications for Salmonids. Proceedings of Urban Ecology and Conservation Symposium, January 24, 2003, Portland, OR. Portland State University, Environmental Sciences and Resources, Portland, OR

2008. Primary Sources of Fine Sediment in the South Fork Stillaguamish River. Interim progress report for Washington State Salmon Recovery Funding Board, Olympia, WA. Snohomish County Public Works Surface Water Management, Everett, WA. (Co-authors: M. Purser, B. Gaddis, S. Britton, T. Coburn, and M. Rustay)

2009. Primary Sources of Fine Sediment in the South Fork Stillaguamish River. Project completion report for Washington State Salmon Recovery Funding Board, Olympia, WA. Snohomish County Public Works Surface Water Management, Everett, WA. (Co-authors: M. Purser, B. Gaddis)

2015. The High Costs and Low Benefits of Attempting to Increase Water Yield by Forest Removal in the Sierra Nevada. 108 pp. Environment Now, 12400 Wilshire Blvd, Suite 650, Los Angeles, CA 90025. (Co-author: CA. Frissell)

Semi-Technical Publications:

1993. Dam the analysis--heal streams instead. The Assoc. of Forest Service Employees for Env. Ethics Inner Voice, 5(6): 1, 4-5.

1994. Invited Preface to Northwest Science Special Issue--Environmental History of River Basins in Eastern Oregon and Washington. Northwest Sci., 68.

PROJECT MANAGEMENT

1993-1996. Technical Assistance Contract with NMFS to produce technical guidance for ESA consultations for effects of land management on critical habitat for Columbia basin salmon. Main duties: Primary Investigator; primary author of peer-reviewed reports including proposed guidelines for salmon habitat effects assessment (Rhodes et al., 1994), evaluation of land management plans' protection of critical salmon habitat (Rhodes, 1995), and evaluation of models for estimating land management effects on salmon habitat (Rhodes, 1996); available scientific literature review; budget tracking; project coordination. Total budget: \$230,000.

Curriculum Vitae: **J.J. Rhodes**
page 8 Proj. Management (cont'd)

1998-2000. Watershed Evaluation and Aquatic Habitat Response to Recent Storms. Main duties: Primary Investigator; design and implementation of monitoring methods, coordination of technical staff in 10 watersheds with differing levels of grazing and logging in 3 subbasins in Idaho, Washington, and Oregon; technical training; data analysis; contract administration; proposal development; report preparation; budget development and tracking; coordination with grantor representatives. Total budget: \$164,000.

1998-2000. Evaluation of Effects of Grazing on Rate of Salmon Habitat Recovery. Main duties: Primary Investigator; design and implementation of monitoring methods, training of field technician; data analysis and synthesis; proposal development; preparation of progress reports; budget development and tracking; coordination with grantor representatives. Total budget: \$73,000.

1998-2001. Monitoring Fine Sediment Levels in Salmon Habitat in Grande Ronde and John Day Rivers. Main duties: Primary Investigator; design and implementation of methods for monitoring fine sediment levels in four rivers; field technician training; data analysis and synthesis; subcontract administration; proposal development; progress and technical report preparation; budget development and tracking; coordination with grantor representatives. Total budget: \$128,000.

2001-2002. Western Native Trout Campaign, Aquatic Scientist and Coordinator. Main duties: Oversight and assurance of scientific integrity of all reports and work products; coordinate conservation efforts among campaign member organizations and other groups working to protect and restore trout habitats and populations; budget tracking; technical and progress report preparation.

HONORS AND AWARDS

1996. Leadership and Excellence. Col. River Inter-Tribal Fish Comm., Portland, OR

1991. Employee of the Year. Col. River Inter-Tribal Fish Comm., Portland, OR

1984. Academic Recruitment Scholarship for Outstanding Graduate Prospect. Univ. of Wash, Seattle, Wash.

1982. Maxey Award -- Outstanding Graduate Student Paper in Hydrology. Univ. of Nev.-Reno.

1980. Winslow and Myron Reuben Scholarship for Outstanding Undergraduate in the Earth Sciences. Univ. of Ariz., Tucson, Az.

ADDITIONAL TRAINING

1993. USFWS Water Temperature Modeling via SNTMP

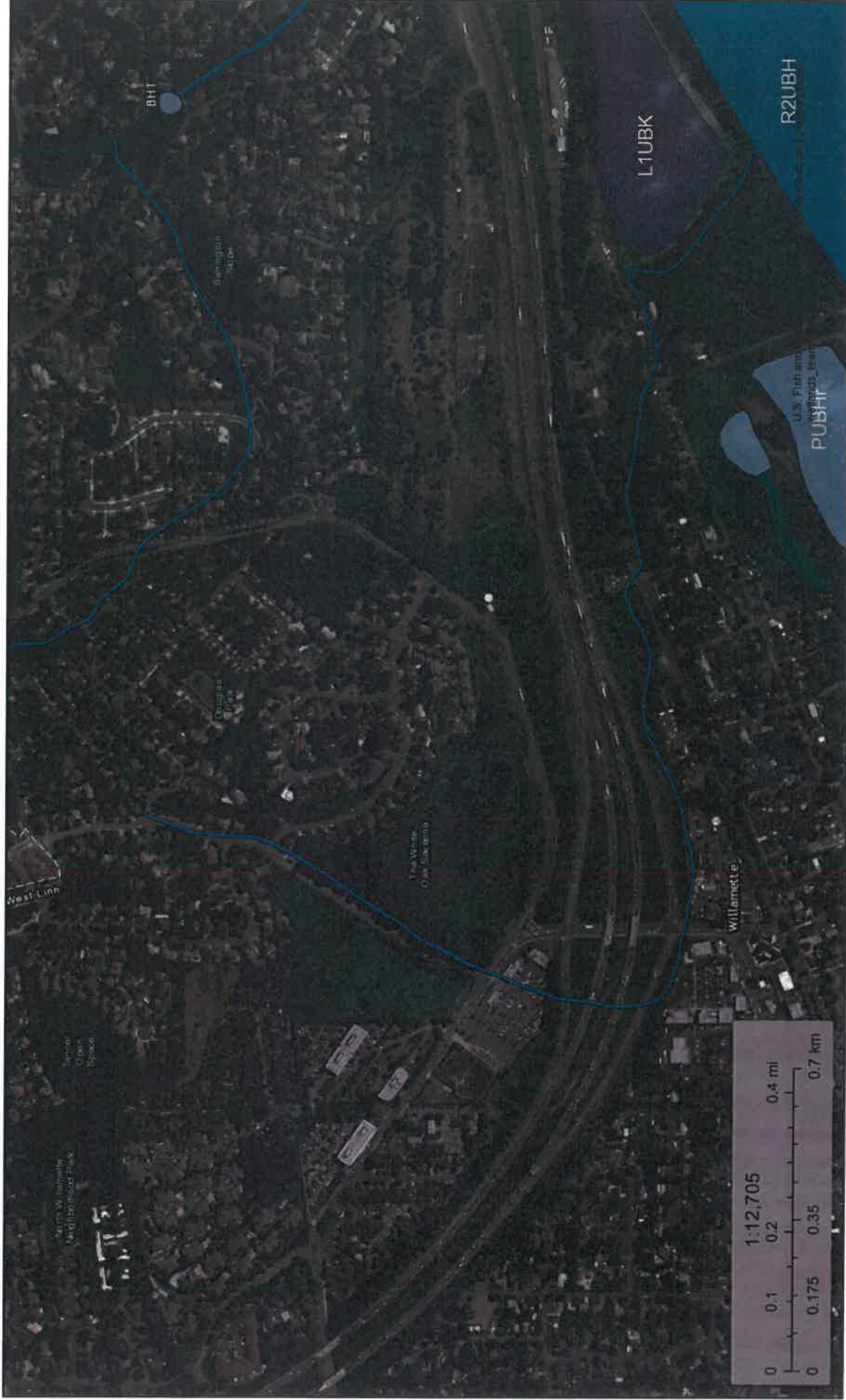
1991. USFWS Introduction to IFIM Investigations



U.S. Fish and Wildlife Service

National Wetlands Inventory

NWI West Linn OR, Bernert Creek 1 to 9t



March 18, 2019

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond

- Lake
- Other
- Riverine

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

Boyd, John

From: Roberta Schwarz <roberta.schwarz@comcast.net>
Sent: Wednesday, June 19, 2019 11:36 AM
To: Planning Commission (Public); Axelrod, Russell; Cummings, Teri; Sakelik, Richard; Relyea, William
Cc: Williams, John; Boyd, John; Savanna Oaks Neighborhood Association
Subject: Bernert Creek Daylighting Project - Updated Cost Estimates and Feasibility Assessment
Attachments: BernertCreekDaylighting_FeasibilityMemo_Final-signed.pdf

Hello again all,

This is the third of four emails that will come to you from us today.
Attached you will find the Feasibility Study and Cost Estimates of daylighting Bernert Creek.

