WATER USE EFFICIENCY PROGRAM

REGIONAL WATER USE EFFICIENCY EFFORTS

Throughout the past 10 years, beginning with the *2005 Interim Regional Water Forecast and Conservation Plan* (RWFCP), the Cities of Kennewick, Pasco, Richland, and West Richland (quad cities) have implemented water conservation plans to ensure that the region has a reliable supply of water and is using water in an efficient manner. The quad cities have been implementing individual WUE programs since 2007 that comply with the DOH WUE Rule.

The original combined WUE goals and objectives of the quad cities, developed in the 2005 RWFCP, have proven to be effective and will continue to be met through implementation of the WUE measures in each city's WUE program. These goals and objectives, as most recently presented in the 2016 RWFCP, are as follows.

- Inform customers of simple, effective water-wise activities.
- Develop a regional marketing campaign.
- Encourage customers to reduce water waste and become more water wise.
- Encourage commercial, industrial, and residential customers to use water wisely.
- Ensure all municipal activities and programs are water wise.
- Encourage wise water use to irrigate large park-like areas.
- Measure the net consumptive water use from the Columbia River.
- Perform a water balance for the region every 6 years as part of each city's water comprehensive plan update.
- Focus the conservation program on using water efficiently.

CITY OF KENNEWICK WATER USE EFFICIENCY PROGRAM

The City's current WUE program elements are summarized in this section.

Planning Requirements and WUE Program Activities

The City's water use data, demand forecasts, and other planning requirements are contained in **Chapter 2** of this Water Comprehensive Plan (WCP). The City is committed to continue collecting water use data beyond that presented in **Chapter 2** for evaluation of its WUE program and water use patterns, and for forecasting demands for future facilities. Consistent with WAC 246-290-810, the WUE program effectiveness will continue to be evaluated within each WCP update.

Recent WUE program activities have involved participation in regional efforts and City-led activities that are presented in the **Selected Measures** section of this chapter.

Water Use Efficiency Goals and the Public Process

Per WAC 246-290-830, WUE goals must be set through a public process and shall be evaluated and reestablished a minimum of every 6 years. The goals and objectives of the City's previous WUE program, which extends to the approval of this WCP, are as follows.

- Maintain annual average demand per capita below 170 gallons per day (gpd), based on the 6-year period between 2008 and 2013.

Results indicate the City is meeting the current WUE goals and objectives as the annual average demand per capita was 132 gpd in 2015. Water consumption per capita has decreased by 12 percent between 2008 (baseline for the City's 2010 WCP) and 2015.

Based on the success the City has had in achieving its DSL goals and objectives, new goals have been proposed to maintain low DSL levels. The proposed WUE goals for the 2016 to 2025 water system planning cycle are as follows.

- Reduce the water demand per capita by 1 percent each year through the 10-year planning period, resulting in an average demand per capita of 119 gpd or lower in 2025.
- Increase awareness among all water users of the value and importance of conserving water, and of the methods available to achieve reductions in water use.

In compliance with the new WUE Rule, a public hearing was held on Month, Day, Year [public hearing to be held during DOH review process. Date in this sentence to be updated once hearing is scheduled], at a City Council meeting to present and discuss the new goals. Background on the City's proposed WUE program, water supply characteristics, water demand forecasts, and other elements were made available 2 weeks prior to the public forum date. The City Council affirmed the new goals on Month, Day, Year.

Water Use Efficiency Program Evaluation and Performance Reporting

The City will continue to evaluate overall demand, per capita water use, and the amount of DSL on an annual basis (coinciding with the production of the Consumer Confidence Report (CCR)). The City will also evaluate the performance of its WUE program and implemented measures at this time by analyzing demand data and determining the long-term trend towards reducing water usage and meeting WUE goals. If the WUE program monitoring shows that progress towards meeting the WUE goals is not being accomplished, more rigorous WUE program implementation or additional WUE program items will be considered, along with a cost-effective evaluation of measures.

The City will continue to provide annual WUE performance reports to its consumers in the CCR, and detail the results of water use monitoring and progress towards achieving the system's WUE goals. A copy of the City's 2015 CCR is included in **Appendix K**. The City will comply with DOH Annual WUE Performance report requirements, due to DOH by July 1st of each year.

EVALUATION AND SELECTION OF WATER USE EFFICIENCY MEASURES

The City's evaluation of WUE measures and selected levels of implementation are presented within this section. The measures fall within three categories of implementation: 1) mandatory measures that must be implemented; 2) measures that must be evaluated; and 3) additional measures selected by the City that either must be evaluated or implemented.

The City served 23,801 water service connections in 2014, which is the base year of the City's WCP. Based on the number of connections, at least nine WUE measures must be evaluated or implemented. Measures that are mandatory cannot be credited towards the system's WUE measures. Since the City implements or plans on implementing all of the evaluated measures presented here, a cost-effective evaluation is not required.

Mandatory Measures

Source Meters

The volume of water produced by the system's sources must be measured using a source meter or other meter installed upstream of the distribution system. Source meters are currently installed and operating at each of the City's sources. The City tests source meters for proper operation on an annual basis, and calibrates the meters if needed. In 2014, the City verified that the source meters at the Ranney collectors and the Kennewick Water Treatment Plant met American Water Works Association standards. Any new sources installed in the future will be equipped with a source meter.

