

EXECUTIVE SUMMARY

ES-1 Purpose

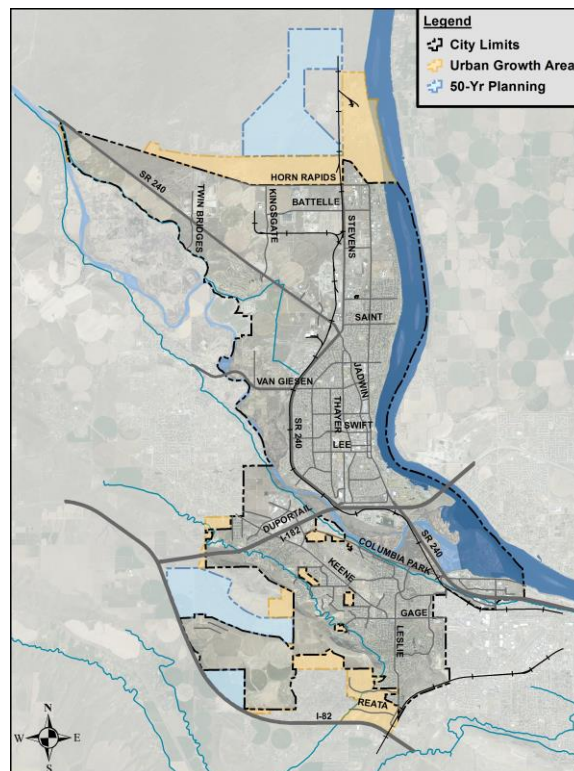
In accordance with WAC 173-240-020(7), the City of Richland (City) maintains a General Sewer Plan which has been reviewed and approved by the Washington State Department of Ecology (WDOE). Long term planning should be reviewed and periodically updated to incorporate changes in population, land use, and regulations. It is recommended that updates occur at 5-10 year intervals. The last comprehensive General Sewer Plan for the City was completed in 2004. The City has experienced significant growth since then and much of the 2004 plan needs updating. The City authorized J-U-B ENGINEERS, Inc. to undertake a General Sewer Plan Update in 2014/2015. The major goals of the 2015 General Sewer Plan Update are as follows:

- Provide a general evaluation of the Wastewater Treatment Plant (WWTP)
- Update the hydraulic model of the sewer collection system to assess the existing conditions (current flows), near-term conditions (areas the City has committed to serve that may be developed soon), and long-term conditions (areas beyond the current City limits to the expected 50-year boundary)
- Identify limitations in the existing collection system and necessary improvements to maintain an appropriate level of service
- Incorporate recent analysis from the South Sewer Study and summarize the history and current plan for providing sewer service to the Badger Mountain Sub-Area
- Update the collection system master plan to serve the expected 50-year boundary
- Develop “Risk of Failure” ratings that incorporate sewer pipe condition data in order to prioritize improvement projects.
- Develop “Consequence of Failure” ratings for sewer pipes in order to further prioritize improvement projects.
- Develop overall scoring criteria for sewer pipes utilizing hydraulics, “Risk of Failure,” and “Consequence of Failure” criteria such that City Staff can combine this data with separate scoring of water pipes and roadways in order to identify and prioritize infrastructure projects.
- Establish a comprehensive Capital Improvement Plan (CIP) with particular emphasis on the next 5 to 10 years
- Document the sewer utility’s financial condition and assess its ability to support the recommendations of the CIP.
- Summarize the City’s current Operations & Maintenance Program and suggest potential changes.
- Summarize the City’s current Pre-Treatment Program and develop a framework for a Fats, Oils, & Grease (FOG) program.
- Satisfy WDOE and WAC requirements for a General Sewer Plan.

ES-2 Planning Boundaries

This General Sewer Plan evaluates the hydraulic capacity of all of the existing sewer pipes that are 10-inches and larger in diameter. The pipes are evaluated not only on existing flow conditions, but the expected flow conditions when the entire Urban Growth Boundary is completely developed. Any existing pipes that were identified as needing to be upsized upon buildout of the UGA, were further evaluated to serve a 50-year boundary – with the goal in mind that any pipes constructed today will have the capacity to function properly through the end of their design life. Similarly, any new pipe extensions were also sized to serve the 50-year boundary. The planning boundaries are depicted in **Figure ES-1**.