Thank you,
Ed and Roberta Schwarz
President and Secretary Savanna Oaks Neighborhood Association



Roberta Schwarz
Neighbors for a Livable West Linn
2206 Tannler Drive
West Linn, Oregon 97068

RE: Feasibility Assessment and Conceptual Cost Estimate of Bernert Creek Daylighting Project

Dear Ms. Schwarz:

Please find attached the 2017 Bernert Creek Daylighting Preliminary Feasibility and Cost Analysis Technical Memorandum and an updated cost estimate. The feasibility assessment is supplemented with the information in this letter that provides additional detail on project permitting requirements and depth of the existing pipe. We have also prepared an updated cost estimate that includes geotechnical investigation and survey services, adjustments to the unit costs of the some of the construction line items in the estimate, a reduced contingency (from 50% to 25%), and updated earthwork and imported material quantities based on additional information reviewed and gathered since 2017. Our current cost estimate is \$320,000 for the entire project as conceived, accounting for survey and geotechnical services, design, permitting, construction oversight, and construction contracting. This exceeds the approximately \$250,000 that you have indicated is available for design and construction. We have also provided a second budget estimate for a reduced project scale, which indicates what we think is attainable within the available budget but eliminates some of the project scope. Assumptions include:

- The length of daylighted stream channel is assumed to be reduced to 600 feet, which would reduce stream channel excavation, reduce the volume of excavated soil to be reused and require lesser amounts of imported materials (streambed aggregate, boulders and logs).
- The assumed cost for a stream crossing (pedestrian bridge) is reduced from \$40,000 to \$5,000, assuming a single prefabricated bridge with handrails is installed, with materials and labor donated. The \$5,000 cost of this item covers coordination, permitting, and procurement.

The updated cost estimates for the larger project as conceived, and for a reduced project scale, do not currently include any assumptions regarding donated time by either engineers or contractors, since per our discussion you anticipate that the design work and thereafter the construction work will be competitively bid by the City of West Linn. We do not advise proceeding with the project assuming that the selected design and permitting consultant or the selected construction contractor will be able or willing to donate some of their time to the project. There may be opportunities through the procurement process to achieve cost savings, and to make it clear to bidders what the available budget is to see if that encourages lower cost bids, but that would be at the City's discretion.



Permitting

To refine our estimate of permitting costs, our land use planner, Kristina Gifford, did a preliminary review of zoning. Daylighting Bernert Creek within the White Oak Savanna site will likely need design review and approval and permits from the City of West Linn. Because the creek is within a stormwater pipe, it may not be considered a wetland or water of the US or Oregon; therefore, wetland removal/fill permits may not be required, but that would need to be confirmed through consultation with regulatory agencies. If there are wetlands along the project alignment that would be affected, state and federal permits would be necessary. According to the City's zoning map, the site is zoned Office Business Center (OBC) and most of the site is designated as Parks. The existing storm drain pipe and proposed daylighted creek also cross a property that is not within the Parks designation. Based on a review of the City's community development code (CDC), we believe the project is likely subject to design review (CDC Chapter 55) and Parks and Natural Area design review (CDC Chapter 56). It is unclear how the City would define the proposed land use: it could be a minor utility, major utility, or special use area (defined in CDC Chapter 56). Special use areas and minor utilities are allowed outright in the OBC zone; a major utility may be allowed as a conditional use.

Our updated cost estimate assumes the permit application and coordination effort will cost \$40,000, which may be high given the likely absence of wetlands. However, the budget and schedule for permitting will depend on information from the project pre-application conference with the City. At the conference, the City would confirm a definition of the proposed site use, whether it would be allowed in the OBC zone, whether the proposed development would require Class I or Class II design review, and the materials required for submittal to the City.

Existing Pipe Condition and Depth

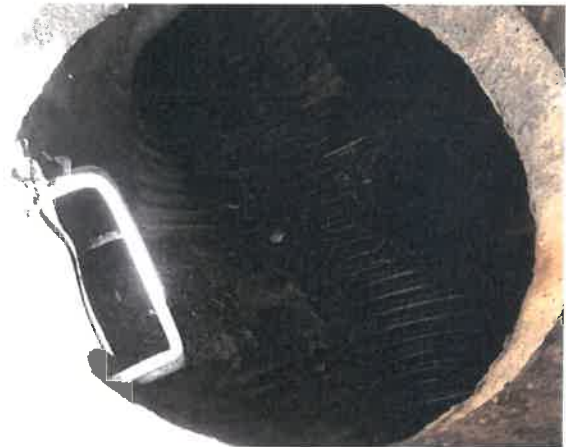
To confirm the feasibility of daylighting the existing pipe and to update quantities of excavation for cost estimating purposes, Alex Svendsen, a Herrera scientist, inspected the existing pipe by accessing four manholes along the alignment. At manhole BEJ7 (upstream). The pipe is approximately 6.5 feet deep (ground surface to pipe invert). Baseflow was observed in the pipe during the visit, which occurred on May 10, 2019. The pipe appears to be made of corrugated metal.



MH BEJ7, Upstream MH along Proposed Daylight Section

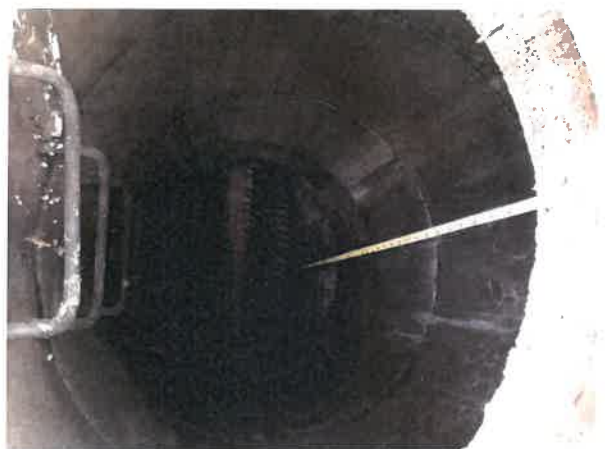
There is a live sewer line approximately 50 feet southeast of Manhole BEJ7 near the base of the adjacent hillside. It appears to be a 12-inch diameter pipe approximately 15 feet below the ground surface; discharge in the pipe was flowing north.

Approximately 200 feet downgradient from MH BEJ7, the pipe was observed approximately 4.5 feet below ground surface. A tree root has grown around the manhole lid at that location.



MH Approximately 200 feet Downgradient from MH BEJ7

Approximately 60 feet downgradient from the main trail, the pipe is at a depth of approximately 10.5 feet below ground surface.



MH Approximately 60 feet Downgradient from main trail

At MH BEJ6, the pipe is at a depth of approximately 5.5 feet below ground surface.



MH BEJ6, Downstream Structure Along Proposed Daylight Alignment

The observed depths of the existing storm drain line are consistent with the concept proposed in the 2017 technical memorandum. Given that the pipe starts in Manhole BEJ7 at a depth of approximately 6.5 feet, constructing a culvert at a slope of approximately 2 percent from this structure that extends approximately 90 feet would allow the culvert to outfall to a splash pad that starts the daylighted stream channel as described in the technical memorandum. Flows from the daylighted stream channel could re-enter the storm drain system via a ditch inlet constructed upstream of Structure MH BEJ6, as described in the technical memorandum.

Thank you for the opportunity to assist you in advancing the conceptual planning for this project. Please feel free to contact us if you have additional questions.

Kate Forester, PLA, Project Manager

971.200.8876

Mary Larkin, PE, Engineer

**WEST LINN OAK SAVANNAH
WEST LINN, OR**

Project: Bernert Creek Daylighting
Construction Cost Estimate: Conceptual Planning Level
Level of Confidence: Medium

Description: Daylight Bernert Creek segment along historic alignment and decommission existing pipe