All interties that the City's water system shares with adjacent water systems are also metered. This includes seasonal and emergency interties.

City of Richland – Gage Boulevard	Emergency only, Two-way
City of Richland – Tapteal Drive	Emergency only, Two-way
Kennewick Irrigation District	
Elliot Lake Potable System	Supply, One-way, One location

Service Meters

All public water systems that supply water for municipal purposes must install individual service meters for all water users. Service meters are currently installed and operating at all connections throughout the distribution system. All future connections that are installed or activated will be equipped with a service meter.

Meter Calibration

The City must calibrate and maintain meters based on generally accepted industry standards and manufacturer information. The City has tested all large (2 inches and larger) meters on an annual basis over the last 5 years. As of 2014, 87 large meters were installed in the City's water system. Of the 87 large meters, 83 met the 95 percent or better accuracy target over the three flow ranges (low, medium, and high) used in the tests. Meters not meeting this goal were repaired, replaced, or scheduled for replacement.

The City repairs or replaces small (less than 2 inches) meters if they are discovered to be defective or not properly measuring water use. The City periodically replaces old meters with meters compatible with an automatic read system.

Water Loss Control Action Plan

To control leakage, systems that do not meet the DSL standard must implement a Water Loss Control Action Plan (WLCAP). The City's rolling 3-year average DSL was below 10.0 percent in

2014, based on the 3-year period of 2012 through 2014. Therefore, a WLCAP is not required to be implemented.

Customer Education

Annual customer education regarding the importance of using water efficiently is a required element of all WUE programs. Customer education is provided in each city's annual CCR to customers and includes information on the system's DSL, progress towards meeting WUE goals, and tips for customers on using water more efficiently. Additional customer education and outreach measures are identified in the **Selected Measures** section.

Measures That Must Be Evaluated

Rate Structure

Evaluation of rate structures to increase water demand efficiency is required (WAC 246-290-100(4)(j)(iv)), but actual implementation of a conservation rate structure counts as a WUE measure (WAC 246-290-810(4)(d)). The City's current utility rates are designed to discourage excessive water use, with additional charges applied to customers that use more water than allocated within a base allotment, counting as a WUE measure. The base rate for residential water for customers within the City limits (as of January 1, 2015) was $20.54 in a 2-month billing cycle. Commercial customers within the City limits are billed varying base rates based on service meter size, ranging from $39.71 for ¾-inch meters to $469.03 for 6-inch meters. All customers are billed an additional $1.167 per 100 cubic feet of consumption in the 2-month billing cycle. Commercial customers also receiving sewer service are billed an additional charge for every 100 cubic feet of water consumed in each 2-month billing cycle. The current rate structure is shown in **Table 4-1**.

Table 4-1
Rate Structure

Service Type	Customer Location	
	Inside City Limits	Outside City Limits
Base Fee		
Residential	$20.54	$45.19
Commercial 3/4-inch	$39.71	$87.36
Commercial 1-inch	$59.39	$130.66
Commercial 1 1/2-inch	$105.62	$232.36
Commercial 2-inch	$138.76	$305.27
Commercial 3-inch	$211.39	$465.06
Commercial 4-inch	$310.46	$683.01
Commercial 6-inch	$469.03	$1,031.87
Consumption per 100 Cubic Feet		
All Services	$1.167	$2.567

In 2016, the City is retaining the services of a financial consultant to perform a rate study on all customer classes.

Reclamation Opportunities

Reclaimed water is treated effluent from a wastewater treatment system that is suitable for a direct beneficial use or a controlled use that would not otherwise occur. The use of reclaimed water is regulated under Chapter 90.46 of the Revised Code of Washington (RCW). Water systems with 1,000 or more connections must evaluate reclamation opportunities (WAC 246-290-100(4)(f)(vii)), but actual use of reclaimed water counts as a WUE measure (WAC 246-290-810(4)(d)) or multiple WUE measures if the reclaimed water is used for multiple purposes.

The City has evaluated using reclaimed water based on the existing wastewater treatment plant effluent quality (Class D – Reclaimed Water), but no reclaimed water is currently used within the City's water service area.

Potential reclaimed water users could be the parks and/or school systems. Irrigating the parks and schools with reclaimed water would require significant financial and social backing. No parks or schools are located near the City's wastewater plant. A large amount of additional infrastructure is needed to get the water to the parks or schools, including crossing State Route 397. This would also mandate modifications to the plant to produce Class A water. Public acceptance of the use of reclaimed water in City parks and schools is uncertain.

Based on Ecology's Water Reclamation and Reuse Standards, the only currently feasible use for the City's wastewater treatment plant effluent is flushing of sanitary sewers. The City will continue to evaluate the feasibility of using reclaimed water for sanitary sewer flushing.

Selected Measures

The City has chosen to implement six different WUE measures, many of which are existing measures. For the purposes of water system planning in this document, the City's water billing classes have been combined into four different groups: single-family residential; multi-family residential; commercial/industrial; and municipal/institutional/other. If a single WUE measure is implemented for different customer classes, it counts as multiple WUE measures. Multiplying the nine different WUE measures across the customer classes in which they will be implemented, the City will implement a total of 21 WUE measures, as shown in **Table 4-2**. This exceeds the requirement of nine WUE measures based on the number of service connections.