Figure ES-1 – Planning Boundaries



ES-3 Collection System Summary

The City's public collection system has expanded from an initial series of pipelines serving the old downtown Richland area to a system containing over 262 miles of gravity pipelines and 14 pumping stations providing public sewer service to a residential population of 53,054. The total area that can be provided with public sewer service totals over 25,000 acres or approximately 40 square miles. The total linear feet of sewer pipelines within the City's public collection system has more than tripled over the past 30 years. The existing wastewater collection system consists of gravity pipelines ranging in size from 6 inches in diameter up to 54 inches in diameter.

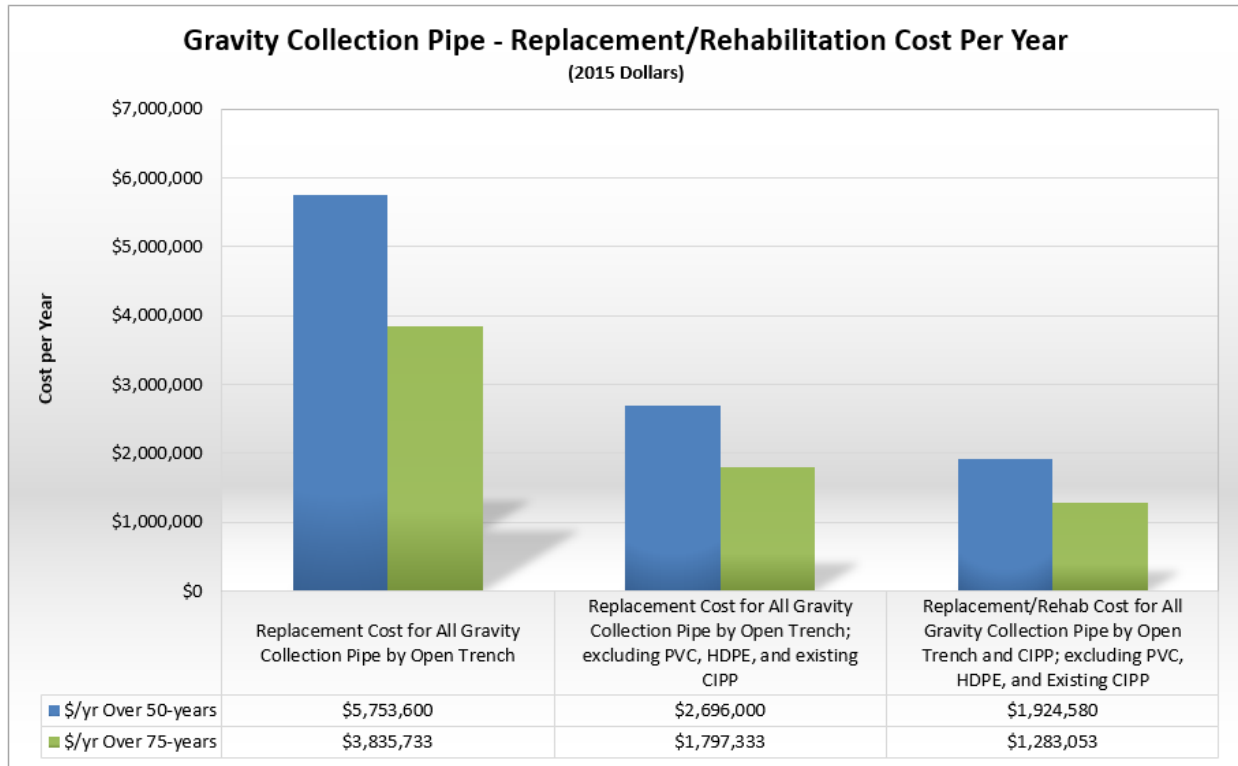
Overall, the existing collection system has adequate capacity to convey current flows through master plan flows as the CIP is implemented. This is evidenced by the relatively few capacity issues within the existing system compared to necessary upgrades to accommodate growth beyond the City's current service limits.

The hydraulic model used in this analysis was created based on land use and zoning conditions at the time of the study, both of which will change over time. Since the models are based on these parameters, it is critical to keep them updated over time to reflect up-to-date conditions. The General Sewer Plan will therefore require periodic updates to remain a current, accurate, and applicable tool in future evaluations. As part of this ongoing maintenance, the Wastewater Utility currently plans to update the Master Plan Model every five to ten years with the assistance of a consultant. Updates may be implemented more frequently if there are significant changes to land use, impact area, collection system, or the rate of development.

Although the hydraulic analysis indicated relatively few capacity issues, the collection system is showing its age and a proactive renewal and replacement program has been developed to address this. A significant effort of this plan was spent prioritizing pipes for replacement and developing a CIP.