Prepared by: M. Larkin 5/10/2019
Checked/Revised by: M. Ewbank 5/14/2019

| NO. | ITEMS OF WORK AND MATERIALS | ESTIMATED QUANTITY | UNIT | UNIT PRICE | TOTAL AMOUNT | NOTES |
|-----|--|--------------------|------|-------------|---------------------|--|
| 1 | Mobilization | 1 | LS | 10% | \$7,190.80 | Assumed 10% total construction cost |
| 2 | Traffic Control, Temporary | 1 | LS | \$5,000.00 | \$5,000.00 | Temporary single-lane traffic |
| 3 | Erosion and Sediment Control and Tree Protection | 1 | LS | \$5,000.00 | \$5,000.00 | |
| 4 | Clearing and Grubbing | 1 | LS | \$5,000.00 | \$5,000.00 | Minimal clearing and grubbing - preserve habitat |
| 5 | Temporary Flow Bypass During Construction | 1 | LS | \$3,000.00 | \$3,000.00 | Minimal pumping - diversion will use gravity |
| 6 | Boulders 24"-36" (nominal diameter) | 100 | EA | \$150.00 | \$15,000.00 | To be placed along alignment /provide grade control |
| 7 | Streambed aggregate | 482 | CY | \$60.00 | \$28,908.00 | To be placed along alignment - cobble assumed |
| 8 | Log Without Rootwad - 15' length | 10 | EA | \$500.00 | \$5,000.00 | Includes procurement and and surface installation |
| 9 | Salvaged Woody Debris | 1 | LS | \$5,000.00 | \$5,000.00 | Salvage any downed trees or pruned branches for use in channel |
| 10 | Stream Channel Excavation and Reuse | 1,170 | CY | \$25.00 | \$29,250.00 | Assumes soil reuse on site to reduce costs |
| 11 | Decommission Existing Pipe in Place | 1 | LS | \$5,000.00 | \$5,000.00 | Fill with CDF (115 CY) |
| 12 | New Pipe Outfall | 1 | LS | \$1,500.00 | \$1,500.00 | Connect to BEJ7 manhole |
| 13 | New Ditch Inlet | 1 | LS | \$2,500.00 | \$2,500.00 | Connect to BEJ6 manhole |
| 14 | Driveway Culvert and Gravel Bedding | 1 | LS | \$25,000.00 | \$25,000.00 | Arch Culvert - 12' span with compacted gravel bedding |
| 15 | Pedestrian Crossing | 1 | LS | \$15,000.00 | \$15,000.00 | Assume a simple prefab bridge with handrails |
| 16 | Interpretive Signage | 2 | EA | \$500.00 | \$1,000.00 | Installation only; estimate assumes that signs are donated. |
| 17 | Seeding/Planting | 1 | LS | \$1,000.00 | \$1,000.00 | Cost is for contractor effort associated with coordination/inspection only. Seeding is to be done by others. |
| | Construction Subtotal | | | | \$160,000.00 | |
| | Construction Contingency | | | 25% | \$40,000.00 | |
| | Survey and basemapping | 1 | LS | \$10,000.00 | \$10,000.00 | |
| | Geotechnical Investigation | 1 | LS | \$15,000.00 | \$15,000.00 | Assumes shallow hand auger borings to characterize soils and assess groundwater elevations. |
| | Modeling and Design | 1 | LS | \$50,000.00 | \$50,000.00 | |
| | Permitting | 1 | LS | \$40,000.00 | \$40,000.00 | |
| | Construction Oversight | 1 | LS | \$15,000.00 | \$15,000.00 | Engineering oversight |
| | Total | | | | \$320,000.00 | |

**WEST LINN OAK SAVANNAH
WEST LINN, OR**

Project: Bernert Creek Daylighting - Reduced Stream Length and Eliminated Services and Bid Items
Construction Cost Estimate: Conceptual Planning Level
Level of Confidence: Medium

Description: Daylight Bernert Creek segment along historic alignment and decommission existing pipe

Prepared by:

M. Larkin

5/10/2019

Checked/Revised by:

M. Ewbank

5/14/2019

| NO. | ITEMS OF WORK AND MATERIALS | ESTIMATED QUANTITY | UNIT | UNIT PRICE | TOTAL AMOUNT | NOTES |
|-----|--|--------------------|------|-------------|---------------------|--|
| 1 | Mobilization | 1 | LS | 10% | \$5,082.20 | Assumed 10% total construction cost |
| 2 | Traffic Control, Temporary | 1 | LS | \$5,000.00 | \$5,000.00 | Temporary single-lane traffic |
| 3 | Erosion and Sediment Control and Tree Protection | 1 | LS | \$5,000.00 | \$5,000.00 | |
| 4 | Clearing and Grubbing | 1 | LS | \$5,000.00 | \$0.00 | Minimal clearing and grubbing - preserve habitat |
| 5 | Temporary Flow Bypass During Construction | 1 | LS | \$3,000.00 | \$3,000.00 | Minimal pumping - diversion will use gravity |
| 6 | Boulders 24"-36" (nominal diameter) | 67 | EA | \$150.00 | \$10,050.00 | To be placed along alignment /provide grade control <i>Assumed quantity reduced by 30% due to reduced daylight channel length</i> |
| 7 | Streambed aggregate | 321 | CY | \$60.00 | \$19,272.00 | To be placed along alignment - cobble assumed <i>Assumed quantity reduced by 30% due to reduced daylight channel length</i> |
| 8 | Log Without Rootwad - 15' length | 7 | EA | \$500.00 | \$3,500.00 | Includes procurement and and surface installation. <i>Assumed quantity reduced by 30% due to reduced daylight channel length</i> |
| 9 | Salvaged Woody Debris | 1 | LS | \$5,000.00 | \$5,000.00 | Salvage any downed trees or pruned branches for use in channel |
| 10 | Stream Channel Excavation and Reuse | 780 | CY | \$25.00 | \$19,500.00 | Assumes soil reuse on site to reduce costs. <i>Assumed quantity reduced by 30% due to reduced daylight channel length.</i> |
| 11 | Decommission Existing Pipe in Place | 1 | LS | \$5,000.00 | \$5,000.00 | Fill with CDF (115 CY) |
| 12 | New Pipe Outfall | 1 | LS | \$1,500.00 | \$1,500.00 | Connect to BEJ7 manhole |
| 13 | New Ditch Inlet | 1 | LS | \$2,500.00 | \$2,500.00 | Connect to BEJ6 manhole |
| 14 | Driveway Culvert and Gravel Bedding | 0 | LS | \$25,000.00 | \$0.00 | <i>Eliminated and assumed to be constructed as future contract.</i> |
| 15 | Pedestrian Crossing | 1 | LS | \$5,000.00 | \$5,000.00 | Assume a simple prefab bridge with handrails. <i>Assume that labor and materials are donated.</i> |
| 16 | Interpretive Signage | 2 | EA | \$500.00 | \$1,000.00 | Installation only; estimate assumes that signs are donated. |
| 17 | Seeding/Planting | 1 | LS | \$1,000.00 | \$1,000.00 | Cost is for contractor effort associated with coordination/inspection only. Seeding is to be done by others. |
| | Construction Subtotal | | | | \$92,000.00 | |
| | Construction Contingency | | | 25% | \$23,000.00 | |
| | Survey and basemapping | 1 | LS | \$10,000.00 | \$10,000.00 | |
| | Geotechnical Investigation | 1 | LS | \$15,000.00 | \$15,000.00 | Assumes shallow hand auger borings to characterize soils and assess groundwater elevations. |
| | Modeling and Design | 1 | LS | \$50,000.00 | \$50,000.00 | |
| | Permitting | 1 | LS | \$40,000.00 | \$40,000.00 | |
| | Construction Oversight | 1 | LS | \$15,000.00 | \$15,000.00 | Engineering oversight |
| | Total | | | | \$250,000.00 | |

TECHNICAL MEMORANDUM

Date: March 27, 2017
To: Roberta Schwartz
From: Abbey Rhode, PE
Subject: Bernert Creek Daylighting Preliminary Feasibility and Cost Analysis

BACKGROUND

Bernert Creek is a tributary to the Willamette River that historically flowed southward along what is now Tannler Drive and then east to the river. Around 1977, the creek was piped as part of a stormwater drainage network to support development. Neighbors for a Livable West Linn (NLWL) and the Trust for Public Land partnered together for over 12 years to raise \$3.5 million and acquire 20 acres of property along and adjacent to the historical creek to preserve ecologically important oak savanna. The park is now a public West Linn Park, owned by the City of West Linn, and officially called The White Oak Savanna. Thousands of volunteer hours, including many classes of students, have volunteered to help restore the site. There is now an opportunity to “daylight” the segment of Bernert Creek that runs along the preserved oak savanna to further enhance the ecological and educational benefits of this important park.

As shown in Figure 1, the existing pipe alignment along the proposed stream channel daylighting corridor consists of a 24-inch concrete pipe (BER6-7) that connects an upstream manhole structure (BEJ7) to a downstream manhole structure (BEJ6). The pipe is approximately 900 feet long with a slope of 0.128 feet/foot (West Linn Public Works 2006).

PROPOSED STREAM CHANNEL DAYLIGHTING

Description

A proposed conceptual alignment for the daylighted stream channel is shown in Figure 1. The upstream end of the new/restored channel would be near structure BEJ7 via a new outfall that discharges piped flow to the channel. The channel would extend southward along the forested area east of Tannler Drive, and at its downstream end would convey flow into a pipe coincident with the existing pipe alignment at or near structure BEJ6 via a new ditch inlet structure. One pedestrian bridge and one drivable culvert crossing would provide public access to the West Linn Oak Savanna along the length of the channel. These crossings would encourage access to the stream to serve as a public demonstration of ecological restoration, and could readily



include interpretive signage to educate visitors on the benefits of stream habitat on water quality and fish.