Plumbing Retrofit Program

The City currently distributes water conservation items to all customer classes, including low flow showerheads, kitchen and bathroom faucet aerators, and toilet dye kits, at no cost to the customers.

Displays at Fairs and Events

The City currently participates in WUE education by providing information on the City website and in educational brochures and displays at the annual Benton-Franklin County Fair. Additionally, Pasco provides educational brochures and displays at the annual Home and Garden Show, which is attended by customers living in the quad cities.

Water Use Audits

The City currently has an audit program for large commercial and industrial users.

School Outreach

Schools within the City are provided WUE education programs presented through partnerships with the Benton-Franklin Health Department and the Franklin Conservation District. These outreach programs helps students and teachers learn about water quality and WUE.

Water Bill Showing Consumption History

The City currently shows consumption history charts and information on water bills for all customer classes.

Table 4-2
WUE Measures

WUE Measure	Implementation Status			
Mandatory WUE Measures				
Source Meters Installed	✓			
Service Meters Installed	✓			
Meter Calibration Compliance	✓			
Water Loss Control Action Plan	Not Applicable			
Customer Education	✓			
WUE Measures That Must Be Evaluated				
Rate Structure	✓			
Reclamation Opportunities	✓			
Selected WUE Measures				
Measure Description	**SF**	**MF**	**CI**	**MEO**
Plumbing Retrofit Program	✓	✓	✓	✓
Displays at Fairs and Events	✓	✓	✓	✓
Water Use Audits			✓	
Rate Structure	✓	✓	✓	✓
School Outreach	✓	✓	✓	✓
Water Bill Showing Consumption History	✓	✓	✓	✓
Total Selected WUE Measures	21			

SF = Single-family Residential
MF = Multi-family Residential
CI = Commerical/Industrial
MEO = Municipal/Institutional/Other

Water Use Efficiency Program Schedule and Budget

The WUE measures described above and selected for implementation by the City are summarized in **Table 4-3** with their corresponding schedule and budget. The successful implementation of this WUE program is expected to achieve the goal of an annual 1-percent reduction in water use per capita through 2025.

Table 4-3
WUE Program Schedule and Budget

WUE Measure	Schedule	Budget
Mandatory WUE Measures		
Source Meters Installed	Ongoing	O&M Funded
Service Meters Installed	Ongoing	O&M Funded
Meter Calibration Compliance	Ongoing	O&M Funded
Water Loss Control Action Plan	Not Applicable	Not Applicable
Customer Education	Ongoing	$2,000/year
WUE Measures That Must Be Evaluated		
Rate Structure	Ongoing	Not Applicable
Reclamation Opportunities	Ongoing	Not Applicable
Selected WUE Measures		
Plumbing Retrofit Program	Ongoing	$2,000/year
Displays at Fairs and Events	Ongoing	Regional Program
Water Use Audits	Ongoing	$2,000/year
Rate Structure	Ongoing	Not Applicable
School Outreach	Ongoing	Regional Program
Water Bill Showing Consumption History	Ongoing	Not Applicable

O&M = operations and maintenance

DISTRIBUTION SYSTEM LEAKAGE

DSL in the City's water system is described and presented in **Chapter 2.** DSL for the last 3 years is as follows, with a current 3-year rolling average of 1.9 percent.

- 2012 DSL: 2.5 percent.
- 2013 DSL: -0.2 percent.
- 2014 DSL: 3.1 percent.

WATER RIGHTS SELF-ASSESSMENT

OVERVIEW

A water right is a legal authorization to use a specified amount of public water for specific beneficial purposes. The water right amount is expressed in terms of instantaneous diversion rate and annual withdrawal volume. Unless water use started before the applicable water code was enacted (1917 for surface water and 1945 for groundwater) and is documented by a water right claim or adjudicated certificate, Washington State law requires users of public water to receive approval from Ecology prior to actual water use. This approval is granted in the form of a water right permit or certificate. However, a state-issued water right is not required for certain uses of groundwater that are exempt from the permitting process, including the use of 5,000 gpd or less for domestic and industrial purposes, unlimited use for stock watering, and irrigation of ½ acre or less of lawn or non-commercial garden.

The process for obtaining a water right involves submitting a water right application that is reviewed by Ecology. If the request is approved, a water right is issued to allow for water use to commence. A water right permit provides permission to construct the necessary wells or diversions, pumps, and pipes to start using water. The water right permit remains in effect until the permit holder determines that their project is complete and they have used as much water as they will under the water right. At that time, the permit holder files a proof of appropriation form, which attests to the rate and volume of water used under the water right. A water right certificate is issued by Ecology following a proof of examination and determination that the amount of water put to beneficial use is consistent with the amount and conditions indicated on the water right permit.

A water right permit can only be issued by Ecology if the proposed use meets the following requirements.

- Water will be put to beneficial use.
- There will be no impairment to existing or senior rights.
- Water is physically and legally available for appropriation.
- Issuance of the requested water right will not be detrimental to the public interest.