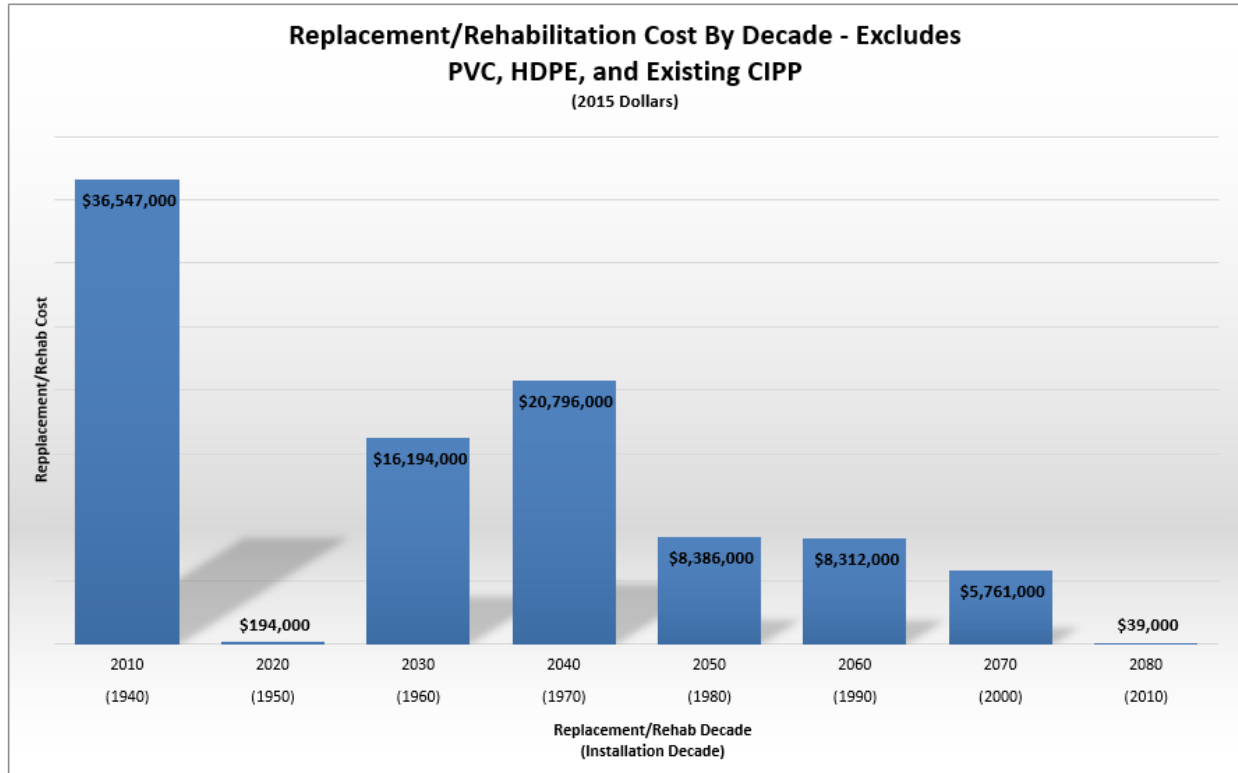
Prioritizing pipes for replacement involves determining which are more likely to fail. For this analysis, the prioritization focused on the City's non-PVC pipe inventory and its useful life. This recommendation assumes that the non-PVC pipe that has not yet been rehabilitated can be rehabilitated/replaced every 75 years with a mixture of trenched replacement and trenchless rehabilitation. This analysis assumes that PVC pipes and any pipes that have recently been rehabilitated will not have to be rehabilitated in the next 75 years. Based on this approach, the City should be budgeting approximately \$1.5 million dollars per year (2015 dollars) for collection system rehabilitation/replacement. A summary of the cost of the various replacement scenarios is depicted in **Figure ES-2**.

Figure ES-2 – Collection System Replacement Cost Analysis



It is worth noting that the above analysis does not take into account the age of the existing pipes. The City has limited data on pipe age; however, an estimate of pipe installation by the decade was developed in order to identify the potential timing of replacement. **Figure ES-3** depicts potential cost of replacement per decade for the next several decades. This assumes a 75-year lifespan for the non-PVC pipe that has not yet been rehabilitated. Because a significant portion of the City was constructed in the 1940s, replacement of a large portion of the City is likely required soon. The City has been aggressively rehabilitating approximately 130,000 LF pipe since 1997 – nonetheless, there is still a significant portion of the aged system remaining. This emphasizes the need for immediate CCTV inspection and condition rating of the system in order to verify if the pipes are in fact near the end of their service life.