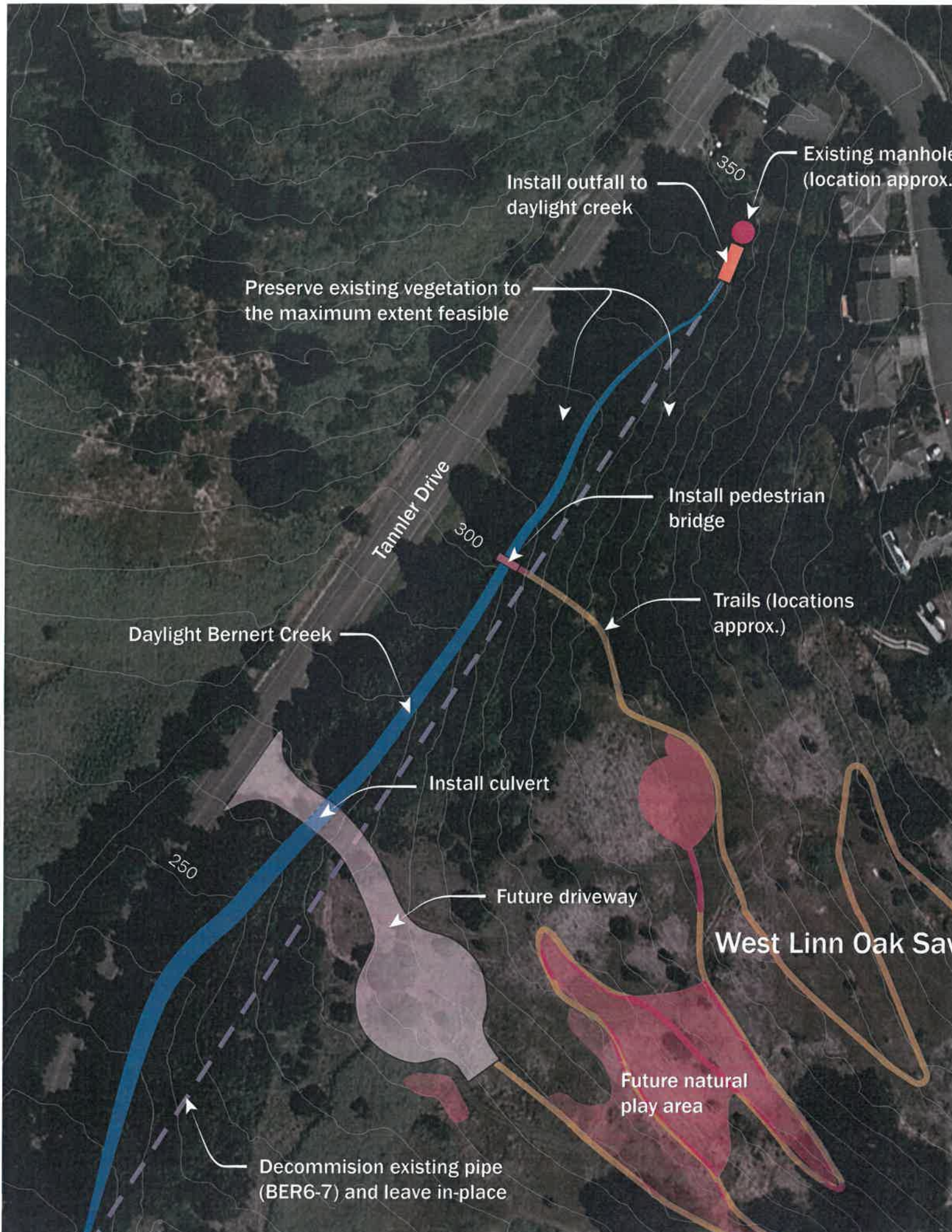
Provided that adequate freeboard is achievable (i.e., additional channel depth above estimated peak flow levels), the proposed concept would decommission the existing BER6-7 pipe and leave it buried in place to reduce cost. One possible design alternative would be to instead retain the pipe for functional flow conveyance, with a new overflow structure or a flow splitter installed in structure BEJ7 that would direct flow into the pipe during high storm flows. Diverting higher flows into the existing pipe could help to minimize the potential for an extreme storm event causing damage to the new/restored channel habitat, though the overflow structure or flow splitter included in this alternative would require an added level of inspection and maintenance attention for the long term to be sure it continues to function as intended.

Benefits

Land development in the Bernert Creek watershed impacts fish habitat downstream by increasing water temperatures and increasing peak storm flows that can erode and otherwise adversely affect fish habitat. Daylighting and enhancing the creek channel would provide shade and increase hyporheic interaction with the soil to decrease water temperatures. While it is assumed that the creek historically provided habitat for salmonid fish species, existing downstream barriers to fish passage are likely preventing access for these species in the oak Savanna site area. In addition, a well-designed channel would provide much more hydraulic roughness than the existing concrete pipe in which Bernert Creek flows, which would slow down flow velocities and provide a modest amount of peak flow attenuation, thereby providing a minor benefit for downstream portions of the creek system.

The proposed channel alignment currently provides a valuable habitat corridor for a wide range of wildlife species. Over 100 vertebrate species have been identified on the property (Mishaga 2014) and it has been estimated that daylighting of the creek would substantially increase the species diversity even further (Mishaga 2013), providing a unique opportunity for residents and visitors to encounter these rarer species in their community setting. As development in the Portland Metro Area continues at a rapid pace to meet the demands of an increasing population, preserved habitats such as the West Linn Oak Savanna are increasingly important to provide vital habitat, and the refuge it provides, for local wildlife.

West Linn Oak Savanna is a preeminent example of how the community can be involved to increase education and awareness of local habitat. One goal for this stream channel daylighting project would be to serve as an accessible demonstration site to educate the community on the importance of healthy streams and the many important functions of riparian corridors. Most visitors to the oak Savanna would enter and/or exit via a route over the creek, where interpretive signage could be placed for their benefit. In addition, many classes of children participate in volunteer efforts at the park and this would be an opportunity for children to learn about the stream in a safe, easily accessible environment.



Existing manhole (location approx.)

Install outfall to daylight creek

Preserve existing vegetation to the maximum extent feasible

Install pedestrian bridge

Trails (locations approx.)

Daylight Bernert Creek

Install culvert

Future driveway

West Linn Oak Sav

Future natural play area

Decommision existing pipe (BER6-7) and leave in-place

Tannler Drive

350

300

250

Feasibility and Design Recommendations

Feasibility considerations for daylighting Bernert Creek amid the oak Savanna area include conveyance capacity for flood prevention and site constraints. This memo is intended to provide an overview of feasibility considerations. Further analysis is recommended to inform design.

The hydraulic feasibility analysis for this memo is based on hydrologic modeling completed by the City of West Linn in 2006 (West Linn Public Works 2006), which included analysis of hydraulic capacity needs for watershed “build-out” conditions. The City’s report calculated peak storm flow rates at the upstream and downstream drainage structures shown on Figure 1. Table 1 lists the results. However, it should be noted that when this analysis was conducted, West Linn Oak Savanna was zoned for development, and so the calculated build-out flows were likely based on the assumption that many of the preserved areas in the Savanna would have included more impervious area than will now be the case. Thus, the City’s peak flow estimates are slightly higher than they would have been if their modeling work accounted for the site as a park space instead of another form of land development.

| Storm Frequency | BEJ7 (upstream structure) | | BEJ6 (downstream structure) | |
|-----------------|---------------------------|-----------|-----------------------------|-----------|
| | 2006 | Build-out | 2006 | Build-out |
| 2-Year | 7.45 | 7.93 | 18.48 | 18.89 |
| 5-Year | 8.82 | 11.13 | 22.97 | 23.43 |
| 10-Year | 9.49 | 13.98 | 25.16 | 25.68 |
| 25-Year | 15.15 | 23.67 | 31.64 | 33.62 |
| 50-Year | 17.42 | 26.00 | 33.36 | 37.90 |
| 100-Year | 20.59 | 29.57 | 35.88 | 44.19 |
| 500-Year | 25.55 | 34.04 | 40.04 | 54.58 |

^a Hydrologic modeling performed with HEC-HMS with detention facilities (West Linn Public Works 2006).

Topographic survey was not available for this area, but the information on the existing pipe alignment enables a good estimate of the overall slope of the stream. Due to the steep slopes in the area, it is estimated that an approximate channel cross section area would need to be a minimum of 7.5 square feet to meet conveyance requirements and provide freeboard to prevent flooding of adjacent ground. For the purpose of developing a planning-level cost estimate, a simplified trapezoidal cross section was assumed with a base width of 2 feet, a depth of 1.5 feet, and a bank full width of 8 feet. However, it is recommended that the channel design not be a uniformly simple trapezoidal geometry, incorporating lateral and vertical (deeper than 1.5 feet) variation and complexity as space allows for increased habitat value. Where feasible, the channel should be allowed to spread as much as possible within a floodplain to distribute energy. The potential stream corridor width is estimated to range between 30 and 50 feet, which should be more than adequate for peak flow conveyance purposes, however, it would result in a narrow riparian corridor between the creek and the road in some places. It is recommended that the



riparian understory be actively maintained to supplement solar shading in areas where the canopy is narrow.