During preparation of the report of examination, Ecology considers existing basin management plans, stream closures, minimum instream flows, hydraulic continuity (surface water interconnected to groundwater), utilization of existing water sources, water conservation, and availability of alternative water supplies, among other things. The water right decision process is increasingly becoming more complex and time consuming, due to the many competing interests for water, environmental issues, and regulatory requirements.

MUNICIPAL WATER LAW

The 2003 MWL (Second Engrossed Second Substitute House Bill 1338; Chapter 5, Laws of 2003; 58th Legislature; 2003 1st Special Session; Municipal Water Supply – Efficiency Requirements) clarified many outstanding questions related to water rights used to supply many water systems. The MWL clarified the definition of what use constitutes a municipal water right and who is a municipal water supplier. The MWL allowed changes to the water right place of use to occur via the approval

of the service area by DOH, as opposed to the previous method of the water right change application process with Ecology. The MWL states that the inchoate (unused) portion of a municipal water supply water right is in good standing if the original water right certificate was issued based on the administrative policy of requiring the pumps and pipes to be in place, but not requiring there to be actual beneficial use. This law was the subject of a lawsuit that questioned the constitutionality of portions of the law; however, on October 28, 2010, the Washington State Supreme Court unanimously ruled that all parts of the MWL are constitutional.

Ecology reissued Water Resources Program Policy 2030 in May 2012 that addressed the implementation of the MWL. This policy document was used to assist with determining if the City's water rights qualify as being for municipal water supply purposes.

Using the definitions provided by the MWL, it has been determined that all water rights held by the City are for municipal water supply purposes, as defined under RCW 90.03.015(4), since the water rights are used to serve 15 or more residential connections or are for governmental or governmental proprietary purposes. Since the water rights are for municipal water supply purposes, that makes the City a municipal water supplier as defined under RCW 90.03.015(3).

EXISTING POTABLE WATER RIGHTS

For its potable municipal supply system, the City currently utilizes one surface water certificate, four groundwater certificates, and one surface water permit. A summary of the City's water right information is presented below and in **Table 4-4**. Copies of the City's certificates and permits are included in **Appendix M**.

Table 4-4
Existing Potable Water Rights

Water Right	Document	Use	Source	Instantaneous Rate (gpm)			Annual Volume (afy)		
				Additive	Non-additive	Total	Additive	Non-additive	Total
GWC 93-D	Certificate	Municipal	WTP; Ranney Collector No. 5	400	0	400	70	0	70
GWC 94-D	Certificate	Municipal	WTP; Ranney Collector No. 5	1,000	0	1,000	450	0	450
GWC 1805-A	Certificate	Municipal	Ranney Collector Nos. 1, 2, and 3	4,950	0	4,950	4,800	0	4,800
GWC 3897-A	Certificate	Municipal	Ranney Collector Nos. 4 and 5	13,500	0	13,500	5,600	0	5,600
S4-25479C	Certificate	Municipal	WTP	25,000	0	25,000	5,280	10,400	15,680
S4-30976P[1] (Phase 1)	Permit	Municipal	WTP; Ranney Collector Nos. 4 and 5; Columbia Park Wells	1,122	0	1,122	1,806.75	0	1,806.75
			Water Right Total	**45,972**			**18,006.75**		

Notes:
(1) S4-30976P is jointly held by the Cities of Kennewick, Richland, Pasco, and West Richland. The first phase of 10 cfs (4,488 gpm) and 7,227 afy was the portion authorized to be utilized by the cities for municipal supply until additional mitigation can be secured to access future phases of the water right. The entire water right, of which one quarter is owned by the City, is equal to 178 cfs and 96,619 afy.

WTP = Water Treatment Plant
gpm = gallons per minute
cfs = cubic feet per second
afy = acre-feet per year

Ground Water Certificate 93-D

Pacific Power & Light Company filed Declaration 131 on February 27, 1946, to get pre-code groundwater use recognized. The information contained within this declaration was certificated by the Washington State Department of Conservation and Development (predecessor to Ecology). Ground Water Certificate (GWC) 93-D was issued to Pacific Power & Light Company, recognizing the use of water for municipal and domestic use within the Town of Kennewick, Benton County, Washington from a well located in Lot 2, Block 5 of Layton's Addition, with a priority date of November 4, 1944. The recognized rates were 400 gallons per minute (gpm) and 70 acre-feet per year (afy).

On July 9, 2012, the Benton County Water Conservancy Board (BCWCB) received an application for change from the City of Kennewick on GWC 93-D, which was assigned tracking number BENT-12-03 by the BCWCB and CG4-GWC093-D by Ecology. The change application requested to change the point of withdrawal to the aquifer storage and recovery (ASR) well. On October 1, 2012, the BCWCB approved the change as requested. On December 20, 2012, Ecology issued an order reversing the BCWCB decision and denying the change application. The reason for the denial included that the original point of withdrawal appeared to be completed in the Saddle Mountain Aquifer, while the ASR well is completed in the deeper Wanapum Formation, which in this area was considered to be a different body of public groundwater. Insufficient information was included to allow Ecology to make a tentative determination on the extent and validity of the water right; the impairment analysis was incomplete, which would not allow Ecology to come to a conclusion, and there were other technical deficiencies. The denial was appealed. The appeal was assigned Pollution Control Hearings Board (PCHB) Case No. 13-009. A settlement agreement was reached between the parties; in response, Ecology issued an order on October 3, 2013, that modified the original BCWCB decision and superseded the prior Ecology denial.