Figure ES 3 – Potential Timing of System Replacement Costs



A pipe replacement program was developed to prioritize sewer pipes with the greatest need for replacement each budget year. The prioritization method is composed of two main categories: likelihood of failure (pipe condition) and consequence of failure (risk). The City maintains only a limited amount of data regarding the existing pipes in the system; therefore, several assumptions were made using the existing data as best as possible. Through workshops with City staff, each category and associated criteria were assigned a weighting value to reflect relative importance. These weights are easily modified and will likely be adjusted and fine-tuned over time as the City implements the replacement and rehabilitation program.

Through the development of the pipe scoring criteria, it became evident that the lack of condition rating for the existing pipes was a key piece of information that was missing. Therefore, the CIP includes an intensive survey of the existing pipes in order to determine condition ratings over the course of approximately three years and at a cost of approximately \$0.5 million per year. Once this data is acquired, the City will then be able to update the scoring criteria and re-prioritize replacement projects to determine which projects to focus on for annual renewals/replacements.

ES-4 Capital Improvement Plan Summary

The CIP identifies and describes the improvements necessary to provide service to the future wastewater service area at a suitable level of service and reserve capacity. It also provides an approximate timeline for implementation of these projects. **Table ES-1** lists the CIP projects with recommended action. **Figure A14** shows the location and type



of each project in the CIP. **Appendix I** contains a project summary and associated capital cost for each CIP project. Projects are categorized as follows:

- Capacity Projects: Required to relieve insufficient hydraulic capacity of existing pipes in the near future; funded by connection fees
- System Expansion: Required to serve new areas within the UGA; funded by connection fees
- Collection System Improvements: Required to upgrade existing pipes and lift stations; funded by a mix of connection fees and rates
- Rehabilitation/Replacement: Required to maintain the integrity of the existing system; funded by rates
- WWTP Improvements: Required to improve capacity maintain the integrity of the existing system; funded by a mix of connection fees and rates
- WWTP Rehabilitation and Replacement: Required to maintain the integrity of the existing system; funded by rates
- Developer Driven Projects: Required to expand the collection system within the UGA but timing is unknown; driven by development.



Table ES-1 – CIP Projects

ID	Description/System Name	Recommend Action	Timeframe and Capital Cost										With Growth ⁽¹⁾
			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
Capacity Projects – Funded by Connection Fees													
CP.1	Leslie Rd Trunk Replacement	Replace 18-inch bottleneck section											\$329,000
CP.2	Keene Rd Collector Replacement	Replace 10-inch bottleneck section							\$329,000				
CP.3	Upper North Interceptor Improvements	New lift station and piping to address neighborhood surcharging										\$2,238,000	
CP.4	Bellerive LS Pump Upgrade & Downstream Improvements	New lift station pumps and downstream pipe replacement to address surcharging										\$1,785,000	
System Expansion – Funded by Connection Fees													
SE.1	Leslie Interceptor Extension	Collection system expansion to extend utility service	\$800,000										
Collection System Improvements – Funded by a split of Connection Fees and Rates													
CS.1	Montana Lift Station Standby Generator	Generator installation to operate lift station during power outages	\$40,000										
CS.2	Columbia Lift Station Standby Generator	Generator installation to operate lift station during power outages	\$25,000										
CS.3	Waterfront Lift Station Replacement	Replace deficient lift station			\$608,000								
Rehabilitation and Replacement Projects – Funded by Rates													
RR.1	Renewals and Replacement	10-yr rehabilitation and replacement program based on Condition Assessment	\$250,000	\$258,000	\$1,599,000 ⁽²⁾	\$1,652,000 ⁽²⁾	\$1,705,000 ⁽²⁾	\$1,761,000	\$1,818,000	\$1,878,000	\$1,939,000	\$2,002,000	
RR.2	Annual Street Overlay Areas	Annual repair and replacement of sewer deficiencies in areas scheduled for re-paving	\$100,000	\$103,000	\$107,000	\$110,000	\$114,000	\$117,000	\$121,000	\$125,000	\$129,000	\$133,000	
RR.3	Infiltration and Inflow Study							\$200,000					