The primary constraints for this project are the steepness of the site and construction access due to the existing native vegetation on the site, which should be preserved to the maximum extent feasible. The overall daylighted channel slope would be approximately 12% on average, which is steep relative to most other stream channels in the region. Due to the steepness, it is recommended that the stream design incorporate grade control elements to prevent large scale erosion and channel bed incision. However, the steepness of the channel would be consistent with the historical channel character. The soils along the proposed daylighting alignment are mapped as part of the Witzel series, which are characterized by slopes up to 40 percent and have a depth to bedrock of 12 to 20 inches (NRCS 2017). This soil type is resistant to long-term erosion. However, grade control may be required in areas where native bedrock was excavated and disturbed during the installation of the pipe alignment, in the form of large boulder weirs, log weirs, and/or placing larger boulders and cobbles throughout the length of the channel, to prevent incision. Depending on the way in which grade control is accomplished, this could greatly impact the overall cost of construction, as well as increase the overall construction impact. Hydraulic modeling of the corridor should be conducted to determine the extent of grade control required, and to aid in sizing grade control components. Furthermore, hydraulic roughness (via cobbles and boulders and/or large woody debris) and vegetation will be important for minimizing erosion at the site following construction. As mentioned previously, if high flows are diverted into the existing pipe then the need for grade control and hydraulic roughness would be somewhat lessened.

Construction access to the site would occur via Tannler Road, which runs alongside the proposed creek corridor. The planning-level cost estimate prepared to accompany this memo includes costs for traffic control. Project construction may require temporary closures of one lane of traffic on Tannler Road. Most of the proposed stream corridor contains mature, native vegetation. Both the design and construction of the creek should be targeted to minimize impacts to established native vegetation along the creek corridor. Significant trees and vegetation should be surveyed along the full width of the future riparian corridor to inform design and identify high priority preservation areas. Construction techniques should include use of low ground pressure equipment and fencing of protected root zones.

Cost

Appendix A contains a planning-level cost estimate for stream daylighting is attached. This estimate includes costs for design, including further analysis such as modeling and surveying to support design, and construction. Due to the limited available information, this estimate includes a 100% contingency for construction, to account for unknown and unforeseen issues that could complicate construction.

Figure 2 shows a rendering of the potential future of daylighting Bernert Creek.



Figure 2. Daylighted Bernert Creek.

References

Mishaga, Richard. 2013. Support for the Acquisition and Restoration of Additional Lands in the White Oak Savanna Area. Letter to Nature in Neighborhoods Grant Committee. January 28, 2013.

Mishaga, Richard. 2014. Vertebrate Wildlife Observed on the ODOT-Administered Oak Savanna Habitat 1995 - 2009. Prepared by Richard Mishaga, Ph.D., Retired Wildlife Ecologist. February 24, 2014.

Natural Resources Conservation Service (NRCS), United States Department of Agriculture. 2017. Web Soil Survey. Available online at <https://websoilsurvey.sc.egov.usda.gov/>. Accessed January 25, 2017.

West Linn Public Works. 2006. West Linn Surface Water Management Plan. City of West Linn. West Linn, Oregon. December 11, 2006.

APPENDIX A

Cost Estimate

**WEST LINN OAK SAVANNAH
WEST LINN, OR**

Project: Bernert Creek Daylighting
Construction Cost Estimate: Conceptual Planning Level
Level of Confidence: Low

Description: Daylight Bernert Creek segment along historic alignment and decommission existing pipe

Prepared by:

A.Rhode

3/27/2017

Checked/Revised by:

M. Ewbank

3/27/2017

| NO. | ITEMS OF WORK AND MATERIALS | ESTIMATED QUANTITY | UNIT | UNIT PRICE | TOTAL AMOUNT | NOTES |
|-----|--|--------------------|------|-------------|---------------------|---|
| 1 | Mobilization | 1 | LS | 10% | \$5,740.00 | Assumed 10% total construction cost |
| 2 | Traffic Control, Temporary | 1 | LS | \$10,000.00 | \$10,000.00 | Temporary single-lane traffic |
| 3 | Erosion and Sediment Control | 1 | LS | \$3,000.00 | \$3,000.00 | Engineer's estimate |
| 5 | Tree Protection | 1 | LS | \$5,000.00 | \$5,000.00 | Many trees to be preserved |
| 6 | Clearing and Grubbing | 1 | LS | \$5,000.00 | \$1,000.00 | Minimal clearing and grubbing - preserve habitat |
| 7 | Temporary Flow Bypass During Construction | 1 | LS | \$3,000.00 | \$3,000.00 | Minimal pumping - diversion will use gravity |
| 8 | Boulders 24"-36" (nominal diameter) | 100 | TN | \$150.00 | \$15,000.00 | To be placed along alignment /provide grade control |
| 9 | Cobbles | 130 | TN | \$80.00 | \$10,400.00 | To be placed along alignment - large cobble assumed |
| 10 | Log Without Rootwad - 15' length | 10 | EA | \$500.00 | \$5,000.00 | Includes procurement and and surface installation |
| 11 | Salvaged Woody Debris | 1 | LS | \$5,000.00 | \$5,000.00 | Salvage any downed trees or pruned branches for use in channel |
| 12 | Stream Channel Excavation and Offsite Haul | 450 | CY | \$50.00 | \$22,500.00 | High unit cost to account for low-impact excavation. Look into soil reuse on site to reduce costs |
| 13 | Decommission Existing Pipe in Place | 1 | LS | \$5,000.00 | \$5,000.00 | Fill with CDF (115 CY) |
| 14 | New Pipe Outfall | 1 | LS | \$3,000.00 | \$3,000.00 | Connect to BEJ7 manhole |
| 15 | New Ditch Inlet | 1 | LS | \$4,000.00 | \$4,000.00 | Connect to BEJ6 manhole |
| 16 | Driveway Culvert and Gravel Bedding | 1 | LS | \$25,000.00 | \$25,000.00 | Arch Culvert - 12' span with compacted gravel bedding |
| 17 | Pedestrian Crossing | 1 | LS | \$15,000.00 | \$15,000.00 | Assume a simple prefab bridge with handrails |
| 18 | Interpretive Signage | 2 | EA | \$2,500.00 | \$5,000.00 | |
| 19 | Seeding/Planting | 0 | LS | \$0.00 | \$0.00 | Not included in estimate - to be done by NLWL |
| 20 | Construction Oversight | 1 | LS | \$15,000.00 | \$15,000.00 | Engineering oversight |
| | Construction Subtotal | | | | \$143,000.00 | |
| | Construction Contingency | | | 100% | \$143,000.00 | |
| | Modeling and Design | 1 | LS | \$50,000.00 | \$50,000.00 | |
| | Permitting | 1 | LS | \$40,000.00 | \$40,000.00 | |
| | Total | | | | \$380,000.00 | |

Boyd, John

From: Roberta Schwarz <roberta.schwarz@comcast.net>
Sent: Wednesday, June 19, 2019 11:53 AM
To: Planning Commission (Public); Axelrod, Russell; Cummings, Teri; Sakelik, Richard; Relyea, William; Walters, Julianna
Cc: Williams, John; Boyd, John; Savanna Oaks Neighborhood Association
Subject: Testimony for June 17th CC Work Session and reason for urgency
Attachments: Testimony for June 17th CC Work Session.pdf

Hello again,

This is the fourth and final of four emails for you today. In his testimony Ed makes reference to a US Fish and Wildlife Service National Wetlands Inventory map which you have already received with the Hydrology report. He also makes reference to several pages from the Goal 5 Inventory and a photo of the Bernert family. We do not have access to those today but will send them later if anyone would like to see them. They are also a part of the Public Record from Ed's testimony submitted at the CC meeting on June 17th.

Mr. Williams let us know that this PC meeting tonight is the Sanitary Sewer Master Plan, not the Surface Water Plan. It was suggested to us to submit information today and we have done so.

Like the testimony that Roberta submitted on June 17th about the lack of fire protection in the White Oak Savanna and the subsequent site tour and written information she obtained from Lt Raeburn of the TVFR, we consider this mistake made in the Planning process of the City of West Linn, to be an issue which must be corrected as soon as possible.

Thank you,
Ed and Roberta Schwarz
President and Secretary
Savanna Oaks N.A.

June 17, 2019

My name is Ed Schwarz and I am President of the Savanna Oaks Neighborhood Association. I am a resident of West Linn. Thank you for placing on the agenda tonight the “daylighting” or redirecting of Bernert Creek to flow above ground once again as it did before being put in a culvert in the 1970s when Tannler Drive was constructed. We have included in your packet tonight 12 relevant pages from West Linn’s Goal 5 Wetland, Riparian, and Wildlife Habitat Inventory completed in 2003 by Winterbrook Planning and paid for by the City of West Linn. This was approved by the Oregon Department of State Lands in 2005. We have also included Community Development Code information.

The White Oak Savanna is a Significant Natural Habitat. The Inventory lists Bernert Creek as a Wetland. Upper Bernert Creek was given an Enhanced Score of 58 on the Habitat Assessment Summary.

This area is listed as a Significant Natural Resource on West Linn’s Goal 5. Bernert Creek is listed on the US Fish and Wildlife Service National Wetlands Inventory map (included in your packet) and on the Clackamas County Surveyor’s map as well.