The current attributes of this certificate are that it is held by the City of Kennewick, with a priority date of November 4, 1944, for municipal and domestic use, year round, at rates of 400 gpm and 70 afy (22,809,570 gallons per year), with points of withdrawal/diversion that include the original Layton's Addition Well No. 1 in Section 6, Township 8 North, Range 30 East W.M. (no longer in use), the surface water treatment plant in Section 31, Township 9 North, Range 30 East W.M., and Ranney Well No. 5 located in Government Lots 1 and 2, Section 35, Township 9 North, Range 29 East W.M.

Ground Water Certificate 94-D

Pacific Power & Light Company filed declaration 132 on February 27, 1946, to get pre-code groundwater use recognized. The information contained within this declaration was certificated by the Washington State Department of Conservation and Development. GWC 94-D was issued to Pacific Power & Light Company recognizing the use of water for municipal supply within the Town of Kennewick, Benton County, Washington from a well located in Lot 6, Block 5 of Layton's Addition, with a priority date of March 19, 1945. The recognized rates were 1,000 gpm and 450 afy.

On July 9, 2012, the BCWCB received an application for change from the City of Kennewick on GWC 94-D, which was assigned tracking number BENT-12-04 by the BCWCB and CG4-GWC094-D by Ecology. The change application requested to change the point of withdrawal to the ASR well. On October 1, 2012, the BCWCB approved the change as requested. On December 20, 2012, Ecology issued an order reversing the BCWCB decision and denying the change application. The reason for the denial included that the original point of withdrawal

appeared to be completed in the Saddle Mountain Aquifer, while the ASR well is completed in the deeper Wanapum Formation, which was considered to be a different body of public groundwater. Insufficient information was included to allow Ecology to make a tentative determination on the extent and validity of the water right; the impairment analysis was incomplete, which would not allow Ecology to come to a conclusion, and there were other technical deficiencies. The denial was appealed. The appeal was assigned PCHB Case No. 13-010. A settlement agreement was reached between the parties; in response, Ecology issued an order on October 3, 2013, that modified the original BCWCB decision and superseded the prior Ecology denial.

The current attributes of this certificate are that it is held by the City of Kennewick, with a priority date of November 4, 1944, for municipal and domestic use, year round, at rates of 1,000 gpm and 450 afy (146,632,950 gallons per year), with points of withdrawal/diversion that include the original Layton's Addition Well No. 2 in Section 6, Township 8 North, Range 30 East W.M. (no longer in use), the surface water treatment plant in Section 31, Township 9 North, Range 30 East W.M., and Ranney Well No. 5 located in Government Lots 1 and 2, Section 35, Township 9 North, Range 29 East W.M.

Ground Water Certificate 1805-A

This groundwater certificate has been held by the City from application through certification.

The current attributes of this certificate are that it is held by the City of Kennewick, with a priority date of February 23, 1950, for municipal water supply, year round, at rate of 4,950 gpm and 4,800 afy (1,564,084,800 gallons per year), with four wells and an infiltration trench located in Government Lot 2, Section 31, Township 9 North, Range 30 East W.M.

The City facilities that correlate with the point of withdrawal location include Ranney Well Nos. 1, 2, and 3.

Ground Water Certificate 3897-A

This groundwater certificate has been held by the City from application through certification.

The current attributes of this certificate are that it is held by the City of Kennewick, with a priority date of February 27, 1957, for municipal water supply, year round, at rate of 13,500 gpm and 5,600 afy (1,824,765,600 gallons per year), with two horizontal collectors (Ranney Wells) located in Government Lot 1, Section 35, Township 9 North, Range 29 East W.M.

The City facilities that correlate with the point of withdrawal location include Ranney Well Nos. 4 and 5.

Surface Water Certificate S4-25479C

This surface water certificate has been held by the City from application through certification.

The current attributes of this certificate are that it is held by the City of Kennewick, with a priority date of April 10, 1977, for municipal water supply, year round, at rate of 55.7 cubic feet per second (25,000 gpm) and 15,680 afy (5,109,343,680 gallons per year), from the Columbia River in the SE ¼ Section 31, Township 9 North, Range 30 East W.M., which is consistent with the location of the City's surface water treatment plant.

The certificate contains a provision that states:

> A total of 10,400 acre-feet per year has been granted under previous certificate; therefore, 5,280 acre-feet per year of the total allowed under this certificate will be a primary right; 10,400 acre-feet per year will be a supplemental supply and may be used in conjunction with, or as an alternate supply, to the existing rights so long as the total annual quantity from all sources does not exceed 15,680 acre-feet per year.