ID	Description/System Name	Recommend Action	Timeframe and Capital Cost										With Growth ⁽¹⁾
			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
WWTP Improvements – Funded by Rates/Connection Fees													
WWTP. 1	Influent Upgrades	Influent Upgrades			\$2,133,000								
WWTP. 2	Engineering Report	Re-Rating Study for Design Criteria						\$411,000					
WWTP Rehabilitation and Replacement – Funded by Rates													
WWTP. RR.1	WWTP Renewals and Replacements	General rehabilitation and replacement				\$551,000	\$568,000	\$587,000	\$606,000	\$626,000	\$646,000	\$667,000	
WWTP. RR.2	Plant Wide HVAC Improvements	System improvements to current HVAC equipment	\$290,000										
WWTP. RR.3	Digester Building MCC	Replace obsolete and failing motor control center hardware	\$80,000										
WWTP. RR.4	Primary Clarifier #2 Coating	Recoat primary clarifier #2 to protect from corrosion		\$165,000									
WWTP. RR.5	Digester #1 Tank Coating	Recoat digester #1 tank		\$330,000									
WWTP. RR.6	Secondary Clarifier #2 Coating	Recoat secondary clarifier #2 to protect from corrosion		\$227,000									
WWTP. RR.7	Clarifier Gear Drive Replacements	Replace obsolete and failing gear drive on the clarifier			\$325,000								
WWTP. RR.8	Plant Pump and Piping Replacement	Annual pump and piping maintenance			\$80,000								
Annual Capital Improvement Plan Total													
Yearly Totals			\$1,585,000	\$1,083,000	\$4,852,000	\$2,313,000	\$2,387,000	\$2,876,000	\$3,074,000	\$2,629,000	\$2,714,000	\$6,825,000	

⁽¹⁾ All capital costs are in 2015 dollars.

⁽²⁾ \$500,000 will be allocated to CCTV and Pipe Condition Rating



Table ES-2 – Developer Driven Growth Projects

ID	Description/System Name	Recommend Action	Timeframe and Capital Cost										With Growth ⁽¹⁾	
			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024		
Developer Driven Growth Projects – Projects to serve growth both inside and outside the UGA														
DD.1	Country Ridge Downstream Improvements	Upgrade downstream pipe to provide for future lift station upgrades and additional pumping capacity												\$4,070,000
DD.2	East Badger South Lift Station	Construction required for development within the East Badger South Basin – SRSR CIP #1 (AHL est.)												\$5,500,000
DD.3	West Badger South Lift Station	Construction required for build-out of West Badger South and East Badger South												\$3,180,000
DD.4	Horn Rapids Interceptor Extension	From Kingsgate Sports Complex to Village Pkwy/Construction as required with growth												\$450,000
DD.5	SR 240 Interceptor	From Village Pkwy to Horn Rapids Rd/Construction as required with growth												\$3,214,000
DD.6	600 Area (South) Interceptor	From Battelle Blvd to Horn Rapids Rd & North/Construction as required with growth												\$3,467,000
Developer Driven Growth Project Total														
														\$19,881,000

⁽¹⁾ All capital costs are in 2015 dollars.

ES-5 Budgeting CIP Projects

The CIP recommends a total of approximately \$30.3 million be spent in capital improvements to the Wastewater Utility over the next 10 years. Improvements proposed include those necessary for the renewal and replacement of existing collection system and WWTP infrastructure to continue providing a safe, reliable, and cost-effective public sewer system. Those expansion improvements which are directly related to growth have been identified in the Master Plan but are not included in the CIP budget because they will generally be financed by developers. The extent of the City's participation, if any, would depend on the implementation of capital projects that may coincide with development.

The financial plan discussed in **Chapter 8** was prepared by FCS GROUP to provide a financial program that allows the wastewater utility to remain financially viable during the planning period.

The objective of the financial plan is to identify the total cost of providing sewer service and to present a financial program that allows the sewer utility to remain financially viable during the study period. The analysis considers the historical financial condition of the utility, the financial impact of executing the capital improvement plan (CIP), the sufficiency of utility revenues to meet future financial and policy obligations, and rate affordability.

The financial plan optimizes the capital funding resources as described in this plan. Local resources may include Facilities Fees, Local Facilities Charges, and utility cash reserves. External resources may include Department of Ecology grants and loans, Community Economic Revitalization Board grants and loans, Public Works Board loans, general obligation bonds and revenue bonds.

The results of the analysis indicate that rate increases are necessary to fund ongoing operating needs and the identified capital program. The City is in the process of completing a rate study to determine the annual rate increase strategy to meet the utility's financial obligations. The findings of the forecast for this GSP indicate that a cumulative increase of 21.5 percent meets the sewer utility's requirements through 2020, while remaining well within the affordability threshold.