Hydrologist Jon Rhodes wrote a report which you have been sent previously and which lists the numerous benefits of daylighting Bernert Creek. They include:

1. Helping to reduce the volume of discharge of urban runoff to the downstream reaches of Bernert Creek and the Willamette River.
2. Likely improving water quality and reducing pollutant loads delivered to Bernert Creek and the Willamette River.
3. Likely benefiting biodiversity because it would contribute to the re-establishment of riparian vegetation. Riparian zones are critically important for biodiversity. Healthy riparian areas benefit a wide array of species including birds, amphibians, other vertebrates, and invertebrates including insects.
4. Likely reduce the long-term costs of maintaining the drainage infrastructure that now conveys runoff from Bernert Creek’s upper watershed. Daylighting the stream would obviate the long-term recurring costs associated with maintaining the drainage infrastructure that currently routes runoff downstream. West Linn’s Engineer estimated that the work needed on the pipe would cost approximately \$160,000. That is in the public record for tonight’s meeting.

Chapter 32 of the CDC supports Bernert Creek being daylighted:

32.020 APPLICABILITY

A. This chapter applies to all development, activity or uses within WRAs identified on the WRA Map. It also applies to all verified, unmapped WRAs. The WRA Map shall be amended to include the previously unmapped WRAs.

32.060 APPROVAL CRITERIA (STANDARD PROCESS)

H. Daylighting Piped Streams.

1. As part of any application, covered or piped stream sections shown on the WRA Map are encouraged to be “daylighted” or opened.

When we last presented to the City Council on daylighting Bernert Creek we were asked for a Feasibility Study and Cost Estimate. We have had both completed by Herrera and have emailed them to you within the past week. The cost is approximately \$320,000 and includes design, further analysis such as modeling and surveying to support design, permitting and approval, and construction.

The benefits listed in the Feasibility Study include providing shade and increasing hyporheic interaction with the soil to decrease water temperatures. Also, species diversity would increase, thereby providing a unique opportunity for visitors to encounter rarer species in this setting. As development in the Portland Metro Area continues at a rapid pace, preserved habitats like the White Oak Savanna are increasingly important to provide vital habitat. And the refuge it provides for local wildlife.

One goal for this stream channel daylighting project would be to serve as an accessible demonstration site to educate the community on the importance of healthy streams and the many important functions of riparian corridors. Most visitors to the Savanna would enter and/or exit via a route over the creek, where interpretive signage could be placed for their benefit. Many classes of children participate in volunteer efforts at the park and this would be an opportunity for children to learn about the stream in a safe, easily accessible environment. We were also asked to make a presentation about this project to the residents of a local Assisted Living Facility and they were very happy to hear that a place so close would be available to them as a spot to sit and listen to birds and hear the creek flowing. The nearby VA Clinic will have patients and staff who will be able to come and enjoy this daylighted stream as well.

We have included Letters of Support from five different Conservation groups who endorse this daylighting of Bernert Creek.

Six hundred thousand dollars (\$600,000) has already been budgeted and approved for a natural play area in the White Oak Savanna. The design of the natural play area could have been handled better by the Park Department. No members of the NA were invited to any design meetings. We were only provided finished maps with small print. We feel that several of the proposed features are not compatible with the White Oak Savanna's habitat. Therefore, we respectfully ask that approximately half of the budgeted amount instead be used to daylight Bernert Creek and the other half be used for construction of a scaled-down Natural Play Area.

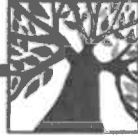
This is something that the community has been requesting for many years. Jon Rhodes did his first report on Bernert Creek for us in 2007. The Girl Scouts made this model as part of the 2013 celebration when we acquired the first 14 acres of the park. Look how they have Bernert Creek daylighted. Please do this for the community. The community did the heavy lifting and raised the \$3.5 million and have volunteered over 16,167 hours so far in restoration. You can support them by leaving this Bernert Creek legacy. The Bernert family has said they will donate the riparian plants for the banks of the Creek. This is local history coming back to life. The last page of your packet is a photo of the Bernert family.

Thank you for the opportunity to present this information.

Respectfully submitted,

Ed Schwarz, President
Savanna Oaks Neighborhood Association

PC – 5 APPLICANTS SUBMITTAL



City of
West Linn

**SANITARY SEWER MASTER PLAN
LAND USE PLANING APPLICATION**

FILE NUMBER:

HEARING DATE:

REQUEST: To consider a recommendation to City Council for adoption of the West Linn 2019 Sanitary Sewer Master Plan (SSMP) Update as Attachment A, along with proposed amendments to Comprehensive Plan Goal 11 and Chapter 85 of the Community Development Code.

**APPROVAL
CRITERIA:** Community Development Code (CDC) Chapters 98, 100 and 105.

PREPARED BY: City Engineering Staff

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GENERAL INFORMATION

APPLICANT: City of West Linn

DESCRIPTION: A recommendation to City Council for consideration of adoption of the West Linn 2019 Sanitary Sewer Master Plan (SSMP) Update as Attachment A. The Commission will also consider recommendations on proposed amendments to West Linn Comprehensive Plan Goals 11 and Chapter 85 of the Community Development Code (CDC).

APPROVAL CRITERIA: Community Development Code (CDC) Chapter 98 provides administrative procedures for legislative amendments to the Comprehensive Plan and the CDC. Section 98.100 of the CDC lists the factors upon which a decision shall be based. These are briefly described below and addressed in greater detail in a separate Section of this report:

1. The Statewide Planning Goals and rules adopted under ORS Chapter 197 and other applicable state statutes;
2. Any federal or state statutes or rules found applicable;
3. Applicable plans and rules adopted by the Metropolitan Service District (Metro);
4. The applicable Comprehensive Plan policies and map; and,
5. The applicable provisions of implementing ordinances.

EXECUTIVE SUMMARY

In 2016, the City of West Linn engaged in a planning process involving citizens and agency stakeholders to update the Sanitary Sewer Master Plan (SSMP). While this is an update to the 1998 SSMP, the 2019 SSMP completely replaces the old plan. The 2019 SSMP maintains the original plan's objectives and basis of planning. The update includes review of facilities constructed since 1998, and consideration of aging facilities, regulatory changes, and population trends, utilizing the current best practices of the industry.

The SSMP is a supporting document to the Comprehensive Plan. The update to the SSMP requires a number of amendments to goals and policies in the Comprehensive Plan, as well as applicable amendments to Chapter 85 of the Community Development Code (CDC).

The proposed amendments to the Comprehensive Plan and CDC in attachment A of the application. Adoption of the proposal will ensure goals and policies, and land use development criteria, are aligned with the vision outlined in the SSMP for an efficient sanitary sewer collection system to meet community needs into the future.

The primary intent of this legislative action is to ensure the City's SSMP and the Comprehensive Plan remain viable tools for decision-makers. By adopting the amendments, the City will also ensure continued compliance with applicable laws, rules, regulations, plans, and programs.

Project Background

The City of West Linn owns, operates and maintains the sanitary sewer collection system within the City, and transports the wastewater to the Tri-City Water Pollution Control Plant for treatment. The Tri-City Water Pollution Control Plant belongs to the Water Environment Services partnership of Clackamas County (WES). The City's Sanitary Sewer Master Plan provides an in-depth analysis of existing system conditions and incorporates hydraulic modeling of the system to identify hydraulic capacity deficiencies in the sewer collection system for both existing and future planning needs. The SSMP is considered a living document that is inherently flexible to allow the City to respond to opportunities and changing conditions as they develop. The main topics covered in the SSMP include the following:

- Identify the basis of planning and performance criteria
- Describe the existing system
- Hydraulic model development and calibration
- Capacity evaluation
- Inflow/infiltration reduction
- Develop a capital improvement program
- Identify planning level cost estimates for identified projects

The SSMP defines the capacity needs of the sanitary sewer collection system to meet current and future populations within the twenty-year planning period based upon population projects, underlying zones, past wastewater flow data, existing conditions and regulatory requirements. The projects identified are conceptual, and future work will be required to design, permit and construct the improvements.

Proposed Comprehensive Plan Amendments

In addition to adopting the West Linn SSMP Update, a number of amendments are proposed to goals, policies, and action measures found in the West Linn Comprehensive Plan. The proposed amendments will ensure consistency and compliance with regional and state plans and policies, and includes the following:

- Update to the narrative for Goal 11 Public Facilities and Services – Section 1 Sanitary Sewers
- Update the goal to provide reliable and environmentally sound wastewater collection.
- Update policy to encourage development and annexation that makes orderly and efficient use of the wastewater collection system.
- Update action measures to:
 - Edit measure #1 to coordinate with WES with regard to sanitary sewer needs.
 - Edit measure #2 to refer to the sanitary sewer system.
 - Add measure #4 continue to make an effort to reduce inflow and infiltration into the collection system.

These changes are more fully shown in the in attachment A of the application.

Proposed CDC Amendments

In addition to adopting the West Linn SSMP, one amendment is proposed to the CDC. The proposed amendment will ensure consistency and compliance with regional and state plans and policies, and includes the following:

- Update chapter 85 to refer to the “SSMP dated March 2019” instead of the “SSMP”.