The volume identified as being granted under previous certificates, 10,400 afy, is the sum of the annual volumes allocated under GWC 1805-A and GWC 3897-A held by the City, which allow for withdrawal from Ranney Collector Nos. 1, 2, 3, 4, and 5. Based on our interpretation of the use of supplemental supply in this provision, combined with the guidance provided in Ecology Water Resources Program Policy 1040, it has been determined that this water right is partially additive and partially alternate to GWC 1085-A and GWC 3897-A. The rates that are additive, under this water right, include the entire instantaneous rate of 55.7 cubic feet per second (cfs) and 5,280 afy (1,720,493,280 gallons per year) of the annual volume granted. So, under this water right the City has the option to divert the entire 15,680 afy from the Columbia River, which would not allow any water to be withdrawn from the Ranney Collectors under GWC 1805-A and GWC 3897-A, or it can elect to divert 5,280 afy from the Columbia River at the surface water treatment plant, which would allow the full water rights under GWC 1805-A and GWC 3897-A to be withdrawn from the Ranney Collectors, or it can opt for any ratio between those two end points.

The additive annual volume of 5,280 afy is considered to be a portion of the volume of water reserved by the adoption of the John Day/McNary Basin Plan, Chapter 173-531 WAC, which is now Chapter 173-531A WAC.

The City facilities that correlate with the point of diversion location include the City water treatment plant, which diverts water directly from the Columbia River.

Surface Water Permit S4-30976P

The Cities of Kennewick, Richland, Pasco, and West Richland jointly applied for and were granted a surface water right. This new water right was assigned tracking number S4-30976. The permit has a priority date of September 23, 1991, and was issued for 178 cfs and 96,619 afy for municipal supply. The City diverts its portion of the permit from the Kennewick Filter Plant, Ranney Wells, and Army Corps of Engineers (COE) – Columbia Park facilities.

This permit was issued on September 15, 2003, and is commonly referred to as the Quad Cities Permit. This permit was the first municipal water right issued from the Columbia River after a long moratorium. The permit has extensive provisions and mitigation requirements, which included the creation of the Regional Water Forecast and Conservation Plan by the quad cities (**Appendix N**).

In order to mitigate low-flow conditions on the Columbia River, Ecology required that the consumptive use under the permit be mitigated when actual river discharge dropped below identified levels. Ecology also specified that the cities' access to water under the permit would be contingent upon there being sufficient mitigation available. For this reason, the permit is designed to be issued in phases, up to the maximum rates of 178 cfs and 96,619 afy. The first phase was issued for 10 cfs and 7,227 afy and assigned a priority date of June 24, 1980, pursuant to WAC 173-531A-050(3). For the first phase, the City's portion was 2.5 cfs and 1,806.75 afy (588,731,294 gallons per year). See the 2014 RWFCP for more details on this permit.

Potable Supply System Conclusions

Since these water rights are all for municipal water supply purposes, the place of use for the water rights are automatically the service area described in this WCP.

The water right certificates and permits for the potable distribution system are included in **Appendix M**. Water Right Self-Assessment Forms for existing, 6-year, 10-year, and 20-year forecasted use are included in **Appendix O**. The basis for the demand projections and analyses in other chapters of this WCP utilize actual 2015 supply data. The Water Right Self-Assessment Forms were prepared in early 2016 prior to inclusion of year-end 2015 data, and are based on projected 2015 supply and demand data. The actual 2015 ADD was calculated to be less than the previously projected ADD used as the basis for the existing and future Water Right Self-Assessment Forms. Since the demand projections and the analyses in other chapters utilize actual 2015 data, the consumption data presented in the existing and future Water Right Self-Assessment Forms is more conservative than what would be calculated based on actual 2015 demands.

NEW WATER RIGHT APPLICATIONS

The City owns, either in whole or in part, portions of three water right applications that are pending before Ecology. One application requests a new surface water right; the other two applications (one groundwater and one reservoir) are associated with the City's ASR project at the Southridge site.

S4-33044(B)A

The City, in conjunction with the Cities of Richland, Pasco, and West Richland, applied for a new joint water right from the Columbia River that was assigned tracking number S4-33044. The water right application has a priority date of November 28, 2011, and requested 165 cfs and 86,983 afy for municipal supply. The City requested to divert its portion from the Kennewick Filter Plant, Ranney Wells, and Army COE – Columbia Park. The instantaneous rate and annual volume requested are equal to the amount of municipal water remaining under S4-30976P beyond the rates that the cities were promised would be mitigated by Ecology in the 2011 Memorandum of Agreement (MOA). The water right was filed to take advantage of the water that was made available for municipal and industrial use through Ecology's Office of Columbia River, Lake Roosevelt Incremental Storage Release Program. Under this program, any entity receiving a water right is required to pay Ecology $35 per acre-foot per year for the life of the water right to offset the costs of developing the supply.

On October 16, 2015, the four cities requested that Ecology administratively split the application such that the City of Pasco was assigned 6.9 cfs and 5,000 afy under the (A) portion of the application, and the four cities were left with 158.1 cfs and 81,983 afy under the (B) portion of the application. This split was necessary since the City of Pasco needs to proceed with having the application processed in order to acquire additional water rights to meet demand beyond its existing water rights.

Ecology has not yet made a final determination on either the (A) or (B) portions of this application.

R4-35237A

The City applied for this reservoir application to store water in the subsurface under an ASR project at the Southridge site. The application was filed based on item 5a in the "Kennewick Underground Artificial (Aquifer) Storage and Recovery (ASR) Project Development Memorandum of

Understanding" (MOU) that was signed between the City and Ecology in January 2008 (**Appendix P**).

The application has a priority date of May 15, 2009, and requests to recharge at a rate of up to 900 gpm to store up to 714 acre-feet (232,657,614 gallons) in the Columbia River Basalt Aquifer System from a well or wells located in SE ¼ Section 17, Township 8 North, Range 29 East W.M. Recharge was proposed to occur between the period of October 15th to June 15th, with extraction occurring during the summer months for municipal supply.

On October 8, 2009, a preliminary permit was issued to the City to drill a test well to assess the feasibility of ASR under this application. This preliminary permit was in effect through September 30, 2010.

On March 14, 2011, a preliminary permit was issued to the City to drill a test well and conduct aquifer testing to assess the feasibility of ASR under this application. This preliminary permit was in effect through March 1, 2013.

On February 10, 2014, a preliminary permit was issued to the City to conduct recharge and recovery testing as part of the completion of construction of infrastructure related to ASR under this reservoir application. This preliminary permit was in effect through January 1, 2015. The target reservoir was identified as the Priest Rapids Member of the Wanapum Basalt Formation within the Columbia River Basalt Aquifer System.

On March 14, 2014, a preliminary permit was issued to the City to conduct recharge and recovery testing as part of the pilot testing for ASR under the reservoir application. This preliminary permit covered activities through January 1, 2015.

On July 1, 2014, a temporary authorization for the beneficial use of water for municipal supply under reservoir application no. R4-35237 was issued to the City. This temporary permit covered operation of the ASR project from July 1, 2014 through October 15, 2015. This temporary permit placed stipulations on the source of the water being injected, when water could be injected and retrieved, the rates at which water could be injected and retrieved, what monitoring needed to be performed during the testing, and what information had to be reported to Ecology.

On April 3, 2015, a temporary authorization for the beneficial use of water for municipal supply under reservoir application no. R4-35237 was issued to the City. This temporary permit covered operation of the ASR project from April 3, 2015 through January 1, 2016. This temporary permit placed stipulations on the source of the water being injected, when water could be injected and retrieved, the rates at which water could be injected and retrieved, the duration of storage between recharge and recovery, what monitoring needed to be performed during the testing, and what information had to be reported to Ecology.

Under the preliminary and temporary permits, the City has installed an ASR well (ASR-1) and an observation well. Pumping tests have been performed on the ASR well to obtain information about the aquifer properties, including the transmissivity of the aquifer and the storage coefficient. Treated water from the City's system has been used to recharge the aquifer and has been recovered using the ASR well. Starting in 2015, the water that is recovered from the ASR well is now able to be utilized for meeting demand within the water system.

In 2015, the City recharged approximately 243 acre-feet of water from the ASR well and withdrew 192 acre-feet after a storage period. The difference between the water added and withdrawn was 51 acre-feet. Unfortunately, for the City, the 51 acre-feet is counted against its existing water rights,

but could not be used. If the recovery percentage is too low, it will reduce the usefulness of the ASR project as a source of supply, as the non-recoverable water will become a new demand on the water system.

According to the 2008 MOU, the City may need to donate a perfected portion of S4-25479C to the Trust Water Right Program to be managed by Ecology consistent with the Columbia River Program, once the ASR project is fully permitted. Donation of this portion of an existing water right to trust will reduce the ability of the City to divert that water directly from the Columbia River. It is currently unknown how large the donation will need to be. In the MOU, Ecology indicated that it planned on using its portion of that trust water right to satisfy the mitigation requirements under the first phase of the Quad Cities Permit (S4-30976). Since the first phase has already been fully mitigated by Ecology, the City is unsure what Ecology would do with this trust water right now.

Ecology has not yet made a final determination on this reservoir (ASR) application.

G4-35338A

The City applied for this groundwater right from the same well that is to be used as part of a new ASR project at the Southridge site. The application was filed based on item 5c in the "Kennewick Underground Artificial (Aquifer) Storage and Recovery (ASR) Project Development Memorandum of Understanding" that was signed between the City and Ecology in January 2008 (**Appendix P**).

The application has a priority date of June 1, 2010, and requests 2,500 gpm from a well located in the NE ¼ SE ¼ Section 17, Township 8 North, Range 29 East W.M. The name of this well is ASR-1. This application is intended to balance the City's pre-ASR and post-ASR water right portfolio in the event that the ASR project is approved, which will require the City to place a portion of its existing perfected surface water rights into the Trust Water Rights Program. The annual volume that could be granted will match the volume placed into the Trust Water Rights Program.

Ecology has not yet made a final determination on this groundwater application.

NON-POTABLE WATER RIGHTS HELD BY THE CITY

The City holds and utilizes one water right that is not connected to its potable system.

G4-29926C

This water right has a priority date of February 9, 1989 and was originally applied for and issued to Cascade Columbia Foods, Ltd. The source of water is a basalt well located within the place of use. It was issued for the purpose of industrial vegetable washing with disposal to a spray field with an area of approximately 2 acres. In 2005, the place of use was obtained by the City and is now occupied by the City of Kennewick Frost Municipal Building. The water right certificate was issued to the City on July 13, 2011, for irrigation of 1.6 acres, during the period of April 1st through December 31st, at rates of 100 gpm and 7.2 afy (2,346,127 gallons per year).