APPLICATION

APPLICABLE CRITERIA

West Linn Community Development Code

Chapter 98.040 Duties of Director

A. The Director shall:

1. If appropriate, or if directed by the City Council or Planning Commission in their motion, consolidate several legislative proposals into a single file for consideration;

Response: The proposed legislative amendments to the West Linn Comprehensive Code and Chapter 85 of the Community Development Code have been consolidated into one file as allowed. The consolidation is appropriate as the proposed amendments will ensure consistency with the adopted plan.

2. Upon initiation of a legislative change, pursuant to this chapter:

a. Give notice of the Planning Commission hearing as provided by CDC 98.070 and 98.080;

b. Prepare a staff report that shall include:.....

c. Make the staff report and all case file materials available 10 days prior to the scheduled date of public hearing under CDC 98.070;

d. Cause a public hearing to be held pursuant to CDC 98.070;

Response: A hearing before the Planning Commission and subsequently City Council will be scheduled as part of this land use application. A staff report will be generated and posted pursuant to CDC 98.040.

Chapter 100 - Procedures for Adoption of Amendment of Supporting Plans:

CDC 100.010 Definitions

A master plan is defined as a supporting document to the Comprehensive Plan.

Response: The SSMP Update is a supporting document to the Comprehensive Plan, therefore the standards of this Chapter must be addressed.

CDC 100.090 Additional Procedures

This refers to procedures set forth in CDC Chapter 98.

Chapter 105 – Amendments to the code and Map:

CDC 105.010 Purpose

This Chapter sets forth the standards for legislative amendments to the CDC and to the map.

Response: An amendment to the CDC Chapter 85 is recommended, therefore the standards of this Chapter must be addressed.

CDC 105.030 Legislative Amendments to this Code and Map

This refers to procedures set forth in CDC Chapter 98.

Chapter 98 - Procedures for Decision Making: Legislative

CDC 98.100 Standards for Decision

A. The recommendation of the Planning Commission and the decision by the City Council shall be based on consideration of the following factors:

1. The Statewide planning goals and rules adopted under Chapter 197 ORS and other applicable State statutes;

Statewide Planning Goal 1 – Citizen Involvement:

This goal outlines the citizen involvement requirement for the adoption of Comprehensive Plans and changes to the Comprehensive Plan and implementing documents.

Response: This goal was addressed with the following steps. The City has maintained a project website tracking the project development since inception in November 2016. The SSMP was introduced to the public at the November 2018 Utility Advisory Board with a more detailed presentation in March of 2019. The draft SSMP has been posted to the City website for public comment since April 2, 2019. Additionally, a public hearing before the Planning Commission and City Council will occur prior to final adoption of the SSMP pursuant to CDC Chapter 98. As a result, the SSMP is in compliance with Goal 1.

No goal or policy changes are recommended.

Statewide Planning Goal 2 – Land Use Planning:

This goal outlines the land use planning process and policy framework. The Comprehensive Plan was acknowledged by DLCD as being consistent with the statewide planning goals.

Response: The City of West Linn has an acknowledged Comprehensive Plan and enabling ordinances. The SSMP was developed to support the underlying land use zones and the populations anticipated. Therefore, the SSMP supports the land use and zoning policies. Goal 2 references carrying capacity, but the only reference to the sanitary system is the overall quality of life. The SSMP recommendations are aimed at properly sizing sanitary facilities and thus helps to maintain the overall quality of life. The amendments will be processed in accordance with City's adopted procedures, which requires any applicable statewide planning goals, federal or state statutes or regulations, Metro regulations or plans, comprehensive plan policies, and the City's implementing ordinances be addressed as part of the decision-making process. This amendment will be processed as a post-acknowledgement plan amendment (PAPA) and noticing requirements will be met. All applicable review criteria has been addressed within this application; therefore, the requirements of Goal 2 have been met.

No goal or policy changes are recommended.

Statewide Planning Goal 5 – Natural Resources:

This goal requires the inventory and protection of natural resources, open spaces, historic sites and areas.

Response: The City is currently in compliance with the State’s Goal 5 program and Metro’s Title 13: Nature in Neighborhoods program, which implements Goal 5. The SSMP does not alter the City’s acknowledged Goal 5 inventories or associated land use programs. No changes will occur to current natural resource protections. As a result, the amendments are in compliance with Goal 5 process requirements.

No goal or policy changes are recommended.

Statewide Planning Goal 6 – Air, Water, and Land Resource Quality:

To maintain and improve the quality of air, water, and land resources of the state.

Response: The City is currently in compliance with Metro’s Title 3: Water Quality and Flood Management program, which implements Goal 6. The SSMP does not alter the City’s acknowledged land use programs regarding water quality and flood management protections. The City is included in the Metro Area Airshed, which is in compliance with Federal Clean Air Act regulations. As a result, the SSMP is in compliance with Goal 6.

No goal or policy changes are recommended.

Statewide Planning Goal 7 – Areas Subject to Natural Hazards:

To protect people and property from natural hazards.

Response: The City is currently in compliance with Goal 7 and Metro’s Title 3: Water Quality and Flood Management program. The SSMP does not alter the City’s acknowledged Goal 7 land use programs. No changes will occur to current natural hazard protections. As a result, the SSMP is in compliance with Goal 7.

No goal or policy changes are recommended.

Statewide Planning Goal 8 – Recreational Needs:

This goal requires the satisfaction of the recreational needs of the citizens of the state and visitors.

Response: West Linn provides a robust range of recreational facilities throughout the community, and has an adopted Parks Master Plan and is in the process of updating that plan. The SSMP does not alter the Parks Master Plan. The SSMP is in compliance with Goal 8.

No goal or policy changes are recommended.

Statewide Planning Goal 9 – Economic Development:

To provide adequate opportunities for a variety of economic activities vital to the health, welfare, and prosperity of Oregon’s citizens.

Response: The City is currently in compliance with Goal 9 and Metro’s Title 1: Requirements for Housing an Employment Accommodation and Title 4: Industrial and Other Employment Areas. The SSMP does not alter the City’s compliance with Goal 9. The SSMP recommendations are aimed at properly sizing sanitary facilities and thus help to support economic growth. The requirements of Goal 9 have been met.

No goal or policy changes are recommended.

Statewide Planning Goal 10 – Housing:

To provide adequate housing for the needs of the community, region and state.

Response: The City is currently in compliance with Goal 10 and the Metropolitan Housing Rule (OAR 660-007/Division 7), and Metro’s Title 1: Requirements for Housing an Employment Accommodation. The SSMP does not alter the City’s compliance with Goal 10. The SSMP recommendations are aimed at properly sizing sanitary facilities and thus help to accommodate housing needs. The requirements of Goal 10 have been met.

No goal or policy changes are recommended.

Statewide Planning Goal 11 – Public Facilities and Services:

To plan and develop a timely, orderly, and efficient arrangement of public facilities and services to serve as framework for urban and rural development.

Response: The City is currently in compliance with Goal 11 through its acknowledged Comprehensive Plan. This includes an adopted Public Facility Plan as required by Oregon Revised Statute 197.712 and Oregon Administrative Rule (OAR) 660-011. The purpose of facility planning per OAR 660-011 is to help assure that urban development “is guided and supported by types and levels of urban facilities and services appropriate for the needs and requirements of the urban areas to be serviced”. The SSMP will update the sanitary sewer component of the Public Facility Plan as allowed by Oregon Administrative Rule 660-011-0010-0045. As a result, the SSMP is in compliance with Goal 11.

West Linn Comprehensive Plan Goal 11: Public Facilities and Services, Section 1 should be amended to read as provided in Attachment A.

Sections 2: Water System; 3: Storm Drainage; 4: Fire and Police; 5: Government Administration Facilities; 6: Libraries; 7: Schools; 8: Private Utilities and Telecommunications; and 9: Health Services are not affected by the SSMP and no changes in goals or policies are required.

Statewide Planning Goal 12 – Transportation:

To provide and encourage a safe, convenient, and economic transportation system.

Response: The City is currently in compliance with Goal 12 and Metro’s Regional Transportation Plan through its acknowledged Comprehensive Plan and TSP as required by Oregon Administrative Rule 660-012 (Transportation Planning Rule). The SSMP does not alter the City’s compliance with Goal 12. The SSMP recommendations are aimed at properly sizing sanitary facilities which does not affect the transportation system. The requirements of Goal 12 have been met.

No goal or policy changes are recommended.

Statewide Planning Goal 13 – Energy Conservation:

Land and uses developed on the land shall be managed and controlled so as to maximize the conservation of all forms of energy, based on sound economic principles.

Response: The City is currently in compliance with Goal 13 through its acknowledged Comprehensive Plan. The adoption of the SSMP does not alter the City's compliance with Goal 13. The SSMP includes a plan to reduce inflow and infiltration into the collections system which would reduce the energy cost to transport wastewater through the pump stations, which supports energy conservation. The requirements of Goal 13 have been met.

No goal or policy changes are recommended.

Statewide Planning Goal 14 – Urbanization:

To provide for orderly and efficient transition from rural to urban land use, to accommodate urban population and urban employment inside urban growth boundaries, to ensure efficient use of land, and to provide for livable communities.