Since this irrigation system is separate from the regional municipal system, the water right and irrigation use will not be considered farther in this WCP.

POTABLE WATER SUPPLY EVALUATION

An evaluation of the City's existing water rights was performed to determine the sufficiency of the water rights to meet both existing and future water demands. **Table 4-5** compares the combined maximum instantaneous water right amounts of the sources with the peak day demand of the system, and the combined maximum annual water right amounts of the sources with the average day demand of the system. As shown in the table, the City has sufficient water rights (both instantaneous and annual amounts) to meet the demands of its existing customers.

Table 4-5
Existing Potable Water Rights Evaluation

Description	Instantaneous Rights / Maximum Day Demand	Annual Rights / Average Day Demand	
	(gpm)	(acre-feet)	(gpm)
Total Water Rights	45,972	18,007	11,163
Existing (2015) Water Demand	14,311	12,308	7,630
Surplus (or Deficient) Rights	**31,661**	**5,699**	**3,533**

Table 4-6 summarizes the results of the future water rights evaluation, which compares the water rights of the existing sources with the system's future 6-year, 10-year, and 20-year demand projections. The analysis considered future demand projections with and without water use reductions from the City's planned WUE efforts, as shown in the table. The results of the future water rights evaluation indicate the City has sufficient water rights to meet the demands through the year 2035.

Table 4-6
Future Potable Water Rights Evaluation

Description	Instantaneous Rights / Maximum Day Demand (gpm)	Annual Rights / Average Day Demand (acre-feet)	Annual Rights / Average Day Demand (gpm)
Year 2021 (+6 years) Without Conservation			
Total Water Rights	45,972	18,007	11,163
Projected Water Demand	15,490	13,323	8,259
Surplus (or Deficient) Rights	**30,482**	**4,684**	**2,904**
Year 2025 (+10 years) Without Conservation			
Total Water Rights	45,972	18,007	11,163
Projected Water Demand	16,419	14,121	8,754
Surplus (or Deficient) Rights	**29,553**	**3,886**	**2,409**
Year 2035 (+20 years) Without Conservation			
Total Water Rights	45,972	18,007	11,163
Projected Water Demand	18,808	16,175	10,028
Surplus (or Deficient) Rights	**27,164**	**1,831**	**1,135**
Year 2021 (+6 years) With Conservation			
Total Water Rights	45,972	18,007	11,163
Projected Water Demand	14,804	12,732	7,894
Surplus (or Deficient) Rights	**31,168**	**5,274**	**3,270**
Year 2025 (+10 years) With Conservation			
Total Water Rights	45,972	18,007	11,163
Projected Water Demand	15,073	12,964	8,037
Surplus (or Deficient) Rights	**30,899**	**5,043**	**3,126**
Year 2035 (+20 years) With Conservation			
Total Water Rights	45,972	18,007	11,163
Projected Water Demand	17,266	14,850	9,206
Surplus (or Deficient) Rights	**28,706**	**3,157**	**1,957**

WATER RIGHT RECOMMENDATIONS

Although the City has sufficient water rights to supply the water system through 2035 and beyond, some administrative paperwork and facility improvements are necessary to fully utilize the City's existing water rights.

A water right change application should be prepared to change the points of withdrawal to GWC 1805-A since Ranney Well Nos. 1, 2, and 3 are no longer used. It is recommended that the City change the points of withdrawal to Ranney Well Nos. 4 and 5. This water right change should not be controversial and will remedy the 2015 issue of exceeding the annual volume from these two Ranney Wells. Even though the annual volume granted under GWC 1805-A can be diverted from the Columbia River at the City's treatment plant under S4-25479C, the instantaneous rate authorized under GWC 1805-A cannot be utilized to meet demand unless the point of withdrawal is changed to include a new source.

On certificate S4-25479C, a request should be made to Ecology to strike the metes and bounds description of the diversion provided under the "Approximate Location of Diversion-Withdrawal" in the water right file since it is not located in the correct quarter section referenced and does not match the actual location of the point of diversion. This language appears to be left over from the originally conceived diversion location, which was changed long ago by Ecology through a water right change process.

Continue pilot testing of the Southridge ASR facility. Discuss the 2008 MOU trust water right donation implications of fully permitting this project with Ecology.

Work jointly with the Cities of Richland, Pasco, and West Richland to identify opportunities for obtaining water rights that can be used as mitigation under permit G4-30976P.

WATER SUPPLY RELIABILITY ANALYSIS

SOURCE OF SUPPLY ANALYSIS

The City's existing active sources include Ranney Well Nos. 4 and 5, and the City's Columbia River surface water treatment plant, which have adequate capacity to meet the existing, 6-year (2021), and 10-year (2025) demand requirements of the water system. Additional source capacity is needed to meet the projected demands beyond 2025. The City is currently performing ongoing testing of an ASR well, which would provide the water system sufficient source capacity beyond the 10-year (2025) planning period. The City is planning to evaluate an expansion of the Columbia River water treatment plant to meet the projected 20-year (2035) source capacity requirements.