Response: The City is currently in compliance with Goal 14 and Metro's Title 11: Planning for New Urban Areas through its acknowledged Comprehensive Plan and land use regulations. The City also has a signed Urban Growth Management Agreement with Clackamas County as required by ORS 195.065. The SSMP does not alter the City's compliance with Goal 14. The SSMP recommendations are aimed at properly sizing sanitary facilities and thus helps to promote orderly growth. The requirements of Goal 14 have been met.

No goal or policy changes are recommended.

Statewide Planning Goal 15 – Willamette River Greenway:

To provide for keeping the land green along the banks of the river and providing for recreation access.

Response: The City is currently in compliance with Goal 15 through its acknowledged Comprehensive Plan and land use regulations. The SSMP does not alter the City's compliance with Goal 15 and is consistent with this goal. The requirements of Goal 15 have been met.

No goal or policy changes are recommended.

Conclusion: Based on the analysis above, the proposed SSMP is consistent with applicable Statewide Planning Goals.

2. *Any federal or State statutes or rules found applicable;*

Oregon Administrative Rule 660-011

Response: The Land Conservation and Development Commission adopted Oregon Administrative Rule 660-011 (Public Facility Planning Rule) to implement Statewide Planning Goal 11. The proposed SSMP describes the sewer facilities necessary to support the land use designated in the City's acknowledged comprehensive plan within the City's urban growth boundary, one component of the City's overall Public Facilities Plan. See the material above which addresses State Wide Planning.

Oregon Administrative Rule 340-041-0009 (7) (DEQ Bacterial Rule)

Response: The requirement generally prohibits the sanitary sewer overflow during the summer except in storms greater than a one in ten-year event, and in winter to a one in five year event. Planning and sizing of sanitary sewers must be based upon this criteria. The SSMP uses the five-year 24 hour storm event with an adjustment for climate change to model the system and size the facilities. The City has not had any documented overflows in the past. The SSMP is in compliance with the rule.

Oregon Administrative Rule 340-045

Response: This rule requires a discharge permit (NPDES or WPCF) for wastewater. The City of West Linn transports the wastewater to the Tri-City Water Pollution Control Plant managed by Water Environment Services (WES). Therefore, the City of West Linn does not discharge wastewater and is not required to have a discharge permit. The SSMP is in compliance with the rule.

Oregon Administrative Rule 340-050

Response: This rule defines the requirement for land application of biosolids. The City of West Linn transports the wastewater to the Tri-City Water Pollution Control Plant managed by Water Environment Services. Therefore, the City of West Linn does not manage biosolids, so this rule does not pertain. The SSMP is in compliance with the rule.

Conclusion: Based on the analysis above, the proposed SSMP is consistent with applicable federal or state statutes or rules.

3. Applicable plans and rules adopted by the Metropolitan Service District;

Response: Metro's responsibility includes management of the boundary that separates urban and rural lands with regard to land use and development, coordinate and plan investments in the transportation system for the three-county area, act a regional clearinghouse for land information, manage regional parks and natural areas, operate regional visitor venues, and oversee the regions solid waste system. Their responsibility does not extend to sanitary sewer collection or treatment.

Under the land use goals 2, 5 and 8 earlier in this document a response has been provided addressing land use planning, natural areas and recreational areas. The SSMP does not affect the Metro plans and rules.

Conclusion: Based on the analysis above, the SSMP is consistent with applicable plans and rules adopted by Metro.

4. *The applicable Comprehensive Plan policies and map*

Response: Comprehensive policies have been addressed in this application under the Statewide Planning Goals. Amendments to Goal 11 Public Facilities and Services Section 1: Sanitary Sewer have been recommended.

The Comprehensive Plan does not include maps pertaining to the sanitary sewer system. Therefore, there are no map changes required.

Conclusion: Based on the analysis above, the proposed SSMP is consistent with the Comprehensive Plan policies and map.

5. *The applicable provisions of the implementing ordinances.*

Response: The applicant is not aware of any additional applicable provisions, which are not found above. Implementing ordinances include:

- *CDC Chapter 55.100 I 4 – Design Review Approval Standards: Public Facilities, Sanitary Sewers.*
- *CDC Chapter 60.070 A 4 – Conditional Uses Approval Standards and Conditions, Adequate Public Facilities.*
- *CDC Chapter 85.170 – General Provisions Submittal Requirements for Tentative Plan, and Supplemental Submittal Requirements for Tentative Subdivision or Partition Plan.*
- *CDC Chapter 85.200 G - General Provisions Submittal Requirements for Tentative Plan, and Approval Criteria, Sanitary Sewers.*

Response: These chapters require design engineers to demonstrate sufficient capacity available in the sanitary sewer system to serve the proposed development. The proposed SSMP provides updated capacity information, but does not alter this requirement. CDC Chapter 85.200 G references SSMP, but not a specific SSMP, therefore that section of the CDC should be modified as proposed in Attachment A.

Chapter 92.010 F – Required Improvements, Public Improvements for all Development, Sanitary Sewer.

Response: This requires that sanitary sewers shall be installed to City standards to serve the subdivision and to connect the subdivision to existing mains. The SSMP does not affect this requirement.

Conclusion: Based on the analysis above, Chapter 85.200 G 1 of the CDC is proposed to be amended to be consistent with the SSMP. Otherwise the proposed SSMP is consistent with the CDC.

Annotated to show deletions and additions to the plan section being modified. Deletions are **~~bold-lined through~~** and additions are **bold underlined**.

1. Proposed Comprehensive Plan Amendments

The following text amendments are proposed for the West Linn Comprehensive Plan:

.....

West Linn Comprehensive Plan goal 11: Public facilities and Services should be amended to read as follows:

SECTION 1: SEWER SYSTEM

BACKGROUND AND FINDINGS

~~West Linn has 110~~ **The City operates and maintains several miles of public sewers public sanitary sewer mains and several pump stations, ranging in diameter from 6 to 24 inches. Wastewater is conveyed through the City sanitary sewer system to the Tri-City Plant for treatment. The Tri-City Water Pollution Control Plant belongs to the** ~~The Water Environment Services partnership Department~~ **of Clackamas County (WES) is responsible for providing wastewater treatment services for the cities of West Linn, Oregon City, and Gladstone. Eleven pumping stations, eight City owned and three owned by Clackamas County, carry the City's wastewater to Clackamas County's Tri-City Wastewater Treatment Plant. The Water Environment Services Department of Clackamas County operates under a master plan adopted for the Tri-City Wastewater Treatment Plant.** The sanitary sewer system is separate from the storm sewer system ~~and untreated storm water drains directly to surface streams.~~

In 1999, the City contracted with Bookman-Edmonston Engineering to update the 1989 Sanitary Sewer System Master Plan. The study determined expansion and rehabilitation needs of the current system, and identified a comprehensive schedule for improvements. **The City's Sanitary Sewer Master Plan, dated March 2109, provides an in-depth analysis of existing system conditions and incorporates hydraulic modeling of the system to identify hydraulic capacity deficiencies in the sewer collection system for both existing and future planning needs.**

.....

GOALS, POLICIES, AND RECOMMENDED ACTION MEASURES

GOAL

Provide **adequate, reliable and** environmentally sound wastewater collection and treatment for all West Linn residents and businesses.

POLICIES

- ~~1. Coordinate sanitary sewer service to existing future residents to allow for the most efficient provision of service within the City and subsequent expansion of the service area.~~ **Encourage**

development and annexation that makes orderly and efficient use of the wastewater collection system.

2. Require the installation of new sanitary sewer collection facilities to be the responsibility of property owners who will receive direct benefit from those facilities. The City may participate in the development of those facilities to the extent that they benefit residents or businesses in addition to those directly involved.
3. Maintain and operate the sanitary sewer system to meet all federal and state permitting requirements.

RECOMMENDED ACTION MEASURES

1. **Participate Coordinate** with the Clackamas County Department of Water Environment Services in meeting the City's sanitary sewer ~~requirements~~ **needs**.
2. Work with Clackamas County and other affected agencies to plan major wastewater treatment facilities. The City recognizes and assumes its responsibility for operation, planning, and regulating ~~the wastewater sanitary sewer~~ system as designated in the City's ~~1999~~ Sanitary Sewer System Master Plan, **dated March 2019**, which is a supporting document of the Comprehensive Plan.
3. Encourage residents with septic systems to connect to the City sanitary sewer system.
4. **Continue efforts to reduce inflow and infiltration into the wastewater collection system to the extent such reduction are documented to be cost-effective and/or required by State or Federal regulation.**

2. **Proposed CDC Chapter 85 Amendments**

The following text amendments are proposed for the Community Development Code Chapter 85:

.....

A plan prepared by a licensed engineer shall show how the proposal is consistent with the Sanitary Sewer Master Plan, **dated March 2019**, and subsequent updates and amendments. Agreement with that plan must demonstrate how the sanitary sewer proposal will be accomplished and how it is efficient. The sewer system must be in the correct zone.